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- Mr. J. Weston..... A specimen of *Belostoma* — ?

## ERRATA.

### TRANSACTIONS.

- Page 34, line 12 from top, for "*Helocypris*," read "*Halocypris*."
- „ 44 „ 1 „ for "*in*," read "*on*."
- „ „ „ 17 „ for "*punctata*," read "*punctato*."
- „ 45 „ 13 „ dele (Pl. XVI. fig. 3).
- „ „ „ 22 „ after "*Serixia modesta*," add "*(Pl. XVI. fig. 3)*."
- „ 47 „ 2 „ for "*corrugatá*," read "*corrugato*."
- „ 50, in description of the figures, Pl. XVI., for "*Serixia apicalis*," read "*Serixia modesta*."
- „ 95, line 6 from top, for "*lateral*," read "*last*."
- „ 102 „ 13 „ for "*fascia*," read "*fasciæ*."
- „ 104 „ 13 „ for "*atro-maculatá vel lineatá*," read "*atro-maculato vel lineato*."
- „ 108 „ 11 „ for "*ionoptera*," read "*ioptera*."
- „ 109 „ 18 „ for "*evidently*," read "*probably*."
- „ 239 „ 3 from bottom, for "*viridi-luteus*," read "*viridi-luteis*."
- „ 248 „ 7 from top, after "*Ropica piperata*," add "*(Pl. XXVI. fig. 4)*."
- „ „ „ 15 „ after "*Ropica posticalis*," omit "*(Pl. XXVI. fig. 4)*."
- „ 256 „ 2 from bottom, for "*excepto*," read "*exceptá*."
- „ 264 „ 2 from top, for "*post-sternal*," read "*meso-sternal*."
- „ 266 „ 4 „ for "*(Pl. XXII. fig. 6)*" read "*(Pl. XXVI. fig. 6)*."
- „ „ in Description of the Figures, Pl. XXVI. fig. 4, instead of "*Ropica posticalis*," read "*Ropica piperata* ; and at fig. 5, instead of "*Phlyarus basalis*," read "*Dorcasta crassicornis*."

### JOURNAL OF PROCEEDINGS.

- Page 13, line 11 from bottom, for "*third*," read "*first*."
- „ 69 „ 3 „ for "*Baley and Lomback*," read "*Bali and Lom-  
bock*."
- „ 97 „ 6 „ for "*brachypterus*," read "*trachypterus*."
- „ „ „ 24 „ for "*brachypterus*," read "*trachypterus*."

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OF

**THE ENTOMOLOGICAL SOCIETY**

OF LONDON,

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TRANSACTIONS  
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I. *Descriptions of the Species of the Australian Lamellicorn Genus Cryptodus.* By J. O. WESTWOOD, Esq., F.L.S., &c.

[Read 7th January, 1856.]

THE interest always attached to anomalous forms will doubtless be considered a sufficient reason for my troubling the Society with the following descriptions of the species of the genus *Cryptodus* of Mac Leay, belonging to the Lamellicorn *Coleoptera*, and which has been well observed to be the most singular of all the Petalocerous groups, as may, indeed, be easily imagined from its having been arranged in the several families *Trogidæ*, *Cetoniidæ* and *Dynastidæ*, to which last-named group it appears to me unquestionably to belong, as I have endeavoured to prove in an article published in the fourth volume of the first series of our Transactions (p. 19). The genus was founded upon a single species significantly named *Cr. paradoxus* by Mac Leay; and in the memoir above referred to I added a second species, differing from the type in the number of the joints of its antennæ (*C. Tasmannianus*, op. cit. p. 21). Short descriptions were subsequently published by Dr. Germar of two more species; and I have now the pleasure to describe several additional species.

2 Mr. J. O. Westwood's *Descriptions of the Species*

Section A. Antennæ 9-articulatæ. Ungues pedum anticorum in mare simplices, æquales. (*Cryptodus* stricte sic dictus.)

Sp. 1. *Cryptodus paradoxus*, Mac L.

"C. ater, punctis impressis, scaber, capite bituberculato, elytris inter strias elevatas punctis excavatis, cum aliis minutissimis ornatis." Mac. L.

Habitat in Australasia. Mus. D. Mac Leay.

The above is the whole of Mr. Mac Leay's description of this species, so that we are unable to determine satisfactorily whether it is identical with the following insect, with which, however, the peculiar punctuation of the elytra, as described by Mac Leay, exactly corresponds.

Sp. 2. *Cryptodus variolosus*, White. (Pl. I. fig. 1.)

"C. convexus, fuscus, varioloso-punctatus, capite distinctius bituberculato, elytris obsolete tricostratis dense varioloso-punctatis." Mas et fem. Burm.

Long. corp. lin. 8—9.

Habitat in Australia. Mus. Brit. Hope, Saunders, &c.

*Cr. variolosus*, White in Gray's Journ., ii. 460.

*Cr. paradoxus*? Westwood in Trans. Ent. Soc. ser. 1, vol. iv. p. 22, tab. 2, fig. 1 z.

*Cr. paradoxus*, Burmeister, Handb. d. Ent. v. 145.

The obscure brown colour of this insect seems to indicate it as specifically distinct from Mr. Mac Leay's species above noticed; the peculiar punctuation of the elytra, namely, variolose dots, with very minute punctures interspersed, is a peculiar character of the insect before us, and agrees with Mac Leay's description. The short broad subdepressed form of the body, the large subquadrate head, the legs destitute of hairs, the 9-jointed antennæ with a large obconic basal joint, and the two spines at the base of the mentum, are also distinctive characters.

Sp. 3. *Cryptodus piceus*, Germ. (Pl. I. fig. 2.)

"C. mento basi emarginato, antennis 9-articulatis, piceus, thorace lateribus rotundato, confertim grosse punctato postice profunde canaliculato, elytris convexioribus, grosse punctatis, dorso subsulcatis." Germ.

Long. corp. lin. 7½.

Habitat Adelaida, Novæ Hollandiæ.

*Cryptodus piceus*, Germ. in Linn. Ent. iii. p. 190.



The small rounded head, the very convex prothorax and elytra, and the chesnut colour, at once distinguish the insects which I have received from Adelaide, and regard as belonging to this species of Germar, from the preceding insect with which they agree in their 9-jointed antennæ, and in having the base of the mentum bituberculated ("mentum latum confertim punctatum, basi emarginatum," is Germar's description of this organ); the basal joint of the antennæ is gradually dilated to the apex, which has the outer angle rounded. The sides of the prothorax are rounded, but the base is considerably wider than the anterior part (contrary to the description of Germar—"basi et apice fere æqualiter angustatis.") The suture and three costæ on each elytron are slightly elevated, each being margined with a slight sulcation, in which is a row of punctures, the interstices being also subsulcated with rows of irregular punctures, nearly agreeing in size with those of the sulci at the sides of the costæ. This character disagrees with Germar's description—"elytrorum punctis grossis seriatim digestis, approximatis, interstitiis in dorso convexiusculis subtiliter et remote seriatim punctatis." Notwithstanding this disagreement, I consider my Adelaide specimens to be identical with Germar's *C. piceus*; but should future discoveries prove them to be distinct, the specific name *C. convexicollis* would well indicate the insect represented in Plate I. fig. 2.

One specimen received from Adelaide is about two-thirds of a line longer than that figured in Plate I.; it is also somewhat more glossy and convex, with stronger punctures on the prothorax and elytra; the latter with the three costæ on the elytra not so well defined; the abdomen beneath without impressed lines, and the sides of the prothorax narrowed from the middle to the hind angles, making this part of the body more rounded, and thus more nearly agreeing with Germar's description.

Section B. Antennæ 10-articulatæ. Ungues pedum anticorum in mare inæquales, uno intus bifido.

a. Prothorax antice haud tuberculo armatus. Elytra parum aut vix sulcata. (Subgenus, *Cryptodinus*, Westw.)

Sp. 4. *Cryptodus Tasmannianus*, Westw. (Pl. I. fig. 3.)

Subdepressus, niger, nitidus, punctatus, capite obsoletius bituberculato; elytris obsolete tricostatis sparsius variolosopunctatis, mento basi truncato, articulo basali antennarum angusto.

Long. corp. lin. 9—10.

Habitat in Terra Van Diemenii. Mus. Westw. &c.

*Cryptodus Tasmannianus*, Westw. Trans. Ent. Soc. ser. 1, p. 21, pl. 2, fig. 1, and details; and Proc. Ent. Soc. 5 July, 1841; Burmeister, Handb. d. Ent. v. p. 144.

*Cryptodus anthracinus*, Erichson in Wiegmann, Arch. 1842, i. p. 161.

The brilliant jet black colour of this species is very characteristic of it. The accompanying figure represents a specimen of the ordinary size and form; there seems, however, to be considerable difference in these respects in different individuals. Thus Mr. Saunders possesses a specimen only nine and a half lines long, proportionably much narrower, and with the sulcus of the prothorax nearly effaced.

Sp. 5. *Cryptodus politus*, Westw. (Pl. I. fig. 4.)

*C. niger*, nitidus, castaneo parum tinctus; capite et prothorace punctatis, punctis minutis et in parte antica media prothoracis subobsoletis, hujus lateribus rotundatis; elytris tricosatis, punctis ovalibus variolosis inter costas notatis, pygidio punctis rotundis; corpore infra nitido tenuissime punctato, mento ad basin emarginato; antennis 10-articulatis, articulo basali angusto, ad apicem parum dilatato recte truncato.

Long. corp. lin. 13.

Habitat in Australia. In Musæo Hopeano, Oxoniæ.

This species, of which I have seen only a single individual, is considerably larger than any of the others described in this paper; from its general appearance it might, at first sight, be considered as a gigantic specimen of *C. Tasmannianus*, being, like it, very glossy and black, but with a slight tinge of chesnut. The head is widened in front of the eyes; it is transverse, finely punctured, with two tubercles on the crown. The antennæ are 10-jointed, the basal joint comparatively narrow, with the extremity extending beyond the insertion of the second joint, and slightly dilated at the tip, which is straightly truncated; the mentum is rounded in front; the disc elevated, its middle being very slightly depressed, marked with numerous fine transverse punctures, and its base emarginate. The prothorax has the sides rounded, the base being wider than the anterior part. The elytra are tricosate, the interstices marked with irregular rows of oval punctures, each surrounded with a delicate line. The anterior tarsi, in the unique specimen which I have examined, are short and thick, the

terminal joint produced into a point beneath the ungues, which are unequal in size, the larger one being much bent, and armed with a strong tooth near its base.

Sp. 6. *Cryptodus Passaloides*, Germ. (Pl. I. fig. 5.)

“*C. mento basi emarginato, antennis distincte 10-articulatis, nigro-piceus, thorace acervatim grosse punctato, lateribus antrorsum angustato; elytris planis grosse punctatis, punctis in disco seriatis.*” Germar.

Long. corp. lin. 10.

Habitat in Australia, Adelaide, Wilson. Mus. Westwood.

*Cryptodus Passaloides*, Germar, in Linn. Ent. iii. p. 189.

Differs from *C. Tasmannianus* in its narrower form and dark chesnut colour, in the more deeply punctured prothorax, and in the mentum being emarginate at the base. The following is Germar's detailed description of the species:—Caput longitudine parum latius, confertim punctatum, vertice tuberculis duobus oblongis divaricatis, antice rotundatum, marginatum. Antennæ piceæ, articulo 1mo trigono, funiculo 6-articulato clava triphylla. Mentum trapezoidale punctatum, basi profunde emarginatum. Thorax postice longitudine duplo latior, margine antico longitudine vix latior, lateribus a basi ad medium fere parallelis, a medio ad apicem rotundato-angustatis, tenuiter marginatis punctis magnis impressis pro parte raris remotis, pro parte magis acervatis obsitis, medio late sed obsolete canaliculatus. Prosternum antico productum, impressum, punctatum, apice subtruncatum. Elytra thorace ter longiora, deplanata, profunde punctata, punctis dorsi majoribus seriatis, linea circulari impressa signatis; laterum crebrioribus inordinatis. Corpus subtus magis piceum, minus dense punctatum.

The specimen represented in the accompanying figure was sent to me from Adelaide by C. W. Wilson, Esq.; it is of a rich glossy dark chesnut colour. The two tubercles on the crown of the head are slightly defined; the tarsi are simple; the basal joint of the antennæ is gradually widened from the base to the extremity, which is obliquely subtruncate; the mentum has the sides strongly deflexed, the middle of the disc very slightly depressed, and the base divided into two acute points, with a semi-circular incision between them. A specimen in the Hopean Collection, from Swan River, is somewhat larger and broader than my specimen, but otherwise agrees with it.

- b. (Sub-genus *Cryptodellus*, Westw.) Prothorax antice in medio tuberculo armatus. Elytra sulcis numerosis, interstitiis acute elevatis.

Sp. 7. *Cryptodus* (*Cryptodellus*) *caviceps*, Westw. (Plate I. fig. 6.)

C. obscure fusco-nigricans, punctatus, punctis luteo-setosis; capite magno semicirculari, margine acuto et recurvo, vertice bituberculato; prothoracis lateribus rotundatis, angulis posticis acutis, margine antico in medio 1-tuberculato, postice canaliculato, elytris multicostatis, mento postice acute appendiculato.

Long corp. lin. 8,

Habitat in Australia, Swan River. In Mus. Hop. Oxon.; et nostr.

This very distinct species is of an obscure brownish black colour, not shining, strongly punctate, the punctures oval, and each bearing a short luteous seta in the middle; the broad prothorax and narrow elytra give the insect a parallel appearance; the head is large and semi-circular, the disc flat, with two small but acute tubercles in the middle; the whole of the margin is sharp and turned upwards; the antennæ are 10-jointed, the basal joint is broad, with the inner apical angle rounded; the maxillæ have the outer lobe very bent and acute at the tip, with a strong acute tooth at its base; the inner lobe is small, obtuse at the tip, with two slight impressions indicating a trifid structure; the mentum is broad, the fore margin slightly emarginate in the middle, the anterior angles rounded, and the base produced into a long acute point, with the sides raised, extending over the jugulum, nearly to the point of the prosternum. The prothorax is wide, with the sides regularly rounded and slightly margined, the hinder angles acute, the base slightly sinuated within the angles; the fore margin with a tubercle in the middle; the disc covered with oval punctures, much larger than those of the head, and the middle of the hind part of the disc is canaliculated. The elytra are rather narrow, with the sides nearly straight, moderately convex, each with eleven rows of round punctures, with the edges not sharp, the row next the suture uniting with the second row near the middle of the elytra; the interstices between these rows of punctures are acutely ridged, each elytron having ten of these ridges or small costæ, the lateral ones being less distinct, and the top of each ridge is marked with a row of minute punctures, bearing short luteous setæ. The subapical tubercle is small, and

the apex of the elytra irregularly and obscurely punctured. The scutellum is semi-oval and scarcely punctured. The body beneath is opaque, with a few minute setigerous punctures. The fore tarsi, in the few specimens I have examined, are simple. The prosternum is dilated at its anterior margin; its hind part is, however, in no manner prominent.

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DESCRIPTION OF THE FIGURES.

PLATE I.

(See descriptions of the species for their natural size.)

- Fig. 1. *Cryptodus variolosus* (*paradoxus*?), magnified.  
1a, extremity of the abdomen; 1b, mentum.
2. *Cryptodus piceus*, magnified.  
2a, antenna; 2b, mentum, showing the tips of the labial palpi; 2c, extremity of abdomen.
3. *Cryptodus Tasmannianus*, magnified.
4. *Cryptodus politus*, natural size.  
4a, antenna; 4b, mentum; 4c, last joint of anterior tarsus, and its ungues.
5. *Cryptodus Passaloides*, magnified.  
5a, antenna; 5b, mentum seen from beneath; 5c, ditto, seen sideways.
6. *Cryptodus caviceps*, magnified.  
6a, head seen from beneath; 6b, mandible; 6c, maxilla seen from above; 6d, maxilla seen obliquely; 6e, mentum seen sideways; 6f and g, antenna seen in different positions; 6h, extremity of elytra and abdomen seen sideways; 6i, extremity of abdomen seen from beneath the podex extending beyond the terminal ventral segment.

II. *On some Entomostraca collected by DR. SUTHERLAND, in the Atlantic Ocean.* By JOHN LUBBOCK, Esq. F.G.S.

[Read January 7th, 1856.]

DR. SUTHERLAND, already so well known for his labours in the Arctic regions (having been appointed Government Surveyor at Port Natal), employed some of his time during the voyage there in collecting *Crustacea*. The *Entomostraca* thus obtained have been submitted to me by Dr. Gray, and I beg leave to lay before the Entomological Society the result of my examination.

The collection contains thirty-five species, of which twenty-three are new, viz.:—

- Calanus inconspicuus.
- „ penicillatus.
- „ latus.
- „ brevicornis.
- „ mirabilis.
- Euchæta Atlantica.
- „ Sutherlandii.
- Undina Danæ.
- „ longipes.
- „ plumosa.
- „ Helenæ.
- „ pulchra.
- Diaptomus dubius.
- „ abdominalis.
- Pontella setosa.
- Clytemnestra Atlantica.
- Corycæus Sutherlandii.
- „ styliferus.
- Copilia Atlantica.
- Sapphirina Danæ.
- „ opaca.
- „ stylifera.
- Halocypris Atlantica.

The proportion of new species, though large, is not more than might be expected if it is considered how little attention has hitherto been given to marine *Entomostraca*. At the same time it

must be confessed that future researches may perhaps prove that the two sexes of one species have been separately described, for the generic descriptions are founded on characters which differ in the two sexes; and it is impossible to distinguish in all cases a female *Undina* from a *Calanus*, or a female *Pontella* from an *Acartia*.

To avoid if possible this source of error, I have been very careful in describing those parts which are generally considered to be alike in both sexes, as, for instance, the organs of the mouth, the natatory legs and the shape of the cephalothorax, and I do not think any difficulty will be found in joining the two sexes when both are known; at the same time, it is not *certain* that the above-mentioned organs are alike in the two sexes of the same species.

The characters upon which species are founded need perhaps some remark, for the hairs are in most cases so variable that it is rather startling to find them relied on in the *Entomostraca* as affording excellent specific characters. However, the examination of thousands of specimens has convinced Professor Dana that such is the case, and the form and position of the hairs, and especially of those on the terminal portion of the anterior antennæ, are as useful in the study of *Entomostraca* as are the teeth in that of *Mammalia*.

The normal number of hairs on each segment of the antennæ of— for instance—a *Calanus* is four, one on the middle of the anterior margin, and at the apex, two anterior and one posterior. The apical segment appears to offer an exception to this rule, but in such cases the apical segment itself is either very minute or perhaps has disappeared, so that the hairs belonging to two segments are apparently collected on one. In confirmation of this, compare the antennæ of *Diatomus abdominalis* or *Calanus inconspicuus* with that of *C. brevicornis*. *C. penicillatus* is remarkable for having a pencil of hairs at the end of the anterior antenna. The antennæ are unequal, the longer one having eighteen, the shorter only thirteen segments, and I consider the terminal tuft to be the hairs which remain, although the segments to which they normally belong have disappeared. I found it impossible to determine the exact number of hairs, but convinced myself that there were more at the apex of the shorter antenna than at that of the longer, which in accordance with this theory ought to be the case.

It is much to be wished that we had some definite system of nomenclature for the appendages and parts of appendages of

*Crustacea.* Professor Milne-Edwards has indeed proposed one in the *Annales des Sciences Naturelles* for 1851, but unfortunately it is only applicable to the decapods. The *Calanidæ* possess ten or eleven pairs of appendages; viz., first two pairs of antennæ, then a pair of mandibles, then three pairs which are generally applied to the mouth, and then four or five pairs of natatory legs. Three pairs are therefore wanting; we may consider them to be those of the first or ocular segment, and of the two posterior segments. I subjoin a table showing the homologies of the genus *Pontella*, and the names used by different observers. It must be observed that Milne-Edwards appears to consider that the maxillæ are wanting, for in his *Nat. des C.* vol. iii. p. 418, he says, "Les machoires paraissent manquer complètement, ou se trouver réduites à l'état de simples vestiges;" if this is the case, his "Pates machoires de la première paire" belong to the seventh segment instead of to the fifth; and the missing appendages are those of the first, fifth and sixth segments.



NAMES USED BY

Segments of the body.	MILNE-EDWARDS, His. Nat. des Crustacées. 1840.	BAIRD, British Entomostraca. 1849.	DANA, Crustacea. United S. Exploring Expedition, 1852.	LILJEBORG, Cladocera, Ostracoda och Copepoda I Skane. 1853.	LUBBOCK.
1	Ant. de la 1er Pr.	Antennæ	1st Pr. Antennæ	1st Pr. Antennæ	1st Pr. Antennæ
2	Antennes de la 2me Pr.	Antennules	2nd Pr. Antennæ	2nd Pr. Antennæ	2nd Pr. Antennæ
3	Mandibules	Mandibles	Mandibles	Mandibles	Mandibles
4	Pates machoires de la 1er Pr.	1st Pr. Footjaws	Maxillæ	1st Pr. Maxillæ	1st Pr. Maxillæ
5	" " 2me Pr.	2nd "	Maxillipeds	2nd "	2nd Pr. Maxillæ
6	" " 3me Pr.	3rd "	1st Pr. Legs	3rd "	Maxillipeds
7	Pates de la 1er Pr.	1st Pr. Legs	2nd "	1st Pr. Legs	1st Pr. Legs
8	" " 2me Pr.	2nd "	3rd "	2nd "	2nd "
9	" " 3me Pr.	3rd "	4th "	3rd "	3rd "
10	" " 4me Pr.	4th "	5th "	4th "	4th "
11	" " 5me Pr.	5th "	6th "	5th "	5th "
12					
13					
14					

The species which I have named *Diaptomus dubius* is one of those intermediate forms whose place is very difficult to determine. It makes one link of a series which connects *Pontella* with *Calanus*. There appear to be two such series, one of which contains *Hemicalanus calaninus*, Da., *H. tenuicornis*, Da., and the other the species which Dana has formed into the group *Calanopia*, which he considers to be a subgenus of *Pontella*. *Diaptomus dubius* belongs to the latter group, but is, if I may use the expression, on the *Calanoid* side of it. The absence of inferior eyes, and the structure of the maxillipeds, are sufficient to prove that it cannot be considered a *Pontella*, while the structure of the inferior antennæ exclude it from *Hemicalanus*. I have been obliged, therefore, to place it in Westwood's genus *Diaptomus*, although it resembles more nearly the species in Dana's subgenus *Calanopia*. I am very averse to multiplying genera, but "*Calanopia*" appears to me to have far more claims to that rank than "*Rhincalanus*." Many facts seem to favour the opinion that there is no such thing as a well marked genus in Nature, but that every intermediate form either does exist or may have existed in Nature; and that to say that any group is well marked, is equivalent to saying that there are many forms with which we are unacquainted. We may expect therefore that such species as *D. dubius* will become more and more frequent as our knowledge increases.

I have requested Dr. Baird to give me his opinion of the proper place of this species. He considers that it belongs to his genus *Temora*. It may be necessary to remind Naturalists that the genus *Calanus* was founded by Leach on the *Cyclops Finmarchicus*, which was both imperfectly known and incorrectly described. Dr. Baird rectified the descriptions and, considering that the falsity of Leach's characters vitiated the genus, described it as *Temora Finmarchica*. Even he, however, was only acquainted with one sex, so that we had thus two genera founded on one species, and that one very imperfectly known. The characters given by Dr. Baird as those of *Temora (Calanus) Finmarchicus*, are those of a large number of *Entomostraca*, and Dana considered that by the rules of the British Association Leach's name ought to be used. Although I regret to be obliged to differ from my much respected friend Dr. Baird, I feel myself obliged to come to the same conclusion as Professor Dana. Now, however, Dr. Baird considers that we have become acquainted in this species (*Diaptomus dubius*) with both sexes of *Temora*, and that the characters must accordingly be altered. Liljeborg in his excellent work "On

the Entomostraca of Sweden,"\* has expressed a similar opinion, and gives the characters of *Temora*, as follows:—"Caput a thorace quinque annulato disjunctum, unum annulum præbens. Abdomen thorace angustius, quatuor-sex articulis compositum. Antennæ secundi paris biramosæ, ramo exteriore articulis septem composito. Palpus mandibularum biramosus, vel appendice branchiali membranacea et setifera præditus. Maxillæ vel pedes maxillares primi paris laminosæ, lobulos plures setiferos, secundi paris breves et crassæ, processus plures setiferos, setis longis plumosis, antice vergentibus, gerentes; tertii paris elongatæ pediformes, simplices articulis sex compositæ, setiferæ, antice vergentes. Ramus interior pedum primi paris inarticulatus, et secundi-quarti paris biarticulatus. Pedes quinti paris antecedentibus dissimiles, dexter maris subcheliformis. Oculus unicus. Sacculus oviferus unicus."

I may observe, however, firstly, that Professor Dana's labours have shown that the number of segments of the cephalothorax, abdomen, and of the branches of the natatory legs, though useful as specific characters, vary in species of the same genus; and, secondly, that though we may think it probable that the right male antenna of *C. Finmarchicus* may be prehensile, we do not know that it is so. Lilgeborg's *Temora velox* appears to me to belong to Westwood's genus *Diaptomus*. If, when we are acquainted with the male of *Calanus Finmarchicus*, we find that it agrees generally with that of the species which I have named *Diaptomus dubius*, it will become a question whether the genus "*Diaptomus*" will not have to be abandoned, as synonymous with "*Calanus*." A new genus must, in that case, be formed for the species described as *Calani* by Kroyer, Dana and myself.

I have observed spermatic tubes on *Euchæta Atlantica*, and *Undina longipes* in one or two instances was furnished with two or three small tubes about a quarter as long as the abdomen, and with long thin necks. There are, perhaps, also spermatic tubes, although I observed them on males. In the genus *Corycæus* there are generally one or two bags attached to the upper side of the abdomen, which may be of the same nature.

#### CALANUS.

- I. Setæ antennarum anticarum apicales subapicalibus longiores.
  - A. Styli caudales curti.

\* Om de inom Skane forekommande Crustaceer af ordingarne Cladocera, Ostracoda och Copepoda.

*C. inconspicuus*, n. sp.

Frons rotundata. Cephalothorax 5-articulatus, crassus, postice obtusus, supernè visus angulis acutis, segmento postico brevi. Antennæ anticæ corporis longitudine, setis brevibus, apicalibus articulum æquantibus unâ longiore; subapicalibus minutis. Maxillæ et maxillipedes ut in *Calano*. Pedes natatorii primi paris ramis 3 et 1-articulatis, quarti paris ramis ambobus 3-articulatis. Abdomen 5-articulatum breve. Setæ caudales quatuor, subæquæ.

If all my specimens are females, which the form of the abdomen seems to render probable, this species may, perhaps, be an *Undina*.

The anterior antennæ are  $\cdot 065$  in length. At the apex there is one rather long hair, and two others rather longer than the apical segment; the penultimate and ante-penultimate hairs are very minute, and all the rest are small.

The second pair of antennæ are  $\cdot 015$  in length. The accessory branch is about one-fourth longer than the organ itself, and the intermediate segments are indistinct; the basal segment of the shorter branch has the margins very straight, and is of equal thickness all the way up; there are six hairs at the apex in one tuft, and seven in the other.

The maxillipeds are of the usual form, and are  $\cdot 02$  in length.

The first pair of natatory legs are  $\cdot 015$  in length, the outer branch has three segments, the inner only one. The inner branch, and the apical segment of the outer branch, have two hairs at the side and two at the apex. The spines on the outer margin are inconspicuous.

The fourth pair are  $\cdot 025$  in length. The branches are both three-jointed, the two basal segments of each branch have a hair at the apex, the terminal segment of the lesser branch has two hairs on the margin and two at the apex; that of the larger branch has three at the margin and two at the apex. The fifth pair of legs appears to be wanting.

The abdomen is 5-jointed; the first and second segments are swollen. The stylets are short, and the four terminal hairs subequal in length.

Collected in  $12^{\circ} 20'$  N. L.;  $25^{\circ}$  W. L. Pl. II. figs. 8, 11.

*C. penicillatus*, n. sp.

Frons obtusa. Cephalothorax 5-articulatus, postice subacutus. Antennæ anticæ inequales, dextrâ cephalothoracis, sinistrâ

corporis longitudine, setis brevibus, apicalibus tamen sublongis, numero minimum viginti et conspicui. Abdomen 3-articulatum. Styli caudales breves.

The inequality in length of the anterior antennæ, and the thick pencil at the end of the same organs, make it very easy to distinguish this species from any other. I only possessed one specimen, which I was obliged to dissect in order to examine the different appendages. The two branches of the second pair of antennæ are nearly equal in size. The basal part of the lateral branch is indistinctly divided into several segments, and has about six long hairs. Length  $\cdot 03$ .

The first pair of maxillæ are  $\cdot 018$ , the second pair  $\cdot 015$ , and the maxillipeds  $\cdot 032$  in length. All these organs are formed as usual in *Calanus*.

The first pair of legs are  $\cdot 032$  in length; both the branches are three-jointed, and have a hair at the apex of each of the four basal segments; the apical segment of the outer branch has three hairs on the margin and two at the apex, besides a curved spine. That of the inner branch has also three at the margin and two at the apex.

The fourth and fifth pairs were, unluckily, imperfect.

The abdomen is short, and the caudal stylets are rather longer than the posterior abdominal segment. The terminal setæ have been broken off.

Length of cephalothorax . . .  $\cdot 100$ .

„ abdomen . . . . .  $\cdot 026$ .

Pl. IV., figs. 1, 3.

#### *C. latus*, n. sp.

Rostrum breve. Frons rotundatus. Cephalothorax 5-articulatus, postice obtusus. Antennæ anticæ corpore vix breviores, setis quibusdam longis, unâ apicali prælongâ, posticâ penultimâ longâ; anticâ penultima ante-penultimisque brevibus. Antennæ postice brevissimæ, appendice laterali tamen longâ. Pedes natatorii primi paris, ramis 2 et 1-articulatis, quarti paris 3-articulatis. Abdomen 4-articulatum stylis brevibus, setis quatuor subæquis.

The hairs on the anterior antenna are short, but about every fourth segment there is one considerably longer than the others. The length of the organ is  $\cdot 135$ , which is very nearly that of the body.

The second pair of antennæ are remarkable. The lateral ap-

pendage is formed as usual, but is about six times as long as the two apical segments of the organ itself. Length  $\cdot 038$ .

Length of the second pair of maxillæ . . .  $\cdot 02$

„ maxillipeds . . .  $\cdot 045$

There is nothing peculiar in the forms of these two pairs of appendages, which resemble those of other *Calani*.

The first pair of natatory feet is  $\cdot 025$  in length, and very closely resembles that of *Undina pulchra*. (Pl. IV. fig. 6.)

The fourth pair is  $\cdot 04$  in length, and appears to me to be exactly similar to that of *Undina pulchra*. (Pl. IV. fig. 7.)

The exact similarity of the natatory legs in these two species, coupled with the fact that I only know the male of the one and the female of the other, force on us the consideration whether they are not the different sexes of the same species. It may be so certainly, but the difference in both pairs of antennæ and in the maxillipeds have induced me to describe them as separate.

Length of cephalothorax,  $\cdot 110$ ; of abdomen,  $\cdot 05$ .

Collected in N. L.  $31^{\circ} 50'$ ; W. L.  $18^{\circ} 30'$ .

Most of the specimens had spermatic tubes attached to the abdomen. Pl. II. fig. 12 and Pl. XI. figs. 8, 11.

## II. Setæ antennarum anticarum apicales subapicalibus non longiores.

### *Calanus communis*, Da.

There are a number of specimens which agree in most points with Dana's description of this species. The apical segment of the anterior antenna in my specimens was, however, rather *shorter* than the preceding, and the second of the abdominal setæ is quite twice as long as the others.

Professor Dana gives no side view; Pl. X. figs. 9, 10, represents the outline of the posterior segment of the cephalothorax; the hooked spine exists in every position between the two in which I have figured it.

Collected in the Atlantic by Dr. Sutherland, from  $12^{\circ} 30' N.$  to  $33^{\circ} 50' S. L.$ , and from  $19^{\circ}$  to  $26^{\circ} W. L.$ ; by Dana from  $8^{\circ} N.$  to  $5^{\circ} S. L.$ , and from  $15^{\circ}$  to  $30^{\circ} W. L.$  Pl. X. figs. 9, 10.

### *Calanus mirabilis*.

Frons subacuta, lateribus inflata. Cephalothorax 5-articulatus, gracilis, postice obtusus. Antennæ anticæ corpore longiores, setis brevibus apicalibus tamen, et setâ anticâ articuli ab apice quarti, longis, et posticâ penultimâ prælongâ. Antennarum

posticarum ramus lateralis multiarticulatus, pyramidatus, setis longis. Mandibulæ palpo magno ramis valde inæquis. Pedes natatorii primi paris ramis 3 et 2?-articulatis. Pedes quarti paris ramis 3-articulatis. Abdomen curtum, 2?-articulatum. Styli caudales breves.

The anterior antennæ are considerably longer than the body; the hairs all along the middle part are small, but some near the apex are very large. The posterior penultimate is the longest, then two at the apex, and one attached to the fourth segment, counting from the apex. Length  $\cdot 17$ .

The posterior antennæ are remarkable for the form of the lateral branch, which is multiarticulate, tapering and clothed with long hairs. Length  $\cdot 033$ .

The palpus of the mandible is also of an unusual shape. Instead of consisting, as usual, of a large basal portion, bearing at the apex two equal short branches, in this species one branch is inserted at the side of the basal part, and is much smaller than the other. Length  $\cdot 033$ .

The second pair of maxillæ are  $\cdot 015$  in length, and the maxillipeds  $\cdot 052$ .

The first pair of natatory legs are  $\cdot 026$  in length; the outer branch is three-jointed; the inner, I believe, has two segments, which are well marked in the second pair of legs, but in the first are very indistinctly separated. The fourth pair is  $\cdot 03$  in length, and both the branches have three segments. The fifth pair appeared to me to be altogether absent.

The abdomen is short, and in my specimen most of the caudal bristles appeared to have been broken off.

Collected in the Bay of Biscay.

Pl. V. figs. 1 to 6.

*Calanus brevicornis*, n. sp.

Frons elongata, angusta, rotundata, stylis longis. Cephalothorax postice obtusus, 5-articulatus articulis posticis subæquis. Antennæ antice cephalothoracis longitudine, fere rectæ, fronte posteriores, setis brevibus, articuli tertii longiore, postica penultima et antepenultima longis, anticis brevibus, antica penultima articulo duplo longiore. Setæ caudales mediocres.

The front is produced  $\cdot 01$  inch beyond the base of the antennæ; the frontal stylets are long, and rise just in front of the antennæ.

Seen from above this species is narrow in proportion to its length. The anterior antennæ are short, being about equal to the cephalothorax in length. The posterior penultimate and antepenultimate setæ are the longest, then the anterior penultimate and that of the third segment; few of the rest are equal to the segments in length.

The two branches of the second pair of antennæ are nearly equal in size, but the accessory branch is rather larger than the other, and has eight long hairs along its outer margin.

The teeth of the mandible are small, and nine in number, besides the usual spine. The outer branch of the palpus has six long plumose hairs; the inner one has twelve, four of which are situated on a prominence at the side, and four more along the margin.

The first and second pair of maxillæ and maxillipeds are formed as usual.

The branches of the natatory legs are three-jointed. In the first pair the basal segment of the inner and lesser branch bears one hair, the second segment two, and the third eight, of which two are on the outer margin, four on the inner, and two at the apex. The larger and external branch has one hair on the second segment, and five on the apical, besides the long terminal spine. In the fifth pair of legs the second segment of the smaller branch has only one hair, and the apical segment eight, three on each margin and two at the apex. The terminal segment of the larger branch has only four hairs, besides the terminal spine.

Abdomen four-jointed, segments gradually decreasing in size. The caudal setæ were in every case broken off, but from the size of the stumps they appear to be of the usual length.

Total length, .12.

Collected in the Atlantic, 35° 10' S. L.; 18° 4' E. L.

Pl. III.

#### *Rhincalanus cornutus*, Da.

Professor Dana found only four or five specimens of this beautiful species, and does not mention whether they were males or females. I also had only a few specimens, and all of mine had the abdomen two-jointed, while in his it was four-jointed. The antennæ also differ from his description. My specimens may therefore perhaps belong to a new species, but they agreed so closely with *R. cornutus*, except in the above particulars, that I did not like to describe them as new.

Collected by Dr. Sutherland, N. L. 27° 30', W. L. 20°.

„ Professor Dana, „ 1° „ 18°.



*Euchæta Atlantica*, n. sp.

Cephalothorax pubescens, 4-articulatus, capite non lateraliter angulatus, postice obtusus. Antennæ anticæ fere corporis longitudine, setas *Euchætæ* diademæ fere similes, setâ posticâ penultimâ dimidium posticæ apicalis non superante, setis antepenultimis perbrevibus. Pedes natatorii quinti paris fœminæ nulli, quarti grandes. Abdomen fœminæ 3-articulatum, articulo primo fœminæ secundum longitudine non superante. Seta caudalis longa, fœminæ nuda. Abdomen maris 4-articulatum; segmento primo brevi.

The second pair of antennæ and first four pairs of legs of this species could hardly be distinguished from those of *Undina plumosa*.

It may be doubted whether the male and female here described belong to the same species, but they were several times collected together without any other nearly allied species, were caught in rather large numbers, and agreed in those organs which do not present sexual differences.

The anterior antennæ of the female are  $\cdot 093$  in length; the setæ are very short, but arranged as usual; some few are very long, and one or two are plumose. Two of the apical hairs are very long, also the posterior penultimate, and the anterior hair of the fourth segment, counting from the apex. The posterior antepenultimate seta is very small. The anterior antennæ of the male are different in appearance, owing to the absence of long setæ; the small ones are very easily broken off, so that I never found a specimen with them all attached. There are three long hairs at the apex, one of them as long as the four apical segments.

The second *pr. antennæ* are formed as in *Calanus*. The long apical hairs of the organ are eleven in number. The accessory branch is longer than the organ, the four intermediate joints are short and indistinct, and the apical hairs are three in number.

The second pair of *maxillipeds* are  $\cdot 021$  inch in length, and divided into four segments. They resemble those of *Calanus*, but are longer in proportion, and consist of four segments instead of three, as usual in that genus. The hairs are large, and seated on protuberances.

The third *pr. maxillipeds* are  $\cdot 05$  in length, large, pediform, and consisting of seven segments; the basal segment is large, with several spinose hairs, the second is almost twice as long as the first, and forms almost a right angle with it. The five apical segments are small and indistinctly separated; they each bear two or

three strong, finely serrated hairs. In the male, the joints of these five segments are so indistinct, that the organ would be described as three-jointed.

*First pr. natatory legs*, .017 in length. The rami in the female are two and one-jointed. Those of the male are three-jointed. They are not spinous, but the margins are partly fringed with delicate hairs.

*The fourth pair of natatories* is much larger, and is similar in the two sexes. It is .03 inch in length, and the rami are both three-jointed. There is a ciliated hair at the apex of each of the basal segments, and the terminal segments have respectively four and five large, ciliated hairs.

*The fifth pair of legs of the male* are slender, and so long as to reach to the front of the cephalothorax when they are turned forwards. The shorter leg of the two consists of four segments, of which the second apparently represents the second basal segment of the natatory legs, and like it bears two branches, the inner one of which is as long as the first segment of the outer branch. The apical segment is long and gradually tapering. The longer leg resembles the shorter one in general appearance, but the inner branch is rudimentary, and the third segment bears at the apex a cylindrical appendage, swollen at the ends, and armed along the edges with a row of teeth.

I do not understand how these legs are used.

Total length .12 inch.

This species much resembles *E. diadema* of Dana, from which it differs chiefly—

1st, in having the angles of the head rounded off;

2nd, in the size of the maxillipeds; and

3rd, in the structure of the fifth pair of legs of the female.

It seems very common, but the females are much more numerous than the males. Dr. Sutherland found it in the Atlantic, from 31° 50' N. Lat. to 3° S. Lat., and from 26° to 18° 30' W. Long.

Some of the females had from five to eleven eggs, and several had a spermatie tube attached to the abdomen; the time of year being from the 9th of August to the 9th of September.

Pl. VIII.

*Euchæta Sutherlandii*, n. sp.

Fœminæ.—Cephalothorax nudus, 5-articulatus, postice obtusus, capite bene arcuato sed non angulato. Antennæ anticæ corpore paulo breviores, setas *E. communi* fere similes, setâ pos-

ticâ penultimâ dimidium posticæ apicalis non superante, setis antepenultimis brevibus. Maxillipedes magni. Pedes natatorii quinti paris magni, simplices.

Abdomen 3-articulatum, articulo tertio duos præcedentes longitudine fere æquante. Seta caudalis secunda corpore longior, nuda.

This species may perhaps be a young form, for the fifth pair of natatory legs has very much the appearance of being immature. I do not think, however, that it can be the young of any already described species, as it has five cephalothoracic segments instead of four, which is the common number; and although *E. pubescens* has, it is true, the same number, yet in that species the additional segment is the posterior one, while here it is formed by the separation of the head. For these reasons it cannot, I think, be considered as the young of the preceding species, with which it was found; besides which, it has a fifth pair of natatory legs, of which I could find no trace in *E. Atlantica*. The shape of the head when seen from above, the second pair of antennæ, mandibles, first and second pairs of maxillæ, maxillipeds and first pair of natatory legs, all very closely resemble those of the preceding species. The fourth pair is rather stouter in proportion. In *E. Atlantica* I could never find any fifth pair of natatory legs in the female, but in this species they are of a considerable size, .027 inch in length, and consist of a two-jointed basal part, bearing two unequal branches, each consisting of one segment, but the outer one much the largest. The two inner ones are not symmetrical. The abdomen is three-jointed, and the third segment is nearly as large as the two first put together.

Of this species there are only three or four specimens. They were caught on the 22nd August, in 12° 21' N. Lat. and 25° W. L.

Length .065 inch.

„ of the maxillipeds .035.

Pl. IX. figs. 1, 2.

*Undina Danæ*, n. sp.

Maris.—Frons quadratus. Cephalothorax 5-articulatus, postice rotundatus, articulo ultimo brevior. Antennæ anticæ corpore breviores; setis brevibus, posticâ penultimâ antepenultimâque articulos non æquante. Abdomen 4-articulatum. Styli caudales breves, setis quatuor plumosis.

This species may be at once distinguished from all of Professor Dana's species by the front being quadrate.

The anterior antennæ are  $\cdot 065$  inch in length. Pl. IX fig. 7, represents the five apical segments.

The posterior antennæ are  $\cdot 02$  inch in length; the four intermediate segments of the branch are obsolete, but their hairs still remain; the branch is rather larger than the organ itself.

Second pair of maxillipeds,  $\cdot 017$  in length, elongate, 7-jointed, formed like the third pair of *Calanus*.

Third pair of maxillipeds, like those of *Euchæta* in shape, the two basal segments being very large, and the remaining five very short, and provided with eight large and strong hairs. Length  $\cdot 035$ .

First pair thoracic legs. Large ramus three-jointed. The apical segment has a strong spine at the apex, a row of very delicate hairs on the outer margin, and four long, plumose hairs on the inner side. The second segment has also a similar hair at the apex, and there is a small spine at the apex of each segment. The smaller or internal branch consists of one segment, bearing five long plumose hairs. The plumose hair, generally situated on the basal segment, was absent in the specimens I examined. The sides of the segments are clothed with very delicate hairs. Length  $\cdot 014$ .

Fourth pair thoracic legs. Both branches consist of three segments. The hairs on the outer branch are arranged as in the first pair, but altogether larger, and the apical spine is serrated on the outer margin, plumose on the inner, and almost as long as the hairs. The hairs on the inner branch are situated as on the outer, but are finer. The margins of the segments are not fringed with hairs, nor is there any basal hair. Length  $\cdot 027$ .

The fifth pair of legs is prehensile and unsymmetrical, but not much larger than the preceding, being only  $\cdot 0303$  inch in length. The right leg is the larger of the two, and consists of four segments, of which the two basal are short and broad, the third long and cylindrical, and the apical small. The left legs seemed to me to be more slender; the second segment is long, and bears two branches, the inner simple, the outer three-jointed.

The abdomen is four-jointed. The basal segment is smaller than the rest. The second segment is the largest, but not much longer than the two last. The caudal stylets are small, and bear four plumose hairs, of which the second is longer than, but not twice as long as, the others. The first pair of natatory legs of this species are very like those of the preceding. The fourth pair of legs have the spines larger in proportion.

Length of cephalothorax . . .  $\cdot 055$  inch.

„ abdomen . . . . .  $\cdot 020$  „

Pl. IX. figs. 6 to 9.

Collected in the Atlantic Ocean, N. L.  $37^{\circ} 20'$  to  $12^{\circ} 21'$ , W. L.  $14^{\circ} 30'$  to  $25^{\circ}$ .

I have called this species after Professor Dana. The Atlas of his great work on *Crustacea* which has recently appeared is another proof of his talents and industry. The high price of it is the more to be regretted, as it is almost indispensable to every one who would study *Crustacea*.

*Undina longipes*, n. sp.

Maris.—Frons quadrata. Cephalothorax 5-articulatus, articulo ultimo brevior, postice rotundatus. Antennæ anticæ corpore breviores setis brevibus, setâ articuli secundi (tertii?) longiusculâ, flexâ, setis apicalibus articulo longioribus, setis penultimis subæquis, articulo longioribus, setâ antepenultimâ posticâ aliis longiore. Abdomen 4-articulatum. Styli caudales 2-articulati, setis 5, secundâ fere duplo longiore.

The shape of the cephalothorax and the form of the apical hairs of the anterior antennæ are quite sufficient to distinguish this species from all that have been hitherto described. The shape of the fifth pair of legs is also peculiar.

Anterior antennæ  $\cdot 075$  in length.

The second pair of antennæ have the accessory branch longer than the organ itself; and besides the usual four hairs belonging one to each of the four small intermediate segments, there are four or five others, signs of a tendency to the separation of other segments.

The second pair of maxillæ are like those of *Calanus*, and quite different from those of the other species of *Undina* which I have seen.

The maxillipeds are small, but like those of *Calanus*.

The first pair of legs are  $\cdot 018$  in length; the rami are both three-jointed.

The fourth pair are larger,  $\cdot 03$  in length.

The fifth pair are much larger, being  $\cdot 1$  in length. The figure will give a better idea of their form than a description could convey.

The abdomen is four-jointed, the segments being nearly equal in size. The caudal lamellæ are two-jointed, and bear five hairs, of which the second is nearly twice as long as the rest.

Total length  $\cdot 1$ .

Collected in the Atlantic,  $12^{\circ} 20'$  to  $8^{\circ} 30'$  N. L.,  $25^{\circ}$  to  $23^{\circ}$

W. L. The species was rather common, but there are no females which I can with certainty refer to it.

Pl. VI. figs. 1 to 5.

*Undina plumosa*, n. sp.

Maris.—Frons obtusa. Cephalothorax postice rotundatus, 4-articulatus. Antennæ anticæ cephalothorace longiores, corpore breviores, aliquando dissimiles, setis brevibus, postica penultimâ antepenultimâ subæquis. Abdomen 4-articulatum. Styli caudales breves; setis 4, setâ secundâ longiore, sed non duplo longiore.

I could not find the usual furcate rostrum in this species.

The second pair of antennæ and first four pairs of legs could hardly be distinguished from those of *Enchæta Atlantica*.

The outline of this species much resembles *Undina vulgaris*.

The anterior antennæ are  $\cdot 09$  in length; the setæ are very short, the largest being situated on the third basal segment; the anterior and posterior seta of the apical segment are longer than the segment, but all the others are very short.

The accessory branch of the second pair of antennæ is larger than the organ itself, and bears three long hairs at the apex. The four intermediate segments are small, and each provided with one long hair. The organ itself is terminated by two tufts of long hairs, six in the one and five in the other, besides a few short ones.

The third pair of maxillipeds are  $\cdot 032$  inch in length, and are seven-jointed, but the five apical segments are very small. The apical segment bears three hairs, the next I believe two, the third one, the fourth and fifth respectively three and four, the sixth three, and the basal one, I believe, two at the apex, and one at the base.

First pair of legs  $\cdot 009$  in length; the usual plumose hair at base is, I believe, absent; there are, however, on both the basal segments several small hairs. The external ramus is three-jointed. The middle segment bears one long hair, and a fringe of small ones; the apical segment has four long hairs, and a spine at the apex. The inner ramus consists of one segment only, which has five long hairs. All the large hairs on these organs are plumose.

The fourth pair are larger,  $\cdot 017$  in length; the rami are both three-jointed. The smaller as long as the first two segments of the larger ramus, which has a spine at the apex of each segment, and two intermediate, as usual, to the apical segment. The usual plumose basal hair is present, but there is no fringe as in the first pair of legs, which may, however, have been broken off. Each

segment of the branches bears one long hair, and the apical one of each five, the small slender apical spine of the first pair of legs being developed into a strong hair, plumose on the inner and serrated on the outer margin.

Fifth pair of legs are  $\cdot 05$  in length; both legs are five-jointed. The smaller leg ends in a sort of round knot, and bears a large spine at the apex of the third segment, and a small inner branch at the apex of the second segment. The larger leg consists of two branches; the inner one small, and appears to have three rudimentary joints, the larger branch has the two first joints large, the apical longer than the preceding segment, bearing a large spine near the middle, slender, and terminating in a fine point.

Abdomen is  $\cdot 036$  in length, four-jointed; the first segment rather short, the three following nearly equal, the caudal lamellæ very short and small, bearing four hairs, of which the second is the longest.

This species was collected in  $27^{\circ} 30' N. L.$ ,  $25^{\circ} W. L.$

I have found no females which I could refer to this species, but this is not to be wondered at, as I only had three or four specimens.

Pl. IX. figs. 3, 4, 5.

#### *Undina Helenæ*, n. s.

Maris.—Cephalothorax 5-articulatus postice obtusus, articulis tribus posticis subæquis. Frons triangulata. Antennæ anticae corpore parcè breviores; setâ articuli secundi (terti?) longâ, leviter flexâ, setâ apicali posticâ longâ, anticâ penultimâ sublongâ, posticâ brevi, posticâ ante-penultimâ articulum vix superante, aliis brevibus. Abdomen 4-articulatum, articulis subæquis; styli caudales parvi.

The second pair of antennæ have the accessory branch nearly twice as long as the organ itself. The four small intermediate joints are hardly distinguishable, but are indicated by the usual five long hairs. At the apex of the organ itself the one tuft consists of six subequal hairs, the other of four long hairs and three smaller ones.

The third pair of maxillipeds are formed as usual; but there is this peculiarity, that the fourth segment, counting from the base, is larger than the third, as in the longipes. The two basal segments are like those of *Calanus* and not like those of *Euchæta*.

Length  $\cdot 028$ .

The first pair of legs have the outer ramus three-jointed; and the inner one, I believe, two-jointed.

Length  $\cdot 025$ .

In the fourth pair both branches have three segments. The hairs on the outer margin are short, thick and spinous. On the inner branch each of the two basal segments has one hair at the apex. The apical segment has two hairs at the margin, and two at the apex. The apical segment has four hairs, and a large spine at the apex.

Length .04.

Fifth pair of legs. Length .055.

Length of cephalothorax . . . . .095.

„ abdomen . . . . .040.

„ Ant. antennæ . . . . .110.

Collected in N. L. 31° 50', L. W. 18° 30'.

Pl. VII. figs. 1 to 5. Pl. IV. fig. 4.

*Undina pulchra*, n. s.

Maris.—Frons triangulata. Cephalothorax 4? articulatus postice obtusus. Antennæ anticæ corpore parè breviores, articulis ultimis tribus subæquis, setis brevibus, setâ articuli tertii longâ, rectâ, setis apicalibus brevibus, unâ tamen sublongâ, posticâ penultimâ, et antepenultimâ perbrevibus. Maxillipedes parvi, articulis quinque ultimis exiguis, ut in *Euchætâ*. Abdomen 4-articulatum. Styli caudales parvi.

In general form this species closely resembles *U. Helenæ*, from which, however, it differs in the form of most of the appendages.

The anterior antennæ have the three terminal segments nearly equal; the middle one rather the smaller of the three. The fourth segment was longer than the two succeeding in the right antennæ of the single specimen at my disposal; but in that of the other side it appeared as if it was in the process of division into two.

The accessory branch of the second pair of antennæ is half again as long as the organ itself, and appears to have only four hairs attached to the small intermediate segments. At the apex of the organ itself the one tuft consists of six long subequal hairs, the other of five long hairs and two short ones.

The two basal segments of the maxillipeds are long and thin, and the five terminal segments are small. Length .031.

The length of the first pair of natatory legs is .023. The outer branch has two segments. There is a hair at the apex of the basal, and two on the margin, and two at the apex of the apical, besides the spine. The inner branch has two hairs at the margin, and two at the apex.

The length of the fourth pair is .035. The margins are less entire, the hairs of the outer margin shorter and thicker, and the



branches both three-jointed. There is a hair at the apex of the two basal segments of each branch, and the apical segment of the inner branch has two hairs on the margin, and two at the apex; that of the outer three at the margin, and two at the apex. There are thus five hairs on the apical segment of the outer branch of the fourth pair, while the first pair had four. The addition arises from the development of the spine.

The fifth pair of legs is long, thin and four-jointed. The basal segment of the larger leg is long and cylindrical; the second segment is swollen, and gives rise to two branches, which in shape are not unlike the prongs of a pitch-fork, with, however, the power of meeting: the outer branch is two-jointed. The smaller leg is very simple, resembling a rod composed of four pieces, the two basal of which are short, and the two apical long and slender.

Length .06.

The abdomen is four-jointed, with the segments subequal; and the caudal stylets small: the second of the caudal setæ nearly twice as long as the others.

Length of cephalothorax . . . . .09.

„ abdomen . . . . .03.

Collected in N. L. 12° 21', W. L. 25°.

Pl. IV. figs. 5 to 8. Pl. VII. fig. 6.

*Diaptomus dubius*, n. sp.

Frons quadrata. Cephalothorax curtus, antice latior, 5-articulatus, angulis posticis acutis, segmento primo maximo, tertio quartoque brevibus. Antennæ anticæ corporis longitudine, setis brevibus; antenna maris dextra medio paulum incrassata, fere 24-articulata, articulis 18 et 19 antice serratis, articulis tribus anticis subæquis. Pes posticus maris maximus ad apicem obtusus, rotundatus; pedes postici fœminæ parvi. Abdomen maris 4, fœminæ 3-articulatum.

There is not a furcate rostrum, but under the front are two little appendages.

The two branches of the second pair of antennæ are nearly equal. The accessory branch has three hairs at the apex, and one at the middle of the apical segment, besides eight along the side, signs of a tendency towards the separation of other intermediate segments over and above the four usual ones.

The second pair of maxillæ and the maxillipeds are formed as in *Calanus*.

The first pair of natatories have the two rami respectively three and two-jointed; and in the fourth pair they are larger, but consist of only two and one segments respectively.

The abdomen is four-jointed in the male, and two-jointed in the female, and in both the caudal stylets are very long, fringed on the inner margin with delicate hairs, besides the five long ones, which are themselves plumose.

Length of cephalothorax (not including the spines) . . .04.

„ abdomen (including the stylets) . . . . .02.

Collected by Dr. Sutherland in 37° N. L. and 14° 30' W. L., and in 27° 30' N. L. and 20° W. L.

There were only four or five specimens, and one of the females had a spermatheca attached to the abdomen.

Pl. II. figs. 1 to 7.

*Diaptomus abdominalis*, n. sp.

Frons subtriangulatus. Cephalothorax postice obtusus, 5-articulatus, articulis posticis subæquis. Antennæ anticæ corpore paulo breviores, setis apicali posticâ, penultimâque anticâ, longis, aliis brevibus. Maxillipedes longæ ut in *Calano*. Abdomen fœminæ 3-articulatum, maris 4?-articulatum. Styli caudales breves divaricatæ.

The second pair of maxillæ are formed as in *Calanus*, and are much shorter than the maxillipeds, being .013.

The maxillipeds are .038 in length, and seven-jointed, the terminal segment being very minute. The basal segment is not much larger than the second.

The natatory legs of the female have both the rami three-jointed. In the first pair the spines are not conspicuous; the first segment of the inner (lesser) branch has one hair, the second two, the third two at the side and two terminal. The two first segments of the outer branch have each one hair; the terminal segment has three hairs at the side, and two at the apex, besides the small ones on the outer margin. Length .045.

In the fifth pair the hairs on the outer margin are more conspicuous. The terminal segment of the inner branch has three hairs on the margin, while on that of the outer branch there are five marginal hairs, and at the apex a short broad spine. Length .04.

The arrangement of the hairs in the male is similar, but the margins of the segments are more or less bulged out.

The fifth pair of legs of the male are small and unsymmetrical, about .022 in length. Those of the female are symmetrical, but not formed like the others, having no trace of an inner branch; they are .01 in length.

The abdomen is large. In the female it is three-jointed, the basal segment being the largest, and the caudal stylets large and rather

longer than the third segment. The abdomen of the male is very curious. It is five-jointed, and has along the sides several tufts of long hairs. I know nothing like this in any other species. The terminal setæ are of moderate length, and the second is rather longer than the others.

Length of cephalothorax .072.

„ abdomen . . . .040, including the stylets.

Collected by Dr. Sutherland in the Atlantic, N. L. 31° 50' to N. L. 27° 30', W. L. 18° to 20°.

Pl. X. figs. 1 to 8.

### *Candace pachydactyla*, Da.

I have some specimens very like *C. pachydactyla*, but it is with great hesitation that I refer them to that species, because they differ in the number of segments of the cephalothorax, in the relative sizes of the two branches of the second pair of antennæ, and do not agree very closely in the structure of the first pair of antennæ. Dana has, however, himself figured a specimen with five cephalothoracic segments as belonging to this species, though, it is true, he expresses a doubt on the subject. The anterior antennæ vary a good deal in different specimens, unless, indeed, several separate species are here united together.

The second pair of antennæ have five long hairs at the end of the small accessory branch, and eleven at the end of the organ itself. In one specimen this organ resembled Dana's fig. 1*b*, Pl. LXXVIII., but in another the two branches were nearly equal in length. The first pair of maxillæ (Pl. VI., fig. 7) are of a very peculiar form, and quite unlike any other that I have seen. I do not know whether the form is generic or only specific. The maxillipeds are small, straight and seven-jointed (fig. 8).

I have several specimens of a female, which I refer to this species, because it agrees in form and in the arrangement of the setæ of both pairs of antennæ, and in the structure of all the organs, which do not present sexual differences. The fifth pair of legs are small and symmetrical (fig. 12), but differ in different specimens.

On the whole, I am inclined to think that two or more nearly allied species are here united, but I have not enough specimens to attempt to separate them.

Collected by Dr. Sutherland in N. L. 12° 21', W. L. 25°, and in N. L. 31° 50', W. L. 18° 30', and by Dana in S. L. 6°, W. L. 24°.

Pl. VI. figs. 6 to 12.

## Genus PONTELLA.

## Sub-genus PONTELLINA.

Cephalothorax postice productus, angulis acutis.

Seta antennarum anticarum apicalis setis subapicalibus brevior.

*Pontella setosa*, n. sp.

Frons subtriangulata. Cephalothorax 6-articulatus, articulo postico magno, angulis posticis brevibus. Oculi superiores grandes. Antennæ anticæ cephalothorace breviores, apicibus fronte valde anterioribus; setis fere rectis, prope basin fere articuli secundi longitudine, postica penultimâ duplo longiore quam apicales. Antenna dextra maris, medio incrassata, 13-articulata, articulo 10 lamellâ dentatâ instructo, articulis sequentibus tribus (ultimis) normalibus. Pes posticus maris dexter cheliformis, digito elongato tenui et curvato. Abdomen maris 4, fœminæ 2-articulatum.

The species seems to form a link between the sub-genera *Pontellina* and *Pontella*, for though the sides of the head are not armed by two projecting angles, as in the latter, they are not quite flat as is usual in the former, but have two rounded swellings instead of angles.

The anterior antennæ are ·08 in length; those of the female, and the left of the male, are very like those of *P. acutifrons*.

The two branches of the second pair of antennæ are somewhat unequal in size.

The outer branch of the first pair of legs has three segments, the inner two.

The fourth pair also agree in this respect, but the spines along the outer margin are more conspicuous.

Fig. 5 represents the fifth pair of the male, and fig. 6 of the female.

The terminal setæ of the abdomen are five in number, and nearly equal in size.

The length of the cephalothorax is ·09 inch, and of the abdomen ·02.

Collected by Dr. Sutherland in N. L. 8° 30', W. L. 23°.

„ 2° 22', „ 19°.

Pl. XI. figs. 1 to 7.

*Clytemnestra Atlantica*, n. sp.

Corpus pyriforme. Cephalothorax acute rostratus 5-articulatus, segmentis postice rotundatis, non dilatatis, marginibus posterioribus fere rectis, segmento postico tamen denticulato. Antennæ anticæ breves. Abdomen promiscue 4-articulatum. Styli caudales mediocres, setis quatuor.

This species may at once be recognised by the form of the body, which is almost pyriform, the posterior angles of the cephalothoracic segments not projecting laterally. The anterior antennæ are very short, scarcely as long as half the breadth of the cephalothorax. The posterior angles of the cephalothorax are acute. The abdomen is short, and the segments are not distinctly marked. It may be divided into two parts, one broad, and consisting, perhaps, of three segments, the last of which bears on each side a small appendage, terminated by two hairs; the other part narrow, short and bearing the two slender stylets.

It was collected in the Atlantic, and, as there was only one specimen, I did not dissect it, but I think there can be little doubt that it belongs to the genus *Clytemnestra* of Dana.

Length .09.

Pl. XII. figs. 12, 13.

*Corycæus Sutherlandii*.

*Cephalothorax* mediocris, segmento quarto elongate acuto. *Conspicilla* fere contigua. Antennæ anticæ 7-articulatæ, setis longissimis, nudis. Antennarum posticarum digitus articulo secundo brevior; setâ articuli primi nudâ. Abdomen 3?-articulatum .02 unc. long.; styli caudales abdomine vix breviores .019 unc. long.; seta caudalis maxima .013 unc. long.

*Anterior antennæ* .012 inch in length. The hairs are nearly twice as long as the organ itself.

*Posterior antennæ* .015. Four-jointed. The basal segment bears two setæ, one short, the other extending beyond the apex of the organ, and appears to be in some measure opposable to the fingers. The second segment bears two teeth at the inner apex, and two "fingers," of which the larger is two-jointed, and the basal part is provided with two teeth. The larger finger is shorter than the second segment, but very little so. The large spine is not plumose.

*The third pair of natatory legs* consist of a two-jointed basal part, and two three-jointed rami. The inner ramus is short, being shorter than the two first segments of the other. The outer

ramus has the apical segment longer than the other two together.

The fourth pair of natatories has the inner ramus obsolete; it is, however, represented by a little knob with a long seta. The other ramus has three sub-equal segments. There is a basal hair, but it is not plumose.

I am not sure whether the abdomen consists of two or three segments, for there is a line across the basal part, but I do not think it represents a joint.

In Dana's arrangement of the genus this species would come next to *C. latus*, from which, however, it may at once be known by the caudal stylets being almost as long as the abdomen.

Attached to the abdomen was, in one case, one, in another two, small oval membranous sacs, which I suppose to be spermatic tubes.

Length .083.

Atlantic Ocean.

Pl. VII. figs. 7, 12.

*Corycæus styliferus.*

Cephalothorax angulis posticis elongatis. Conspicilla remotiuscula. Antennæ anticæ longe setulosæ. Antennarum posticarum carpus digito brevior, setis duabus carpi fere longitudine, nudis? Abdomen 2-articulatum. Styli caudales abdominis longitudine, seta una longa, stylis vix brevioribus, aliis brevibus.

Length of cephalothorax, including the angles, .036; of the abdomen, .025; total length .056.

Collected in N. S. 12° 21'; W. L. 25°.

Pl. V. figs. 7, 8.

*Copilia Atlantica*, n. sp.

Cephalothorax fronte latus, et profunde excavatus, segmentum anticum postice paulo latior, segmentis posticis latere obtusis, utroque præcedenti angustiore, ultimo ad apicem dorsalem posticum spinigero. Antennæ posticæ ad articulum primum setulosæ, digito longo. Pedes natatorii primi parvis ramis triarticulatis, pedes postici ramis 3 et 1-articulatis. Abdomen tenue, sine stylis, cephalothoracis dimidio brevius, obsolete 5-articulatum. Styli abdomine longiore, tenuissimi.

This species very much resembles *C. mirabilis* of Dana, which was found in the Pacific Ocean. The chief differences are, the deeper frontal excavation, and the three-jointed branches of the

first three pairs of natatory legs, which in Dana's figure have four segments. He has not, however, described them, and the figure may be erroneous on this point. Length of ceph.  $\cdot 06$ ; of abdomen,  $\cdot 03$ ; of abdominal stylets,  $\cdot 04$ ; total length,  $\cdot 120$ . The depth of the frontal excavation is  $\cdot 004$ .

In the Atlantic, N. L.  $12^{\circ} 21'$ ; W. L.  $25^{\circ}$ .

Pl. IV. figs. 11 to 14.

*Sapphirina Danæ*, n. sp.

Cephalothoracis segmentum primum breve. Conspicilla contigua non-prominentia. Digitus antennarum posticarum paulo brevior quam carpus, unguiculo elongato. Lamellæ caudales subovatae, apice interno breviter denticulato, ad apicem rotundatae, setis quatuor duabus apicalibus, aliis externis, omnibus dimidio lamellæ, non brevioribus.

This species much resembles *S. coruscans*, but is broader in proportion, the conspicilla are not prominent, the first segment of the cephalothorax is not so long as broad, and the caudal lamellæ have no hair at the inner apex. The length is  $\cdot 092$ , the breadth  $\cdot 046$ . The length of the caudal lamellæ is  $\cdot 01$ , and the breadth  $\cdot 0046$ . The length of the second segment of the posterior antennæ is  $\cdot 011$ , of the finger  $\cdot 0099$ , and of the claw  $\cdot 004$ . The basal part of the anterior antennæ has no distinct articulations, and the second apparent segment is longer than the two following.

Colour a brilliant metallic blue.

Collected in the Atlantic,  $27^{\circ} 30'$ , N. L.; W. L.  $20^{\circ}$ .

Pl. XII. figs. 9, 10, 11.

*Sapphirina opaca*, n. sp.

Fœminæ.—Conspicilla contigua. Digitus antennarum posticarum carpo brevior, unguiculo fere dimidii digiti longitudine. Cephalothorax 5-articulatus, ovatus, segmentum primum literæ  $\sqcap$  formam similis, segmentis duobus posticis latere rotundatis. Abdomen 6-articulatum, segmento primo parvulo, secundo rotundato, tertio, quarto quintoque lunatis, postico parvulo. Styli caudales magni, longitudine  $\cdot 008$ , latitudine  $\cdot 005$  unc., apice interno denticulato. Opaca.

This species very closely resembles *S. indigotica*, from which it differs only in having the anterior segment of the cephalothorax separated, and in the fourth and fifth segments being rounded at the margins. Length  $\cdot 063$ .

Atlantic Ocean.

Pl. V. figs. 9, 10, 11.

*Sapphirina stylifera*, n. sp.

Digitus antennarum posticarum tenuis, carpo fere duplo longior. Lamellæ caudales longæ, latitudine  $\cdot 002$ , longitudine  $\cdot 025$  unc.

This species may at once be distinguished from any other by the length and narrowness of the caudal stylets. I had only two specimens, neither of which were in a very good state of preservation, and I could not determine with certainty whether the conspicilla were contiguous or not.

Collected in N. L.  $12^{\circ} 21'$ ; W. L.  $25^{\circ}$ .

Pl. IV. figs. 9, 10.

*Halocypris Atlantica*, n. sp.

Forma *Conchæciam* refert, latere visa, literæ  $\cup$  elongatæ formam similis, postice paulo altior, margine supero recto, incisurâ medianâ, antico et infero leniter arcuato, postico obliquo, infernè rotundato, supernè angulato, ad apicem obtuso. Supernè visa, *C. agili* angustior.

This species appears to be somewhat intermediate between the genera *Conchæcia* and *Halocypris*. In external form it more resembles the former, but the structure of the anterior antennæ and the mandibles proves that it in fact belongs to the latter.

The anterior antenna (Pl. XII., fig. 3) differs from that figured by Dana in consisting only of one segment. The hairs belonging to it were all imperfect, except two. I only had two specimens, and did not succeed in detaching the maxillipeds uninjured. The figures are magnified thirty times, except figs. 1 and 2, which are magnified only fifteen times.

Length  $\cdot 086$ .

Collected in N. L.  $12^{\circ} 21'$ ;  $25^{\circ}$  W.

Pl. XII. figs. 1 to 8.



DESCRIPTIONS OF THE PLATES.

PLATE II.

- Fig. 1. *Diaptomus dubius*, n. sp. Outline, seen from above.  
 2. " Right anterior antenna of male.  
 3. " Maxilliped.  
 4. " Leg of the first pair.  
 5. " " fourth pair.  
 6. " Fifth pair of legs of the male.  
 7. " " female.  
 8. *Calanus inconspicuus*, n. sp. Outline seen from above.  
 9. " Terminal segments of the anterior antenna.  
 10. " Leg of the first pair.  
 11. " " fourth pair.  
 12. *Calanus latus*, n. sp. Terminal segments of the anterior antenna.

PLATE III.

- Fig. 1. *Calanus brevicornis*, n. sp. Outline, seen from above.  
 2. " Antenna of the second pair.  
 3. " Mandible.  
 4. " Maxilla of the first pair.  
 5. " Maxilliped.  
 6. " Leg of the first pair.  
 7. " " fifth pair.

PLATE IV.

- Fig. 1. *Calanus penicillatus*, n. sp. Outline, seen from above.  
 2. " Maxilla of the first pair.  
 3. " Leg of the first pair.  
 4. *Undina Helenæ*, n. sp. Maxilla of the first pair.  
 5. *Undina pulchra*, n. sp. Maxilliped.  
 6. " Leg of the first pair.  
 7. " " fourth pair.  
 8. " Fifth pair of legs, male.  
 9. *Sapphirina stylifera*, n. sp. Outline.  
 10. " Antenna of the second pair.  
 11. *Copilia Atlantica*, n. sp. Front.  
 12. " Leg of the first pair.  
 13. " " fifth pair.  
 14. " Antenna of the second pair.

PLATE V.

- Fig. 1. *Calanus mirabilis*, n. sp. Outline, seen from above.  
 2. " Antenna of second pair.  
 3. " Mandible.  
 4. " Leg of first pair.  
 5. " " fourth pair.  
 6. " Abdomen and end of cephalothorax, seen from the side.  
 7. *Corycæus styliferus*, n. sp. Outline, seen from above.  
 8. " " the side.  
 9. *Sapphirina opaca*, n. sp. Outline, seen from above.  
 10. " Antenna of the first pair.  
 11. " " second pair.

## PLATE VI.

- Fig. 1. *Undina longipes*, n. sp. Outline, seen from above.  
 2. " End of anterior antenna.  
 3. " Maxilla of the first pair.  
 4. " " second pair.  
 5. " Fifth pair of legs, male.  
 6. *Candace pachyductyla*. End of anterior antenna.  
 7. " Maxilla of the first pair.  
 8. " Maxilliped.  
 9. " Leg of the first pair.  
 10. " " fourth pair.  
 11. " " fifth pair of legs.  
 12. " Leg of the fifth pair.

## PLATE VII.

- Fig. 1. *Undina Helena*, n. sp. Outline.  
 2. " End of anterior antenna.  
 3. " Maxilliped.  
 4. " Leg of the first pair.  
 5. " Fifth pair of legs.  
 6. *Undina pulchra*, n. sp. End of anterior antenna.  
 7. *Corycaeus Sutherlandii*.  
 8. " Maxilliped?  
 9. " Anterior antenna.  
 10. " Leg of the first pair.  
 11. " Fifth pair of legs.  
 12. " Abdomen.

## PLATE VIII.

- Fig. 1. *Euchæta Atlantica*, n. sp. Outline of the front and of the anterior antenna, seen from above.  
 2. " End of the anterior antenna, female.  
 3. " Leg of the first pair, male.  
 4. " " fourth pair, female.  
 5. " Fifth pair of legs, male.  
 6. Abdomen and part of the cephalothorax, seen from the side, female.

## PLATE IX.

- Fig. 1. *Euchæta Sutherlandii*, n. sp. Outline, seen from the side.  
 2. " Fifth pair of legs.  
 3. *Undina plumosa*, n. sp. End of anterior antennæ, male.  
 4. " Posterior antennæ.  
 5. " Fifth pair of legs.  
 6. *Undina Dana*, n. sp. Front, seen from above.  
 7. " End of the anterior antennæ.  
 8. " Maxilliped.  
 9. " Fifth pair of legs, male.

PLATE X.

- Fig. 1. *Diaptomus abdominalis*, n. sp. Outline, seen from above.  
 2. " " End of anterior antenna, male.  
 3. " " Posterior.  
 4. " " Leg of the first pair.  
 5. " " " fourth pair.  
 6. " " Fifth pair of legs, female.  
 7. " " " male.  
 8. " " Abdomen and end of cephalothorax of female, seen from above.  
 9. } *Calanus communis*, Dana. End of cephalothorax, seen from the side.  
 10. }

PLATE XI.

- Fig. 1. *Pontella setosa*, n. sp. Outline, seen from above.  
 2. " " Maxilliped.  
 3. " " Leg of the first pair.  
 4. " " " fourth pair.  
 5. " " Fifth pair of legs, male.  
 6. " " " female.  
 7. " " End of cephalothorax, seen from the side.  
 8. *Calanus latus*, n. sp. Front, seen from above.  
 9. " " Posterior antenna.  
 10. " " Maxilla of the first pair.  
 11. " " Abdomen and end of cephalothorax.

PLATE XII.

- Fig. 1. *Halocypris Atlantica*, n. sp. Outline, seen from the side.  
 2. " " " above.  
 3. " " First antenna.  
 4. " " Second "  
 5. " " Mandible.  
 6. " " Maxilla.  
 7. " " Leg of the first pair.  
 8. " " " second pair.  
 9. *Sapphirina Danæ*, n. sp. Outline, seen from above.  
 10. " " First antenna.  
 11. " " Second "  
 12. *Clytemnestra Atlantica*, n. sp. Outline, seen from above.  
 13. " " Antenna of the second part.

These drawings were made with the help of the Camera lucida.  
 The secondary hairs in figs. 2, 3, 4 and 5 of Pl. V. are too thick.

III. *How may the Onward Progress of the Study of Entomology be best furthered?* By H. T. STAINTON, ESQ.

[Read February 4th, 1856.]

HE who looks around him at the countless forms of insect life which meet his eyes on every side may well despair of ever obtaining an intimate knowledge of *all* these little creatures; the study of *any one group* would furnish him with occupation for life.

It is a common but erroneous notion, that to restrict one's investigations to a single group would have the effect of contracting one's ideas; if to *know* any thing *thoroughly* be an evil, it is an evil by no means widely disseminated; one person cannot *know* every thing, however clever and industrious he may be; he may be well informed on a great variety of subjects, but *information* is not *knowledge*. Information may be derived from books, or from conversation with others; knowledge is only obtained by our own actual study of the objects themselves.

A person may be narrow-minded and pedantic from an excess of information, having a superficial knowledge of a variety of subjects but no thorough knowledge of any; but unless the mind of the individual be very singularly constructed, no amount of thorough knowledge will induce prejudiced and one-sided views.

It is utterly impossible for any person to penetrate deeply into any one branch of study without finding that he is obliged to make himself acquainted with many collateral branches, which bear more or less immediately upon the object of his attention. And from the very fact of his having penetrated deeply into the mysteries of some branch of knowledge, he is well aware of the limited extent of his knowledge of these collateral branches, in which probably he knows more than many a well-informed man who considers himself to have a good knowledge of every thing. And the student, considering himself very ignorant on such a subject, is surprised to find that those who are evidently more ignorant than himself should consider themselves very learned.

But whilst enunciating as an axiom that actual knowledge can only be obtained by perseveringly pursuing some particular branch of study during a long series of years, it may well be urged, is it

not better to content one's-self with a general information than to penetrate into these mysteries, where we at once find ourselves at a depth where our labours are hardly appreciated by any of our acquaintance?

By no means; the bee rifles the flower of its honey not for its own immediate pleasure and enjoyment, but in order that it may be carried home and added to the common store for the future use of the community: the bee swallows the honey, and afterwards regurgitates it into a cell prepared for its reception; so must it be with the scientific student,—he must probe science to her innermost recesses, (he must remember that the bee buries herself in the corolla of some tubular flower,) and having acquired an amount of knowledge by the actual investigation of objects themselves, he must arrange and classify the knowledge so obtained, and then, having thoroughly digested it, he must reproduce it in a simple, intelligible form, so that those who have not time to pursue for themselves the peculiar branch of study to which he is devoted, may yet be able to derive advantage from his labours; just as the bees which remain occupied in the hive are benefited by the honey collected by those which go abroad.

Each student thus adds not only to *his own knowledge*, but also to *the information of many others*, and he in turn will derive an excess of gratification and pleasure from the labours of other students in different branches of science, far above that which the generally well-informed man derives from the same labours.

It may be that it will sometimes happen that the student, who has penetrated the hidden mysteries of some branch of science, will selfishly content himself with enjoying the sweets of knowledge, without endeavouring to make others partakers of his good cheer: either from laziness, egotism or a feeling of contempt for those beneath him, he may be inclined either to keep his knowledge entirely to himself, or else to publish it in such a form that it can only be comprehended by those almost as conversant with the subject as he happens to be himself. Such feelings should be carefully guarded against, as, if once they find entrance, they would be apt to increase in the mind of the student and to diminish his usefulness.

In the course of the next few years we shall probably see a large increase in the crop of Entomological students, and it is of very great importance to the progress of science that each individual should not attempt too much, but should devote his energies and attention to some comparatively limited group. If twenty individuals were each to master a separate group of some of the

many of the insect tribes that have as yet been little explored, and if each were to elaborate the knowledge he obtained so as to make it available to the community, who can doubt that a vast impetus would be given to the onward progress of our science, and that it would advance by rapidly accelerating strides?

Each investigator of any particular group becomes at once a focus to which all chance observations by others are referred; it is thus that, in looking through Mr. Smith's "Monograph of the British Bees," we find that it condenses not merely his own observations during twenty years, but also a mass of extraneous observations made by others, themselves unaware of their value, but which, being communicated to Mr. Smith, were at once recognised by him as supplying some important link in the chain of information he was collecting.

And this alone is no slight help to the progress of Entomology. Every year and during the season, one may say every day, a number of observations are made, some merely repetitions of such as had been often made before, some confirmatory of facts which rested only on the evidence of single observations, some made for the first time. Many, very many of these never get recorded; the observers are not aware of their value. But, let each branch of the extensive circle of Entomology have its special investigator, and each observer can at once refer to him any fact which has struck him, bearing, or supposed to bear, upon his special subject; and though we can never expect that every observation made will be rendered available, we may reasonably expect that the number of observations which at present fall still-born to the ground will be reduced.

The substance of the deductions arrived at, in the progress of this inquiry, is as follows.

1. Let each student of Entomology restrict himself to some limited field of investigation.
2. Let each make known the object of his peculiar predilections and encourage general observers to communicate to him any facts bearing upon it.
3. Let each, as soon as he has acquired and digested a sufficient amount of knowledge, publish it in an intelligible form, not restricting himself solely to details, but wherever opportunities occur, generalising the subject as much as the extent of his knowledge will permit.

Immediately this third point has been reached on any one branch, it will give a vast impetus to its study, and will render the co-operation of observers more active and also more service-

able, each seeing to what especial point his attention should be directed.

If, instead of pursuing the course here pointed out, each individual were to content himself with a general information on a variety of subjects, it would be utterly impossible to make any real progress, for each observation that happened to be made would be comparatively useless, there being no one to whom to refer, in order to ascertain whether it was of any value or not. When this is borne in mind it can hardly excite our wonder that Entomology should hitherto have progressed with such painful slowness, and it may indeed cause surprise that so much time should have been spent in elaborating *theories*, whilst a collection of *facts* on which alone theories ought to have been founded was disregarded.

The first step in the progress of our investigations in any branch of our science is to draw a line of demarcation between what *is* known and what *is not* known.

The student who is earnestly at work will never be anxious that any discoveries he may make should be especially recorded as *his* discoveries; his object is that all new discoveries be recorded and made generally available, not for the enhancement of his own honour, but for the furtherance of science; for however numerous may be the new observations he may make, or the connecting links in the arrangement of groups which he may be the first to seize, he will bear in mind that his talents of observation and perception are but given to him for a definite purpose, and he cannot but remember the inquiry—

“ What hast thou, that thou did'st not receive ?  
Now if thou did'st receive it, why boastest thou  
Thyself, as though thou had'st not received it ? ”

The earnest and truth-seeking student will never cavil at another for reproducing his ideas, even if he do so without acknowledgment; a third party might make such complaint with a good grace, but never the individual supposed to be aggrieved. To complain querulously that another has published his ideas, would lead one strongly to infer that he did not pursue science for its own sake, but for the sake of some honour or distinction it might confer.

And the student who enters upon a long course of investigations will not be disheartened or dismayed by the reflection that in all probability he will never live to complete them; his object is to be “ doing something,” whether he ever bring that which he

is doing to completion or not ; if he leaves his work unfinished, others will rise up after him and resume the thread of his labours and carry the good work onward ; but whilst we contend that there is no room for faint-heartedness in considering the shortness and uncertainty of life, we must not forget to draw from it the wholesome lesson of doing *at once* what we have in our power to do, and not delaying and postponing this or that investigation for "a more convenient season" that may never come.

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IV. *Descriptions of New Genera and Species of Asiatic Longicorn Coleoptera.* By F. P. PASCOE, Esq., F.L.S., &c.

[Read 3rd March, 1856.]

THE collections of insects recently sent to this country by Mr. Wallace from Malacca and Borneo are especially rich in the longicorn *Coleoptera*, the greater part being new to Entomologists. The more remarkable I now bring to the notice of the Society, and to these I have added a few others yet undescribed collected by Mr. Fortune in North China.

BLEMMYA.

Maxillary palpi shorter than the labial, with the terminal joints in both rounded ; mandibles produced ; antennæ short, with the basal joint thick and longer than the third, the sixth to the eleventh widely dilated on one side ; thorax unarmed, rounded, wider behind ; elytra depressed ; legs short, robust.

A remarkable genus, whose nearest affinity appears to be with *Mallosoma*.

*Blemmya Whitei.* (Pl. XVI. fig. 6.)

*B. atra* ; scutello albo ; elytris atris, carinatis, fasciâ angusta alba, in singulis interruptâ. Borneo.

Black, thickly and roughly punctured, a fringe of white appressed hairs on the posterior margin of the prothorax, but interrupted as they approach the scutellum, and not continuous be-



neath; elytra with a prominent carina on each commencing at the basal angle and indistinctly terminating near the apex; rather below the middle a narrow band formed of white hairs, interrupted at the carina, and scarcely confluent at the suture; beneath black; the posterior margins of the episternum and margin of the first abdominal segment each furnished with a fringe of white hairs.

Length  $7\frac{1}{2}$  lines.

*Blemmya bifasciata*.

*B. atra*; scutello concolore; elytris atris, fasciis angustis duabus albis. Borneo.

Size of the last; black, very closely punctured, fringe of white hairs at the posterior margin of the prothorax, continuous, two white hairy fasciæ dividing the elytra into three equal parts; under surface as in *B. Whitei*, but tomentose, with four abdominal segments margined with white. There is only a faint trace of the carina in this species.

PROTHEMA.

Head rather produced; palpi equal, subfiliform; antennæ long, with the sixth to the tenth joints dilated on one side towards the end; thorax rounded, wider behind; elytra rather short, depressed; scutellum minute; four anterior legs moderate; posterior lengthened, with their tarsi compressed.

This genus, like the last, appears to be allied to *Mallosoma*.

*Prothema signata*. (Pl. XVI. fig. 5.)

*P. atra*, scabra, corpore subtus hirto; elytris singulis maculis duabus pilosis ochraceis, unâ scutellare curvata, alterâ pone mediam transversâ lunulata. China Borealis.

Black, with the head, thorax and elytra rough from numerous small granulations, a curved line from near the shoulder bordering the scutellum and directed outwards, and a transverse lunulate spot below the middle of each elytron covered with ochraceous hairs; body beneath tomentose, white, with a diluted saffron yellow tinge on the sides.

Length 7 lines.

*Prothema funerea*.

*P. atra*, scabra, pilis flavescens infra vestita. China Borealis.

Black, and granulated as in the last, but without any hairy

specks in the elytra. In my specimen the under surface is not so brightly marked as in the first species, and the sides of the elytra are nearly parallel, not dilated posteriorly.

Length 7 lines.

#### ACROCYRTA.

♂ Antennæ longer than the body, basal and fourth joint shorter than the third, fifth to the eleventh longest and subequal, and all from the third to the ninth more or less thickened and spined at the end; the eleventh (in ♂ only) hooked; thorax lengthened, subcylindrical; elytra rounded, spined at the apex; legs long, four posterior femora biapiculate, tibiæ and tarsi much compressed.

The remarkable apical hook of the antennæ exactly resembles that of *Ancylocera*, but is found only in the males; the genus is allied to *Clytus*.

#### *Acrocyrta clytoides*. (Pl. XVI. fig. 1.)

*A. atra*; prothorace punctata, angulis posterioribus albo-marginatis; elytris pilosis, maculis duabus, scutelloque albis. Borneo.

Black, head minutely punctured; prothorax more coarsely and closely punctured, the inferior and lower margin with a narrow border of white hairs, the anterior portion having an indistinct blueish blotch on each side; scutellum white; elytra impunctate, with two white hairy fasciate marks, the basal mark bent with its apex towards the scutellum, the apical nearly transverse in both, becoming attenuate as they approach the margin; body beneath pilose, black, with the borders of the episternum and two first abdominal segments white; antennæ with the first five joints black, the three next leaden at the base, the rest black.

Length  $7\frac{1}{2}$  lines.

#### *Astathes simulator*.

*A. rubro-miniata*, hirsuta; thorace gibbosa; elytris concavis, postice dilatatis, apice marginali oblique spinosis; oculis nigris. Borneo.

Of a dark red colour and shining, covered with nearly erect setose hairs; thorax rough, raised into a prominent somewhat bifid gibbosity; elytra concave, posteriorly dilated, and each terminating on the inner margin in a spine directed obliquely outward; antennæ with the last two or three joints black.

Length ♂ 4 lines; ♀ 5 lines.

At the first glance this species closely resembles the West African *A. testator*, F., from which, however, it is abundantly distinguished by the apical spine and well marked characters in the elytra and antennæ.

SERIXIA.

Head wider than the thorax, the antennæ filiform, longer than the body, with the first, third and fourth joints sub-equal and slightly spined at the end, the under surface ciliated; thorax short, equal, with the anterior and posterior margins grooved; elytra depressed, dilated posteriorly.

This genus has much the form of *Astathes* and *Entelopes*, but differs from both in its longer and more slender antennæ.

*Serixia apicalis*. (Pl. XVI. fig. 3.)

*S. griseo-glaucia*, nitida; elytris sericeo-tomentosis, striato-punctatis, apice luteis; thorace, capite, antennisque nigris; pedibus flavis. Malacca.

Glaucous grey, the elytra silky shining, striate punctate, with a bright luteous spot on the apex of each; antennæ and eyes black; the head and thorax black, with a slight tinge of grey; legs yellow.

Length 5 lines.

*Serixia modesta*.

*S. griseo-nitida*; elytris sericeo-tomentosis punctato-striatis; thorace capiteque obscure fulvis; antennis nigris; pedibus flavis. Borneo.

Smaller than the last, and without the apical spot; the head and prothorax of a dull fulvous colour, in other respects very similar.

Length 4 lines.

NEOXANTHA.

Head small; eyes reniform, undivided; antennæ moderate; maxillary palpi clavate; prothorax rounded, equal; elytra convex; legs robust.

A genus near *Astathes*, but differs in its reniform undivided eyes, clavate palpi and other characters.

*Neoxantha amicta*. (Pl. XVI. fig. 4.)

*N. croceo-flava*, pilosa; prothorace tuberculis tribus nigro-nitidis; elytris singulis plagis duabus viridi-nigris; antennis variegatis, tarsis nigris. China Borealis.

Light saffron yellow, densely hairy, with longer setose hairs

sparingly interspersed; a black triangular spot between and rather behind the eyes; prothorax with one central and two black mamillated shining tubercles; each elytron with two greenish black median patches, one discoidal, the other at the side beneath it; sides of the mesothorax and first abdominal segments black; antennæ with the third and fourth joints yellowish, the rest black; tarsi and ends of the femora black.

Length 7 lines.

*Entelopes Wallacei.*

*E. rubro-fulva*; elytris punctatis, pectore ventreque nigris; pedibus fulvis; femoribus posticis nigris. Borneo.

Of a dull brick red colour, with the elytra much punctured; eyes black, antennæ pale; legs pale reddish yellow, thighs of the posterior pair of legs almost entirely black; metathorax and abdomen black.

Length 6 lines.

The form of this species is more elongate than in *E. glauca*, and there is no trace of any spots. It appears to be very rare, as Mr. Wallace has sent but a single specimen to England.\*

DIALEGES.

♂ Head with the neck long, the eyes entirely divided, the palpi equal; antennæ longer than the body, with the basal joint short and thick, the third very long, and this with the four or five following nodose, and densely ciliated beneath; thorax elongate, unarmed, narrower before and transversely wrinkled; elytra long, narrow, truncate and spined at each angle; legs rather long, the femora very robust, the tarsi compressed.

*Dialeges* differs from the restricted genus *Cerambyx* (*Hammaticherus*) in its divided eyes, ciliated antennæ, the remarkable elongation of its neck, and the thorax without the lateral spine.

\* Since this paper was read, I have seen Dejean's specimen of *Entelopes brevicollis* (*E. glauca*, Buq.), in M. Chevrolat's collection, and I have little doubt of its being the same species as that which I have figured under the supposition of its being distinct. It wants, however, the apical spot, and on comparison there may be other differences. It is from Java. Mr. Wallace sends another insect from Malacca, smaller, with larger spots, which he considers to be specifically distinct; as he has had the advantage of seeing them in a living state, there may be some differences in their habits or economy which has led him to this opinion. In this case, Dejean's *E. brevicollis* will be a third species, and *E. Wallacei* will then rank as a fourth.

*Dialeges pauper.* (Pl. XVI. fig. 7.)

*D. brunnea*, sericeo-pilosa; prothorace corrugatâ; elytris brunneo-velutinis, singulis plagis duabus sub-quadratus fuscis. Borneo, Malacca.

Head and prothorax greyish-brown, the latter with a darker or nearly black figure resembling the letter W; elytra velvety, light brown with silvery reflections, and having each two oblique and somewhat quadrate blotches of dark brown; beneath brown, with a whitish tomentum.

Length 13 lines.

Another of Mr. Wallace's Bornean insects closely resembles the above in its colouring, and I have no doubt will prove to be the female; it is much smaller, less elongate, with small femora, antennæ shorter than the body, and altogether of a different character, being perfectly glabrous and having the last six or seven joints compressed and dilated at their extremities.

*Triammatus Chevrolati.*

*T. griseo-hirtus*, nigro-variegatus; elytris tuberculis nigris nitidis, singulis plagis duabus nigro-brunneis; subtus griseis, lateribus capitibus pectorisque albis. Borneo.

Hairy, greyish, variegated with black; on the head three and on the prothorax five indistinct black lines, a white line commencing from under the eyes and gradually spreading out into a patch on the mesothorax; elytra with numerous black tubercles near the shoulders, and with coarse black punctures below, having on each a well-defined brown patch, and below, but extending to the margin, another and larger one, and between these a white mark; antennæ with the fourth joint (♀) brown, the fifth to the last brown only at the ends.

Length 10 lines.

*Monohammus luridus.*

*M. piceus*, punctulatus, subtus albo-pilosus, elytris punctatis, nigro-maculatis, pilis cinereis tectis. China Borealis.

Head and thorax pitchy, minutely punctured, elytra covered with ashy grey hairs, irregularly punctured and having on each about twelve black spots; body beneath covered with whitish hairs, legs black, sparingly clothed with short whitish hairs; antennæ black.

Length 6 lines.

This will come into the group with *M. beryllinus*, Hope, and other allied species.

*Monohammus aspersus.*

*M. atro-fuscus*; prothoracis lateribus fulvo-vittatis; elytris piceis, punctatis, fulvo-maculatis, corpore subtus castaneo. Malacca.

Dark brown, a fulvous line in front of the eye, and another beneath, both extending to the mouth; prothorax with a narrow line on each side, and above the spine; elytra pitchy, irregularly punctured and having numerous spots varying in size scattered over the surface; antennæ brown, with the third, fourth and fifth joints lighter at the base; legs, palpi and under surface chestnut brown.

Length 8 lines.

*Monohammus infelix.*

*M. brunneus subsericeus*; elytris punctatis, fasciis duabus undulatis obscure plumbeis. China Borealis.

Brown, with a slight silky pubescence, thorax rather narrow, nearly smooth, elytra irregularly punctured, deeper near the shoulders, which are without tubercles, and having two waved plumbeous bands, the lower the most distinct, but neither meeting at the suture; under surface silky brownish white; legs brown; antennæ brown; the basal part of nearly all the joints lead colour.

Length 7 lines.

*Monohammus blattoides.*

*M. convexus*, piceus; antennis mediocris; capite prothoraceque punctatis, vittisque sextis fulvis longitudinaliter dispositis; elytris maculis pilosis fulvis, humeris productis. Borneo.

Convex, pitchy black, the antennæ moderate (♂ with the fourth and fifth joints fusiform) black, the bases of the joints from the fourth to the seventh greyish white; head and thorax irregularly punctured, and having six fulvous hairy stripes, two extending from between the antennæ to the elytra, and terminating on each side the scutellum; another stripe commences behind the eye, and a third beneath from the main line of the face, these last not being visible from above; elytra longitudinally punctured and covered with small distinct irregular hairy fulvous spots, each elytron having near its humeral angle a wide prominent spine; under surface with more or less fulvous squamous patches at the sides, particularly of the abdominal segments; legs pitchy, varied with grey.

Length 14 lines.

The peculiar antennæ of the male, and the absence of the naked shining tubercles on the elytra, so general in the *Monohammus*, appear to point this out as the type of a new genus.

*Monohammus diophthalmus.*

*M. brevis*, piceus, pilis brevibus cinereo-albis tectus; elytris singulis basi sub-ocellatis, maculâque magnâ laterali brunneis; antennis mediocris sub-ciliatis. China Borealis.

Pitchy, covered with short greyish white hairs; sides of head and thorax brown, having a broad stripe, extending from between the antennæ to the scutellum, greyish white; elytra with a small brown sub-ocellate spot at the base, having five or six black shining tubercles in the centre and several more on the shoulder, a large brown somewhat triangular spot at the side, beyond the middle and spreading out at the margin; antennæ moderate, sub-ciliated beneath; legs, particularly the tarsi, covered with short whitish hairs.

Length 12 lines.

This species is near *M. crucifer*, F., from Ceylon.

*Monohammus? angustus.*

*M. ? elongatus*, pilosus, fulvo-brunneus; prothorace tuberculato; elytris punctatis singulis plagâ obliquâ laterali fuscâ; antennis longis fuscis, pedibus brevibus fuscis. China Borealis.

Narrow, elongate, and covered with yellowish brown hairs; prothorax rather short, with numerous black shining tubercles, the lateral spine acute; elytra punctate, with an oblique dark brown patch, not meeting at the suture, pointing and becoming less determinate towards the apex, above this patch is a somewhat yellowish mark and below it another; legs brown and rather short, particularly the posterior pair; antennæ rather long, brown, the joints generally darker towards their apices.

Length 9 lines.

In its lengthened form and short legs this insect assumes a different *facies* from others of the genus *Monohammus*.

*Golsinda tessellata.*

*G. nigra*, densissimè pilosa; elytris albo-maculatis, profunde punctatis; antennis pedibusque annulatis. Borneo.

Dull brownish black, marked everywhere above with round or oval distinct or occasionally confluent spots, but more obscurely on the thorax and around the scutellum; on the head the principal marks are a white patch on the cheeks, an X shaped mark be-

tween the eyes and an irregular spot behind them; the first nine joints of the antennæ, as well as the femora and tibia, more or less annulated with black and light whitish grey, the two first joints of the tarsi white, the third black, the claws grey with the hooks black; prothorax in the middle with five confluent tubercles, and a smaller one at the side; elytra irregularly and coarsely punctate, and having two sharp spines or tubercles at the base of each, the humeral angle less tuberculate; antennæ with the seventh joint in the male having internally a small rounded tooth at the apex.

Length 10 lines.

Mr. White has favoured me with his MS. description of another species (*G. reticulata*) closely allied to this, from India, but having larger and more generally confluent spots or rather blotches, the black portion being reduced to a mere reticulation. Both have the antennæ with the seventh joint toothed; but in a third species from Borneo (*G. corallina*, White's MS.) this is absent.

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DESCRIPTION OF THE FIGURES.

PLATE XVI.

- Fig. 1. *Acrocyrta clytoides*.  
2. *Entelopes glauca*, Buq. var.  
3. *Serixia apicalis*.  
4. *Neoxantha amicta*.  
5. *Prothema signata*.  
6. *Blemmya Whitei*.  
7. *Dialeges pauper*.



V. *Characters of a few apparently undescribed Insects collected by James Gibbon, Esq., at Moreton Bay.* By EDWARD NEWMAN, Esq., F.L.S.

[Read 4th February, 1856.]

Class COLEOPTERA, Linn.

Stirps ELATERINA, Newman.

Genus ELATER, Linnæus.

Sp. 1. *Elater (Alaus) Gibboni*, Newman.

*Niger, lanugine brevi tricolori, i. e., albido, cinereo, nigro, dense vestitus, quoad elytra colore nigro vittatim disposito, elytris et prothorace medianis longitudinaliter detritis, lanugine nudatis, tunc aterrimis glaberrimis, illis 9-striatis, striis ordinatim profunde punctis: subtus, lanugine testaceo-fusco omnino dense tectus.* (Corp. long. 1.5 unc.; elytrorum lat. max. .5 unc.)

The serrated antennæ are short, scarcely half as long at the prothorax and of an opaque dingy black, the basal joints slightly tinged with rust-colour, this being due to the pile, which appears originally to have clothed every part of the insect; the head is semicircularly notched in front, its colour grey, sparingly interspersed with black and testaceous scale-like hairs; the eyes are black, naked and brilliantly glabrous: the prothorax has on its anterior margin two small teeth, which project slightly over the head; it is densely covered dorsally with greyish white pile, except along the mesial line, where it appears to have been denuded by friction, and where the exposed dermal envelope is intensely black and brilliantly glabrous; the grey pile is interrupted on the lateral margins by five equidistant black spots, one occupying each angle and three intervening, the middle one is the largest and is somewhat quadrate; the pile of the prothorax, like that of the head, is interrupted by specks of black and testaceous: the elytra are densely clothed with pile, each has nine striæ and the interspaces are alternately slightly raised and slightly depressed; the pile on the depressed interspaces is tinged with testaceous, that on the

elevated interspaces is whiter and is interrupted by lengthened spots of an intense velvety black. Beneath, every part of the insect is covered with a dense concolorous pile of a testaceous brown colour.

The species of the very natural division of *Elater*, which has received the name of *Alaus*, are of uniform habit and uniformly of large size: this beautiful species, the only Australian one which I have happened to meet with, is no exception, and I have been less particular in details of form and sculpture, because they present no salient differences. Mr. Gibbon found a single specimen in a saw-pit, and I have great pleasure in associating it with the name of one who has done so much for the Entomology of Australia, and who has with such liberality presented the rarities of his collection to our national Museum.

Sp. 2. *Elater (Dorcostoma) Jansoni*, Newman.

*Obesus, depressus, subcomplanatus, fuscus, opacus, pilis sparsis brevibus adpressis pallidioribus omnino tectus; capite mediocri, in prothorace recepto, prothorace duplo angustiori; labro porrecto acuto; mandibulis exsertis porrectis, extus hirsutis, prominentibus, dente mediano valido interno armatis, apice uncinatis, acutissimis; oculis aterrimis glabris, prominulis; prothorace lato antice sinuato, lateribus dilatatis, antice subrotundatis postice subexcavatis, angulis posticis productis, dentem magnum truncatum utriusque lateris fingentibus; elytris dilatatis marginatis, costis paullulum at manifesto reflexis puncto-striatis, striis 9. (Corp. long. 1 unc.; elytrorum lab. max. .425 unc.)*

Brown, unicolorous without gloss, beset with short scattered appressed hairs. Antennæ about equal in length to the prothorax, 11-jointed, flattened, slightly serrated; labrum somewhat trigonate, porrected, acute in front; mandibles very strong, porrected, prominent, slightly hooked and very acute at the tips, and having one large strong very acute tooth, situate about the middle of the internal margin; prothorax broad, the longitudinal and transverse breadth nearly equal, its anterior margin excavated to receive the head, and the excavation slightly sinuated, the lateral margins dilated, anteriorly rounded, posteriorly somewhat excavated, each posterior angle produced into a large blunt tooth; elytra broad, somewhat depressed, the costal margin dilated and somewhat reflexed, the dilation originating below the shoulder; the disk impressed with nine well-marked punctate striæ, the interstices

somewhat convex, the punctures of striæ regular, moderately deep, very distinct; legs short; prosternum verrucate; mouth, antennæ and legs somewhat rufo-piceous, the whole under surface clothed more thickly than the upper with short pale pile.

A single specimen of this interesting insect, captured by Mr. Gibbon, is in that gentleman's collection.

I have named it in honour of our learned Curator, Mr. Janson, than whom no one has studied the *Elaterina* with more profound science or acuteness. The species is particularly interesting, as subserving the view entertained by the illustrious Kirby of connecting the *Elaterina* with certain *Cebrionidæ*, more particularly with the *Anelastes Drurii* of Kirby, described and figured in the twelfth volume of the Linnæan Transactions.—Linn. Trans. xii. 285.

#### Stirps CERAMBYCINA, Newman.

##### Genus STENODERUS.

##### Sp. 1. *Stenoderus quietus*, Newman.

*Caput ac prothorax testacea, glaberrima, oculis antennisque nigris; scutello nigro, quoad discum depresso opaco, quoad marginem posticum simicirculariter elevato; elytris latis testaceis opacis nullo modo signatis, carinis elevatis 4 concoloribus; prosterno procoxisque læte testaceis, metasterno nigro; mesocoxis testaceis, mesofemoribus sordide testaceis; tibiis tarsisque omnibus, metapedibusque omnino nigris; abdomine chalybeo-nigro, lumine mutato iridescente.* (Corp. long. .5 unc.; elytrorum lat. .15 unc.)

Head and prothorax above and below bright testaceous, very glabrous: eyes, antennæ and scutellum black; elytra testaceous, opaque, broader than is usual in the genus; each has four sharp well-defined parallel ridges extending throughout its entire length; the fore and middle coxæ are testaceous; the fore and middle femora testaceous, but more dusky; all the tibiæ and tarsi and the whole of the hind legs are black, devoid of gloss; the metasternum and abdomen are black and shining, and exhibit iridescent colours when moved in the light.

Hab. Moreton Bay. A single specimen was collected by Mr. Gibbon, together with abundance of allied species, as *Pentacosmia atricilla*, *Stenoderus ostricilla*, &c.

## Class LEPIDOPTERA, Linn.

Stirps SPHINGINA, Newman.

Genus DEILEPHILA, Ochseneimer.

Sp. 1. *Deilephila Dalii*, Newman.

*Alis anticis fuscis, colore transversim undato; lunulá medianá nonnunquam puncto quoque proximo niveis; posticis ferrugineis nullo modo signatis; abdomine pallide fusco incisuris saturatioribus.* (Corp. long. 1·6 unc.; alarum dilat. 3 unc.)

The fore wings are brown, waved transversely with a somewhat darker hue; near the centre of the disk of the wing is a snow-white lunule, and almost close to the anterior limb of this, but slightly nearer the apex of the wing, and also nearer its costa, is a spot of the same colour; these markings, very conspicuous and ornamental in the greater number of specimens, are subject to much variation, both as to magnitude and distinctness, the white in some instances is tinged more or less with the prevailing colour of the wing, and occasionally is altogether obliterated; hind wings altogether ferruginous, with paler cilia. Head, thoracic segments and abdomen brown, the last decidedly the palest, but each segment has on each side a dark patch at the base. Beneath, the clothing of the face and palpi is whitish, the sternum and abdomen brownish grey; the fore wings are dingy brown, with two narrow transverse and somewhat indistinct waved discoidal lines.

A common species at Moreton Bay. Mr. Gibbon took it in some abundance. I have named it in honour of Mr. Dale, of Glanville's Wootton, one of our very best practical Entomologists.

Genus MACROGLOSSA, Ochseneimer.

Sp. 1. *Macroglossa Nox*, Newman.

*Fusco-nigra; alis posticis nigerrimis, margine costali late albido; abdominis segmentis lateraliter nigro niveoque ornatis.* (Corp. long. 1·5 unc.; alarum dilat. 2·2 unc.)

Above, the palpi, head, thoracic segments and fore wings are dark brown approaching to black, the fore wings exhibiting traces of transverse fasciæ of a darker hue, and all these also exhibit

slight metallic reflections of green and blue; the hind wings are intensely black as regards all that portion exposed when the wings are extended at right angles with the body, but in the folded portion near the abdomen are two pale clouds, and the entire costal margin covered by the fore wing is white; the abdomen is nigro-æneous along the middle, the æneous tint being due to a rather copious sprinkling of glittering golden scales among the black; three segments near the base have, on each side, a basal black spot and a marginal white one; the anal brush is black, the tips of the scales paler. Beneath, the palpi, face and sternum are whitish grey, the dark colour of the epicranium and the white of the under side distinctly and abruptly separated from each other, the dark colour descending obliquely to the lower margin of the eye; the abdomen blackish, approaching to grey towards the anus, but the anal brush quite black; the basal segments are marked with white in the centre, and four of the segments have a very conspicuous snow-white spot on each lateral margin; the fore wings are black, inclining to grey at the base, and the hind wings are black exteriorly, but grey towards the base, and especially in the folded portion near the abdomen.

This appears to be a common insect at Moreton Bay. Mr. Gibbon brought home many specimens, some of which are presented to the British Museum.

### Stirps BOMBYCINA, Newman.

#### Genus CASTULO, Walker.

##### Sp. 1. *Castulo Doubledayi*, Newman.

*Antennis bipectinatis nigris, ramulis fuscescentibus; epicranio oculisque nigris; labipalpis porrectis læte miniatis; prothorace miniato; mesothorace atque patagiis nigricantibus; abdomine rufescenti; alis anticis nigricantibus, costâ rufescenti, maculâ basali rufescente vagâ, maculâ prope angulum analem albidâ; posticis flavis, margine postico late nigricante.* (Alarum dilat. 1.2 unc.)

*Male.*—Labial palpi bright red, somewhat acuminate, ascending and porrected; crown of the head and eyes black; antennæ rather less than half as long as the fore wings, strongly bipectinated, the shaft black, the pectinations pale brown; prothorax bright red; mesothorax and tippets nearly black; abdomen reddish-orange coloured; fore wings—above—black, sprinkled with orange scales,

but these, although numerous, are so minute as scarcely to alter the general black colour of the wing; costa red for about half its length,—this colour commences within a short distance of the base, and extends beyond the middle; at the basal angle of the hinder margin is a reddish spot, and above this, between it and the costa, are two very small spots of the same colour,—on the hinder margin also, and near its anal angle, is a cream-coloured blotch, various both in size and shape; hind wings bright orange, with a broad black border, which ceases just before the anal angle; fore wings (beneath) blackish-brown, with the costa red, and a yellowish suffused blotch near the anal angle and extending thence along the margin to the base; hind wings reddish-orange, with a central black lunule and a broad black border, this diminishes towards the anal angle, before reaching which it ceases entirely,—the extreme margin of the wing is paler, and the cilia again dark; the under side of the head, thoracic segments and the coxæ are bright red; femora reddish-black in front, tibiæ blackish mingled with red; fore and middle tarsi blackish, hind tarsi golden yellow; fore tibiæ unarmed, middle tibiæ with two strong apical spines, hind tibiæ with four strong spines—two median, two apical; abdomen (beneath) red, with a black vitta along the middle, and a row of black dots along each side; the three segments preceding the anus are slightly dilated laterally, and each furnished with a lateral tuft or brush somewhat as in *Macroglossa*.

This species is certainly allied to others which Mr. Walker has placed in his new genus *Castulo*, but is quite distinct from any he has described. *Setina irrorella* and *Gnophria rubicollis* are its nearest allies in the British Fauna. I have named it after my friend Henry Doubleday, who is, *nemine contradicente*, the prince of British Lepidopterists. Two specimens only were taken.

## Class DIPTERA, Linn.

### Stirps TABANINA, Newman.

#### Genus PANGONIA, Fabricius.

##### Sp. 1. *Pangonia Walkeri*, Newman.

*Testacea, nitida; scutello, sterno ventreeque aterrimis; alis nitidissimis hyulinis, nebula apicali fusca; pedibus basi fuscis, apice tibiis tarsisque testaceis.* (Corp. long. .75 unc.; alarum dilat. .85 unc.)

Testaceous above and very shining, yet clothed in patches with fulvo-testaceous pubescence; the rostrum is not longer than the

mesothorax, the eyes dark brown, the head clothed below with hoary pubescence; mesonotum testaceous, brilliantly glabrous; scutellum black, glabrous; sternum black, but clothed with a hoary fulvous pubescence; abdomen fulvous above, with a median, not very distinct, blackish marking extending from the scutellum to the third segment, black beneath, with the exception of a pale yellowish band immediately behind the hind legs, and this is interrupted by three black obscurely defined markings, one of them central, the others lateral; coxæ and nearly the whole of the femora dark brown, approaching to black; tibiæ and tarsi testaceous.

Hab. Moreton Bay, North Australia; a single specimen was taken by Mr. Gibbon, and is in that gentleman's collection. The species of *Pangonia* is dedicated to Mr. Walker, whose labours in the *Diptera* are familiar to all Entomologists, and to whom I am indebted for pointing out the novelties in the *Lepidoptera* and *Diptera* in this collection.

#### Stirps ASILINA, Newman.

#### Genus DASYPOGON, Meigen.

#### Sp. 1. *Dasygogon Grantii*, Newman.

*Niger, lanugine brevissimo aureo passim vestitus; alis opacis, læte fulvis; pedibus nigris; femoribus apice, tibiis basi, læte testaceis.* (Corp. long. .85 unc.; alarum dilat. 1 unc.)

Black, clothed in patches with a very short golden pile; face clothed with brilliant golden pile; rostrum and antennæ black; wings opaque, deep rich fulvous, the colour deeper in the vicinity of the rays, which are concolorous, paler in the centres of the cells; femora black at base, testaceous at apex; tibiæ testaceous at base, black at apex; tarsi entirely black, each joint emitting strong black spines; claws very strong and black, pulvilli pale yellow.

Hab. Moreton Bay, North Australia, where a single specimen was taken by Mr. Gibbon, and is in that gentleman's collection. This species is dedicated to Mr. Frederick Grant, a most diligent collector of British *Diptera*.

VI. On the Transformations of Natal Lepidoptera. By  
W. W. SAUNDERS, Esq., F.R.S., &c. &c.

[Read June 2nd, 1856.]

THE accompanying drawings of the transformations of several species of *Lepidoptera* from S. E. Africa were made by Mr. R. W. Plant, of Natal, so well known as a collector of objects of natural history. The drawings were accompanied with very scanty details regarding the habits and economy of the species depicted; still I think they may be useful to Entomologists, and I therefore beg to lay them before the Entomological Society as a slight contribution towards the history of the *Lepidoptera* of S. E. Africa. The species of *Lebeda*, Walk., which is figured, appears new to science, and the following are the characters of it, which have been kindly contributed by Mr. Walker.

*Lebeda cuneilinea*, Walker.

Fœm. Cinereo-fusca; antennæ latè pectinatæ; abdomen cernivum; alæ anticæ cervinæ, cinereo-subfasciatæ, guttis discalibus lineaque exteriore transversa angulosa nigris testaceo-marginatis; posticæ cervinæ.

Female.—Cinereous brown. Antennæ deeply pectinated. Abdomen and wings fawn colour; fore wings with two indistinct, incomplete and diffuse cinereous bands, with a few black dots, and with one testaceous dot in the disk, and with an exterior transverse oblique zigzag black testaceous bordered line. Wings beneath pale fawn colour, with two distinct regular complete darker bands.

Length of the body, 21 lines; of the wings, 48 lines.

There are two other African species of this genus, *L. contraria* and *L. bipars*; and *L. cuneilinea* is nearly allied to, but distinct from, the former, which inhabits West Africa.



REFERENCE TO PLATES.

PLATE XIII.

- Fig. 1a. Larva of *Papilio Policenes*, Cram.  
1b. Pupa of do.  
1c. Larva, name unknown.  
2. Larva of a *Sphinx*.  
3a. Larva of *Attacus mythimna*, West.  
3b. Cocoon of do.

PLATE XIV.

- Fig. 1. Larva of *Anthona arata*, West.  
1a. Pupa of do.  
2. Larva, name unknown.  
3a. Larva of *Egybolia Vaillantina*, Boisd.  
3b. Pupa of do.  
3c. Perfect insect.

PLATE XV.

- Fig. 1a. Larva of *Lebeda cuneilinea*, Walk.  
1b. Cocoon of do.  
1c. Perfect insect.  
2a. Larva, unknown.  
2b. Cocoon of do.

VII. *Notes on the Wing Veins of Insects.* By J. O.  
WESTWOOD, ESQ., F.L.S.

[Read June 2, 1856.]

It cannot but have been observed by persons who have taken the trouble to watch the progress of Entomological science during the past quarter of a century, that there has grown up a very constant practice, where difficulties of a physiological kind have arisen with reference to the structures or uses of particular organs of the insect world, of assuming that we are in the necessary inability to determine the question, because the general construction of these tribes of animals is so very different from that of ourselves and other vertebrated tribes. This kind of reasoning appears to me, however, in many cases to be only a plea for ignorance, carelessness of investigation or sluggishness of mind in reasoning upon the facts which our own researches, or those of previous authors, have revealed. That insects have no orifices in the head which we can assign definitely to those of the ears or nose of the higher animals, is no reason why insects should not hear or smell; but that with elaborately furnished mouths and digestive apparatus, delicate instruments of touch, wonderfully-constructed eyes, most powerful muscles, and a singular system of circulation, we should affirm that we cannot understand the physiology of the senses of taste, touch and sight, or the processes of motion or circulation, appears to me to be unworthy of the advanced state of physiological science in the present day. A paper entitled a "Memorandum on the Wing Rays of Insects," by Mr. Newman, has been recently published in our Transactions, Vol. III. N. S. p. 225, so full of what appears to me to be false deductions, and in which the differences between exosteate and endosteate animals is so strongly insisted upon, that I must take leave to trouble the Society with a few notes on the subject. After remarking upon the necessity of some one rising to take up the mantle of George Newport, and upon the great assistance which the nervures, veins, ribs, rays or bones of the wings of insects afford in enabling us to distinguish species, genera, and even families from each other, Mr. Newman believes he is correct in saying that we make no attempt to ascertain their use, or to learn

the allotted part which they play in the economy of the animal, the definite function which these organs are specially created to perform; and then he mentions a series of celebrated authors who have not attempted to work out conclusions which they have left to be inferred from the names which they have given to the various parts in question. But in this list he singularly omits the names of those great modern physiologists who have actually treated upon this question, including even George Newport himself, whose remarks, subsequently to be cited, it is evident that he can never have read. In like manner, at the same time he completely ignores the peritracheal controversy which has attracted so much attention lately on the continent. The following passages, from the works of Owen, Burmeister and Newport, will prove distinctly that circulation takes place in the wings of insects through these nervures, veins, or whatever else they have been termed.

Professor Owen, in his lectures on the invertebrate animals, observes, "The strong and numerous nervures which sustain the thin alary membranes of the *Libellula* are articulated processes of the external chitinous tegument. A circulation can be traced through these membranes, at least in their early and softer state; air vessels are abundantly spread over the supporting frame work.

"The wings of insects are essentially flattened vesicles sustained by slender but firm hollow tubes called nervures, along which branches of the tracheæ and channels of the circulation are continued.

"The chief merit of the re-discovery of the circulation of blood in insects is due to Carus, its phenomena having been witnessed in the appendages of insects by other observers, as Ehrenberg, Wagner, Burmeister, Bowerbank and Tyrrell."

Professor Burmeister (*Man. of Entomology*, translated, p. 96) observes, that "in outward appearance the wings present themselves as flexible but dry membranes, which are traversed by various horny ribs. These ribs, or more properly VEINS, as they are in fact vessels, but incorrectly called nerves, arise all from the roots of the wing." And again (p. 407), "In all perfect insects of the order *Dictyoptera* (*Neuroptera*), namely, in the wings of just disclosed *Libellulæ* (*L. depressa*) and *Ephemæræ* (*E. lutea* and *marginata*), Carus saw a distinct motion of the blood. *Hemerobius chrysops*, *Semblis bilineata* and *S. viridis* exhibited in their wings (and the latter also in their antennæ) a motion of the juices. In the former Carus saw the streaming blood pass upon the anterior margin through the chief ribs and distribute itself upon the whole margin to the apex; it returned back through the ribs, lying

nearest to the posterior margin. Through the central connecting transverse ribs blood also passed from the proceeding to the returning current." Burmeister then enters into lengthy details, both structural and physiological, the result of which is that although the ribs, as the translator calls them, contain tracheæ, or air vessels, the latter are enclosed within a vacant space, in which the juices can freely circulate (p. 412).

Newport, again (article "Insecta," in *Cyclop. Anat. and Physiology*, p. 112), after stating the observations of Carus, Burmeister, Tyrrell, Wagner, and especially Bowerbank, in the *Entomol. Magazine*, vol. 1, p. 243, as well as observations of his own, proceeds, "From these facts we are led to express an opinion, which has been long entertained by us, that the course of the blood, whether simply along intercellular spaces, or bounded by distinct vessels, is almost invariably in immediate connexion with the course of the tracheæ. This opinion is founded upon the circumstance that nearly all the observations that have hitherto been made have shown that the currents of blood in the body of an insect are often in the vicinity of the great tracheal vessels, both in their longitudinal and transverse direction across the segments, and it is further strengthened by Mr. Bowerbank's observations on the course of the blood in the wing." After detailing these observations, he concludes, "These observations are exceedingly interesting in reference to the general velocity of the circulation, and the means by which it is carried on in the wing. The entire absence of pulsations is remarkable, *as it completely identifies these vessels as VEINS*, since it is well known that the circulation is carried on through the body by means of regular pulsations of the dorsal vessel.

Such are the considerations which induced me, in my portion of the "*Genera of Diurnal Lepidoptera*," to employ the term vein for these organs, and to assert that physiological investigations had proved them to be such.

But Mr. Newman (after demolishing a phantom of his own creation, in the shape of a nerve hypothesis, every writer who had employed the term nervure having expressly guarded himself from the implication of an inferred identity between the functions of true nerves and these nervures, the latter of which names cannot be considered as a diminutive of the former, but has always been used and intended as a distinct term), and after also citing my observations in the "*Genera of Diurnal Lepidoptera*," hesitates to accept the premises, because he denies that a single observation has ever been made that can warrant such a conclu-

sion. I can only account for such a denial on the supposition that Mr. Newman had not taken the trouble to consult the leading authorities on the subject.

But Mr. Newman further rejects the vein theory, because the organs in question form a strong durable frame work supporting a filmy membrane, like the paper on the frame of a kite, and because certain profoundly-devised experiments of his own, such as cutting the leading bars or rays of the frame across, and removing the membrane itself from the frame-work, have taught him (what every child who ever sent up a kite into the air would have told him was self-evident), that the structure would not support the object in the air if the frame of the kite were sent up without paper, or if the chief bars of the frame were broken. Unquestionably, then, Mr. Newman's assertion, that these organs are instruments of support, is correct; in fact, it has never been disputed, but on the contrary affirmed by all writers; but it does not thence follow that the organs in question are not veins. An electric wire is not less an electric wire because it is enveloped in a gutta percha tube, and used as an electric telegraph wire. In the construction of the wings of insects two objects were necessary, a system of support and a system of circulation which required defence, and we see in the arrangement of these organs one of the most admirable contrivances of a divine and omniscient Creator which can be pointed out in the many marvellous peculiarities of the insect frame.

Having, however, arrived at the conclusion that the rays of an insect's wing perform precisely the same functions as the bones of a bat's wing, and that the wing of a butterfly is the exact analogue of the wing of a bat, Mr. Newman seems to have been alarmed at the result, and instead of employing for these organs the name of any of the bones of the vertebrata (one of which, rib, or rippe, has been long used for them by German Entomologists), he rejects Dr. Leach's term, pterygostea or wing-bones, and thinks "that the simple word ray, Latinized by radius, will be found sufficiently descriptive, and fortunately possesses another claim, that of priority."

I readily admit that if we knew nothing of the functions of these organs, it would be very advisable to apply to them a name which implies no known function, just as it is still advisable to retain the name antennæ in preference to that of feelers or ears, but with positive physiological facts before us, I maintain that we are fully justified in giving to these organs the name of veins.

I have only to add that the final remark of Mr. Newman quoted above is a fallacy. The term radius has not the priority over that of nervures, or veins, for the organs in question. Jurine, who first proposed the term radius, employed that of nervures for the organs in question. "Ayant étudié les ailes des hyménoptères et des diptères, j'ai remarqué que leurs nervures formaient un réseau cellulaire, &c." (N. Méth. class Hym., p. 2); and after describing the two strong parallel *nervures* at the anterior margin of the wing, he says, "Ces deux nervures n'ayant pas encore reçu de nom, j'ai jugé qu'il était nécessaire de leur en donner un:—en conséquence j'ai donné celui de radius à la nervure externe et celui de cubitus à l'interne" (*Ibid.* p. 3).

P.S. Since these notes were written a remarkable memoir by A. H. Haliday, Esq., on the same subject, and in which the vein theory is also maintained, has appeared in the Dublin Natural History Review.

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VIII. *A Revision of the British Atomariæ; with Observations on the Genus.* By T. VERNON WOLLASTON, Esq. M.A., F.L.S.

[Read 5th January, 1857.]

HAVING paid some little attention, during the last few years, to our native *Atomariæ*, I propose, in the following paper, to lay before the Society an enumeration of the species which have been hitherto ascertained to inhabit the British Isles. The confusion which has unfortunately arisen through the inaccurate identifications of the late Mr. Stephens, whose collection (now in the British Museum) must moreover be regarded as the sole interpreter of his very meagre and unsatisfactory diagnoses, has rendered the task a somewhat tedious one; nevertheless, a careful collation of his entire series (amounting, however, to only 111 specimens in all), in conjunction with the assistance which I have derived from the material which various friends (amongst whom Messrs. Waterhouse, Janson, Douglas, Murray and Morris Young, should be particularly mentioned) have placed in my

hands, has enabled me, I trust, to form a tolerably correct estimate as to the actual species which our fauna includes. The examination of 1,137 British specimens from various parts of the country (661 of which were collected by myself, and 247 by Mr. Waterhouse), has given me a very fair insight into the about of aberration, from local disturbing causes, to which the several representatives are subject; and if, in addition to this, I include the eighty-seven Continental types with which my cabinet is supplied, the specimens which have passed under my own immediate observation, whilst compiling the present memoir, is no less than 1,224.

With respect to the affinities of the genus, I will merely remark, that whilst at one of its extremities it is intimately related to the *Cryptophagi*, it merges at the other, still more decidedly, into *Ephistemus*. So nearly akin is it indeed to the latter, that, after a careful dissection, I can perceive no structural differences (of any constancy) between the two, except that the *Atomariæ* have a minute tooth immediately within the apex of their mandibles, and have the joints of their funiculus (though this is not always very perceptible) alternately long and short; whilst even the normal *facies* of the groups, which (from the small size, subglobose bodies, and shorter limbs of the *Ephistemi*) might seem at first to be remarkably dissimilar, is in reality so lost sight of in the less typical forms, that at times it is not easy to pronounce, without a close examination, to which of them certain species appertain. This is eminently the case with an *Atomaria* peculiar to Madeira, and which is so shortened and rounded in its outline that I had regarded it, in my "Insecta Maderensia," as an *Ephistemus*; though, not having had occasion, whilst compiling that volume, to dissect the immediately allied groups, I had formed it into a distinct section of the genus, characterized by the very peculiarities (of antennæ and mandibles) which constitute the almost sole permanent feature of the *Atomariæ*.

I would call particular attention to the fact, of what the respective insects are to which the *Atomariæ* approximate, at either extremity of the genus, because upon it depends the collocation of the several species *inter se*; and because I believe that this circumstance, if duly considered, is more likely to point out a natural arrangement of them than any one character can possibly do, which may chance to be selected, for the purpose of reducing them into sections. It is on this account that I have rejected the greater or less approximation of the antennæ, which Erichson has made use of, in classifying them,—believing that if it were strictly

adhered to, species which are intimately related would be placed asunder; though more especially from the conviction that the relative distance between the antennæ and eyes is a character of such doubtful importance in the *Atomariæ*, and moreover so difficult of observation (except in a very few and well-marked cases) in objects thus small, as to be practically worthless. If, however, we bear in mind the close affinity of certain members to the *Cryptophagi*, and of others to the *Ephistemi*, we shall at once acknowledge the propriety of commencing the genus with such an insect as the *A. ferruginea* (which, in general aspect and habit, is almost a *Cryptophagus* in miniature), and of ending it with the *Ephistemus*-like *versicolor*: and so, having once settled our extremes, it becomes a comparatively easy task to fill in the means.

With these few remarks, I will proceed to the consideration of the species themselves,—merely observing that the three loose and general divisions into which I have distributed them are more likely, I think, to be found in accordance with Nature, and therefore to be easily understood, than if they had depended on one or two minute characters, of which a slightly greater or less antennal approximation (often difficult to appreciate even beneath the microscope) formed the main element.

S. I. *Body with sides more or less parallel; prothorax behind usually truncated and more or less distinctly margined.*

Sp. 1. *Atomaria ferruginea*.

*Cryptophagus ferrugineus*, Sahl., Ins. Fenn. i. p. 58.

*Atomaria pallida*, Woll., Ann. and Mag. of Nat. Hist. xviii. p. 452, pl. 9, fig. 1 (1847).

———— *ferruginea*, Erich., Nat. der Ins. Deuts. iii. p. 377 (1848).

At once known by its uniform testaceous hue; subdepressed, pubescent surface; and by the ninth joint of its (rather long and robust) antennæ being so far reduced in dimensions as to cause the club to appear scarcely more than biarticulate. Its prothorax is less truncated behind than is the case with the other members of this division of the genus,—being somewhat posteriorly-produced in front of the scutellum. It is apparently extremely rare, the only British examples which I have seen, except the four which I myself possess, being in the collection of the Rev. Hamlet Clark. His specimens, together with three of my own, were captured at Fulbourn, near Cambridge, in 1847; and one I took



subsequently in Gloucestershire,—at Withington, on the Cotswold Hills, in 1852. It is unrepresented in the Stephensian cabinet.

Sp. 2. *Atomaria fmetarii*.

*Kateretes fmetarii*, Hbst, Käf. v. p. 14, Tab. 45, fig. 4 (1793).

*Dermestes fmetarius*, Fab., Syst. Eleu. i. p. 316 (1801).

*Atomaria fmetarii*, Erich., Nat. der Ins. Deuts. iii. p. 377 (1848).

This species may be recognized by its large size (it being the longest of the British *Atomariæ*, though not so large in general bulk as the *A. Hislopi*) and subcylindrical form, by its densely (though not very deeply) punctured surface, by its ample and convex prothorax, and by its basally much approximated antennæ. Like the last species, it is apparently extremely rare, and unrepresented in the Stephensian cabinet,—the only specimen which has come under my observation having been captured by myself at Danes Dyke, near Flamborough, in Yorkshire, during July, 1853. I possess examples, taken at Stettin and sent to me by Herr Kraetz, which differ in no respect from the English one.

Sp. 3. *Atomaria linearis*.

*Atomaria linearis*, Steph., Ill. Brit. Ent. iii. p. 70 (1830).

——— *nigriventris* (p.), Steph., Ill. Brit. Ent. iii. p. 69 (1830).

——— *linearis*, Erich., Nat. der Ins. Deuts. iii. p. 384 (1848).

The exceedingly narrow, parallel, and subdepressed form of this species, in conjunction with the extreme delicacy of the posterior margin of its (subquadrate) prothorax, will at once distinguish it from the remainder of the genus. It is generally distributed throughout England, though not usually very abundant anywhere. I have taken it at Cransley, in Northamptonshire; at Gravesend and Plumpstead, in Kent; at Bletchingley, in Surrey; and at Farmington (on the Cotswold Hills), in Gloucestershire; and it has been captured by Mr. Waterhouse at Gosport, Erith and Highgate, and by Mr. Bates at Leicester. Mr. Haliday also reports its occurrence in Ireland. There are ten specimens under the name of *linearis* in the Stephensian cabinet, nine only of which however are the true species,—one of them being the *A. nigriventris*.

Sp. 4. *Atomaria elongatula*.

*Atomaria nigriventris* (p.), Steph., Ill. Brit. Ent. iii. p. 69 (1830).

——— *elongatula*, Erich., Nat. der Ins. Deuts. iii. p. 383 (1848).

Allied to the *A. fmetarii*, from which, however, it may be readily distinguished by its rather smaller size and more elongated, sub-

depressed form, by its darker and browner hue, and by its much less developed prothorax,—which is narrower than the elytra. It is rather a scarce insect, though widely distributed throughout the country. I have taken it at Whittlesea Mere; at Spridlington, near Lincoln; at Bridlington, on the Yorkshire coast; at Cransley, in Northamptonshire; at Basset Down and Avebury, in Wilts; at Farmington, in Gloucestershire; at Treneglos, in Cornwall; and in the county of Cork (near Kanturk), in Ireland. And it has been captured by Mr. Morris Young, in Renfrewshire.

Amongst the seven specimens which are labelled "*nigriventris*" in the Stephensian cabinet, there is a single *elongatula*. As five, however, out of the remaining six are unquestionably the examples which Mr. Stephens described from (as, indeed, is proved by the labels which are attached to two of them), and are identical with the (subsequently established) *A. nana* of Erichson, it is clear that the title of *nigriventris* will have to be conceded to that species, and cannot, therefore (although of prior date to *elongatula*), affect the present insect.

Sp. 5. *Atomaria umbrina*.

*Cryptophagus umbrinus*, Gyll. Ins. Suec. iv. p. 291 (1827).

*Atomaria nigrivestris* (p.), Steph., Ill. Brit. Ent. iii. p. 69 (1830).

——— *umbrina*, Erich., Nat. der Ins. Deuts. iii. p. 380 (1848).

Approaches very closely to the *A. nigriventris*, but it may be known by its usually slightly larger size, by its somewhat less shining, and just perceptibly flatter and less deeply punctured surface, and by the structure of its prothorax,—which is transversely impressed in the centre of its hinder region, with indications of a short costa, or raised line (often very obscure), on either side of the depression, and with its sides and posterior angles more evidently margined. I have received specimens from Mäerckel's collection, as also from Paris, which agree perfectly with the English ones. It is by no means a common insect in this country. I have, however, captured it at Mablethorpe, on the Lincolnshire coast; at Cransley, in Northamptonshire; at Shenton, and in the Ambion wood, near Market Bosworth, in Leicestershire; at Holm Bush, near Brighton; and at Withington, in Gloucestershire: and it has been taken by Mr. Waterhouse at the Crystal Palace, Sydenham. Mr. Murray also has found it near Edinburgh, and Mr. Haliday in Ireland.

The *A. nigrivestris* of the Stephensian collection is composed of four specimens of the *A. umbrina*, Gyll., and five of the *A. nana*,

Erich. : but as no one of them has Mr. Stephens's "typical label" attached to it, it is impossible to decide which of the two species his diagnosis (which agrees with neither) was intended to represent. As Gyllenhal's *Cryptophagus unbrinus*, however, was published three years before Mr. Stephens's *A. nigrirostris*, it is certain that the latter title (even if applied by the author to Gyllenhal's insect) cannot in any way interfere with the former.

S. II. *Body more or less oblong ; prothorax as in the last section.*

Sp. 6. *Atomaria nigriventris*.

*Atomaria nigriventris* (*testibus t. t.*), Steph., Ill. Brit. Ent. iii. p. 69 (1830).

———— *nigrirostris* (p.) *et linearis* (p.), Steph., Ill. Brit. Ent. iii. p. 69 (1830).

———— *nana*, Erich., Nat. der Ins. Deuts. iii. p. 379 (1848).

The rather deeply punctured surface and subcylindrical body of this species, which has the thorax slightly narrower than is the case in the preceding one (as also less distinctly margined, with no indications of a central transverse impression behind, and usually darker), will serve to separate it from its allies. It appears to be rather common in the neighbourhood of London. Mr. Waterhouse has captured it in the Hammersmith marshes, at Highgate, Hampstead, Greenhithe and Erith; Mr. Douglas at Darenth wood; and I have taken it at Box Hill and Southend. In more distant spots I have no evidence of its being so abundant: I have, however, met with it at Spridlington, near Lincoln; Mr. Waterhouse has found it at Gosport; Messrs. Murray and Morris Young, in Scotland; and Mr. Haliday states that it occurs in Ireland. I have a specimen, taken at Cassel, which was examined by Erichson himself: it agrees precisely with the British ones.

As already stated, under species 4, the *A. nigriventris* of the Stephensian collection is coincident with the (subsequently established) *A. nana*, of Erichson,—which, in accordance with the law of priority, is consequently superseded. True it is that Mr. Stephens's cabinet contains, under the name of *nigriventris* (in addition to the five individuals of our present species), a single example of the *A. linearis*, and another of the *A. elongatula*: but that these are mere after-interpolations, and need not be taken into account, is proved by the fact that two, out of the five individuals above mentioned, have labels attached to them; and it is well known that Mr. Stephens was in the habit of appending to the *type*, from which his diagnosis was drawn out, some sort of a ticket;—

whilst the circumstance, that in the present instance there are actually *two* labelled specimens (one only being commonly indicated), renders this the more certain.\*

Sp. 7. *Atomaria pellata*.

*Atomaria pellata*, Kraatz, Ent. Zeit. 95 (1853).

A rather large and well-marked species, and one which may be known by the darkness of its hue,—which fades off, on the elytra (especially towards the apex), into a more or less bright chestnut; by its medially dilated prothorax; and by its pale cinereous pubescence. Its limbs also are actually more variegated than is the case in the allied species,—the femora, the apical half of the tibiæ, and the extreme apex of the tarsi, being dark. In some respects it approaches the *A. elongatula*; but its rather shorter, more ovate, and convexer form, and more distinctly margined prothorax, will, in conjunction with the characters above enumerated, at once separate it therefrom. I possess five specimens of a pale infuscated-ferruginous hue; but I doubt if they are more than immature. It is one of the rarest of the British *Atomariæ*: I have, however, captured it at Spridlington and South Ferriby, in Lincolnshire; at Shenton, in Leicestershire; and in Professor Henslow's garden at Hitcham, in Suffolk. Mr. Janson, also, has taken it at Hampstead, near London; and Mr. Morris Young in the neighbourhood of Paisley. Like the *A. ferruginea* and *fimetarii*, it is unrepresented in the Stephensian cabinet.

\* Considering that there are five examples of the *A. nana*, of Erichson, under each of the Stephensian species, *nigrirostris* and *nigriventris*, it may perhaps be asked whether the former has not as great a claim as the latter to be regarded as the exponent of it. To this, however, I would reply that it certainly has not; first, because the *nana* and *umbrina* are almost equally combined under the *nigrirostris*, whereas under the *nigriventris* the specimens are all referrible to *nana* except two (those two, moreover, being so distinct *inter se*, and from the *nana*, that they could not have been regarded by Mr. Stephens as identical with the rest); and, secondly, because there is no label attached to any one of the specimens under *nigrirostris* (thereby warranting that it may be considered as, *par excellence*, typical), whereas under the *nigriventris* two (and those veritable *nanas*) are ticketed. Conceding therefore (as I think we must necessarily do) that the continental *A. nana* is strictly synonymous with the Stephensian *nigriventris*, it follows that the *nigrirostris* of Stephens should be identified with the *A. umbrina*: and it is further evident, moreover, that, as the latter name is prior to the Stephensian one, the title of *nigrirostris* must be altogether suppressed.

Sp. 8. *Atomaria fuscipes*.

*Cryptophagus fuscipes*, Gyll., Ins. Suec. i. p. 182 (1808).

*Atomaria fuscipes et carbonaria* (p.), Steph., Ill. Brit. Ent. iii. p. 68 (1830).

————— Erich., Nat. der Ins. Deuts. iii. p. 388 (1848).

The totally black hue of this little species (even the limbs being as dark, almost, as the body) renders it unnecessary for me to call attention to any of its other diagnostic characters. It is exceedingly abundant in many of the sub-northern counties, especially towards the coast; but it appears to be rarer near London: Mr. Waterhouse has, however, taken it sparingly at Highgate. I have brushed it in immense profusion from off the grass at the edges of the cliffs at Bridlington and Flamborough, in Yorkshire; and I have also captured it at Fleetwood, in Lancashire; at Spridlington, South Ferriby, and Scawby, in Lincolnshire; at Whittlesea Mere, Hunts; at Cransley, in Northamptonshire; at Southend, in Essex; at Linton, in North Devon; at Treneglos, in Cornwall; in Lundy Island; the Isle of Wight; and at Holyhead, in North Wales. Mr. Morris Young, also, has captured it in Scotland; and Mr. Haliday records its occurrence in Ireland. It is remarkable that there are but two examples of it in the Stephensian cabinet,—one of which is rightly identified, and placed (alone) under *fuscipes*; whilst the other (which appears to be a rather large specimen, and immature) forms the *type* of Mr. Stephens's *A. carbonaria*.

Sp. 9. *Atomaria pusilla*.

*Dermestes pusillus*, Payk., Fna Suec. i. p. 295 (1798).

*Silpha phæogaster et evanescens*, Mshh, Ent. Brit. i. pp. 125, 126 (1802).

*Atomaria fulvicollis, thoracica, evanescens, phæogaster, basella* (p.)  
*et castanea* (p.), Steph., Ill. Brit. Ent. iii. pp. 64, 65, 66 (1830).

————— *pusilla*, Erich., Nat. der Ins. Deuts. iii. p. 397 (1848).

The very minute size, and oblong, subdepressed form of this species will at once distinguish it from the remainder of the *Atomaria*. In colour it is extremely variable, (which may account, indeed, for the number of, so called, "species" into which it has been separated); nevertheless, the more or less rufo-ferruginous hue of its (laterally rounded) prothorax, and of the hinder region of its elytra, is generally traceable. It is tolerably

abundant, and evenly distributed, throughout England. I have taken it at Spridlington, near Lincoln; at Cransley, in Northamptonshire; at Basset Down, in Wilts; at Farmington, in Gloucestershire; at Fowey and Penheale, in Cornwall; at Llangefni and Holyhead, in Anglesey; in the grounds of Trinity College, Dublin; and at Rosnalee, in the County of Cork. It has also been captured by Mr. Janson, at Hampstead; by Mr. Waterhouse, at Weybridge; and by Mr. Morris Young, and Mr. Murray, in Scotland. In the Stephensian cabinet, the *A. fulvicollis*, *thoracica*, *evanescens*, *phæogaster* and *basella* (except one specimen of the last, which belongs to the *atricapilla*) are referrible to the *Dermestes pusillus* of Paykull. There is also one example mixed up with the *A. castanea*; but this is merely, I imagine, the result of accident.

Sp. 10. *Atomaria atricapilla*.

*Atomaria atricapilla* (Kby), Steph., Ill. Brit. Ent. iii. p. 66 (1830).

———— *basella* (p.), Steph., Ill. Brit. Ent. iii. p. 65 (1830).

———— *nigriceps* (Maerk.), Erich., Nat. der Ins. Deuts. iii. p. 396 (1848).

———— *rufa*, *atricapilla* et *nigriceps*, Murray, Cat. Col. Scot. p. 41 (1853).

The oblong form and testaceous hue of this common species—its head, abdomen and scutellary region being alone darker (and often very obscurely so) than the remainder of the surface—will sufficiently characterize it. I have taken it in profusion at Bridlington, in Yorkshire; at Mablethorpe, Spridlington, and South Ferriby, in Lincolnshire; at Wittlesea Mere; at Cransley, in Northamptonshire; at Cromer, in Norfolk; at Hitcham, in Suffolk; at Southend, in Essex; at Bletchingley, in Surrey; at Chepstow, in Monmouthshire; at Withington and Farmington, in Gloucestershire; at Linton and Mount Edgcumbe, in Devon; at Fowey, in Cornwall; in Lundy Island; the Isle of Wight; at Holyhead, in North Wales; and near Kanturk, in Ireland. It has also been captured by Mr. Waterhouse in the neighbourhood of London (namely, at the Crystal Palace, Sydenham; Greenhithe and Erith), by Mr. Murray and Mr. Morris Young, in Scotland. The title of *nigriceps*, by which this insect is known on the Continent, has, in accordance with the law of priority, to give way to that of *atricapilla*,—a species sufficiently well defined by Mr. Stephens in his "Illustrations," and unmixed with any other even in his collection.

Sp. 11. *Atomaria Berolinensis*.

*Atomaria Berolinensis*, Kraatz, Ent. Zeit. p. 94 (1853).

——— *castanea* (p.), Steph., Ill. Brit. Ent. iii. p. 66 (1830).

A species which may be known by its oblong, subcylindrical body, broad head, deeply punctured, pubescent surface, and by its subventricose elytra and prothorax,—the line of separation between the two being, consequently, somewhat depressed. In its normal state it is rufo-testaceous, with its head, prothorax, scutellary region, and the outer margin of its elytra (especially towards the shoulders), more or less dusky, or obscured: but when immature it is wholly testaceous,—under which circumstances it might almost be mistaken, at first sight, for the *A. atricapilla*. Its more strongly sculptured surface, however, longer limbs, and more ventricose prothorax and elytra (the former of which is squarer and more largely developed, and is especially convex upon its hinder disk), will serve to distinguish it readily from that common insect. It appears to be somewhat scarce; I have, however, captured it at Danes Dyke (near Flamborough), in Yorkshire; at Lea, South Ferriby, and Scawby, in Lincolnshire; at Cransley, in Northamptonshire; at Withington, in Gloucestershire; and at Tintern, in Monmouth. It has been also taken by Mr. Waterhouse at Gosport, Northampton, and Reigate; and by Mr. Morris Young, in Scotland. There is but a single specimen of it in the Stephensian cabinet,—mixed up (probably through an oversight) with the *A. castanea*.

Sp. 12. *Atomaria fuscata*.

*Cryptophagus fuscatus*, Schön. Syn. Ins. ii. p. 100 (1808).

*Atomaria castanea* (p.), *testacea* (p.), et *rufipes* (p.), Steph. Ill. Brit. Ent. iii. pp. 66, 68 (1830).

——— *fuscata*, Erich. Nat. der Ins. Deuts. iii. p. 394 (1848).

Dark examples of this species are not always easily separable, at first sight, from the *A. atra*. It is, however, rather larger, on the average, than that insect, somewhat less deeply punctured, and with its prothorax narrower and much less convex,—the extreme hinder margin, moreover, being more distinctly sinuated, and elevated in the centre. In its normal state, it may be easily recognized by its dull surface and clouded-castaneous hue,—its tendency being to be more or less infuscated about its anterior region, and to become gradually paler as we approach its posterior one. Its legs, also, are rather longer, and more dusky, than is the

case in the allied species. It is a local insect. I have, nevertheless, taken it in considerable abundance at Whittlesea Mere, as also (though less plentifully) at Paxton, in Huntingdonshire; at Spridlington, South Ferriby and Scawby, in Lincolnshire; at Bridlington and Danes Dyke, in Yorkshire; at Cransley, in Northamptonshire; at Southend, in Essex; at Withington, in Gloucestershire; at Llangefni, in Anglesey; and at Killarney, in Ireland. It has also been captured by Mr. Douglas at Shirley, near Croydon; by Mr. Waterhouse at Weybridge and Greenhithe; and by Mr. Murray, and Mr. Morris Young, in Scotland. It constitutes the type of the *A. castanea*, Steph.,—a species, however, which has (in the collection) a specimen of the *A. Berolinensis* and *pusilla* mixed up with it. It also forms a portion of the *A. testacea*, Steph. (the type of which species is an immature *analis*), and the type of the *A. rufipes*, Steph.: it is fortunate, therefore, amidst so much confusion, that the title of *fuscata* has the priority over any Stephensian one.

Sp. 13. *Atomaria gutta*.

*Atomaria gutta*, Steph., Ill. Brit. Ent. v. p. 407 (nec coll.) (1832).

————— Newm., Ent. Mag. ii. p. 201 (1834).

————— Erich., Nat. der Ins. Deuts. iii. p. 387 (1848).

The pale, transverse (though sometimes ill-defined) central fascia with which the elytra of this species are adorned, in conjunction with its oval form and exceedingly convex prothorax, will serve to separate it from the remainder of the British *Atomariæ*. Occasionally the apex, also, of the elytra, as well as the dorsal fascia, is testaceous; and I have one example in which the two are confluent: in English specimens, however, the medial dash is usually alone pale. It is, apparently, extremely rare. I have taken it at Whittlesea Mere, in Huntingdonshire; and Mr. Waterhouse has met with it at Reigate.

Although Mr. Stephens's description applies, without doubt, to this conspicuously marked insect, it is to be observed that the specimens, in his cabinet, are not referrible to the *A. gutta*, but to the *A. apicalis*.

Sp. 14. *Atomaria atra*.

*Kaleretes ater*, Hbst, Käf. v. p. 15, Tab. 41, fig. 5 (1793).

*Atomaria atra*, Erich., Nat. der Ins. Deuts. iii. p. 392 (1848).

The oblong-ovate form, and rather strongly punctured surface, of the *A. atra*, in conjunction with its dark hue (the apex of the elytra being alone obscurely fuscous) and very convex pro-



thorax,—the extreme hinder margin of which, like that of the *A. mesomelas*, is not raised in the centre,—must serve to distinguish it from its allies. It would appear to be one of the rarest of the British species,—the only specimen which I have seen, except my own (out of the 1,137 which I have examined), being in the possession of Mr. Waterhouse, by whom it was found in the Hammersmith marshes during January of 1856. The examples in my own cabinet I captured at Withington, in Gloucestershire, and at Slapton Ley, in the south of Devon. Mr. Haliday, however, informs me that it has been met with in Ireland.

In the Stephensian collection the present species does not exist, Mr. Stephens's *A. atra* being composed of five specimens of the *A. analis* (which was his *type*), and one of the *versicolor*.

Sp. 15. *Atomaria mesomelas*.

*Dermestes mesomelas*, Hbst, Käf. iv. p. 143, Tab. 41, fig. 7 (1792).

*Corticaria dimidiata*. Mshn, Ent. Brit. i. p. 112 (1802).

*Atomaria mesomelas et dimidiata* (p.), Steph., Ill. Brit. Ent. iii. p. 67 (1830).

————— Erich., Nat. der Ins. Deuts. iii. p. 386 (1848).

A beautiful and distinct little *Atomaria*, readily known by its oblong-ovate form, dark shining surface, and by the bright testaceous hue of its limbs and apical half of its elytra,—the junction between the light and dark portions being usually exceedingly abrupt. Its prothorax is occasionally rufescent; but in normal specimens it is as dark as the basal region of its elytra. It frequents marshy and damp places, and is somewhat local. I have taken it in the Cambridgeshire fens, and at Whittlesea Mere, in Huntingdonshire; at Withington, in Gloucestershire; at Slapton Ley, in the south of Devon; and at Tenby, in South Wales. Mr. Waterhouse has captured it in the Hammersmith marshes, at Reigate, and Gravesend; and Mr. Haliday records it as occurring in Ireland.

It is an insect so conspicuous and well-marked, that the Stephensian specimens standing under *mesomelas* are unadulterated with any other species. It forms, however, only a portion (though the typical one) of Mr. Stephens's *A. dimidiata*,—under which name there are two examples of *mesomelas* (one of which is the Marshamian *Corticaria dimidiata*), three of *analis*, and one of *apicalis*.

Sp. 16. *Atomaria basalis*.

*Atomaria basalis*, Erich., Nat. der Ins. Deuts. iii. p. 391 (1848).

The rather broad, oblong-ovate form, and thickly punctured, pubescent surface, of the *A. basalis*, in conjunction with the peculiarity of its colouring,—which is of a dull black, the apical two-thirds of its elytra being rufo-testaceous (with the line of demarcation between the light and dark portions ill-defined),—will at once distinguish it from its allies. Occasionally more than two-thirds of the elytra are testaceous, leaving only their extreme base suffused with a darker tint. I possess a series of this insect taken by myself about twelve years ago; but whether at Cambridge, or on the Cotswold Hills of Gloucestershire, I cannot at present (having failed to make a note at the time) recal. I have seen specimens, however, which were captured by Mr. Murray, near Edinburgh. It is unrepresented in the Stephensian collection.

Sp. 17. *Atomaria munda*.

*Atomaria munda*, Erich., Nat. der Ins. Deuts. iii. p. 388 (1848).

Well distinguished by its oblong-ovate form, finely punctulated surface, by its more or less rufescent, or piceo-rufescent, hue, and by the deep central transverse impression at the base of its prothorax,—the impression being at either extremity terminated by a short raised costa, or ridge. It is exceedingly rare; and, like the last, unrepresented in Mr. Stephens's cabinet. I have not, myself, ever met with it, but possess a specimen from the north of England; and I have seen others, in the collection of Mr. Waterhouse, which he captured at Southgate, near London.

S. III.—*Body more or less ovate; prothorax usually somewhat produced behind (in front of the scutellum), and less distinctly margined along its posterior edge.*

Sp. 18. *Atomaria nigripennis*.

*Dermestes nigripennis*, Payk., Fna Suec. i. p. 292 (1798).

*Atomaria nigripennis*, Steph., Ill. Brit. Ent. iii. p. 67 (1830).

Erich., Nat. der Ins. Deuts. iii. p. 390 (1848).

Immediately known by its convex, ovate form, bright, subglabrous, lightly punctured surface, and by its rufous head and prothorax,—the latter of which is broadly margined towards its posterior angles, and with a deep transverse impression behind, the impression however having scarcely any indication (even beneath

the microscope) of being terminated at either extremity by a raised costa. It is one of the rarer species, at any rate towards the south: my specimens are from the north of England; and it is recorded in Mr. Murray's catalogue to occur in the Dalmeny woods, near Edinburgh.

Sp. 19. *Atomaria Hislopi*, n. sp.

*A.* Oblongo-ovalis, antice et postice subacuminata, nigra, nitidissima, subglabra, parce subtiliterque punctata; prothorace amplo, valde convexo, postice latiusculo immarginato et foveâ mediâ transversâ profundâ impresso, ad latera subtilissime marginato atque vix rotundato; elytris minus distincte et parcius punctulatis, concoloribus; antennis pedibusque ferrugineis.

Long. corp. lin. 1.

*A.* Oblong-ovate, exceedingly shining, convex, nearly glabrous (being very sparingly beset with a short, decumbent, and cinereous pubescence), and black. *Prothorax* large, slightly dilated in the middle (though, nevertheless, wide posteriorly), exceedingly convex, and with a deep (though somewhat short) transverse central fovea behind; perfectly immarginate along its posterior edge (which is subsinuated,—that portion moreover which is immediately behind the fovea being a good deal raised), though very delicately margined at its sides,—which are but very slightly rounded. *Elytra* convex, and rather more finely and sparingly punctured than the prothorax; broadest about the middle (being narrowed and rounded off at the shoulders), and rather attenuated posteriorly; immaculate. *Antennæ* and *legs* ferruginous; with the *femora* of the latter infuscated towards their base.

A large, robust, and well-marked *Atomaria*, somewhat resembling, at first sight, the *A. turgida* of Erichson. It is, however, abundantly distinct, specifically, from that insect; from which it may be at once known, not only by its superior bulk and more acuminated outline (both before and behind), but likewise by its uniformly black, brighter, subglabrous and less punctured surface, and by its more ample prothorax,—which is immarginate (though deeply impressed in the centre) behind. In its general habit it has more in common, I think, with the *A. nigripennis* than with any other of our British species; nevertheless its much larger bulk, and the sinuated hinder margin of its prothorax, would remove it into the vicinity of the *A. analis* and *turgida*. In its posteriorly immarginate prothorax it recedes from most of the *Atomariæ* with which I am acquainted.

There is an old example of it in the Stephensian cabinet,—unnamed, and without any reference to the locality from whence it came. It has, however, been lately re-discovered by Mr. Hislop in Scotland, who found it beneath the dung of grouse (though this, I imagine, was a merely accidental circumstance,—the *Atomariæ* being accustomed to harbour under such like *rejectamenta*, indiscriminately) in Perthshire. I have seen a specimen of it in the collection of Mr. Janson, and another in that of Mr. Murray of Edinburgh,—both of which however were obtained from Mr. Hislop, who would appear therefore to have been (latterly at least) its sole captor, and to whom I have dedicated the species.

Sp. 20. *Atomaria apicalis*.

*Atomaria dimidiata* (p.), *carbonaria* (p.), *gutta* (sec. coll., nec descr.), *rufipes* (p.), et *dorsalis* (p.), Steph., Ill. Brit. Ent. iii. p. 67—69 (1830).

———— *apicalis*, Erich., Nat. der Ins. Deuts. iii. p. 395 (1848).

An *Atomaria*, which is exceedingly variable in size, but which may be at once distinguished by its ovate form (it being much acuminate both before and behind), piceous hue, and by its strongly punctured, pubescent surface. Its prothorax, from being so much narrowed anteriorly, has its sides scarcely at all rounded. It appears to be more common within the London district than elsewhere: I have seen a large series of it taken by Mr. Waterhouse at Weybridge, Hampstead, and at the Crystal Palace, at Sydenham; and it has been captured by Mr. Janson, at Hampstead and Finchley. The only spot in which I have myself observed it is at Avebury (on the Marlborough Downs) in Wiltshire.

It will be perceived, on reference to the synonymes cited above, that it forms a portion of five of the species in the Stephensian cabinet: as, however, it does not appear to have been the *type* of any of them (as is proved by the labels attached to the examined specimens), none of those titles can in any way interfere with that which was applied to it by Erichson in 1848.

Sp. 21. *Atomaria analis*.

*Cryptophagus analis*, Schüpp., in litt.

*Atomaria testacea* (p.), *dimidiata* (p.), *atra* (p.), et *dorsalis* (p.), Steph., Ill. Brit. Ent. iii. p. 66—69 (1830).

———— *analis*, Erich., Nat. der Ins. Deuts., iii. p. 398 (1848).

The present species and the following one are rather allied, in general aspect, to the *A. apicalis*. They may both of them, how-

ever, be distinguished from that insect by their more lightly punctured elytra, and by their being less acuminate both before and behind,—their prothoraces moreover (which are slightly bisinuate along their posterior margin) being more rounded at the sides than is there the case. From the *A. ruficornis* the  *analis*  may be known by its somewhat larger bulk, more oblong form, more perceptibly punctured elytra, and by its prothorax being altogether broader, and less narrowed posteriorly, than in that species. It would seem to be a rather scarce insect in the south; it has, however, been taken by Mr. Douglas near Croydon. Specimens have been forwarded to me from Paisley by Mr. Morris Young, and from Edinburgh by Mr. Murray: and (in addition to my own series, which was collected, some years ago, whilst at Cambridge) I have myself met with it at Rosnalee, near Kanturk, in the south of Ireland.

When immature it forms the type of the *A. testacea*, and when mature of the *A. atra*, of Mr. Stephens. The latter of these names, however, belongs in reality to a totally different insect, and the former (which is represented in the Stephensian cabinet by two specimens of *fuscata*, and one, imperfectly developed, of the species under consideration) is inapplicable to the present *Atomaria*, which is generally (with the exception of the shoulders and posterior region) of a deep black: hence neither of them will clash with the title proposed for it by Schüppel, and subsequently adopted by Erichson. As for the Stephensian names of *dimidiata* and *dorsalis* (under each of which there are, in the collection, examples of the  *analis* ), they, fortunately, do not concern us here, since the *typical* specimen of neither of them is referrible to our present insect.

Sp. 22. *Atomaria ruficornis*.

*Silpha ruficornis*, Mshn, Ent. Brit. i. p. 125 (1802).

*Atomaria ruficornis*, *carbonaria* (p.), *et dorsalis* (p.), Steph., Ill. Brit. Ent. iii. p. 67—69 (1830).

*Cryptophagus terminatus* (Dahl.), Comolli, Col. Nov. ac Rar. Prov. Novocom. p. 20 (1837).

*Atomaria terminata*, Erich., Nat. der Ins. Deuts., iii. p. 399 (1848).

The slightly smaller size, and more ovate outline, of this species, in conjunction with its less distinctly punctured elytra (which are much rounded off at the shoulders), shorter and more robust antennæ, and the structure of its prothorax (which is constricted behind, and somewhat more posteriorly produced, in front of the scutellum, than is the case in that insect), will readily separate it

from the *A. analis*. It is pretty generally distributed throughout the country: I have taken it at Bridlington, in Yorkshire; at Spridlington and Cainby, in Lincolnshire; at Whittlesea Mere, in Huntingdonshire; at Cransley, in Northamptonshire; at Plumpstead, in Kent; at Basset Down, in Wilts; at Withington, in Gloucestershire; at Weston-super-Mare, in Somerset; and at Chepstow, in Monmouth. It has also been captured by Mr. Waterhouse near Brighton, at Gosport, and near London; by Mr. Douglas, at Darenth Wood and Lee, in Kent; and by Mr. Murray and Mr. Morris Young, in Scotland.

It is the *A. terminata* of the Continent; but, as that name was not published until 1837, and our present insect is the undoubted *Silpha ruficornis* of the "Entomologia Britannica" (as is proved by the existence of the original example, with a label attached to it, in the Stephensian cabinet), it is evident that the Marshamian title has the priority, and must therefore be adopted.

The *type* of the *A. dorsalis* of Stephens (though mixed up, in his collection, with an example of the *apicalis*, and another of the *analis*) is, likewise, the continental *A. terminata*: hence, both of these names (*dorsalis* and *terminata*) must be suppressed in favour of the Marshamian one of *ruficornis*.

Sp. 23. *Atomaria versicolor*.

*Atomaria atra* (p.), Steph., Ill. Brit. Ent. iii. p. 67 (1830).

———— *versicolor*, Erich., Nat. der Ins. Deuts. iii. p. 399 (1848).

———— *turgida*, Murray (nec Erich.), Cat. Col. Scot. p. 42 (1853).

In its distinctly punctured surface, the *A. versicolor* approaches the *apicalis*. It is, however, on the average, somewhat larger, and much less ovate, than that insect; it is also brighter, and less pubescent, and its prothorax is more rounded at the sides. In the peculiarity of its colouring moreover, which is of a rich rufopiceous tint, with the shoulders and apical region of the elytra more or less clearly rufescent, it recedes from most of its allies. It is one of the scarcer species; and it is remarkable that, out of the 1,137 British specimens of the genus which I have examined, there are, with the exception of my own series, but four examples of the *A. versicolor*: one of these is in the Stephensian cabinet (where it is mixed up with five individuals of the *analis*, which are made to represent the *A. atra*), and the other three were taken by Mr. Morris Young in Renfrewshire,—being the actual examples registered by Mr. Murray as the *A. turgida* (which, however, is a totally different insect), in his catalogue of the Coleoptera of Scotland. I have myself met with it in considerable abundance at Withington, on the Cotswold Hills of Gloucestershire (prin-

cipally beneath the dry dung of sheep); as also (though less commonly) at South Ferriby and Spridlington, in Lincolnshire; at Shenton, in Leicestershire; at Tintern, in Monmouth; and in the Rev. H. A. Simcoe's woods, at Penheale (near Launceston), in Cornwall.

Such are the general statistics (so far as I have been able to ascertain them) of our native *Atomariæ*. The following catalogue will show, at a glance, the manner in which the various species should be cited, with reference to the synonymy of British and continental naturalists; and I need merely remark, that the *types* of the Stephensian collection (always plainly indicated) are regarded as the sole exponents of the Stephensian species,—no allusion being required, in such a list, to those numerous instances of the admixture, everywhere, of non-typical specimens, all of which have been fully discussed in the preceding memoir.

1. ferruginea, Sahl.  
*pallida*, Woll.
2. fimetarii, Hbst
3. linearis, Steph.
4. elongatula, Erich.
5. umbrina, Gyll.  
*nigrirostris*, Steph.
6. nigriventris (Kby), Steph.  
*nana*, Erich.
7. peltata, Kraatz
8. fuscipes, Gyll.  
*carbonaria*, Steph.
9. pusilla, Pk.  
*fulvicollis*, Steph.  
*thoracica*, Steph.  
*evanescens*, Mshm, Steph.  
*phæogaster*, Mshm, Steph.  
*basella*, Steph.
10. atricapilla (Kby), Steph.  
*nigriceps*, Erich.
11. Berolinensis, Kraatz
12. fuscata, Schön.  
*castanea*, Steph.  
*rufipes*, Steph.
13. gutta (Newm.), Steph.
14. atra, Hbst

15. mesomelas, Hbst  
    *dimidiata*, (Mshm), Steph.
  16. basalis, Erich.
  17. munda, Erich.
  18. nigripennis, Pk.
  19. Hislopi, Woll.
  20. apicalis, Erich.
  21. analis (Schüp.), Erich.  
    *testacea*, Steph.  
    *atra*, Steph.
  22. ruficornis, (Mshm), Steph.  
    *terminata*, Com.  
    *dorsalis*, Steph.
  23. versicolor, Erich.
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IX. *On the Recent Progress of Micro-Lepidopterology on the Continent.* By H. T. STANTON, Esq.

[Read July 7th, 1856.]

TWENTY-FOUR years have now elapsed since the publication of Treitschke's first volume on the *Tineæ*. This was the first general descriptive work treating of that group of *Lepidoptera* that had appeared on the *Continent* since the time of Fabricius. It was a work which at once rendered the figures of Hübner far more generally serviceable, for the frequently misnamed figures of Hübner were here referred to their correct names, and their histories and habits were given. Sometimes histories were applied to the wrong species, and many species were handled in a manner to create confusion. But whatever may be the faults of Treitschke's work, it was a vast step, and it contributed very materially to the production of Stephens's fourth volume of his "Illustrations," which appeared in 1834 and 1835.

When a general work on a group of insects has appeared, each Entomologist seeks there for the name of any species he may chance to meet with; and if he happens to find it there, well and good, but if not he probably describes it in some scientific journal or in the transactions of some learned society: but were the general work non-existent, he would feel utterly disheartened at the



apparent impossibility of naming his capture; there would be no pleasure in catching a new species, and the science would stand still.

We are always apt to compare works with those which have *succeeded* them, whereas it would be more correct to compare them only with those which have *preceded* them. Viewed in this light, however intrinsically worthless Treitschke may now appear to us, there can be no question that it rendered most essential service to the science in its day, and contributed very materially to the onward progress of Micro-Lepidopterological discovery.

In 1838 appeared Duponchel's eleventh volume of his "*Lepidoptères de France*." Published after Treitschke's and Stephens's works had given their impulse to the study, it is not surprising that in many respects it was an improvement upon either, and embellished with coloured figures of all the insects it described, one would have thought that France, possessing such a work, would soon take the lead in the path of *Tinea*-investigation. But it has not been so, and this volume of Duponchel's remains as a sort of high water-mark to show the highest point which the study of the *Tineæ* ever attained in France. Even Duponchel himself, in his Supplement, came down-hill with a fearful velocity, and no one has yet been found in France to repair the tissue of blunders he then perpetrated.

But one year after the publication of Duponchel's handsome 8vo. appeared a small paper in a little-known German scientific journal; yet this paper has exercised an influence over the development of the science, such as it seldom falls to the lot of one individual to wield.—Zeller's "*Versuch einer naturgemässen Eintheilung der Schaben*" appeared in Oken's "*Isis*" for 1839.

It will be interesting to notice the cause of this small paper exercising so vast an influence. Those who were collecting this group of insects in this country, twenty or even ten years ago, are aware that species were referred to certain genera, by rules entirely arbitrary; this was an *Aphelosetia*, that was an *Amaurosetia*; but *why* it was so, no one knew; it was all guess work. This fault was not peculiar to us as English: it prevailed in Germany, it prevailed in France; in the last-named country, I believe, it prevails to the present day. Now it was impossible to look through this "*Attempé à un Systematic Arrangement of the Tineæ*" of Zeller, without perceiving that good tangible characters were given for the genera; that they were, so to speak, mathematically distinct. You had only to take up an insect, examine its palpi, antennæ, form of hind wings, &c., and at once you could settle in

which genus to place it, without any reference to the markings on the wings.

Some may remember, that *Marginepunctella* and *Perlepidella* (then called *Formosella*) used to be placed side by side in the same genus, and it was even questioned by some whether they were specifically distinct; now by a reference to the smoothness or roughness of the head, by the structure and clothing of the palpi, it is at once seen that they belong to genera far apart.

Naturally this paper of Zeller's produced the greatest effect in Germany, where the serial work of Fischer Von Röslerstamm, with coloured illustrations of the metamorphoses of many of the Micro-Lepidoptera, appeared continuously from 1834 to 1843.

But Professor Zeller was not content with having indicated the arrangement and genera of the *Tineæ*; he proceeded to work up, monographically, the species in individual genera, and in 1846 appeared, in the first volume of the "Linnæa Entomologica," his treatise on the genus *Lithocolletis*; and each succeeding volume of the "Linnæa" has contained papers by the same author on one or more genera of *Tineina*, of which the following is a brief enumeration:—

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|------------------|---|
| 1846. Vol. I.    | <i>Lithocolletis</i> .  |
| 1847. Vol. II.   | <i>Argyresthia</i> , <i>Ocnerostoma</i> , <i>Gracilaria</i> , <i>Coriscium</i> and <i>Ornix</i> .   |
| 1848. Vol. III.  | <i>Lyonetia</i> , <i>Phyllocnistis</i> , <i>Cemistoma</i> , <i>Opostega</i> , <i>Bucculatrix</i> ,<br><i>Nepticula</i> , <i>Trifurcula</i> and <i>Tischeria</i> . |
| 1849. Vol. IV.   | <i>Coleophora</i> and <i>Goniodoma</i> .  |
| 1851. Vol. V.    | <i>Incurvaria</i> , <i>Micropteryx</i> and <i>Nemophora</i> .   |
| 1852. Vol. VI.   | <i>Euplocamus</i> , <i>Tinea</i> , <i>Eriocottis</i> and <i>Lampronia</i> .   |
| 1852. Vol. VII.  | <i>Lypusa</i> , <i>Talæporia</i> , <i>Solenobia</i> , <i>Diplodoma</i> and <i>Xysmatodoma</i> .   |
| 1853. Vol. VIII. | <i>Adela</i> and <i>Nemotois</i> .  |
| 1854. Vol. IX.   | <i>Exæretia</i> , <i>Depressaria</i> and <i>Orthotælia</i> (with some exotic<br>genera).  |
| 1855. Vol. X.    | <i>Butalis</i> .  |

But the very fact of there being such excellent Monographs made the want of a good general work on the subject more painfully felt; and the Monographs published but a few years ago are already quite obsolete, by no means representing the state of our knowledge at the present day, so that the subject was seen in a distorted point of view, only a small portion being as it were in focus, and the rest more or less indistinct and misty.

The group of *Micro-Lepidoptera* had been studied in Finland, by Herr Tengström and Dr. Nylander; in Livonia, by Madame Lienig; in Stettin, by Graf Nicelli; in Breslaw, by Dr. Wocke; in Vienna, by Herrs Mann, Heeger, Lederer; in Berlin, by Herr Bouché; in Jena, by Herr Schläger; in Hanover, by Herr Kross-

man; in Regensburg, by Dr. Herrich-Schäffer, and Herrs Hoffman; in Frankfort-on-the-Main, by Senator Von Heyden, Herrs Schmid and Mühlig; and in Freiburg, by Dr. Reutti; and in Zurich, by Herr Bremi and Professor Frey: was it wonderful that a section of Entomology, thus enthusiastically cultivated from flat, fenny Finland to Switzerland, with its Alpine lakes, should progress?—wherever the German language was current, the impetus given to the study by the writings of the Glogavian Professor was felt and appreciated. Professor Zeller himself ransacked Sicily; Italy yielded her spoils to the energetic temperament of Herr Mann and his wife, and the Sardinian Micro-Lepidoptera have still a lively recollection of Dr. Staudinger's visit to their island. Nay, Dr. Wocke penetrated into France, carrying off a new *Lithocolletis*, which, as though in derision of the French Entomologists, who were not acquainted with it, (and are, perhaps, not yet aware of its existence,) he named *Parisiella*. The Germans appeared to have found their mission was not only to investigate the riches of their own country, but they looked on Italy, Spain and France as foreign countries to be explored; just as Mr. Wallace goes out to the Brazils and to Borneo and Sumatra, not trusting to the natives of those countries working out the natural histories of the forms of animal and vegetable life by which they are surrounded.

Dr. Herrich-Schäffer, in the progress of his "Systematische Bearbeitung der Schmetterlinge von Europa," arrived in 1853 at the fifth volume, which contains the *TINEINA*; this volume, now completed, consists of 394 pages of text quarto, with upwards of ninety plates, containing more than 800 coloured figures. Such a work may well be conceived to be a vast storehouse of information, a sort of dictionary of the groups of insects on which it treats. Containing as it does upwards of eleven hundred species of European *Tineina*, it is evident that no great amount of detail could be expected in so limited a space. Dr. Herrich-Schäffer, whose labours in other branches of Entomology have prevented his giving his whole attention to the small moths, has produced a volume that will always be useful, and which, on account of the plates, will remain valuable 100 years hence; but in the system and in the genera, there is much with which those who have worked more exclusively at the group will hardly be disposed to agree, and even in the separation of allied species we miss many nice discriminations that had already been pointed out by others.

The first systematic work on the group that had appeared in Germany since Treitschke's volumes were published, one sees at

a glance how vast a stride had been effected; but during the last month, an unpretending 8vo. volume, of 430 pages, without plates, has appeared, which at once takes its stand as *the* Continental work on the *Tineina*.

It is impossible to overestimate the value, the utility of the "Tineæ and Pterophori of Switzerland," by Professor Frey:\* though specially applying only to the *Tineæ* of Switzerland, yet as few of the species are peculiarly Swiss, and even those may be found elsewhere if well sought for, it will, on account of the immense amount of systematized details it gives of the habits of the families, genera and species, of their geographical distribution throughout Europe, be read with extreme interest in every corner of Germany, and indeed wherever the German language is understood. It is hardly possible to conceive a more enjoyable book for a student of the *Tineina*; in the genus *Lithocolletis* eight pages are devoted to *Pomifoliella*, *Oxyacanthæ*, *Cydoniella*, *Sorbi*, *Torminella* and *Cerasicolella*! In the genus *Nepticula* at least *eight new species* are described!!

Frey's work will not in any way interfere with the usefulness of Herrich-Schäffer's; each renders the other of more use than it otherwise would have been. It is worked out in a somewhat similar style to my volume of the "Insecta Britannica," but far more completely; going far more into detail, and discussing, as already noticed, the geographical distribution throughout Europe of each species, genus and family; besides, it incorporates all the latest and most recent discoveries, rectifies errors committed by Herrich-Schäffer or myself. In short, this volume clearly establishes the reputation of Professor Frey of Zurich as the first *Micro-Lepidopterist* in Europe.

\* Die Tineen und Pterophoren der Schweiz, von Prof. Heinrich Frey. Zurich, Verlag von Meyer und Zeller. 1856.

X. *Description of Two Insects belonging to Pseudomela, a New Genus of Chrysomelidæ.* By JOSEPH S. BALY, Esq.

[Read 3rd March, 1856.]

THE following genus bears, in its vertical and deeply inserted head, a striking resemblance to *Eumolpus*, near which it was placed in my cabinet, until a closer examination showed me that its true relations were with the *Chrysomelidæ* proper; the perpendicular or horizontal positions of the head, so well marked in the typical genera *Eumolpus* and *Chrysomela*, are of much less value in the aberrant forms of the two families, and not of themselves sufficient to separate them, without having recourse to other characters. Lacordaire, in the introductory chapter to his Monograph on the *Phytophages*, points out the characters to be derived from the tarsi; in the separation of the present families they are most important; the *Eumolpidæ* have the third joint invariably deeply cleft or bilobed, and the fourth, or claw, more or less toothed. The *Chrysomelidæ*, on the other hand, have their penultimate joint entire, *Gastrophysa* and *Phratora*, genera allied to the *Halticidæ*, alone excepted; their claw again is generally simple, although the exceptions to this latter rule are numerous. The two species described in the present paper are both from Africa; one received from Old Calabar by A. Murray, Esq., of Edinburgh, after whom I have named it, the other from Port Natal, sent by Mr. Plant.

Family CHRYSOMELIDÆ.

Genus PSEUDOMELA.

*Antennæ* robust, flattened, subclavate, rather longer than the thorax, their first joint incrassate, clavate, the second short, the third and fourth equal, ovate, slightly thickened towards the apex, the rest dilated, compressed, covered with short hairs. *Palpi* clavate, truncate, the third joint rather broader than the fourth. *Body* ovate, convex; head perpendicular, deeply inserted in the thorax, the latter transverse; *legs* and *tarsi* simple, the latter with their penultimate joint entire.

Sp. 1. *Pseudomela Murrayi*.

Oblong-ovate, convex, finely punctured, fulvous, antennæ (the four basal joints excepted) and legs black.

Long. 5 lin.

Head shining, sparingly punctured; thorax half as broad again as long, convex, its apex scarcely concave, the base slightly convex, side margins rounded, their anterior and posterior angles acute, surface punctured, shining, punctures more scattered on the disc; scutellum smooth; elytra ovate, convex, three times the length of the thorax, rather broader than the latter at the base, sides nearly parallel in front, their apex rounded, surface distinctly punctured; on each elytron are several nearly obsolete longitudinal lines, pale fulvous; beneath fulvous, closely punctured; legs black, thighs sometimes pitchy.

Old Calabar.

Sp. 2. *Pseudomela Natalensis*.

Ovate, very convex, strongly punctured, pale pitchy, body beneath, antennæ and legs black.

Long.  $3-3\frac{2}{3}$  lines.

Deeply punctured, antennæ entirely black; thorax transverse, nearly twice as broad as long, convex above, its apex concave, posterior angles obtuse, side margins rounded, surface coarsely punctured, indistinctly excavated on the sides; scutellum finely punctured; elytra ovate, convex, deeply punctured, sides more rounded than in the former species; beneath black, closely punctured, a few stains on the apical, and the extreme margin of all the abdominal segments, pitchy.

Port Natal.

Smaller than the last, more globose, the puncturing coarser.

XI. *On New Genera and Species of Longicorn Coleoptera.*  
 Part II. *By* FRANCIS P. PASCOE, Esq., F.L.S., &c.

[Read Jan. 5th, 1857.]

ALTHOUGH the present communication is but the continuation of a former one read to the Society last March, I have somewhat enlarged its scope by not exclusively confining myself to the Longicorns of Asia. From all countries there are numerous species and many new forms in our collections, still unnamed and undescribed; and the more remarkable of these, I hope, from time to time, to bring under the notice of the Society.

While expressing my acknowledgments elsewhere to gentlemen for facilities afforded me in one way or another, I cannot help tendering my thanks here to our president, W. W. Saunders, Esq., F.R.S., &c., &c., for his liberality in placing many fine and curious forms in my hands for publication, in addition to the numerous rarities with which he has enriched my cabinet. To Adam White, Esq., of the British Museum, I owe many valuable suggestions; nor, without the facilities afforded by that now really noble institution, both in its museum and library, would it be possible to ascertain what had been done by naturalists, who have scattered their writings about in every imaginable form of publication. The life-like drawings of the more remarkable forms here described, from the well-known pencil of J. O. Westwood, Esq., leave nothing to be desired, and I can only regret that the exigencies of the situation do not allow me to avail myself still further of his skill.

To avoid repetition it is to be understood that all described in this paper from Malacca and Borneo are due to the researches of Mr. Wallace; and when Mr. Low, a professed naturalist and resident in the latter country, tells us in his work ("Sarawak," p. 87) that "beetles\* are very scarce," it may be inferred by those who have seen, from time to time, the extensive collections sent to this country by the former gentleman, with what energy

\* Why not get rid of this word, which is not confined, in common parlance, to the *Coleoptera*, and is almost universally applied to the cockroach only, by the vulgar? We have "mammal" and "mollusc" naturalized among us recently—why not "coleop"?

he must have prosecuted his labours. To Mr. Fortune, so well known for his Travels in China, we owe all we possess from the north of that empire. With regard to other countries, I have mentioned the name of the collector whenever it has been known to me.

#### DYNAMOSTES.

Head wider than the thorax, elongated behind the eyes. Antennæ approximate, 11-jointed, the first thick and nearly twice the length of the third, which is somewhat shorter than the fourth, and nearly equal with the rest, the second excepted. Maxillary palpi longer than the labial, with their terminal joints inversely conical. Elytra depressed, wider than the thorax. Legs with the femora very stout, the tibiæ unarmed, the posterior deeply notched, tarsi short, claws slender.

This most remarkable form has no very obvious affinity with any genus of *Prionidæ* yet known. The only specimen I have seen is in the rich collection of W. W. Saunders, Esq.

#### *Dynamostes audax*. (Pl. XXII. fig. 1.)

D. fusco-piceus; elytris tricostatis, interstitiis punctis lineis duabus ordinatis. India.

Pitchy brown, sparingly clothed with short stiff hairs, particularly on the tibiæ and antennæ; head coarsely punctured, except a space on the vertex, which is smooth and polished; prothorax roughly punctured, with two or three faint striæ in the middle; elytra with three longitudinal ribs, the interstices having a double row of coarse punctures; legs stout, the femora large, the tibiæ simple, the posterior with a deep notch internally at the end; tarsi short, the claws slender.

Length  $13\frac{1}{2}$  lines.

#### *Prionus fossatus*.

P. fusco-piceus; mandibulis capiteque rudè punctatis, inter oculos excavato; prothorace subtilissime punctato, angulo posteriori mutico; elytris tri-costulatis, leviter punctatis; tibiis canaliculatis. China Borealis.

Pitchy brown, paler or shading gradually into chesnut behind; eyes large, rather approximate, a wide groove between the eyes, a ridge on each side the groove, and a prominent elevation below which gives insertion to the antennæ, the latter and the mandibles coarsely punctured; antennæ with all the joints after the fourth of nearly equal length; prothorax delicately punctured, short,



rather broad, with two spines on each side, the posterior angle unarmed; scutellum transverse, with fine punctures; elytra sub-parallel, finely punctured with three costulæ and the sutural angle distinct; legs moderate, chesnut brown, tibiæ canaliculate, posterior tarsus rather long.

Length 17 lines.

This seems to be the common form of *Prionus* in North China.

*Prionus hydropicus.*

*P. castaneo-fuscus*; mandibulis capiteque subtiliter punctatis, inter oculos subsulcato; prothorace punctato, angulo posteriori spinoso; elytris bicostulatis scabrosis, angulo suturali rotundato. China Borealis.

Dull chesnut brown, eyes moderate, rather distant, with a flat surface between them, divided by a slight groove and finely punctured; mandibles very minutely punctured; antennæ with the last five or six joints very short, and, except the last, cup-shaped; prothorax with three spines on each side, including the one at the posterior angle; elytra widest in the middle, rather short, convex, sub-costulate, minutely corrugated, and with very slight traces of punctures, the sutural angle rounded; legs moderate, tibiæ simple, posterior tarsus short.

Length 14 lines.

NEOSTENUS.

Head small, eyes reniform, palpi slender, unequal; antennæ rather long, the first joint shorter than the third, the fourth and fifth rather longer, and with the remainder sub-equal and dilated on one side; thorax simple, rounded; elytra very long and narrow, but shorter than the abdomen; legs very short, tibiæ simple.

The habit of this genus is so very remarkable as to suggest a doubt, at the first glance, of its belonging to the *Prionidæ*; its affinity, however, to *Aphanasium* and *Philus*, is evident. The only example which has fallen under my notice is in Mr. Saunders's collection, and is apparently a female: when the male is known it will be probably necessary to modify some of the above characters.

*Neostenus Saundersii.* (Pl. XXII. fig. 2.)

*N. fusco-piceus*, subtus pubescens; prothorace crebre punctato; elytris brunneis, costatis, humeris elevatis. Nova Cambria Australis.

Pitchy brown, with a greyish pubescence beneath; thorax thickly and minutely punctured; elytra light brown, each with

two prominent ribs, and at the sides two others, but less evident, none reaching to the apex, the interstices very finely punctured, the humeral angles rather raised.

Length 17 lines.

*Cerambyx? morosus.*

C. fuscus; prothorace mutico, transversim corrugato; elytris pube flavescente vestitis, apice angulatis ad suturam spinosis; antennis scabris, piceis, articulis a tertio ad septimum apice spinosis. Borneo.

Brown, with a delicate pubescence principally on the elytra; head elongated, with a deep longitudinal furrow between the eyes and a transverse groove above the labrum, in which are two round tubercles; prothorax transversely grooved, the grooves curved and irregular; scutellum small; elytra finely punctured, having each three faint striæ, and somewhat gibbous towards the base, the apex angular, with the suture produced into a spine; antennæ glabrous, roughly tubercled, the third to the seventh joints spined at the end; legs rufous brown.

Length 25 lines.

This fine species scarcely accords with *Cerambyx*, if we take *cerdo*, *heros*, *orientalis*, &c. as the types.

XOANODERA.

Head rather narrow; eyes large, broadly emarginate; palpi lengthened, the maxillary longer than the labial, the terminal joint oblong truncate; antennæ longer than the body, the first four or five joints rounded, the remainder dilated, the fourth shortest, except the second; thorax lengthened, pyriform; elytra long, truncate at the apex; legs moderately long.

This genus, and the two following (*Calpazia* and *Zatrephus*) are related to the restricted genus *Cerambyx*, but have quite a different habit. *Xoanodera* is more particularly distinguished from its allies by its unequal palpi. In *X. trigona*, the outer maxillary lobe is elongated and porrect, with a brush-like tip: *X. magister* has no such structure apparently, and may form another genus.

*Xoanodera trigona.* (Pl. XXIII. fig. 1.)

X. fusca, opaca; prothorace longitudinaliter striato; elytris profunde punctatis, postice dilatatis albido-hirtis, lateribus nudis. Malacca.

Upper surface opaque, pitchy brown; the head, sides of the prothorax and the undersurface covered with thickly set short

yellowish hairs; pubescence on the elytra partial, a large sub-triangular spot on each side, being entirely free of hairs and very coarsely and deeply punctured; there are also a few half-naked patches, principally near the apex; antennæ and legs brown, thickly set with short hairs.

Length 12 lines.

*Xoanodera magister.*

X. piceo-fusca vel nigra, sub-nitida, maculis lineiformibus albido-villosis lateralibus ornata; prothorace transversim striato; elytris elongatis, versus apicem leviter attenuatis. Borneo.

Pitchy brown or black, slightly shining; from the eye and along the sides of the thorax and elytra extend three or four lines of elongated spots, sometimes coalescing with one another, and formed of short thickly set yellowish white hairs; these are so placed as to leave a broad naked space from the crown of the head to the apex of the elytra, while the interstices on the latter are very slightly punctate; antennæ and legs pubescent.

Length 17 lines.

CALPAZIA.

Antennæ longer than the body, the first five or six joints rounded, the rest dilated on one side, the seventh longest; palpi sub-equal; the last joint of the maxillary nearly triangular; thorax rather broad, somewhat elliptic, unarmed; elytra small; legs rather long, with the hinder femora reaching nearly to the end of the elytra.

The broad elliptic thorax, small elytra and longer legs are the most characteristic points of this genus, which in habit is not very unlike *Elaphidion*.

*Calpazia vermicularis.* (Pl. XXIII. fig. 2.)

C. fusco-niger; prothorace transversim striato; elytris punctatis sub-parallelis, pilis sparsis brevibus adpressis irregulariter dispositis, singulis maculâ magnâ nigrâ ornatis. Borneo.

Upper surface dark brownish black, more or less furnished with short appressed somewhat glossy yellowish hairs, sparingly on the head and on the sides of the prothorax, leaving the central striated part bare, and on the elytra, which are nearly parallel, except on the large black post-median patch extending the whole breadth of the elytron, the hairs are very irregularly arranged in little convoluted clusters, giving the part a sort of worm-eaten

appearance; under surface, legs and antennæ testaceous brown, with a sparse silky pubescence.

Length 8 lines.

#### ZATREPHUS.

Head moderate; antennæ distant, shorter than the body, the first four or five joints rounded, the rest dilated on one side; palpi short, nearly equal, the last joint nearly as long as the rest together; thorax longer than broad, narrow in front and corrugated; elytra rather broad, truncate at the apex; legs short.

The two insects which I have placed in this genus differ in habit, so that their being congeneric is doubtful. In all probability these with *Calpazia* and *Xoanodera*, and possibly other groups, are the representatives of extensive series, for of the five species composing these three genera, Mr. Wallace has detected only six specimens, *Xoanodera trigona* alone having occurred a second time; their capture, then, is a mere accident, and it may be left to the imagination to infer how many more await future research.

#### *Zatrephus pannosus*. (Pl. XXIII. fig. 3.)

*Z. brunneus*; prothorace rugoso fulvo-lanuginoso; elytris elongatis, pilis fulvo-albidis densissime tectis. Borneo.

Brown; head with a deep groove between the eyes; prothorax very rough, with indeterminate striæ and tubercles, and here and there with little patches of fulvous woolly hairs; elytra densely covered with pale brownish white appressed hairs, except a naked glossy spot near the apex of each; antennæ everywhere covered with short fulvous hairs; legs and under surface with pale brown hairs.

Length 14 lines.

#### *Zatrephus inscitus*.

*Z. fuscus*; prothorace medio bicostato, lateribus corrugatis; elytris brevibus, sub-sericeis flavis, postice dilatis. Borneo.

Head and thorax deep brown, the latter at both the anterior and posterior margins with two transverse striæ, between which are two central longitudinal ribs, the sides being irregularly corrugated; elytra wider posteriorly, the apex divaricate, pale brown, covered with short yellowish silky hairs; under surface, legs and antennæ clothed with short hairs.

Length 11 lines.

*Sternacanthus picticornis.*

S. niger nitidus; elytris rubris, fasciis tribus nigris ornatis; antennis nigris, articulis 3-tiis, 4-tis, 5-tis flavis; segmento ultimo abdominis flavo. Para.

Closely resembles the *Prionus undatus* of Olivier, but is larger, proportionably broader and more depressed, and has the lateral abdominal segment of a dull yellow colour; the bands on the elytra are much narrower, and the black spot on the shoulder is absent. I have only seen the specimen in my own collection, which appears to be a female.

Length 11 lines.

## NOSERIUS.

Head rather produced behind, but broad between the eyes; palpi equal, the maxillary thicker; antennæ moderate, the third joint longest, the rest nearly equal; thorax broader than long, slightly depressed, tubercled laterally; elytra long, rounded at the apex; legs moderate, slender; thighs simple.

*Stromatium* appears to be the nearest ally of this genus, from which it differs in habit and the absence of the thoracic "plate."

*Noserius tibialis.* (Pl. XXIII. fig. 4.)

N. pallide-testaceus, pubescens; antennis tibiisque piceis; oculis apicibusque mandibularum nigris. Borneo.

Pale testaceous and delicately pubescent; antennæ, except the first joint, blackish-brown; the eyes and tips of the mandibles black; tibiæ, the apices of the thighs and part of the first tarsal joint pitchy black; prothorax with a minute tubercle at the sides; elytra faintly striated; scutellum minute.

Length 7 lines.

*Stromatium alienum.*

S. pallide-testaceum, pubescens; prothorace mamillis duabus posticis; elytris parallelis tricostatis, punctis elevatis sparsis aspersis. Espiritu Santo (Brasilia).

Pale testaceous, finely pubescent; prothorax at each posterior angle with a round mamillated protuberance; elytra with three or four rows of elevated points and three ribs, the inner or sutural one being very short and almost obsolete, the two others gradually increasing in length and distinctness, while at the apex there appears another, formed, however, by the deflection of the elytron.

Length 6 lines.

Although the common *Stromatium strepens*, F., has a wide range in the old world, I have nowhere seen it mentioned as a native of the new; however, it seems to be common about Rio de Janeiro: and I have now the pleasure of adding another species, not very dissimilar, but abundantly distinct in its prothoracic mamillary protuberances and other characters, from Espiritu Santo, a province bordering Rio on the north.

*Pachylocerus plumiferus*. (Pl. XXIII. fig. 5.)

P. brunnescente-ruber; prothorace rude sulcato, subnitido atromaculato; elytris pubescentibus opacis atromaculatis; antennis articulis tertio ad sextum apice plumosis; metathorace abdomineque pubescente atro, prothorace subtus pedibusque ferrugineis. India.

Brownish red, the head and thorax glabrous, the latter deeply sulcate, shining, with eight black spots not very clearly defined, four of which are central and two on either side; elytra pubescent, very dull, each with about four small black spots towards the base and a large black patch posteriorly; abdomen and breast black, with a somewhat silvery pubescence, the thorax beneath and legs ferruginous; antennæ very thick; the ends of the joints, from the third to the sixth, with a tuft of short hairs on one side beneath.

Length  $10\frac{1}{2}$  lines.

This may be possibly the male of Olivier's *Cerambyx crassicornis*, yet his figure is so unlike the present insect, and his description so loose, as fairly to justify their separation, until his original specimen, if it be in existence, can be re-examined. The tufts on the antennæ are, probably, only sexual. This rare insect is in the collection of Mr. Saunders.

PYRESTES.

Head produced; antennæ short, laterally dilated; maxillary palpi longer than the labial; prothorax subcylindrical, elongated; elytra sinuated exteriorly near the shoulders, dilated posteriorly; legs short.

Allied to *Erythrus*, Wh., but with a very different thorax: in that genus, too, the palpi are nearly equal.

*Pyrestes eximius*. (Pl. XXII. fig. 3.)

S. niger, nitidus; prothorace transversim striato; elytris punctatis abdomineque coccineis. Borneo.

Head, thorax, scutellum and legs black; abdomen and elytra

vermilion red; prothorax minutely and transversely striated; elytra rather coarsely punctured, thickened at the suture, and moderately sinuated at the apex.

Length  $6\frac{1}{2}$  lines.

*Pyrestes miniatus.*

*P. ruber*, pubescens; prothorace transversim minutissime-striato elytris que tenuiter punctato; oculis abdomine que nigris, hoc segmentis ultimis duobus rubris. India Borealis.

Head, thorax and elytra red; antennæ, eyes, legs, posterior portion of the thorax beneath and abdomen black (except the two last segments, which are pale red); prothorax with very fine transverse striæ, and with the elytra pubescent and covered with numerous minute punctures. In the collection of W. W. Saunders, Esq.

Length  $5\frac{1}{2}$  lines.

*Pyrestes hæmaticus.*

*P. rubro-coccineus*, punctatus, subtus niger; abdomine politâ brunneo-coccineâ. China Borealis.

About the size of *Pyrestes eximius*; vermilion red, hairy, and rather thickly punctured; antennæ brownish red, deepening into black at the end; tibiæ and tarsi dark red; eyes and beneath black; the abdomen dark red, polished; prothorax with scarcely any traces of striæ; elytra deeply sinuated. In the British Museum.

*Clytellus Westwoodii.*

*C. ater*, glaber, nitidissimus; elytris elongatis sub-parallelis, bigibbosis, apicibus albo-hirtis. Borneo.

Deep pitchy black, smooth and shining; head parallel with the thorax, which is narrow and deeply constricted behind; elytra rather lengthened, nearly parallel at the sides, and depressed about the middle so as to form a double gibbosity, at the apex of each a small triangular white spot formed by short silky hairs; legs pitchy brown; a very few scattered hairs appear on the face, the hollow of the elytra, and on the tibiæ.

Length  $3\frac{1}{4}$  lines.

As we are indebted to Mr. Westwood for our knowledge of this curious genus, I have taken the opportunity of attaching his name to a second very distinct species, differing from the typical *Clytellus methocoides* in its larger size, more linear outline, and

the absence of the reflexed spinous tubercle on the shoulder which characterizes that species.

DEUTEROMMA.

Antennæ setaceous, twice as long as the body, the joints nearly equal, except the two first, which are shortest; eyes four; palpi short; prothorax depressed, rounded at the sides and slightly toothed, constricted behind; elytra parallel, depressed; legs long, the femora and tibiæ compressed.

In the species described below, the coxæ, particularly of the intermediate legs, are unusually large and placed so apart, that the insertion of the femora can be almost seen from above; these femora, too, in one sex at least, are remarkably bent and attenuated at their base. There is another species, but the only two specimens I have seen are very imperfect.

*Deuteromma callidioides*. (Pl. XXIII. fig. 6.)

D. testaceo-brunnea; elytris fusciscentibus pube cinereo tectis; oculis nigris. Borneo.

Head, prothorax and antennæ yellowish brown; elytra blackish brown (except a very small part of the base, which is the same colour as the thorax), covered with short greyish hairs; legs yellowish brown, the middle and posterior pair darker, and furnished with a greyish pile; under surface with colours corresponding to the upper.

Length 4 lines.

*Didymocantha thoracica*.

D. testaceo-brunnea; prothorace fusco rugoso, maculis albolanuginosis ornato; elytris apiculatis punctatis, punctis setuliferis, maculâ irregulari post-medianâ margineque posticali fuscis. Australia [Moreton Bay].

Head and prothorax brown, the latter roughly tuberculate, with a broad oblique stripe of white woolly hairs on each side, and an oblong spot at the base; scutellum white; elytra punctured, very roughly on the upper half, an erect setulose hair arising from the base of each puncture, testaceous-brown; an irregular post-median spot, and the posterior third, bordered with dark brown, the suture ending in a sharp projecting spine; legs with the apices of the femora black; under surface somewhat glossy, with a white spot on the side of each abdominal segment.

Length 11 lines.



*Blemmya humeralis.*

*B. atra*; elytris singulis lineo humerale et fasciis duabus transversis suturâ non attingente, albis; corpore subtus pube sericeo-argentatâ. Malacca.

Deep black; the prothorax finely punctured with a narrow white border at the anterior and posterior margins; elytra covered with a fine pile and having on each a white line, commencing between the shoulder and scutellum, continued downwards to about a third of its length, where the first transverse band occurs, and a little below this a second and broader one, but neither attaining the suture, at the apex an indistinct pale blotch; antennæ with a silvery pubescence; body beneath covered with a white silky pile.

Length  $4\frac{1}{2}$  lines.

This is especially interesting as a Malayan species of a genus founded on two Bornean insects, which I proposed in a former communication. The remarkable carina which is so evident on the elytra of one of the latter, and of which only a faint trace exists in the other, disappears altogether in the present species; in this, too, the antennæ are proportionably longer and the joints less dilated, the third being longer than the first; the legs, also, are more slender, and the whole form less robust.

*Tmesisternus gratiosus.* (Pl. XXII. fig. 4.)

*T. niger*, nitidus, glaberrimus; prothorace lateribus albo-vittatis; elytris biapiculatis, singulis lineis tribus curvatis albis; subtus thorace albo-marginatis, segmentis abdominis lateribus albo-maculatis. Insula Pinorum.

Black, smooth and shining, with a very slight brassy tint, and marked above and beneath with lines and stripes, formed by short white closely-appressed hairs; on the head, between the eye and the insertion of the antennæ, again behind the eye, which is continuous with a lateral thoracic stripe; an oblong central spot on the scutellum, and lastly, four transverse white marks on each elytron not meeting at the suture, the first close to the junction with the thorax, the second about the middle, which is slightly interrupted, the third curved downwards, and at the apex we have it formed by the line of hairs projecting backwards. Beneath there is the same polished surface as the thorax, more or less margined with white lines of hairs, as well as the abdominal segments at the sides anteriorly, but gradually becoming obliterated towards the last.

Length 5 lines.

I have carefully examined the descriptions of *Tmesisterni*, in the French "*Voyages*," as well as the more recent ones of Montrouzier and Perroud, and cannot find that this insect has been anywhere described. It was found in the Isle of Pines by Mr. Macgillivray of H. M. S. Herald, and is in the rich collection of W. W. Saunders, Esq.

#### SCOPADUS.

Head large, eyes reniform, antennæ longer than the body, ciliated beneath. Prothorax narrower than the head, vaulted above and rather longer than broad. Elytra crested at the shoulders, very convex at the apex and rounded. Legs with the femora thickened, the tarsi very short.

Closely allied to *Leptoplia*, Dej., which, however, differs in its large globular thorax, and very compressed and lengthened femora.

#### *Scopadus ciliatus*. (Pl. XXII. fig. 5.)

S. fusco-ater, setis sparsis flavescens obtectis; dimidio basali elytrorum, pedibus antennisque obscure luteis. Ad Flumen Amazon.

The whole body above sparingly furnished with long yellowish setulose hairs. Thorax black, with a narrow white median longitudinal line at its base, extending to about half its length. Face dull yellowish; eyes black; antennæ varied with black and dull yellow. Elytra with not quite half the apical portion black, and where it ceases having each two small white spots, the remainder of the elytra fulvous yellow, each shoulder having an elevated crest crowned with a tuft of longish hairs, from the base of each crest and on the outside an oblique groove, converging towards the suture so as to form a mark like the letter V. Legs brownish yellow, beneath yellowish, the abdomen shining black.

Length 4 lines.

#### *Agelasta irrorata*.

A. anthracina; elytris tenuiter griseo-hirtis, nigro-irroratis, guttis albis sparsis ornatis. Malacca.

Deep coal black, the upper surface sparingly furnished with short stiff erect hairs; prothorax with a tubercle on each side; elytra sprinkled over with small black naked spots, among which are also twelve or fourteen small pure white ones; antennæ black, with the bases of the third, fourth, fifth and sixth joints grey; legs black, the tibiæ grey in the middle, the four posterior femora varied with grey, the last tarsal joint, and the bases of all

the claws white; beneath greyish, with one or two white spots on the sides.

Length 8 lines.

A genus hitherto confined to Borneo and the Phillippines; it is not like in colour any other species.

*Cacia concinna.*

*C. castanea*, nitida; elytris punctatis, parce aureo-maculatis. Borneo.

Rich chesnut brown, shining; prothorax smooth; elytra having each six or seven very distinct golden yellow spots; antennæ with the first four joints very hairy beneath, the rest small, the fifth white, the remainder brown; under surface paler.

Length 4 lines.

The first four joints of the antennæ are rather larger than usual in this genus, and are together nearly twice the length of the remainder. It is rather an aberrant species.

*Cacia setulosa.*

*C. brunnea*, fusco-variegata, fortiter punctata; elytris sub-trifasciatis; scutello albo; antennis pedibusque setulosis. Java.

Pale brown, with dark brown markings and very coarsely punctured; head dark brown, hairy; prothorax smooth, with two spots on the anterior margin, and four on the posterior; elytra depressed, with a line of hairs on their exterior borders, and three dark imperfect fasciæ; scutellum dull white; legs hairy, varied, the tibiæ with a pale ring in the middle, tarsi pale; antennæ furnished beneath with numerous stiff erect hairs, particularly the three first, the fourth with a slight trace of a tuft at the apex, the third, fourth and fifth paler at the base.

Length 4 lines.

Allied to *Cacia spinigera*, Newm.

*Cacia confusa.*

*C. grisea*; capite prothoraceque lineis duabus nigris; elytris punctatis, variegatis, fasciâ transversâ posticali fuscâ; antennis longis. Malacca.

Dull grey; a band, commencing from behind each eye, extends in a parallel line over the prothorax; elytra sparingly but coarsely punctured, varied with a few small brown irregular obscure spots, and at the posterior third a broad rather indistinct band; antennæ

one-third longer than the body, slightly ciliated beneath, brown, the fifth joint and base of the fourth excepted, which are white; legs brown, with a pale band in the middle of each tibia.

Length 4 lines.

*Cacia inculta.*

*C. brunnea*, flavido-fuscoque variegata; prothorace transversâ; scutello pallide-ochraceo; elytris fasciis duabus apiceque fuscis; antennis mediocribus, articulo tertio curvato. Borneo.

Brown, varied with dark brown and yellowish; prothorax short, with dark spots and patches, and the side with an oblique stripe; scutellum pale buff; elytra coarsely punctured with two fascia, the upper curved downward from the shoulder, and the most distinct, particularly at its anterior border, the lower formed by two interrupted patches; behind this there is a dark spot or two, the apex being very distinctly tipped with dark brown; antennæ scarcely longer than the body, and very slightly ciliated, reddish brown, the apex of the fourth joint with a black tuft, its base and that of the fifth pale; legs with the four posterior tarsi pale, the anterior reddish, all, with the tibiæ, obscurely banded in the middle.

Length  $5\frac{1}{2}$  lines.

*Cacia Newmanni.*

*C. fusca*; prothorace humerisque albo-bilineatis; elytris punctatis basi tuberculato, postice lineis duabus curvatis, unâ albâ alterâ nigrâ, ornatis. Malacca.

Brown; prothorax with a white line commencing behind the eyes and directed obliquely outward over the shoulder, within this there is a wider black one, which, however, is confined to the prothorax; elytra coarsely punctured, with a large tubercle between the shoulder and scutellum, having a curved white line, and behind a broader black one, extending obliquely across the lower half, and with an obscure patch or two near the apex; legs with the basal half of all the tibiæ pale, the rest with the tarsi black; antennæ with the first joint dark brown, the second and third reddish brown, the fourth black, and all these hairy, especially the last, the fifth joint white, the remainder light brown, deepening gradually into black.

Length  $2\frac{1}{2}$  lines.

I have named this elegant little insect after E. Newman, Esq., F. L. S., &c. &c., who first characterized this now tolerably ex-

tensive genus, and to whom oriental Entomology is more particularly indebted.

*Penthea Saundersii.*

*P. picea*, rugoso-punctata, maculis lineisque albis ornata; antennis ciliatis griseo-annulatis; corpore subtus pedibusque pube albidâ tectis. Flumen Cygnorum.

Pitchy black, roughly and irregularly punctured, with numerous distinct variously-shaped markings, composed of whitish silky hairs scattered over the upper surface; on the head, a line on the vertex and between the eyes, one round the orbit, and two oblong patches on the cheek; the anterior and posterior margins of the prothorax with double lines, and in the centre an  $\times$  shaped mark; on the elytra numerous spots more or less round, angular and curved; scutellum small, concave; under surface and legs covered with a dense whitish pile; tarsi and antennæ black, the latter ciliated underneath, with the third to the seventh or eighth joints grey at their base.

Length 18 lines.

The fine insect from which this description is made is in the collection of W. W. Saunders, Esq., and was taken by the botanist, Drummond, in the interior of the Swan River colony.

*Monohammus hilaris.*

*M. niger*; prothorace lateribus verticeque flavo-vittatis; elytris cano-pubescentibus, guttis flavis aspersis; antennis articulis plurimis basi canis. China Borealis.

Black, with spots and stripes of yellow hairs; vertex sulcated and striped longitudinally, a spot beneath the insertion of the antennæ and another on the cheek; prothorax transversely corrugated, with a broad stripe on each side above the spine and two oblong spots beneath it; elytra truncate at the apex, with a greyish pubescence, several small spots and a row of five larger ones on the outer side of each; antennæ light grey, with the two first and the apices of all the others black, except the last, which is black only in the middle; body beneath pubescent, with yellow spots.

Length 12 lines.

*M. punctulatus*, West., is very near this.

*Monohammus permutans.*

*M. olivaceo-aureus*, pube velutino tectus; prothorace angusto, fortiter spinoso; elytris sericeo-undulatis, certo situ visis

nebulosis; antennis griseis, articulis apice nigris. China Borealis.

Densely covered with a somewhat greenish-golden velvet pubescence, the elytra varied by three or four irregular-clouded bands, which, according to position, is darker or lighter, *i. e.*, the dark becoming the light, and *vice versâ*; prothorax rather narrow, with the spine produced; antennæ with the top of each joint black, the rest pale grey; legs varied with grey and brown.

Length 13 lines.

There are two or three undescribed species very near this.

*Monohammus carissimus.*

*M. ater*, pube crocêâ densissimâ tectus; prothorace breve, atro-maculatâ vel lineatâ; elytris irregulariter reticulatis. Burmah.

Black, with variously disposed patches of short appressed saffron yellow hairs, the smooth black surface showing in the intervals; on the prothorax two spots in a line with the eye, which sometimes coalesce and form a line; and on the elytra various irregular reticulations, among which may be recognized three larger patches on the sides of each, and a common central one at the base; under surface and legs dull yellow; antennæ yellow, with the first and second joints and the apices of the remainder black, except the three last, which are brown.

Length 8 lines.

A beautiful species, not likely to be confounded with any other.

STEGENUS.

Head narrow; antennæ approximate, rather longer than the body, with the first four joints densely clothed with short stiff hairs.

Thorax unarmed, longer than broad, contracted both before and behind; elytra broader than the thorax; legs rather short.

Nearly allied to *Actophora*, Newm., from which it differs chiefly in the antennæ.

*Stegenus dactylon.* (Pl. XXII. fig. 6.)

*S. fuscus*; prothorace subsulcato, confertim punctulato; elytris striatis, interstitiis rugoso-punctatis, humeris productis, apicibus fulvo-notatis; subtus lateribus albis; antennis articulis quinto ad ultimum luteis. Borneo.

Deep brown, approaching to black, beneath the eye a white stripe which extends along the side of the thorax, and, but

more diffusely, of the abdomen; prothorax (and crown of the head) minutely punctate, and having three or four very indistinct grooved lines; elytra produced at the shoulders, each having three very coarsely punctured and prominent striæ, and at the apex a buff-coloured mark formed by very short thick-set hairs and extending up between the striæ for a short distance; the seven last joints, forming the simple portion of the antennæ, luteous.

Length  $7\frac{1}{2}$  lines.

*Cereopsius\* marmoreus.*

*C. niger*, sub-elongatus; prothorace tuberculato, lateribus fortiter spinosis; elytris apiculatis, griseo-marmoratis; antennis fuscis. Malacca.

Brownish black, rather narrow; the prothorax varied with grey, strongly spined at the sides, and with about eight tubercles on its surface; elytra with short appressed hairs, deeply punctured on the shoulders, with numerous grey and black transverse zig-zag markings, the outer angle terminating in a spine; antennæ brown; body beneath and legs with a greyish pubescence.

Length  $9\frac{1}{2}$  lines.

*Cereopsius exoletus.*

*C. ater*; prothorace sub-nitido, maculis duabus albis; elytris lateribus albescentibus, singulis maculis tribus albis, apice spinosis; antennis (articulo primo atro) brunneis. Borneo.

Dull black, pubescent; space round the eye, except at the upper part, and the whole under surface, covered with greyish white hairs; prothorax rather glossy, having a slight ridge between the lateral spines and a distant furrow near its anterior border, while on each side and in front there is a large well-defined white spot; elytra very opaque, punctate, particularly at the base, the lateral apex produced into a spine and having on each side, commencing just below the shoulder, a greyish patch, extending nearly to the apex, and in which are placed three white spots, two anterior and one posterior. Antennæ smooth, light brown, except the first joint, which is black; tibiæ at the end shading into brown.

Length 10 lines.

*Phymasterna concreta.*

*P. curta*, convexa, densè pube albidâ tecta; prothorace antice rotundato, postice spinoso; elytris sub-triangularibus fasciculatis, fortiter punctatis; antennis mediocribus. Natal.

\* Syn. *Cereopsis*, Bl.; a name employed by Leach in 1801, for a genus of birds.

Body short and compact, covered with appressed whitish hairs; prothorax very broad, rounded in front, each posterior angle terminating in a spine; elytra broad at the shoulders, decreasing, with a slight curve at the sides, to the apex, covered with white hairs mixed with buffish blotches partially disposed in longitudinal curved lines with coarse rough punctures between them, and each having two fascicles, one between the shoulder and suture, the other on the apical third of the elytron; antennæ not longer than the body.

Length 4 lines.

*Praonetha posticalis.*

*P. griseo-fusca*, varia; elytris medio depressis, bicostatis, basi elevato-cristatis; antennis mediocribus. Ceylon.

Greyish brown, varied; prothorax with two obscure longitudinal lines at the base, darker externally; elytra bicostate, roughly punctured, depressed towards the middle, where there is a dull crescent-shaped greyish band, and towards the apex another and more deeply defined, the base of each elytron raised into a crest; antennæ scarcely longer than the body, ciliated beneath.

Length  $3\frac{1}{2}$  lines.

*Praonetha melanura.*

*P. griseo-fusca*; elytris fortiter punctatis; abdomine segmento ultimo nigro; antennis brevibus, articulo quarto albo-cincto. Malacca.

Greyish brown; head sooty; prothorax thickly punctured; elytra tinged at the base and posterior half with brownish yellow, the middle greyish, very coarsely punctured in regular lines; tarsi and last abdominal segment black; antennæ shorter than the body, dark brown, the fourth joint white in the middle, the third with a slight tuft of hair, the remainder ciliated.

Length  $5\frac{1}{2}$  lines.

ACONODES.

Antennæ slender, shorter than the body, the third joint longest; maxillary palpi with the terminal joint ovate, pointed; eyes small, broadly emarginate; thorax wider than the head, longitudinal, slightly tumid at the sides; elytra convex, wider posteriorly, each terminating in a divaricate point; legs slender, thighs simple.



Nearly allied to *Hoplopterus*,\* Bl. The only example that I have seen is at the India House, and was collected at Darjeeling, by Dr. Pearson. Like the Dorcadions of Europe, its habitat is probably under stones and clods of earth; and if the Anglo-Indians, while at the sanatoria in the "hill-country," and under the curse of having nothing to do, were to direct their attention to this or other kindred subjects, the tedium of their sojourn would be diminished, and the discovery of many novelties the result. India is still a new field for Entomology. We only know the finer species.

*Aconodes montanus*. (Pl. XXIII. fig. 7.)

A. obscure-fuscus, rugoso-punctatus; elytris tuberculato-cristatis. Himalaya Montes.

Dull or dirty brown, and coarsely punctured; prothorax with a slight longitudinal crest; elytra tuberculate in about three rows, the one towards the suture forming three crests, of which the two basal are the most elevated.

Length  $4\frac{1}{2}$  lines.

*Hathlia Buckleyi*, Moore's MS.

H. breviter cylindrica, pilis argenteis brevissimis densissime tecta; capite prothoraceque lineâ mediâ prope obsoletâ; elytris apice divaricatis, atro-punctulatis; oculis antennisque nigris. India Borealis.

Body rather short and nearly cylindrical, covered with a very short dense silvery white pile; on the crown of the head and continuous with the prothorax an obscure broad line; elytra somewhat attenuated posteriorly, the apex divaricate, the dorsal surface with numerous very distinct punctures, apparently caused by the absence of the pile, the black substance of the elytra showing beneath; eyes and antennæ black.

Length 7 lines.

The museum at the India House is indebted to Colonel Buckley for many of its most interesting insects, and Mr. Moore has therefore named this interesting coleop after him.

*Apomecyna frenata*.

A. atra, subnitida, lineâ communi ab oculis, lateribus prothoracis ad medium elytrorum transversim connexâ, alterâque semilunari versus apicem, niveis. Malacca.

\* This name must be changed, as it was applied in 1831 to a genus of birds, by the Prince of Canino.

Black, slightly punctured and shining, a snowy-white line, composed of very short appressed hairs, extending from the eye along the sides of the prothorax and elytra to about the middle, where it crosses and unites with the opposite one, and behind this, but not quite at the apex, a crescent-shaped line, from which, at the suture, a finer line is continued to the apex; under surface, with the sides of the thorax and abdominal segments, whitish.

Length  $5\frac{1}{2}$  lines.

This differs from the true *Apomecynæ* in having the elytra rounded at the apex.

*Entelopes ionoptera.* (Pl. XXIII. fig. 8.)

*E. luteus*; elytris crebre punctatis verticeque violaceis; apice elytrorum luteis. Borneo.

Luteous yellow; crown of the head deep violet; eyes and tips of the mandibles black; elytra rich violet, except a very small patch on the spinous apex, which is yellow, the upper two-thirds finely pubescent and thickly punctured, the lower third smooth and shining, with the punctures unfrequent.

Length  $4\frac{1}{2}$  lines.

This is a true species of *Entelopes*, agreeing perfectly in generic character but having the elytra a little less convex; in colouring, however, it departs entirely from the two or three (?) other species known, and in this respect it approaches very nearly *Astathes*.

*Astathes straminea.*

*A. purpureo-atra, angusta*; antennis, elytris, pedibusque pallide luteis. Burmah, prope Rangoon.

The head, thorax and the whole under surface purplish black; the antennæ, which are slightly ciliated beneath, legs and elytra, pale fulvous yellow, the latter faintly striate and shining; prothorax transversely trituberculate.

Length  $4\frac{1}{2}$  lines.

*Astathes purpurea.*

*A. purpurea, nitida*; metathorace subtus, antennis, tarsisque flavidis. Malacca.

Deep purple, shining; prothorax with three central tubercles and one on either side; elytra each with two abbreviated costæ; metathorax beneath, antennæ and tarsi dull yellowish.

Length 5 lines.

*Astathes terminata.*

A. atra; elytris purpureo-metallicis, his tertio apicali, antennis, articulo primo excepto, tarsisque flavis; corpore infra piceâ.  
Malacca.

Head and prothorax black, the latter punctate, with three slightly-developed tubercles; elytra brilliant metallic purple, the lower third bright yellow, each with three median ribs. Lower part of the tibiæ, tarsi, palpi and antennæ dull yellow, the first joint of the latter excepted, which is black; beneath pitchy brown.

Length  $6\frac{1}{2}$  lines.

## ECTATOSIA.

Head small; eyes completely divided, the upper vertical, small; antennæ stout, half the length of the body, rounded; the third and fourth joints long, exceeding the remainder together; palpi short, the terminal joint oval pointed; thorax unarmed, longitudinal, sub-cylindric; elytra very long, rather depressed; legs moderate, simple.

A remarkable form and evidently allied to *Tetraglenes*, Newman. It was discovered by Dr. Horsfield, in Java, some thirty years ago, and now forms part of the collection at the India House.

*Ectatosia Moorei.* (Pl. XXIII. fig. 9.)

E. alba, lineis brunneis longitudinalibus transversim connexis.  
Java.

Head small, rather narrower than the thorax; the upper eye nearly vertical, small and sub-linear, the lower distant and transversely oblong; elytra rather wider than the thorax, slightly depressed, the apex divaricate; antennæ very robust, sparingly ciliated beneath. The whole upper surface a dull white, with pale brown longitudinal lines, which are connected by shorter transverse ones, so as to give a tessellated appearance, which is particularly marked on the elytra; one stripe, extending from the eye to the apex of the elytra, is broader than the rest: there are also two darker lines on the prothorax, and the suture shows a gradually widening line for about two-thirds of its length, when it expands into a round patch, but under a glass the transverse lines may still be detected; under surface, legs and antennæ obscure brownish white.

Length 9 lines.

I have dedicated this fine species to F. Moore, Esq., the curator of the Museum at the India House, as a slight acknow-

ledgment of the liberality and courtesy shown by him to all wishing to examine that extensive collection of everything pertaining to our Indian empire.

## ERIS.

Head wider than the thorax; the palpi short, filiform; the antennæ longer than the body, distant at their insertion, the basal and fourth joint of equal length, but graduated from the third. Eyes reniform. Thorax narrow, longer than broad, unarmed; elytra depressed. Legs moderate.

The affinities of this genus are not very evident, but I am disposed to place it for the present near *Olenocamptus*; the only species known bears a considerable general resemblance to some *Anthribidæ*, also natives of the same region.

*Eris anthriboides.* (Pl. XXII. fig. 7.)

*E. brunnea*, capite (vertice alba) prothoraceque nigro bilineato; elytris punctatis bicostatis, pilis griseis brevissimis vestitis; antennis longis, ciliatis, pedibusque fuscis variegatis. Borneo.

Brown, crown of the head white, on each side from the eyes and over the prothorax a black stripe; beneath the eye a white mark, becoming greyish as it extends over the side and under parts; scutellum small; elytra covered with a greyish pile, each having two longitudinal ridges, the outer one being much less distinct; antennæ long, black, the bases of the joints from the third to the seventh grey; anterior legs brown, the four posterior varied, the tibiæ ringed with grey in the middle.

Length 6 lines.

*Nemotragus cincticornis.*

*N. brunneus*, punctatus supra flavescenti-infra albo-squamosus; elytrorum lateribus nudis; antennis longissimis, articulo septimo albo-cincto. Natal.

Brown, covered above with yellowish scales, except the sides of the elytra, which are bare, prothorax finely, elytra more coarsely punctured; antennæ very long, with the seventh joint having the upper half white, except a very small portion at the apex; fourth and fifth joints occasionally pale at the base; legs very short, under surface covered with white scales.

Length 11 lines; of the antennæ 30 lines.

There is what appears to be but a variety, differing considerably in size, but with no other characters apparently.

## NOËMIA.

Head moderate, gibbous between the eyes; antennæ long, approximate at their base, inserted below the eyes, which are rounded and entire; labial palpi small, the maxillary with the last joint longer and ovate. Thorax narrow, acuminate at the sides. Elytra nearly linear, rounded at the apex. Legs moderate, the tarsi short.

The insertion of the antennæ below the eyes is a peculiarity among the Longicorns, so far as I am aware, confined to this genus; it is otherwise very nearly allied to *Stenoderus*.

*Noëmia flavicornis*. (Pl. XXII. fig. 8.)

*N. cyanea*; labro, palpis, femoribus basi, tarsis antennisque flavis. Malacca.

Deep indigo blue, with sparingly scattered hairs; labrum, palpi, thighs as the base, tarsi and antennæ yellow; elytra punctate striate, with a slight violet reflection at the sides.

Length 7 lines.

In some specimens the antennæ are furnished beneath with long silky hairs, arranged in a single row.

*Noëmia Stevensii*.

*N. viridis*; prothorace nitidâ; elytris testaceo-brunneis apice marginibusque nigris; antennis, palpis, tibiis tarsisque flavis, femoribus nigris, basi flavis. Borneo.

Head and thorax shining green; elytra punctate striate, light testaceous brown, the apex and margins, but not extending to the shoulders, black; antennæ, palpi and legs yellow, the thighs only at the base, the remainder being black; under surface green, shining.

Length 7 lines.

I have dedicated this species to Samuel Stevens, Esq., F. L. S. &c., to whom I am indebted for many facilities in examining Mr. Wallace's and other collections, and by whom my cabinet has been enriched by many rare insects.

NOTE.—The genus *Deuteromma* should be placed near *Noserius*. The second species alluded to above (*ante*, p. 98) may be thus temporarily characterized:—

*Deuteromma testacea*.

*D. pallide-testacea*; antennarum articulis primo et secundo oculisque brunneis. Borneo.

Length  $4\frac{1}{2}$  lines.

## DESCRIPTION OF THE FIGURES.

## Plate XXII.

- Fig. 1. *Dynamostes andax*.  
2. *Neostenus Saundersii*.  
3. *Pyrestes eximius*.  
4. *Tmesisternus gratiosus*.  
5. *Scopadus ciliatus*.  
6. *Stegenus dactylon*.  
7. *Eris anthriboides*.  
8. *Noëmia flavicornis*.

## Plate XXIII.

- Fig. 1. *Xoanodera trigona*.  
2. *Calpazia vermicularis*.  
3. *Zatrephus pannosus*.  
4. *Noserius tibialis*.  
5. *Pachylocerus plumiferus*.  
6. *Deuteromma callidioides*.  
7. *Aconodes montanus*.  
8. *Entelopes ionoptera*.  
9. *Ectatosia Moorei*.

XII. *Observations on Genera.* By H. T. STAINTON, Esq.

[Read December 1st, 1856.]

THERE are probably many persons who have hardly given any serious consideration to the nature of genera. A knowledge of species is no doubt the first and most important step the naturalist has to make, but yet as genera do exist, it is desirable that some clear conception should be attained, if practicable, of what constitutes a genus.

A genus is a collection of species which agree more or less rigorously in the possession of certain definite characters.

Combined with this agreement in structural character, we shall generally find a considerable degree of uniformity of habit.

A perfect uniformity in the structural character is not to be anticipated in any genus, and where by accident we do meet with it, it can only arise from such genera being extremely limited in extent, and the somewhat abnormal species belonging to them not having yet been discovered.

Just as we find from that infinite variety in nature that hardly two leaves of a tree are exactly similar in every respect, hardly two specimens of a species are precisely alike, so we should not be surprised to find, were the different species of a genus minutely examined, that there is more or less structural diversity amongst them.

The question, what amount of diversity of structure should necessitate the removal of a species from a genus, is of course always open to much discussion.

Manifestly it would not be desirable to have as many genera as species; if we had, we should entirely lose the object which we gain by the acceptance of genera. Say, for instance, we have a genus composed of twenty species: we are aware, if we know the name of any one species, that it is related more or less intimately to the remaining nineteen. But supposing the whole twenty are divided into as many genera: then, when we learn the name of a species, we learn nothing of its relations; we are obliged to put a second question—"What genus does it come next to?"

Now, if the genus cannot consist of species all mathematically agreeing in structure, and if it is found unadvisable to create new

genera for every slight discrepancy of structure, it is evident that we have a certain *carte blanche* allowed us, and there is an *elasticity*, so to speak, about genera.

Supposing again in our genus of twenty species there are found some half dozen that agree amongst themselves in the development of some particular organ, and have so strong a family likeness that they are at once recognised as forming a group; here we might, without causing a difficulty, create these species into a genus;—but whether that genus would eventually stand is a point which would remain for future solution when new species occurred. If such new species were found agreeing rigorously with the characters on which the new genus was constituted, such species would tend to confirm the stability of the genus; but supposing, on the other hand, any new species that might be met with formed connecting links between the new genus that had been erected, and the remaining species of the old genus from which it had been separated, the new discoveries might in this way completely bridge over the chasm between the two genera and again reunite them into one.

Though it is an evil to have many genera consisting only of single species, this cannot always, in the gradual progress of science, be avoided. Sometimes species are met with so peculiar in some one or more of their organs that they cannot be referred to any known genera, though it will sometimes happen that the discovery of further species may eventually show that such insects are only the extreme and abnormal forms of existing genera.

Hence it will be found, that, as we progress in the discovery of species, some new genera will be created, and some genera will be merged into others, perhaps again after a time to be revived as distinct. A more rigorous examination of structure, and a closer acquaintance with the habit of species, will often lead to the formation of new genera, irrespective of the discovery of new species.

The superficial observer will be apt to complain of this increase in the number of genera as an unnecessary complication of affairs—whereas, in point of fact, it is in reality a step towards their simplification. For if several species agree *inter se* in the possession of several characteristics, it is simpler to have them as a distinct genus than as a group, somewhat isolated, in a larger genus.

The fact of our having a series of genera, each consisting of only a single species, does not necessarily imply something defective in our notions of genera, because it may happen that each



of these single species represents the type of one extensive genus, but of which the other species are unknown to us, not occurring in the restricted area to which our investigations have been confined.

That the limits of genera are not always closely defined, that they shade off as it were imperceptibly at the edges, is nothing more than we might have anticipated. Rigidly defined mathematical genera, with no intermediate species, exist only as phantoms in the brain of the systematizer, and, brought face to face with the facts of nature, such phantoms vanish.

I do not profess to have propounded anything novel in the preceding observations, and I believe it will be found that what I have said is so exactly similar to the remarks on the same subject by Mr. Wollaston in his Treatise "On the Variation of Species," that on that very account it may appear still less necessary to intrude the subject upon the Society. My object, however, has been to bring the subject primarily before the notice of some of the readers of the Society's Transactions, and with this view I have purposely been as brief and as explicit as I could.

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XIII. *Observations on the Difficulties attending the Discrimination of the Species of the Genus Stylops.* By  
FREDERICK SMITH, Esq.

[Read May 5th, 1856.]

THE morning of the 16th of April, 1856, held out a promise of a good day for collecting bees, and so it proved, as my son on that day obtained not less than fifty specimens of *Andrenidæ*, on Hampstead Heath, in the finest possible condition, together with some examples of *Nomada signata*, *N. borealis* and *N. Lathburiana*. His magazine was a bottle containing bruised laurel, for miscellaneous collecting, but for any specimens of particular interest, I furnished him with pill boxes, of the latter kind he obtained the sexes of *Andrena fulva*, taken "in coitu," and a pair of *Andrena*

*varians*, under similar circumstances. I had previously captured the sexes of both the species in a similar way, but of the *A. varians* only a single pair. On an examination of the male, captured by my son, I am even more inclined to the opinion that *A. helvola* and *A. varians* constitute but one species, being the representatives of the opposite ends of a chain of varieties. I can detect no difference beyond the greater or less development of the angle, or tooth, at the base of the mandibles of the males, and the females run so insensibly into a string of varieties, that I am unable to draw a line of demarkation for any separation of species.

The most interesting capture, however, was a styloized specimen of the male of *Andrena Trimmerana*. I readily detected, from the cylindrical portion of the cocoon of a *Stylops*, which projected between the segments of the abdomen, that the individual it contained was a male; I lost no time in extracting it, when it proved to be one of the finest I have seen; one side of the cocoon I observed had a transverse slit, from which I conjectured, that the *Stylops* was in the act of effecting its escape when the bee was captured. Having carefully spread out my insect on card, I at once proceeded to make a careful drawing of it, whilst in its perfect and recent condition.

The results of my examination of this insect, in a state of perfection, I consider very interesting; in the first place, I will point out a few particulars, necessary to be borne in mind when I come to some observations on the various representations of species, in different publications.

When a male *Stylops* is seen in a living state it is a very different creature to that which many may have pictured to themselves, having had no other guide than the caricatures which have appeared of it; and, with one or two exceptions, they cannot be considered otherwise. The texture of all parts of the body of a male *Stylops* is of so delicate a nature, that within two hours after death the entire appearance of the insect is changed; bearing no nearer resemblance to the living creature, than a shrivelled mummy does to the once manly and graceful Egyptian; the head becomes more or less distorted, and the remarkable lateral appendages of the thorax, which in life were rounded on one side and flattened on the other, become entirely changed in form; the abdomen, which when living, or recent, is of an elongated cylindrical form, after death collapses and shrivels up into the crumpled mass which is usually depicted; in fact, such is the

delicate texture of the whole body, that no representation of a dried specimen is of much use in attempting to determine the species; for it is quite certain that the form which many of the parts of the insect will assume in drying, must in a great measure be accidental.

Having made a drawing of my fresh specimen, I was anxious to ascertain the species, for which purpose I consulted the following authorities:—from Kirby's description and figure I only derived the satisfaction of confirming my opinion, that I possessed an undoubted species of *Stylops*; but found it impossible to ascertain whether mine was the *Stylops Melittæ* or not.

The *Stylops Childreni*, figured in "Griffith's Animal Kingdom," is from Nova Scotia; still having the opportunity of examining the typical example, in the Museum collection, I compared mine with it, and found that it very closely resembled it, but is distinguished by a marked characteristic difference in the form of the antennæ. The engraving of *S. Childreni* gives a very indifferent idea of the insect, the relative proportion of parts being very defective.

*Stylops Kirbii*, is figured by Sowerby in the "Zoological Miscellany," the typical specimen being in the Museum collection; this figure bears very little resemblance to the insect, the thorax is badly drawn, and no one on examining the insect would imagine the figure was intended to represent it.

*Stylops aterrima*, of Newport; figured in "The Linnæan Transactions," of which I possess the typical specimen; this is a very poor figure,—in one respect, the worst that has appeared; that part which is represented in the figure as the abdomen, is in fact the metathorax; the scutellum is represented, but it has to answer for metathorax as well as itself; the true abdomen, in the specimen, is crumbled up and lies beneath the metathorax. On a careful comparison of my recently captured specimen with the typical one of *S. aterrima*, I believe them to be the same species.

*Stylops Dalii*; this is figured by Mr. Curtis in his usual beautiful and correct manner; making a little allowance for the shortness of the abdomen from shrinking after death, I have seen no figure to be compared with it; the details are also admirable. There are two specimens of this species in the Museum, presented by J. C. Dale, Esq.; I have therefore compared my insect with them, and I have come to the conclusion that they are identical; it will therefore appear, that on a comparison of specimens, I have arrived at the conclusion that probably they are all of one species; the figures indeed are widely different, but with the exception of

118 Mr. Smith on *Discrimination of Species of Stylops.*

that by Mr. Curtis,\* they bear little resemblance to the insects; whether my insect is identical with that discovered by Mr. Kirby there is no means of ascertaining; probably it is, and it may hereafter be ascertained, that we have only one species in this country, in which case I would hope it may retain the name of *Stylops Mellittæ*.

In making the above observations I have had but one aim and object in view, that of endeavouring to prove the necessity of making correct delineations of every specimen of *Stylops* which Entomologists may obtain, either whilst the insect is living, or immediately after death. By these means my opinion of there being only one species in this country will either be established or refuted. In either case a great advantage will accrue; representations will be available whereby Entomologists will be enabled to ascertain the name of such captures as they may acquire, for I do not think it possible to do so from the best descriptions of these remarkable creatures; and if the hints which I have given of the necessity of making correct delineations of the insect, and careful magnified outlines of parts, be followed up, then I shall have the satisfaction of knowing that I have not written these observations in vain.

DESCRIPTION OF PLATE XXIV.

- A *Stylops Spencii*, Westw. Trans. Ent. Soc. Lond. Vol. I.; A 1, tarsus of ditto.  
B *Stylops aterrimus*, Newport, Trans. Linn. Soc. Vol. XX.; B 1, natural size.  
C *Stylops Trimmerana* (*Mellittæ?*), Smith; C 1, tarsus of ditto; C 2, antennæ of ditto; C 3, head, viewed behind with a portion of the thorax; C 4, lateral thoracic appendage (pseudolitron).  
D *Stylops Childreni*, drawn by F. Smith from the type specimen in the British Museum; D 1, antennæ of ditto; D 2, thorax and abdomen of ditto, from plate in Griffiths' Cuvier's Anim. King. Vol. XV. Pl. 59; D 3, antennæ of ditto, from Griff. Anim. King.  
E Head of *Stylops Mellittæ*, Sowerby's Brit. Miscel. Vol. I. Pl. 45; E 1, thorax and abdomen of ditto.  
F Head of *Stylops Dalii*, Curtis's Brit. Entom. Fol. 226, Pl. 226; F 1, antennæ of ditto.

\* That of *Stylops Spencii*, by Mr. Westwood, in the first volume of "The Transactions of the Entomological Society," I cannot give any opinion upon, not having seen the typical specimen; but I think the two apical joints of the antennæ must be too small, and the abdomen much too short.

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XIV. *Characters of undescribed Diptera in the Collection of W. W. Saunders, Esq., F.R.S., &c.* By FRANCIS WALKER, Esq., F.L.S., &c.

[Read 2nd February, 1857.]

HAVING been favoured by the kindness of Mr. Saunders with the opportunity of describing the new species of Exotic *Diptera* in his collection, I beg leave to offer the MSS. to the Entomological Society: Each family is accompanied by a synopsis of some or of all of the genera contained in it, excepting those which have been lately registered in the 1st, 2nd and 3rd parts (2nd series) of the British Museum Catalogue of *Diptera*.

BRACHYCERA.

Fam. 1. STRATIOMIDÆ.

In the British Museum Catalogue of *Diptera*, 2nd series, Part I. about 379 species of this family are enumerated. The first and third numbers of the Journal of the Proceedings of the Linnean Society contain descriptions of eleven additional species of three new genera discovered in Malacca, Singapore and Borneo by Mr. Wallace. Macquart, in the Fourth Supplement to his "Diptères Exotiques," describes about twenty-five new species and three new genera (*Heteracanthia*, *Toxocera* and *Campeprosopa*), and lastly, Loew, in the Verhand. Zool. Botan. Verein in Wien, v. (1855), gives a synopsis of the genera, to which he adds the five following:—

1. *Plecticus*. Type, *Sargus testaceus*, Fabr. Four new species, of which *Pl. apicalis* is synonymous with *Sargus luridus*, Walk. Journ. Proc. Linn. Soc. 1, 8.
2. *Merosargus*. Type, *Sargus fasciatus*, Fabr. Two new species.
3. *Chrysonotus*. Type, *Sargus bipunctatus*, Scop.
4. *Microchrysa*. Type, *Chrysomyia polita*, Linn.
5. *Analcocerus*. Type, *A. nigriceps*, Loew. One new species.

The eleventh volume of the Linnæa Entomologica contains "Beitrag zur Kenntniss exotischer Stratiomyiden von Dr. A.

Gerstäcker." He describes the following genera and species:—

1. *Cyphomyia*. Twenty-four species, eleven or twelve of which are new.
2. *Chordonota*, N. G. Type, *Cyphomyia inermis*, Wied.
3. *Euparyphus*, N. G. Type, *Cyphomyia elegans*, Wied.
4. *Stratiomys*. Nine species, five of which are new, two Mexican, two South American, and one South African.
5. *Ptilocera*. Three species, two of which are new, one from Ceylon, and one from Port Natal.
6. *Acanthina*. Two species, both of which are new, one from Brazil, and one from Ceylon.
7. *Chauna*. One species.
8. *Blastocera*, N. G. One Brazilian species.
9. *Spyridopa*, N. G. One Brazilian species.
10. *Panacris*, N. G. One Cayenne species,

#### GENUS ACANTHINA, Wied.

##### *Acanthina porcata*.

*Mas.*—Nigra, antennis lanceolatis ferrugineis apice nigris thorace non longioribus, thorace strigis marginalibus argenteo-tomentosis, scutello spinis ferrugineis, abdomine crasso contracto brevi lato strigis marginalibus argenteo-tomentosis, genubus halteribusque fulvis, alis vix cinerascensibus, stigmatibus maximo venisque nigris, his basi ferrugineis.

*Male.*—Black; antennæ lanceolate, ferruginous with black tips, not longer than the thorax; thorax with marginal streaks of silvery tomentum; scutellum with ferruginous spines; abdomen thick, contracted, broader and much shorter than the thorax, with marginal streaks of silvery tomentum; knees and halteres tawny; wings very slightly greyish, with a large black stigma; veins black, ferruginous at the base.

Length of the body 3 lines; of the wings 6 lines.

Amazon Region.

##### *Acanthina longicornis*.

*Fœm.*—Nigra, capite thoraceque cinereo-tomentosis, antennis linearibus thorace vix brevioribus, thorace strigis obscurè rufescentibus, abdomine dilatato strigis marginalibus radiatis argenteo-tomentosis, tarsis testaceis apice nigris, alis cinereis nebula costali nigricante, venis nigris, halteribus ferrugineis.

*Female*.—Black; head and thorax with cinereous tomentum; antennæ filiform, nearly as long as the thorax; thorax with dull reddish streaks; abdomen not longer than broad, much broader than the thorax, with radiating marginal streaks of silvery tomentum; tarsi testaceous, with black tips; wings grey, with a blackish tinge by the costa adjoining the discal areolet; veins black; halteres ferruginous.

Length of the body 3 lines; of the wings 6 lines.

Amazon Region.

Genus STRATIOMYS, Geoff.

*Stratiomys inanimis*,

Testacea aut viridis, antennis pallidè fulvis, thorace fascia vittisque duabus latis nigris, alis limpidissimis, venis pallidè testaceis.

Testaceous (green when living); antennæ pale tawny; thorax with two broad black stripes, and with a black band in front of the scutellum; wings quite limpid; veins pale testaceous.

Length of the body 4 lines; of the wings 6 lines.

China.

Fam. 2. XYLOPHAGIDÆ.

Thirty-six species of this family have been described.

Genus XYLOPHAGUS.

*Xylophagus basipunctatus*.

Niger, subtus fulvus, capite apud oculos argenteo, subtus albo-piloso, antennis, thoracis lateribus, pectore, abdominis lateribus subtus apiceque pedibusque fulvis, pectore abdomineque argenteo-tomentosis albo-pilosis, abdomine fasciis tribus albis, apicem versus nigro-piloso, tarsis nigris, tibiis anterioribus, genibus posticis tarsisque posterioribus basi testaceis, alis sublimpidís, fascia abbreviata apiceque cinereis, halteribus fulvis apice albidis.

Black, tawny beneath; head with silvery tomentum about the eyes and with white hairs beneath; antennæ tawny; first and second joints bristly, second very short, third lanceolate, shorter than the first; thorax tawny along each side; pectus tawny, with silvery tomentum and white hairs; abdomen tawny on each side, beneath and at the tips, mostly covered with silvery white tomentum, with white hairs towards the base, and with short black hairs to-

wards the tip, second, third and fourth segments with white hind borders; legs tawny; anterior tibiæ and hind knees testaceous; tarsi black; posterior tarsi testaceous at the base; wings nearly limpid, grey towards the tips, and with an incomplete grey band in front of the middle; veins black, testaceous at the base; halteres tawny, with whitish tips.

Length of the body 4 lines; of the wings 7 lines.

Australia.

### Fam. 3. TABANIDÆ.

Many new and yet undescribed species of this family have been discovered since 830 species were recorded in the above-mentioned Catalogue. Seven new species are described in the Linnean Society Journal, and Macquart, in his fourth Supplement, describes thirty-nine new species, and two new genera, *Mesomyia* and *Pelecorhynchus*.

#### GENUS TABANUS, Linn.

##### *Tabanus imponens.*

*Fœm.*—Cervinus, capitis callo ferrugineo longo gracili, thorace cano-subtomentoso, tarsis nigris, tibiis posticis nigro vix ciliatis, alis cinereis, halteribus apice albidis.

*Female.*—Fawn colour; head with a long slender uninterrupted ferruginous callus; proboscis ferruginous; antennæ broken; thorax and pectus with a slight hoary bloom; abdomen unvaried; tarsi black; hind tibiæ with a very narrow black fringe; wings grey; veins ferruginous; halteres with whitish tips.

Length of the body 8 lines; of the wings 16 lines.

Pará.

##### *Tabanus uncinatus.*

*Fœm.*—Niger, antennis subarcuatis, articuli 3<sup>i</sup> dente valido brevissimo, thoracis lateribus scutelloque obscurè ferrugineis, abdominis fascia albida, tibiis albis apice nigris, alis cinereis, venis nigris.

*Female.*—Black; antennæ slightly curved; third joint with a very short and stout tooth; sides of the thorax and scutellum dark ferruginous; abdomen with a whitish band at two-thirds of the length; tibiæ white, with black tips; wings grey; veins black; fore branch of the cubital vein curved at its base, nearly straight



from thence to the tip; subanal vein joining the anal at some distance from the border.

Length of the body 5 lines; of the wings 9 lines.

Pará.

*Tabanus bitinctus.*

*Fcem.*—Piceus, capitis callo longo angusto, antennis nigris arcuatis, cornu distincto, abdomine ferrugineo, apice nigricante, alis obscurè cinereis, venis nigris, halteribus apice albidis.

*Female.*—Piceous; head with a long, slender and uninterrupted callus; antennæ black, curved, with a distinct horn at the base of the third joint; abdomen ferruginous, blackish at the tip; wings dark grey; veins black; fore branch of the cubital vein simple, forming a distinct obtuse angle near its base, almost straight from thence to its tip; subanal vein joining the anal at some distance from the border; halteres with whitish tips.

Length of the body 6 lines; of the wings 12 lines.

Pará.

*Tabanus cingulifer.*

*Fcem.*—Piceus, capitis callo nigro angusto antice subdilatato, antennis nigris, articulo 3<sup>o</sup> subdilatato, thoracis lateribus, scutello pectoreque cano-tomentosis, abdominis segmentis cano-marginatis, pedibus nigris, tibiis albo latè cinctis, alis cinereis, venis stigmatæque nigris.

*Female.*—Piceous; head with a slender black shining callus, which is slightly dilated in front; proboscis, palpi and antennæ black, the latter slightly dilated and angular at the base of the third joint, but without a horn; sides of the thorax, scutellum and pectus with a hoary tinge; abdomen with a hoary band on the hind border of each segment; legs black; tibiæ white, black at the base and towards the tips; wings grey; veins and stigma black; fore branch of the cubital vein nearly straight, subanal vein joining the anal at some little distance from the border.

Length of the body 4 lines; of the wings 8 lines.

Amazon Region.

*Tabanus mallophoroides.*

*Fcem.*—Niger, capite apud oculos albo, callis duobus parvis, antennis cornu elongato arcuato, thorace guttis duabus laterilibus albis, abdomine rufo, fasciis duabus basalibus flavis,

vitta dorsali nigricante, femoribus ciliatis, tibiis ciliatis, alis purpureo-nigricantibus, striga discali lurida, apicibus subcinereis, halteribus fulvis apice albis.

*Female*.—Black, stout, short; head white on each side above and along the eyes; two small shining calli; antennæ with a curved horn, which is nearly as long as the third and following joints together; thorax with a white dot on each side by the base of the wing; abdomen red, with two yellow basal bands, which beneath are united but widely interrupted in the middle, a blackish stripe in the middle above; tibiæ ciliated; femora slightly ciliated; wings blackish, with purple reflections; a lurid streak in each disk; tips hyaline, slightly greyish; halteres tawny, with white tips.

Length of the body 6 lines; of the wings 12 lines.

Allied to *T. festivus*, Wied.

Amazon Region.

*Tabanus humillimus.*

*Fœm.*—Nigricans, capite cervino subtus cano, callis duobus (postico minimo) fuscis, antennis fulvis parvis simplicibus, callis humeralibus pedibusque fulvis, pectore cano, abdominis segmentis fulvo-marginatis, alis subcinereis, halteribus testaceis.

*Female*.—Blackish; head hoary beneath, fawn colour between the eyes, with a very small brown callus on the vertex and another in front; eyes dark red, all the facets very small; mouth and antennæ tawny, the latter short, slender, simple; humeral calli and legs tawny; pectus hoary; hind borders of the abdominal segments dull tawny; wings greyish; veins black, ferruginous towards the base; fore branch of the cubital vein simple, nearly straight; subanal vein joining the anal at some little distance from the border; halteres testaceous.

Length of the body 4 lines; of the wings 8 lines.

Celebes.

Genus SILVIUS.

*Silvius nitescens.*

*Mas.*—Cinereus, subtus testaceus, antennis fulvis, thorace vittis tribus canis, margine testaceo, abdomine fulvo, maculis trigonis flavo-tomentosis, lituris lateralibus nigricantibus, pedibus fulvis, tarsis piceis, alis subcinereis, halteribus fulvis apice albidis.

*Male*.—Grey, testaceous, and with testaceous hairs beneath; proboscis black, tawny at the base: antennæ tawny; thorax with three hoary stripes, and with testaceous borders; disk of the pectus hoary; abdomen above tawny; hind part with blackish marks on each side, and with triangular spots of shining yellow down; legs tawny; tarsi piceous; wings slightly greyish; veins black, tawny in front and towards the base; halteres tawny, with whitish tips.

Length of the body 5 lines; of the wings 10 lines.

Australia.

#### Fam. 4. ACROCERIDÆ.

With the following exception no accessions to this family have apparently been published since the seventy-four species which are noticed in the British Museum Catalogue.

The genus *Panops* was then hardly known in England. Both sexes of *P. Baudini* are now in Mr. Saunders's collection; the abdomen of the male is almost entirely black, and its antennæ are about twice the length of those of the female.

Dr. Gerstäcker, in his "Beitrag zur Kenntniss der Henopier," Ent. Zeit. Stett. xvii. 339, has described the following new genera and species of this family:—

*Acrocera læta*. Sardinia.

*Eulonchus* (N.G.) *smaragdinus*, California.

*Oenaea lugubris*. Bahia.

#### *Philipota limosa*.

*Nigra*, capite flavo, vitta interrupta nigra, thorace vittis quatuor, scutello, pectore, segmentorum abdominalium marginibus pedibusque pallidè flavis, scutello macula fusca, femoribus basi nigris, tarsis nigricantibus, alis limpidis.

Black, head pale yellow, with an interrupted black stripe; thorax with four pale yellow stripes; pectus mostly pale yellow; scutellum pale yellow, with a brown discal spot; abdomen with a pale yellow band on the hind border of each segment; legs pale yellow; femora black at the base; fore femora black above for some space from the base; tarsi blackish; wings limpid; veins black, pale yellow at the base; halteres pale yellow.

Length of the body  $2\frac{1}{2}$  lines; of the wings 6 lines.

Valley of the Amazon.

## Fam. 5. ASILIDÆ.

## Sub-fam. 1. MYDASITES.

Fifty-nine species of this sub-family are referred to in the Catalogue, and Macquart has published seven species of *Mydas* and one of *Cephalocera*, in his fourth Supplement.

*Mydas effracta.*

*Fœm.*—Nigra, capite anticè subtusque, antennis basi, thoracis vittis duabus, scutello pedibusque fulvis, abdomine maculis sex luteis, femoribus posticis basi flavis, alis luridis, striga discali fuscescente, areolarum discis sublimpidis, venis halteribusque fulvis.

*Female.*—Black, thinly clothed with tawny hairs; head tawny in front and beneath; antennæ at the base and proboscis tawny; thorax on each side with a tawny stripe, which is dilated in front about the callus; scutellum tawny; abdomen on each side with three luteous spots, which are obliquely truncated hindward; legs tawny; hind femora yellow at the base; wings lurid, with a brownish discal streak at nearly three-fourths of the length; most of the areolets with nearly limpid discal streaks of various breadth; veins and halteres tawny.

Length of the body 11 lines; of the wings 15 lines.

Anstralia.

*Mydas signata.*

*Mas.*—Atra, capite piceo albo-piloso, thorace maculis duabus anticis vittisque duabus lateralibus interruptis testaceis, abdomine maculis lateralibus trigonis argenteis, pedibus anterioribus piceis, alis albido-limpidis, venis nigris fusco-submarginatis, halteribus ex parte albidis.

*Male.*—Deep black; head thinly clothed with whitish hairs, above piceous, with hoary tomentum on each side; thorax with two testaceous spots in front, and with an interrupted irregular testaceous stripe on each side; abdomen with triangular silvery hoary spots on each side; anterior legs piceous; wings whitish, limpid; veins black, slightly bordered with brown; halteres partly whitish.

Length of the body 10 lines; of the wings 12 lines.

Australia.

This species differs much from the preceding one; the antennæ

are much shorter, and the first cubital areolet has a very much shorter petiole, and rejects a short branch at its base.

Sub-fam. 2. DASYPOGONITES.

The Catalogue contains 411 species of this sub-family, in addition to which Macquart has published twenty-one species in his fourth Supplement, and two new genera, *Codula*, and *Senoxericera*.

Genus DASYPOGON.

*Dasygogon æqualis*.

Ferrugineus, linearis, capite supra nigricante, facie subauratâ, mystace nigro supra pallido-subaurato, antennis nigris basi ferrugineis, thoracis parte anticâ vittaque postica nigris, abdomine basi fasciisque nigris, maculis duabus anticis testaceis, alis cinereis apud costam luridis, venis ferrugineis, halteribus testaceis.

Ferruginous, linear; head blackish between the eyes, slightly gilded in front; mystax composed of short black bristles, above which there are a few pale slightly gilded bristles; proboscis black; antennæ black, nearly as long as the breadth of the head; first and second joints ferruginous; third lanceolate, much longer than the first and the second together; thorax black in front and on the disk, and with a black hind stripe; abdomen linear, almost as broad as the thorax, black at the base, with a testaceous spot on each side of the second segment, and with a black band on each of the following segments; legs slender; wings grey, lurid in front; veins ferruginous; halteres testaceous.

Length of the body  $4\frac{1}{2}$  lines; of the wings 8 lines.

Port Natal.

*Dasygogon suavis*.

*Mas.*—Ferrugineo-rufus, gracilis, capite posticè albo, facie subauratâ, mystace albo, antennis fulvis, articulo 3° sublineari supra nigro, thorace vittis tribus canis, femoribus tibiis tarsisque posticis apice nigris, alis luridis, areolarum discis sublimpidis, venis nigris, halteribus testaceis.

*Male.*—Ferruginous-red, slender; head pale, gilded in front with shining white tomentum behind; mystax with a few white bristles; proboscis piceous; antennæ tawny; third joint nearly linear, black above; thorax with three indistinct hoary stripes; legs rather slender; tips of the hind femora, of the hind tibiæ, and

of the hind tarsi, black ; wings lurid ; disks of the areolet nearly limpid ; veins black ; halteres testaceous.

Length of the body 5 lines ; of the wings 8 lines.

Australia.

### Sub-fam. 3. LAPHRITES.

The Catalogue contains 217 species of this sub-family. Macquart has published eight species in his fourth Supplement.

#### *Laphria fortipes.*

Nigra, robusta, capite pilis nigris densè vestito subtus albido-hirto, antennarum articulo 3<sup>o</sup> subclavato, abdomine nitente purpurascente subcupreo, segmentorum marginibus posticis apiceque albo-pubescentibus, pedibus crassis pilosis, femoribus posticis valdè incrassatis, tibiis posticis arcuatis, alis limpidis, venis halteribusque fulvis, illis apice nigris.

Black, stout ; head thickly clothed with long black hairs, and beneath with whitish hairs ; antennæ nearly as long as the breadth of the head ; third joint subclavate, slightly pubescent, a little longer than the first and second joints together ; abdomen shining, with a purplish cupreous tinge, and with white down on the hind border of each segment and at the tip ; legs thick, pilose ; hind femora much incrassated ; hind tibiæ curved ; wings limpid ; veins tawny, black towards the tips, with the usual structure ; halteres tawny.

Length of the body 6 lines ; of the wings 8 lines.

Port Natal.

### Genus LAMPRIA, Mac.

#### *Lampria cilipes.*

*Mas.*—Nigra, capite postico cinereo, mystace fulvo, antennis thorace paulo longioribus, articulo 3<sup>o</sup> longissimo depresso, thorace vittis quatuor subauratis, scapulis fulvis, pectore cinereo, abdomine fulvo, disco fusco, pedibus fulvis, tibiis posticis extus nigris ciliatis, alis cinereis, apud costam nigricantibus, striga basali lurida, halteribus fulvis.

*Male.*—Black ; head behind with cinereous tomentum ; mystax with a few tawny bristles ; antennæ a little longer than the thorax ; third joint linear, depressed, more than twice the length of the first and the second together ; thorax with four indistinct stripes of slightly gilded tomentum ; scapulæ tawny ; pectus cinereous ;

abdomen tawny, disk above brown; legs tawny; hind femora very thick; hind tibiæ black and ciliated exteriorly; wings dark grey, blackish in front, with a lurid streak at the base; halteres tawny.

Length of the body  $3\frac{1}{2}$  lines; of the wings 7 lines.

Amazon Region.

#### Sub-fam. 4. ASILITES.

The Catalogue contains 654 species of this sub-family. Macquart has published 44 species in his fourth Supplement.

#### Genus TRUPANEA, Macq.

##### *Trupanea venerabilis.*

*Mas.*—Cinereo-cervina, capite albo-piloso, fronte argentea, mystace pallidè testaceo, antennis nigris, thorace fasciis nigris, abdomine nigro fasciis cinereis, pedibus ferrugineis, coxis femoribusque nigris, alis subcinereis.

*Male.*—Cinereous-fawn colour; head with white hairs beneath; front silvery white; mystax composed of pale testaceous bristles; proboscis and antennæ black; seta of the latter a little longer than the third joint; thorax with black bands; abdomen black, shining, with a cinereous band on the hind border of each segment; legs ferruginous, with black hairs and spines; coxæ and femora black; wings slightly greyish; veins black, ferruginous at the base.

Length of the body 5 lines; of the wings 9 lines.

Port Natal.

##### *Trupanea leucopyga.*

*Mas.*—Nigra, testaceo-pilosa, pectore cinereo, abdomine fasciis tribus testaceis, apice albo, tibiis posticis testaceis apice nigris, alis subcinereis, venis nigris, halteribus testaceis.

*Male.*—Black; head and fore part of the thorax with testaceous hairs; hind part of the latter with tawny hairs; pectus cinereous; abdomen with three testaceous bands on the forepart; tip with white hairs; hind tibiæ testaceous, with black tips; wings slightly cinereous; veins black; halteres testaceous.

Length of the body 7—8 lines; of the wings 12—14 lines.

China.

Genus *ASILUS*, Linn.*Asilus sericans.*

*Fcem.*—Cinereus, capite cano, fronte subaurata, mystace albido supra nigro, antennis nigris, thorace vittis quatuor nigris, pectore cano, abdomine nigro oblanceolato, basi lateribusque cinereis, apice compresso nitente, pedibus ferrugineis, coxis femoribusque nigris, alis subluridis.

*Female.*—Cinereous; head hoary; front very slightly gilded; mystax composed of some whitish shining bristles, above which there are a few more slender black bristles; proboscis and antennæ black, seta of the latter longer than the third joint; thorax with four distinct black bands; pectus hoary; abdomen black, oblanceolate, cinereous at the base and along each side; tips compressed, shining; legs ferruginous, with black spines and hairs; coxæ and femora black; wings slightly lurid; veins black.

Length of the body 5 lines; of the wings 8 lines.

Amazon region.

*Asilus firmatus.*

*Fcem.*—Cinereus, capite aurato subtus albido-hirto, mystace nigro supra testaceo, antennis nigris, thorace vittis quatuor nigris abbreviatis, abdomine maculis trigonis fuscescentibus, apice nigro subcompresso, pedibus nigris, femoribus supra tarsisque basi ferrugineis, tibiis fulvis, alis cinereis, areolis posticis luridis cinereo-strigatis, venis nigris, halteribus fulvis.

*Female.*—Cinereous; head with pale gilded tomentum, clothed beneath with whitish hairs; mystax with black hairs towards the antennæ, and with pale testaceous bristles towards the proboscis; antennæ black, arista not longer than the third joint; thorax with four short black stripes; abdomen with a triangular brownish spot on each segment, tip black, slightly compressed; legs black, femora ferruginous above, tibiæ tawny, tarsi ferruginous at the base; wings grey, lurid hindward, with a grey streak on the disk of each areolet; veins black; halteres tawny.

Length of the body 10 lines; of the wings 14 lines.

Port Natal.

*Asilus mendax.*

*Mas.*—Ater, nigro-setosus, capite subtus cano-piloso, facie auratâ, mystace nigro, tibiis tarsisque subtus fulvo-pubescenti-



bus, alis nigricantibus fascia lata basali lactea, halteribus fulvis.

*Male*.—Deep black, with black bristles; head with some hoary hairs beneath; face with bright gilded tomentum, mystax with many black bristles; legs rather thickly clothed with black hairs and bristles, tibiæ and tarsi clothed beneath with bright tawny down; wings blackish, with a broad milk-white band very near the base; halteres tawny.

Length of the body 10 lines; of the wings 16 lines.

Celebes.

*Asilus Shalumus.*

*Fœm.*—Niger, capite mystaceque auratis hâc setis paucis nigris, antennis ferrugineis, thorace fuscescente, lateribus pectoreque auratis, pedibus fulvis, robustis, nigro-setosis, femoribus mediis nigro-spinosis, alis cinereis subluridis, venis ferrugineis, halteribus testaceis.

*Female*.—Black; head gilded; mystax with gilded bristles, with which are some few more slender black bristles; antennæ ferruginous, arista black, almost as long as the preceding part; thorax with brownish tomentum, sides and pectus gilded; legs tawny, stout, with black bristles, middle femora with black spines; wings grey, slightly lurid, veins ferruginous; halteres testaceous.

Length of the body 12 lines; of the wings 20 lines.

China.

Genus LEPTOGASTER, Meigen.

*Leptogaster cingulipes.*

Nigra, capite cano, antennis basi testaceis, thorace fulvo nitente vitta picea, pectore testaceo albido-tomentoso, femoribus et tibiis basi fasciaque tarsisque basi subtus testaceis, alis limpidis apice cinereis, venis nigris, halteribus albidis apice nigricantibus.

Black; head with hoary tomentum; antennæ testaceous at the base; thorax tawny, shining, with a piceous stripe; pectus testaceous, with whitish tomentum; femora and tibiæ testaceous at the base and with a testaceous band, tarsi testaceous towards the base beneath; wings limpid, tips cinereous, veins black; halteres whitish, with blackish knobs.

Length of the body 4 lines; of the wings 6 lines.

Valley of the Amazon.

## Fam. 6. LEPTIDÆ.

This family contains about seventy-six species and eleven genera, of which *Lampromyia* seems to be more nearly allied to the *Bombylidæ*.

## SYNOPSIS OF THE GENERA.

- \* Caput convexum.
- † Proboscis elongata, gracilis, sub corpus recumbens.
- ‡ Palpi breves. *Lampromyia*, Macq.
- ‡ Palpi longi. *Dasypalpus*, Macq.
- †† Proboscis brevis, crassa.
- ‡ Antennarum articulus 4<sup>us</sup> longus.
- § Antennarum articulus 3<sup>us</sup> conicus aut rotundatus.
- × Palpi incumbentis.
- Oculi nudi. *Leptis*, Fabs.
- +→ Oculi villosi. *Dasyomma*, Macq.
- ×× Palpi elevati.
- Abdomen cylindricum, longissimum. *Vermileo*, Macq.
- +→ Abdomen conicum, mediocre.
- ++ Arista mediocris. *Chrysopila*, Macq.
- +++ Arista longissima. *Syneches*, Walk.
- §§ Antennarum articulus 3<sup>us</sup> transversus. *Athorix*, Meig.
- ‡† Antennarum articulus 4<sup>us</sup> brevis.
- § Antennarum articulus 3<sup>us</sup> brevis. *Ptiolina*, Stæg.
- §§ Antennarum articulus 3<sup>us</sup> longus. *Spania*, Meig.
- \*\* Caput planum. *Exeretoneura*, Macq.

## Fam. 7. BOMBYLIDÆ.

## Sub-fam. 1. THEREVITES.

Contains about 115 species and six genera.

## SYNOPSIS.

- \* Proboscis gracilis, elongata. *Xertomyza*, Weid.
- \*\* Proboscis brevis, crassa.
- † Antennarum articulus 3<sup>us</sup> nudus.
- ‡ Antennarum arista vix distincta.
- § Corpus angustum.
- × Proboscis non prominens. *Thereva*, Latr.
- ×× Proboscis prominens. *Anabarhynchus*, Macq.
- §§ Corpus latum, pilosissimum. *Exapata*, Macq.

- ‡‡ Antennarum arista distincta, triarticulata. *Ruppellia*, Wied.  
†† Antennarum articulus 3<sup>us</sup> hirtus. *Chyromyza*, Wied.

*Thereva arida.*

Cinerea, subtus albida, capite callis duabus nigris subrotundis, antennis apud apices nigricantibus, thorace vittis quinque fuscis interruptis, abdomine glaucescente, pedibus fulvis, tarsorum articulis apice nigris, alis subcinereis, apud costam luridis, venis halteribusque fulvis.

Cinereous, whitish beneath; head with two nearly round black shining calli; antennæ blackish towards the tips; thorax with five slender, much interrupted, brownish stripes; abdomen glaucous hoary; legs tawny, joints of the tarsi with black tips, terminal joints wholly black; wings slightly greyish, lurid along the costa; veins and halteres tawny.

Length of the body 4 lines; of the wings 6 lines.  
Australia.

*Thereva scutellaris.*

*Mas.*—Nigra, antennis linearibus basi fulvis, thorace vittis duabus pectoreque cinereis, scutello ardentè rufo, abdominis segmentis albo-marginatis, pedibus fulvis, alis limpidis, venis halteribusque testaceis.

*Male.*—Black; antennæ linear, tawny towards the base; thorax with two cinereous stripes; pectus cinereous; scutellum very bright red; abdomen with a white band on the hinder border of each segment; legs tawny; wings limpid, veins and halteres testaceous.

Length of the body  $2\frac{3}{4}$  lines; of the wings 4 lines.  
Valley of the Amazon.

Sub-fam. NEMESTRINITES.

Contains about thirty-seven species, and is here divided into four genera, *Trichophthalma* being combined with *Hirmonoura*.

SYNOPSIS.

- \* Alæ reticulatæ.  
† Caput thorace angustius; proboscis corpore longior. *Mægistorhynchus*, Macq.  
†† Caput thoracis latitudine; proboscis corpore non longior, *Nemestrina*, Latr.

\*\* Alæ non reticulatæ.

† Frons lata. *Fallonia*, Meig.

†† Frons sat angusta; oculi hirti; proboscis brevis, aut vix elongata. *Hirmoneura*, Wied.

The genera *Trichopsidea* and *Colax* connect this sub-family and the following one with the *Æstridæ*.

*Trichophthalma lætilinea.*

*Mas et Fœm.*—Nigra, subtus cana, capite thoracisque vittis quatuor canis, abdomine fasciis duabus testaceis, pedibus fulvis, alis vix cinerascentibus, venis fulvis.

*Mas.*—Thoracis abdominisque lateribus cano-pilosis. *Fœm.*—Thoracis lateribus cano-pilosis, abdominis lateribus nigropilosis.

*Male and Female.*—Black; hoary and with hoary hairs beneath; head hoary; thorax with four hoary stripes, and on each side with testaceous hairs in the male, and with hoary hairs in the female; abdomen with two shining testaceous bands, sides with shining testaceous hairs in the male, and with black hairs in the female; legs tawny; wings very slightly greyish, veins tawny.

Length of the body 6—7 lines; of the wings 12—14 lines.

Australia.

*Trichophthalma albibasis.*

*Fusca*, subtus alba, capite albo, antennis nigris basi testaceis, abdomine lurido vitta nigricante, basi lateribusque albobilosis, fasciulis duobus lateralibus nigris, pedibus fulvis, alis cinereis, apud costam fuscis, venis nigris.

Brown, with white tomentum and hairs beneath; head with white tomentum; proboscis black; antennæ black, testaceous at the base; thorax with brownish hairs; abdomen lurid, with a blackish stripe, thickly clothed with white hairs at the base, sides with white hairs, which are interrupted by two small tufts of black hairs; legs tawny; wings grey, brown along most of the length and half the breadth, veins black.

Length of the body 6 lines; of the wings 14 lines.

Australia.

*Trichophthalma primitiva.*

*Canalata*, crassa, albido-pilosa, abdomine fasciato, pedibus piceis, alis subcinereis, venis nigris.

Hoary, thick and broad, with whitish hairs which form bands on the abdomen; legs piceous; wings slightly greyish, veins black.

Length of the body 6 lines; of the wings 12 lines.

Australia.

*Trichophthalma bivitta.*

Nigricante fusca, albo-pilosa, subtus alba, capite albo, antennis nigris basi albis, thoracis lateribus testaceo-pilosis, abdomine vittis duabus latis pallidè luteis, pedibus fulvis, alis cinereis apud costam fuscis, venis nigris, halteribus testaceis.

Blackish brown, narrow, with white hairs, underside with white tomentum; head white; proboscis and antennæ black, the latter white at the base; thorax with testaceous hairs along each side; abdomen with a broad pale testaceous stripe on each side; legs tawny; wings grey, brown along the costa, veins black; halteres testaceous.

Length of the body 4 lines; of the wings 8 lines.

Australia.

Sub-fam. 3. ANTHRACITES.

This family contains about 600 named species, and many more have been discovered, but are not yet described.

SYNOPSIS.

- \* Antennæ remotæ; frons lata.
- † Proboscis crassa, brevis, nonnunquam longa.
- ‡ Os clausum; ocelli nulli; proboscis nulla; antennarum articulus 3<sup>us</sup> subglobosus. *Colax*, Weid.
- ‡ Os apertum; proboscis distincta.
- § Alæ venis externo mediis quatuor.
- × Facies convexa; antennarum articulus 3<sup>us</sup> elongatus, subulatus.
- Antennarum articulus 3<sup>us</sup> rectus; pedes elongati. *Exoprosopa*, Macq.
- — Antennarum articulus 3<sup>us</sup> divergens; pedes breves. *Tomomyza*, Weid.
- × × Facies plana, mystacina; antennarum articulus 3<sup>us</sup> brevis. *Spogostylum*, Macq.
- § § Alæ venis externo mediis tribus. *Anthrax*.
- † † Proboscis gracilis, elongata.
- ‡ Alarum areola 1<sup>a</sup> postica clausa. *Callostoma*, Serv.
- ‡ ‡ Alarum areola 1<sup>a</sup> postica aperta.

- § Antennarum articulus 3<sup>us</sup> elongatus.  
 × Antennarum articulus 3<sup>us</sup> subuliformis.  
 → Corpus non pilosum. *Mulio*, Latr.  
 →→ Corpus pilosum. *Sericosoma*, Macq.  
 ×× Antennarum articulus 3<sup>us</sup> spatulatus. *Enica*, Macq.  
 §§ Antennarum articulus 3<sup>us</sup> brevis. *Litorhynchus*, Macq.  
 \*\* Antennæ approximatæ; frons maris angusta.  
 † Proboscis brevis aut vix elongata.  
 † Alæ areolis tribus submarginalibus. *Neuria*, Newm.  
 † Alæ areolis duabus submarginalibus.  
 § Antennarum articulus 3<sup>us</sup> subulatus.  
 × Facies plana; antennæ consuetè insertæ. *Anisotamia*, Macq.  
 ×× Frons convexa; antennæ inferius insertæ. *Plesiocera*, Macq.  
 §§ Antennarum articulus 3<sup>us</sup> conicus aut rotundatus.  
 × Antennarum articulus 3<sup>us</sup> conicus. *Lomatia*, Curt.  
 ×× Antennarum articulus 3<sup>us</sup> rotundatus. *Ogcodera*, Macq.  
 †† Proboscis gracilis, elongata.  
 † Caput thorace angustius.  
 § Antennarum arista brevis; alæ areolis quatuor posterioribus.  
 × Antennarum articulus 1<sup>us</sup> vix elongatus, 3<sup>us</sup> pyriformis; alæ areolis tribus submarginalibus. *Adelidea*, Macq.  
 ×× Antennarum articulus 1<sup>us</sup> elongatus, 3<sup>us</sup> compressus, plerumque subulatus; alæ areolis duabus submarginalibus.  
 → Antennæ non pilosæ. *Bombylius*, Linn.  
 →→ Antennæ pilosæ. *Acreotrichus*, Macq.  
 §§ Antennarum articulus 1<sup>us</sup> brevissimus; 3<sup>us</sup> fusiformis, elongatus, obtusus; arista distincta nulla; alæ areolis tribus posterioribus. *Usia*, Latr.  
 †† Caput thoracis latitudine.  
 § Alæ areolis quatuor posterioribus.  
 × Alæ areolis tribus submarginalibus.  
 → Antennarum articulus 1<sup>us</sup> crassus; 3<sup>us</sup> pyriformis. *Ploas*, Latr.  
 →→ Antennarum articulus 1<sup>us</sup> sat gracilis; 3<sup>us</sup> conicus. *Cyl-  
lenia*, Latr.  
 ×× Alæ areolis duabus submarginalibus.  
 → Antennæ capite longiores.  
 ++ Alæ areola una marginali. *Corsomyza*, Wied.  
 +++ Alæ areolis duabus marginalibus. *Eniconeura*, Macq.  
 →→ Antennæ capite breviores.  
 ++ Palpi elongati.  
 ∞ Palpi articulis duobus ultimis æqualibus. *Apatomyza*, Weid.;  
*Tabuda*, Walk.; *Choristus*, Walk.

- ∞∞ Palporum articulus ultimus tantum elongatus.
  - O Palpi nudi, antennarum articulus 3<sup>us</sup> tumidus. *Megapalpus*, Macq.
  - O O Palpi pilosi, antennarum articulus 3<sup>us</sup> fusiformis. *Dasypalpus*, Macq.
- ++++ Palpi breves.
  - ∞ Antennarum articulus 1<sup>us</sup> elongatus.
    - O Antennæ arista distincta nulla. *Amictus*, Wied.
    - O O Antennæ arista brevi. *Thlipsomyza*, Weid.
  - ∞∞ Antennarum articulus 1<sup>us</sup> brevis.
    - O Proboscis arcuata; antennarum articulus 3<sup>us</sup> convexus. *Cyclorhynchus*, Macq.
    - O O Proboscis recta, antennarum articulus 3<sup>us</sup> fusiformis. *Phthiria*, Meig.; *Parisus*, Walk.
  - § § Alæ areolis tribus posterioribus.
    - × Abdomen elongatum; pedes postici elongati, coxis incrassatis. *Systropus*, Wied.
    - × × Abdomen ovatum.
      - Proboscis arcuata; antennæ capite longiores, articulus 1<sup>us</sup> 3<sup>o</sup> longior. *Toxophora*, Weid.
  - Proboscis recta.
    - ++ Antennæ capitis vix longitudine, articulus 1<sup>us</sup> 3<sup>o</sup> brevior. *Geron*, Meig.
- ++++ Antennæ capite longiores. *Heterostylum*, Macq.
- +++++ Antennæ capite multo longiores. *Lepidophora*, Westw.

Of these genera *Exoprosopa* (Macq.) or *Trinaria* (Mulsant), *Litorhynchus* (Macq.), and *Neuria* (Newm.) or *Comptosia* (Macq.), were originally combined with *Anthrax*, with which genus they are connected by so many gradations that I have for a while reunited them with it. *Ligyra* (Newm.) is also included in that genus.

The genus *Cyrtosia* (Perris), which is characterized by the wing having no discal areolet, may also be included in this family.

#### Genus ANTHRAX.

The species being very numerous are here noticed with reference to their geographical distribution. About four hundred have been described.

#### EUROPE.

About seventy species have been recorded, but the number may probably be somewhat reduced. They may be divided into four

groups; a few of them appear also in North Africa and West Asia, one in North America, and one in Hindostan. The group *Exoprosopa*, which comprises most of the species of *Anthrax* in warm regions, appears along the south-east and south borders of Europe.

NORTH AMERICA

Contains about forty described species, which form seven groups.

MEXICO.

Some of the North American species extend to Mexico, besides which it is inhabited by nine species and five groups.

WEST INDIES.

Five groups and fourteen species, two of which also inhabit Brazil, and one is said to have been found in New Guinea.

SOUTH AMERICA.

Ten groups and fifty-five species.

Group 3. DIPT. SAUND. 166.

*Anthrax convexa.*

*Picea*, capite argenteo, antennis pedibusque nigris, thorace fulvo-piloso, scutelli margine ferrugineo, abdomine fasciis duabus albidis, fasciculis duobus basalibus, apice argentea, femoribus fulvis, alis cinerascensibus, basi costaque fuscis.

Piceous; head silvery; proboscis and antennæ black; thorax with tawny hairs in front and along each side; scutellum with a ferruginous border; abdomen with slight whitish bands, one near the base more distinct than the others, a tuft of white hairs on each side at the base, tip silvery; legs black, femora mostly tawny; wings greyish, brown at the base and along three quarters of the costa.

Length of the body 4 lines; of the wings 10 lines.

Valley of the Amazon.

*Anthrax dorsalis.*

Testacea, thoracis disco nigro, scutello fulvo, abdomine fasciis tribus contiguis nigris, alis dimidio basali fusco testaceo-notato incisuris quatuor.

Testaceous; disk of the thorax black; scutellum tawny; abdomen with three short contiguous black bands; wings brown,



with some testaceous marks on more than half the surface from the base, the brown part extending for three quarters of the length of the costa to near the tip of the interior border, its outline with four indentations.

Length of the body  $33\frac{1}{2}$  lines ; of the wings 7—8 lines.

Valley of Amazon.

Group 6. DIPT. SAUND. 166.

*Anthrax decemmacula.*

Nigricans, testaceo-hirta, capite postico sordidè albido, abdominis lateribus obscurè fulvis, pedibus fulvis, alis subcinereis fusco-decemmaculatis, basi costâque subfuscis.

Blackish ; head dingy, whitish behind ; thorax and abdomen with short pale testaceous hairs and with rather longer hairs on each side ; abdomen dull, tawny on each side ; legs tawny ; wings slightly greyish, brownish at the base and along most of the length of the costa, and with ten darker brown dots, which are on the transverse veins or on the curves and angles of the other veins.

Length of the body 2— $3\frac{1}{2}$  lines ; of the wings, 5—8 lines.

Valley of the Amazon.

*Anthrax conclusa.*

Mas.—Nigricans, fulvo-pubescent, abdominis lateribus basi fulvis, apice argenteo, pedibus fulvis, tarsis nigris, alis limpidis, basi perobliquè fuscis.

Male.—Blackish, with dull tawny pubescence ; proboscis and antennæ black, the former a little longer than the head ; sides of the abdomen tawny towards the base, tip with silvery pubescence ; legs tawny, tarsi black ; wings limped, brown towards the base, outline of the brown part very oblique, extending from full three quarters of the length of the costa to the middle of the interior border, and is contiguous to three black spots ; veins black ; halteres testaceous.

Length of the body  $4\frac{1}{2}$  lines ; of the wings 10 lines.

Valley of the Amazon.

Like Group 5, DIPT. SAUND. 166, but with the hind legs ciliated.

*Anthrax lurida.*

Nigricante picea, ex parte ferruginea, nigro-hirta, pedibus anterioribus fulvis, posticis nigro dense ciliatis, alis luridis.

Blackish piceous, partly ferruginous, with black hairs ; anterior legs tawny ; hind legs thickly and deeply fringed with black hairs ; wings lurid ; veins of the same colour.

Length of the body 6 lines ; of the wings 14 lines.  
Valley of the Amazon.

Group 10. DIPT. SAUND. 167.

*Anthrax lineata.*

Nigra, thoracis lateribus testaceo-pilosis, abdomine fasciis quatuor pallide auratis, apice albo, alis limpidis, basi strigaeque subcostali fuscis.

Black ; thorax with testaceous hairs along each side ; abdomen with four pale gilded bands, first band near the base, second beyond the middle, hardly interrupted ; third and fourth slight, sub-apical, tip with white hairs ; wings limpid, brown at the base, and with a brown subcostal streak.

Length of the body 3 lines ; of the wings 7 lines.  
Valley of the Amazon.

*Anthrax solita.*

Nigra, capite argenteo, thoracis lateribus fulvo-pubescentibus, abdominis segmentis tomento fulvo marginatis, alis limpidis, basi costaque interiore fuscis, venis nigris, halteribus testaceis.

Black ; head silvery ; thorax with tawny pubescence on the borders, and on the margin of the scutellum ; hind borders of the abdominal segments with tawny tomentum ; wings limpid, brown at the base and along a short space of the costa ; veins black ; halteres testaceous.

Length of the body  $3\frac{1}{2}$  lines ; of the wings 8 lines.  
Valley of the Amazon.

Group 14. DIPT. SAUND. 168.

*Anthrax inexacta.*

Nigra, angusta, pedibus gracilibus, alis longiusculis sat angustis, bistriente basali oblique nigro-fusca, extus subcinerascens.

Black, narrow ; legs slender ; wings rather long and narrow, blackish brown on nearly two-thirds of the surface, the outline of the brown part extending from seven-eighths of the length of

the costa to the end of the interior border ; exterior part slightly greyish.

Length of the body 3 lines ; of the wings 8 lines.

Valley of the Amazon.

*Anthrax angustipennis?*

Nigra, abdomine fasciculis duobus basalibus albis, apice argentea, alis vitreis longis angustis, vittâ costali nigrâ attenuatâ, incisuris quatuor.

*Anthrax angustipennis?* Macq. Dipt. Exot. ii. p. 64, 26, Pl. 21, fig. 9.

Black, narrow ; abdomen with a white tuft on each side at the base ; apical third part silvery white ; wings vitreous, long and narrow, black along the costa, the black part successively decreasing in breadth from the base, with four indentations on its hind side.

Length of the body 3—3½ lines ; of the wings 8—9 lines.

Valley of the Amazon.

GALAPAGOS.

One species.

CANARY ISLES.

Three species and two groups.

AFRICA.

Seven groups and seventy species.

Group 3. DIPT. SAUND. 166.

*Anthrax commiles.*

Nigra, thoracis lateribus fulvo-pilosis, scutello ferrugineo, abdominis lateribus basi ferrugineo-pilosis apice nigro-pilosis, maculis quatuor lateralibus, ventre basi fulvo, alis sublimpidis, basi costâque fuscis.

Black ; thorax with tawny hairs on each side ; scutellum ferruginous, except at the base ; abdomen with ferruginous hairs on each side at the base, and with black hairs towards the tip, two white lateral spots at about half the length, and two sub-apical, underside tawny towards the base ; wings nearly limpid, dark brown on the whole breadth towards the base, and for more than three-fourths of the length along the costa ; the outline of the brown part clearly defined and almost straight.

Length of the body 4½ lines ; of the wings 11 lines.

Port Natal.

*Anthrax argentilatus.*

Nigra, thoracis marginibus fulvo-pilosis, abdomine fulvo, lateribus argenteo-tomentosis, alis basi costâque fuscis.

Black ; thorax with tawny hairs in front and along each side ; abdomen tawny, with silvery tomentum along each side, except at the base and towards the tip ; wings wholly brown for near one-fourth of the length from the base, and brown along the costa for three-fourths of the length ; the outline of the brown part very oblique and slightly concave.

Length of the body 4 lines ; of the wings 10 lines.

Port Natal.

MADAGASCAR.

Two groups and three species.

ISLE OF FRANCE.

One group and two species.

DESERTS OF TARTARY, AND SOUTHERN COASTS OF THE CASPIAN SEA.

One group and five species.

PERSIA.

One group and two species.

ARABIA AND MESOPOTAMIA.

(Exclusive of several species inhabiting the borders of the Red Sea, and described in Klug's "Symbolæ Physicæ.")

Three groups and six species.

SOUTH ASIA.

Seven groups and forty-three species.

The largest species of this region much resemble those of South America, but those of Australia, as is usual in other genera, are very different in structure.

Group 7. DIPT. SAUND. 165.

*Anthrax latifascia.*

Nigra, thoracis margine antico lateribusque fulvo-pilosis, abdomine fasciâ latâ subauratâ, apice argenteo, alis subcinereis, basi costâque fuscis.

Black ; thorax with tawny hairs in front and along each side ; abdomen with a broad pale gilded band ; tip silvery ; wings slightly greyish, wholly brown at the base, and brown along the costa for five-sixths of the length ; the outline of the brown nearly straight, but rather undefined.

Length of the body 3 lines ; of the wings 8 lines.

China.

*Anthrax combinata.*

Nigra, capite subaurato, thoracis marginibus fulvo-pilosis, scutello piceo, abdominis lateribus nigro-pilosis, fasciculis duobus basalibus testaceis, fasciâ albidâ subauratâ media, apice argenteo, alis subcinereis, triente basali costâque fuscis.

Black ; head with pale and slightly gilded tomentum in front and beneath ; thorax with tawny hairs in front and along each side ; scutellum piceous ; abdomen with black hairs along each side, with a tuft of testaceous hairs on each side at the base, and with a whitish slightly gilded band across the middle ; tip silvery ; wings slightly greyish, brown for one-third of the length from the base, and for five-sixths of the length along the costa ; outline of the brown part nearly straight, but somewhat undefined.

Length of the body 5 lines ; of the wings 12 lines.

China.

AUSTRALIA.

Eleven groups and about fifty species.

Group 3. DIPT. SAUND. 166.

*Anthrax albirufa.*

Nigra, thoracis lateribus pectoreque pilis rufescentibus, pectore fascia interrupta alba, abdomine pilis basalibus, fascia interrupta apice ventre que albis, lateribus nigro-pilosis, alis subcinereis apud costam nigro-fuscis.

Black ; thorax with reddish hairs on each side and in front ; pectus with reddish hairs, which are interrupted by a white band ; abdomen with white hairs at the base, with an interrupted white band hindward, and with a white tip ; sides with black hairs ; underside with a white disk ; wings slightly greyish, blackish brown along the costa for half the breadth and three-fourths of the length ; hind border of the brown part dilated at the base and in the middle.

Length of the body 6 lines ; of the wings 12 lines.

Australia.

Group 8. DIPT. SAUND. 167. NEURIA, Newm.

*Anthrax subsenex.*

Nigra, sat angusta, subtus cana, capitis lateribus subtus fulvo-tomentosis, abdominis lateribus basi cano-pilosis, pedibus fulvis, tibiis posticis tarsisque nigris, alis cinereis longis angustis, basi costâque fuscis, venis nigris, halteribus testaceis apice fuscescentibus.

Black, rather narrow, hoary beneath; head with tawny tomentum on each side beneath; abdomen thickly clothed with hoary hairs on each side at the base; legs tawny; tarsi and hind tibiæ black; wings grey, long, narrow, brown at the base and along three quarters of the length of the costa; veins black; halteres testaceous, with brownish tips.

Length of the body 7 lines; of the wings 14 lines.

Australia.

Group 10. DIPT. SAUND. 167.

*Anthrax sobricula.*

Nigra, sat angusta, fulvo-pilosa, capite subtus pectoreque albido-pubescentibus, alis subcinereis, basi costâque fuscis.

Black, rather narrow, clothed above with tawny hairs, which have whitish reflections; head on each side beneath and pectus with whitish down; head small, much narrower than the thorax; wings greyish, brown at the base and along the costa for two-thirds of the length.

Length of the body  $3\frac{1}{2}$  lines; of the wings 8 lines.

Australia.

COUNTRY UNKNOWN.

Eight groups and thirty species.

Genus LOMATIA, Curtis.

*Lomatia fasciolaris.*

Nigra, capite corporisque lateribus fulvo-pilosis, alis albidis, fasciis duabus incompletis fuscis, marginibus subcinereis, costâ fuscâ ex parte ferrugineâ, halteribus testaceis.

Black; head and sides of the body clothed with pale tawny hairs; wings whitish, greyish about the borders, brown and

partly ferruginous along the costa, and with two brown incomplete bands, the exterior one much broader than the other; halteres testaceous.

Length of the body  $4\frac{1}{2}$  lines; of the wings 12 lines.

Port Natal.

In Mr. Saunders's collection.

Genus BOMBYLIUS, Linn.

*Bombylius areolatus.*

Fuscus, subtus fulvus, capite apud antennas ferrugineo subtus cano, antennis nigris, thorace vittis duabus albis, scutello ferrugineo, abdomine vittis tribus argenteis, lateribus nigropilosis, pedibus halteribusque fulvis, alis subcinereis, basi costaque fuscis.

Brown, and clothed with brown hairs, tawny beneath; head ferruginous about the base of the antennæ, hoary beneath: proboscis and antennæ black; thorax with a stripe of white hairs on each side; scutellum ferruginous; abdomen with three stripes of silvery white down, and with long lateral and apical black hairs; legs and halteres tawny; wings greyish, brown at the base and along the costa till near the tips; the outline of the brown rather irregular; veins black.

Length of the body  $3\frac{1}{2}$  lines; of the wings 9 lines.

Australia.

Genus LEPIDOPHORA, Westw.

*Lepidophora vetusta.*

Mas.—Nigra, capite thoraceque cinereo-tomentosis nigrosetosis, scutello thoracisque lateribus ferrugineis, abdominis apice densè plumoso, femoribus ex parte ferrugineis, alis nigris, apice margineque postico limpidis, halteribus apice albis.

Male—Black; head and thorax with cinereous tomentum, and with short black bristles; scutellum and borders of the thorax ferruginous; tip of the abdomen thickly plumed; femora partly ferruginous; wings black, limpid at the tips and along the hind border; halteres with white tips.

Length of the body 8 lines; of the wings 12 lines.

Valley of the Amazon.

*Lepidophora secutor.*

Mas.—Nigra, pectore cinereo-tomentoso, abdominis apice plumoso, alis nigricantibus apice cinereis.

*Male*.—Black; pectus with dark cinereous tomentum; abdomen with black apical plumes; wings blackish, grey and hyaline towards the tips.

Length of the body 6 lines; of the wings 10 lines.

Valley of the Amazon.

GENUS PHTHIRIA, Meig.

*Phthiria lurida*.

Nigro-fusca, capite antico fulvo, thorace fulvo-hirto, scutello fulvo, abdomine fasciis tribus anterioribus latis interruptis fulvis, alis subcinereis, basi costâque luridis, halteribus apice albis.

Blackish brown; head tawny in front; proboscis and antennæ black, the former hardly longer than the thorax; thorax with short tawny hairs; scutellum tawny; abdomen with three broad anterior interrupted tawny bands; hairs short, black; legs black; wings greyish, with a lurid tinge at the base, and along most of the length of the costa; halteres with white knobs.

Length of the body 3 lines; of the wings 8 lines.

Para.

*Phthiria lineifera*.

Nigra, subtus cano-hirta, capite, thorace, scutello segmentisque abdominalibus testaceo-marginatis, pedibus fulvis, alis cinereis, costa fuscescente, venis nigris, halteribus testaceis.

Black, with hoary hairs beneath; head with a testaceous line about the eyes; thorax and scutellum with a testaceous border; hind borders of the abdominal segments testaceous; legs tawny; wings grey, brownish along the costa for three-quarters of the length; veins black; halteres testaceous.

Length of the body 2 lines; of the wings 4 lines.

Australia.

GENUS GERON, Meig.

*Geron albidum*.

Nigrum, albido-pilosum, pedibus albido-tomentosis, alis limpidis, venis halteribusque albis.

Black, rather thickly clothed with whitish hairs; legs with whitish tomentum; wings limpid; veins and halteres white.

Length of the body  $2\frac{1}{2}$  lines; of the wings 5 lines.

Valley of the Amazon.



*Geron? tenue.*

*Mas.*—Nigrum, gracile, proboscide arcuato, antennarum articulo 3° lanceolato, pedibus fulvis, tarsis nigris, alis subcinereis, venis nigris, halteribus fulvis.

*Male.*—Black, slender; proboscis curved, more than half the length of the body; third joint of the antennæ lanceolate; legs tawny, rather long and slender; tarsi black; wings greyish; veins black; halteres tawny.

Length of the body  $2\frac{1}{2}$  lines; of the wings 5 lines.

Country unknown.

Fam. 8. SCENOPINIDÆ.

Two or three European and one African species are all that are yet known of the *Scenopinidæ*.

Fam. 9. EMPIDÆ.

This family is, as yet, not much known beyond Europe, where the species are about 400 in number, while in the rest of the world hardly more than thirty have been recorded. The genera are all European, with the exception of the *Eriogaster*, Macq., *Aplomera*, Macq., and *Niconia*, Walk. The type of the latter is *Empis penthophora*, Wied.

Genus EMPIS, Linn.

*Empis reciproca.*

*Fæm.*—Cana, proboscide fulvo apice nigro, antennis nigris, thorace vittis tribus cinereis, abdominis apice sub-compresso sub-attenuato, pedibus fulvis pilosis, alis cinereis.

*Female.*—Hoary; proboscis tawny, black at the tip; antennæ black; thorax with three dark cinereous stripes; abdomen slightly attenuated and compressed towards the tip; legs tawny, pilose; wings grey, veins black, testaceous at the base; halteres testaceous.

Length of the body 2 lines; of the wings 4 lines.

United States.

Genus HILARA, Meig.

*Hilara plebeia*.

*Fœm.*—Nigra, pedibus anticis ferrugineis, alis limpidis, venis stigmatæque nigris, halteribus fulvis.

*Female.*—Black; four legs ferruginous; wings limped, veins and stigma black; halteres tawny.

Length of the body  $1\frac{1}{2}$  line; of the wings 3 lines.

United States.

Genus RHAMPHOMYIA, Hoffmanssegg.

*Rhamphomyia expulsa*.

*Mas.*—Nigra, alis cinereis, venis nigris.

*Male.*—Black; hind legs a little longer and stouter than the others; wings grey, veins black.

Length of body  $1\frac{1}{2}$  line; of the wings 3 lines.

United States.

*Rhamphomyia tristis*.

*Fœm.*—Nigra, thorace cinereo vittis duabus nigris, alis limpidis, venis nigris, halteribus albis.

*Female.*—Black; thorax with cinereous tomentum, which is interrupted by two black stripes; wings limpid, veins black; halteres white.

Length of the body 2 lines; of the wings 4 lines.

United States.

Genus PLATYPALPUS, Macq.

*Platypalpus vicarius*.

*Fœm.*—Niger, nitens, pedibus testaceis gracilibus subæqualibus, alis limpidis, venis testaceis.

*Female.*—Black, shining; legs testaceous, slender, nearly equal in size; wings limpid, veins testaceous, externo-medial veins very slightly curved.

Length of the body 1 line; of the wings 3 lines.

United States.

Genus TACHYDROMIA, Fabr.

*Tachydromia postica.*

Nigra, antennis, abdomine basi subtus pedibusque testaceis, femoribus tibiisque posticis piceis, alis cinereis, venis nigris, halteribus albidis.

Black; antennæ, abdomen at the base beneath and legs testaceous; hind femora and hind tibiæ piceous; wings cinereous, veins black; halteres whitish.

Length of the body  $1\frac{1}{2}$  lines; of the wings 3 lines.

United States.

*Tachydromia vittipennis.*

Nigra, antennis pedibusque testaceis, alis cinereis apud margines obscurioribus, halteribus albidis.

Black; antennæ and legs testaceous; wings grey, darker along the borders of the veins; halteres whitish.

Length of the body 2 lines; of the wings 4 lines.

United States.

Fam. 10. DOLICHOPIDÆ.

The European species of this family are from 150 to 200 in number, and the exotic species, which contain no genera different from those of Europe, may amount to 100 or 150.

Genus PSILOPUS, Megerle.

*Psilopus unguivena.*

*Mas.*—Læte viridis, antennis nigris thorace longioribus, thorace subcyanescente, abdomine subaurato, pedibus testaceis, alis subcinereis, venis nigris.

*Male.*—Bright green; antennæ black, much longer than the thorax; thorax slightly bluish; abdomen somewhat gilded; legs testaceous, long, slender; wings greyish, veins black, fore-branch of the præbrachial veins very much bent, nearly rectangular; discal transverse vein very deeply undulating.

Length of the body  $4\frac{1}{2}$  lines; of the wings 7 lines.

United States.

Genus *DOLICHOPUS*, Latr.

Of this genus Mr. Saunders's collection contains a few apparently undescribed North American species, but it is difficult to ascertain their characters on account of the manner in which they are set.

Fam. 11. *LONCHOPTERIDÆ*.

Fam. 12. *PLATYPEZIDÆ*.

The European species of these families may amount to about thirty. No exotic species have yet been discovered.

Fam. 13. *PIPUNCULIDÆ*.

About twenty European species. One from North America has been described, and another occurs in Australia.

Genus *PIPUNCULUS*, Latr.

*Pipunculus translatus*.

*Mas.*—Niger, nitens, capite antico argenteo, genubus tarsisque, alis limpidis, venis nigris.

*Male.* Black, shining; head silvery in front; knees and tarsi tawny; wings limpid, veins black.

Length of the body  $1\frac{1}{4}$  line; of the wings 2 lines.  
United States.

Fam. 14. *SYRPHIDÆ*.

The species of *Syrphidæ* may be about 1000 in number, and as a synopsis of all the genera would be unsuitable here, a list of those which do not occur in Europe is subjoined:—

NORTH AMERICA.

*Chymophila*, Serville; *Ceratophya*, Wied.; *Sphecomyia*, Latr.; *Mixtemyia*, Macq.; *Plagiocera*, Macq.; *Imatisma*, Macq.; *Ocyptamus*, Macq.; *Somula*, Macq.; *Polydonta*, Macq.

SOUTH AMERICA.

*Mixogaster*, Macq.; *Dolichogyna*, Macq.; *Senogaster*, Macq.; *Copestylum*, Macq.

AFRICA.

*Platynochætus*, Wied. (also occurs in Sicily); *Senaspis*, Macq.

ASIA.

*Megaspis*, Macq.; *Priomerus*, Serv.; *Asarkina*, Serville; *Grapto-myza*, Wied.; *Dolichoremus*, Macq. (Type, *Eristalis crassus*, Fabr.)

AUSTRALIA.

*Orthoprosopa*, Macq.; *Coiloprosopa*, Macq.; *Hemilampa*, Macq.

NEW ZEALAND.

*Plesia*, Macq.

Genus CERATOPHYA, Wied.

The two following species differ much in colour and size from the two described by Wiedemann.

*Ceratophya luridescens*.

*Fœm.*—Piceo, thorace pectoreque aurato-fasciatis, abdomine maculis duabus lateralibus basalibus fulvis, tarsis subtus fulvis subauratis, alis luridis cinereo-marginatis, halteribus testaceis.

*Female.*—Piceous; head with whitish tomentum on each side in front; third joint of the antennæ nearly twice the length of the first; thorax and pectus with a slender gilded band; abdomen with an elongated tawny spot on each side at the base; tarsi tawny and slightly gilded beneath; wings lurid, grey along the hind border and at the tips; halteres testaceous.

Length of the body 6 lines; of the wings 11 lines.

Valley of the Amazon.

*Ceratophya bicolor*.

*Mas.* Picea, abdomine, femoribus tibiisque posticis ferrugineo-rufis, alis nigricantibus cinereo-marginatis.

*Male.*—Piceous, like the preceding species in structure; head with testaceous tomentum on each side in front; abdomen, hind femora and hind tibiæ ferruginous red; wings blackish, dark grey at the tips and along the hind border.

Length of the body  $5\frac{1}{2}$  lines; of the wings 11 lines.

Para.

Genus CERIA, Fabr.

*Ceria divisa.*

Nigra, segmentorum abdominalium marginibus posticis flavis, pedibus ferrugineis, femoribus nigricantibus, alis cinereis apud costam nigricante-trimaculatis.

Black; hind borders of the abdominal segments yellow; legs ferruginous, hind femora blackish; wings grey, with three blackish costal spots, the third apical and larger than the others.

Length of the body 4 lines; of the wings 7 lines.

Port Natal,

Genus MICRODON, Meig.

*Microdon testaceus.*

Ferrugineus, capite supra nigricante-cæruleo, tibiis albidis, supra apice tarsisque nigris, alis subcinereis.

Ferruginous, clothed with short hairs; head above blackish blue; scutellum bidentate; tibiæ whitish, black above towards the tips, tarsi black; wings greyish, veins black, ferruginous towards the base.

Length of the body 5 lines; of the wings 10 lines.

Port Natal.

Genus HELOPHILUS, Meig.

*Helophilus strenuus.*

*Mas.*—Niger, thorace vittis quatuor testaceis, scutello luteo, pectore cinereo, abdomine luteo fasciis vittaque interrupta cyaneo-nigris, femoribus posterioribus incrassatis, alis subcinereis.

*Male.*—Black; head with white tomentum in front; thorax with four testaceous stripes; scutellum luteous; pectus cinereous; abdomen luteous, with a bluish black interrupted stripe, and a bluish black band on the hind border of each segment; posterior femora very thick, with cinereous hairs; wings greyish, veins black, ferruginous at the base.

Length of the body 9 lines; of the wings 14 lines.

*Helophilus scitus.*

*Fæm.*—Niger, capite ferrugineo, peristomatis lateribus albis nigro-notatis, thorace vittis fasciisque tribus luteis, scutello

fulvo, pectore aurato, abdomine maculis duabus basalibus lateralibus trigonis luteis, pedibus fulvis, femoribus flavis, anticis nigro-notatis, alis subcinereis, apud costam fuscis, halteribus flavis.

*Female*.—Black; head ferruginous, with pale gilded tomentum about the eyes, white with a black shining mark on each side of the peristoma; thorax with three imperfect luteous stripes and as many luteous bands; scutellum tawny; pectus gilded; abdomen with a triangular luteous spot on each side at the base; fore borders of the segments with testaceous tomentum; legs tawny, femora mostly pale yellow, fore femora with a black dot on each at the base; wings greyish, brown along the costa, veins black; halteres pale yellow.

Length of the body 6 lines; of the wings 11 lines.

Valley of the Amazon.

*Helophilus auratus.*

*Mas*.—Niger, aureo-pubescent, abdomine æneo, alis subcinereis, apud costam nigris.

*Male*.—Black, covered with gilded down, which is brightest on the vertex; abdomen æneous; wings greyish, brown in front, veins black.

Length of the body  $4\frac{1}{2}$  lines; of the wings 7 lines.

Valley of the Amazon.

Genus MERODON, Latr.

*Merodon torpidus.*

Niger, capite antico-albo, antennis fulvis, abdomine fasciis interruptis cano-tomentosis, alis obscure cinereis.

Black; head white in front; antennæ tawny; abdomen with an interrupted band of hoary tomentum on the fore border of each segment; wings dark grey, veins black.

Length of the body 6 lines; of the wings 9 lines.

Genus SYRITTA, St. Farg. et Serv.

*Syritta transversa.*

*Mas*.—Nigra, capite aurato, antennis ferrugineis, thorace fasciis duabus anterioribus transversis interruptis maculaque trans-

versa auratis, abdomine æneo, maculis duabus basalibus lateralibus testaceis, pedibus ferrugineis, femoribus posticis crassis denticulatis, alis cinereis, venis nebulosis, halteribus testaceis.

*Male*.—Black; head with pale gilded tomentum, face with a bluish black callus; antennæ ferruginous; thorax with two anterior interrupted bands of gilded tomentum, and with a transverse spot of the same in front of the scutellum; abdomen æneous, with an elongated testaceous spot on each side at the base; legs ferruginous, hind femora thick, minutely denticulated beneath; wings grey, clouded about the veins, which are black; halteres testaceous.

Length of the body 4 lines; of the wings 7 lines.

Valley of the Amazon.

Genus TEMNOCERA, St. Farg.

*Temnocera trifascia*.

Fulva, abdomine fasciis tribus nigris, 3<sup>a</sup> interrupta apicali, tibiis tarsisque ferrugineis, alis subcinereis apud costam subluridis, stigmatum maculaque costali subapicali nigricantibus.

Tawny; abdomen with three black bands on the hind borders of the segments, third band interrupted, apical; tibiæ and tarsi ferruginous; wings very slightly greyish, slightly lurid along the costa, stigma and a costal subapical spot blackish, veins black.

Length of the body 5 lines; of the wings 8 lines.

Para.

*Temnocera circumdata*.

Testacea, antennis luteis, thoracis disco purpureo cupreo, abdomine fasciis tribus latis trijunctis nigris, pedibus nigris, femoribus ferrugineis basi nigris, alis subcinereis, halteribus niveis.

Testaceous; antennæ luteous; disk of the thorax purplish cupreous; disk of the pectus black; abdomen with three broad black bands, which are connected in the middle and on each side; legs black, coxæ tawny, femora ferruginous, black towards the base; wings greyish, veins black, tawny at the base; halteres snow white.

Length of the body 3½ lines; of the wings 8 lines.

Valley of the Amazon.



*Temnocera integra.*

Pallide fulva, abdomine guttis duabus lateralibus subapicalibus nigris, tibiis tarsisque supra ferrugineis, alis limpidis, guttâ apud stigma nigrâ.

Pale tawny; abdomen with two black dots on each side towards the tip; tibiæ and tarsi ferruginous above; wings limpid, stigma testaceous, with a black dot at the base, veins black, testaceous at the base and along the costa.

Length of the body  $3\frac{1}{2}$  lines; of the wings 6 lines.

Valley of the Amazon.

Genus LYCASTRIS, n. g.

Epistoma porrectum, lanceolatum, thorace vix brevius; os corpore vix brevius; antennæ petiolo insertæ; articuli 1<sup>us</sup> et 2<sup>us</sup> breves, 3<sup>us</sup> latus, subellipticus, arista nuda; thorax et abdomen pilosa; pedes simplices; alæ venâ transversâ præbrachiali longâ, arcuatâ, perobliquâ.

Epistoma prolonged into a porrect lanceolate horn, which is nearly as long as the thorax; mouth nearly as long as the body; antennæ seated on a short porrect horn, first and second joints short, third broad, nearly elliptical; arista bare; thorax and abdomen pilose; legs simple; transverse præbrachial vein long, curved, very oblique, placed beyond the middle of the discal areolet; transverse vein between the cubital and the præbrachial ending at the tip of the former.

*Lycastris albipes.*

Testacea, capite piceo, abdomine cyaneo piceo, segmentorum marginibus posticis albedo-pilosis, pedibus albis piceo-fasciatis, alis vix subcinereis, venis transversis subnebulosis, halteribus apice piceis.

Testaceous; head piceous, with testaceous tomentum about the eyes; pectus hoary; abdomen bluish piceous, with a band of whitish hairs on the hind border of each segment; legs white; anterior femora at the base, hind femora excepting the tips, tips of anterior tarsi and of hind tibiæ and hind tarsi, piceous; wings very slightly greyish; transverse veins slightly clouded; veins black, testaceous towards the base; halteres with piceous tips.

Length of the body  $5\frac{1}{2}$  lines; of the wings 11 lines.

Hindustan.

Genus *PIPIZA*, Fallen.*Pipiza Pica.*

*Fœm.*—Nigra, nitens, oculis tomento albo marginatis, thoracis guttis quatuor lateralibus scutellique margine fulvis, abdomine subpiceo, femoribus basi piceis, tarsis albis apice piceis, alis limpidis, basi strigâ contiguâ costali fasciâque abbreviatâ nigris, halteribus fulvis.

*Female.*—Black, shining; head with white tomentum about the eyes; face somewhat lurid in the middle; thorax with two tawny dots on each side; scutellum with a tawny border; pectus hoary; abdomen slightly piceous; femora piceous towards the base; tarsi white, with piceous tips; wings limpid, black at the base and with an adjoining black costal streak which joins a black band, the latter is obsolete towards the hind border; halteres tawny.

Length of the body 4 lines; of the wings 7 lines.

Valley of the Amazon.

*Pipiza divisa.*

*Fœm.*—Nigra, pectore cano, abdomine vittis duabus lateralibus ferrugineis, pedibus piceis, femoribus basi, genubus tarsisque subtus ferrugineis, alis limpidis, dimidio basali nigricante posticè cinereo, halteribus fulvis.

*Female.*—Black; pectus hoary; abdomen with a ferruginous stripe along each side; legs piceous; femora at the base, knees and tarsi beneath ferruginous; wings limpid, basal half blackish, excepting the hind border, which is grey; alulæ white; halteres tawny.

Length of the body  $3\frac{1}{2}$  lines; of the wings 6 lines.

Vera Cruz.

*Pipiza dolosa.*

*Mas.*—Nigra, pectore cinereo, abdomine nigro purpureo, alis subcinereis dimidio basali antice nigricante, halteribus fulvis.

*Male.*—Black; pectus cinereous; abdomen blackish purple; legs piceous; wings greyish, blackish along half the length from the base, except towards the hind border; alulæ white; halteres tawny.

Length of the body 3 lines; of the wings 6 lines.

Valley of the Amazon.

Genus SYRPHUS, Fabr.

*Syrphus subchalybeus.*

Fulvus, capite antico glauco, thorace vittis duabus æneis lineisque duabus intermediis fulvis, tibiis posticis piceis, alis cinereis, dimidio basali antice lurido.

Tawny; head glaucescent in front; thorax with two æneous stripes, each of which is intersected by two tawny lines; hind tibiæ piceous; wings grey; basal half, excepting the hind border, lurid; veins ferruginous.

Length of the body 5 lines; of the wings 10 lines.

Valley of the Amazon.

Genus RHOGA, n. g.

*Mas.*—*Parago* affinis, caput sat angustum, oculi supra non connexi; antennarum articulus 1<sup>us</sup> longus; 3<sup>us</sup> brevior, subclavatus; arista nuda; abdomen sessile oblanceolatum, thorace vix duplo longius; tibiæ posticæ subdilatatæ, subciliatæ; metatarsi postici dilatati.

*Male.*—Body rather narrow; eyes parted above; first joint of the antennæ much longer than the third, which is subclavate; arista bare; abdomen sessile, oblanceolate, hardly twice the length of the thorax; hind tibiæ slightly dilated and ciliated; hind metatarsus dilated; wings with the veins much like those of *Paragus* in structure; transverse præbrachial vein placed much before the middle of the discal areolet; transverse præbrachial vein rejecting a branch towards the base of the wing.

*Rhoga lutescens.*

*Mas.*—Pallide lutea, thoracis disco nigro, tibiis posticis extus nigro-pilosis, alis limpidis, fascia apiceque subcinereis.

*Male.*—Pale luteous; head with a black callus on the vertex, and another above the base of the antennæ; thorax with a large black radiating spot on the disk; hind tibiæ with black hairs on the outer side; wings limpid, greyish in the middle and at the tips; veins pale luteous, black in the grey part; halteres testaceous.

Length of the body 2½ lines; of the wings 5 lines.

Para.

## Fam. 15. CONOPIDÆ.

The *Conopidæ* are probably about fifty in number, and are nearly all contained in the genus *Conops*, which Rondani has divided into several ; the latter may be considered as sub-genera. Macquart has established the following more distinct genus :—

- \* Antennæ on the sides of the porrect front. *Pleurocerina*, Macq.
- \*\* Antennæ at the tip of the porrect front. *Conops*.

XV. *On the Oriental Species of Butterflies related to the Genus Morpho.* By J. O. WESTWOOD, Esq., F.L.S. &c.

[Read March 3rd, 1856.]

THE beautiful insects which form the subject of the present communication are the eastern representatives of a group of butterflies of large size, which, with these oriental exceptions, are exclusive natives of the new world, and which in respect to their size may be ranked amongst the largest known species of butterflies, and in the brilliancy of the colours of many of the species and the grandly ocellated markings of their wings, may equally vie in beauty with any of their rivals. *Morpho Cypris* is in fact the empress of the butterfly world. In respect likewise to their natural relations, resulting either from their direct affinities with other groups of butterflies, or their more distant analogies both with other butterflies and other tribes of animals, invertebrated and vertebrated, these insects are so interesting, that I cannot but think that a few remarks, with reference especially to such relationships as they exhibit, may not be without advantage (affecting as they do the primary distribution of the whole of the butterflies—*Lepidoptera Diurna* or *Rhopalocera*—as well also as that of the primary groups of the *Annulosa* themselves), at a time when Lepidopterology counts so many votaries, who, however, for

the most part never give a thought to the higher objects of zoological study, but content themselves with capturing or rearing, and occasionally describing, new or rare species of moths and butterflies.

In thus recalling attention to the remarkable principles which have been laid down within the past thirty years as regulating the natural distribution of animals, I do not think I shall run any risk of being regarded as upholding that doctrine of Linnæus, thrice repeated in his "*Philosophia Botanica*," that the true end of our science is the discovery of the natural system,\* or arrangement of natural objects with reference to each other, to the manifest disparagement of those higher inquiries into the manners and customs, economic uses or injuries, and all those other relations of life, of an animal in reference to its operations in the universe, which St. Pierre has so excellently expressed under the title of "*Harmonies of Nature*," and for the performance of which it has in fact been called into existence.

If the *Γνωθι σεαυτὸν* of Solon was accounted the chief of the seven sentences of the seven wise men of Greece, written in letters of gold on the temple of Diana, and was in more recent times employed by Linnæus as the specific character of the human race (*HOMO SAPIENS*, *Nosce teipsum*, *Syst. Nat.* i. 28), so in respect to natural objects, the naturalist must make himself thoroughly acquainted with every peculiarity in the structure and habits, transformations and physiology of the objects of his study. To attempt the description of an animal before its structure has been thoroughly investigated, or to construct systems of nature (which may indeed appear plausible upon paper) before a profound investigation has been made of the same peculiarities in each of the primary types or groups, is but to build houses on the sand, to be washed down by the tide of knowledge, as it is more and more swollen by the accumulation of fresh facts. "*FACTS BEFORE THEORY*" has indeed been my motto ever since I commenced the study of insects. But still inquiries as to the principles of the natural system of the creation and theories formed with a view to its elucidation, even if occasionally false, are unquestionably valuable, because it has always happened that the promulgation of

\* "*Methodi naturalis fragmenta studiosè inquirenda sunt. Primum et ultimum hoc in Botanicis desideratum est*" (p. 27). "*Methodus naturalis est ultimus finis Botanicæ*" (p. 101). "*Classes quo magis naturales, eo, ceteris paribus, præstantiores sunt. Ad fines conveniunt habitu —, &c. Summorum Botanicorum hodiernus labor in his sudat et desudare debet. Methodus naturalis hinc ultimus finis Botanicæ est et erit*" (p. 137).

such theories has constantly been attended with new suggestions, often highly original, interesting, and valuable; and thus no one can rise from a careful study of the theoretical portions of the works of MacLeay, Vigers, Horsfield, Swainson, or Newman, without being struck with the many new ideas which these writers have formed on the natural distribution and arrangement of the various objects of nature on which they have exercised their talents and ingenuity. That one and all of them should have occasionally bent or even sacrificed nature to theory is no more to be wondered at than the discovery of the true system of nature itself would have been with the few genuine materials we at present possess, accumulated as they have been within so few years.

Let us see, for instance, what are the chief points in a Lepidopterous insect which appear likely to be of importance in enabling us to judge of its natural relation and place in the system of nature. I do not here allude to its internal anatomy, although no one can doubt that this is even of higher importance than its external structure.

Structure of the egg and its peculiarities; external form of the larva at its different periods of growth; structure of its mouth, spiracles, legs, prolegs, caudal appendages, &c.; external form and other peculiarities of the chrysalis, its mode of suspension or situation in a cocoon or otherwise; external structure of the perfect insect, including its antennæ, their form and number of joints, spiral tongue and palpi; eyes; legs, with their tarsi and unguis; form and position of the wings; arrangement of wing veins; abdomen and abdominal appendages in the opposite sexes, and other sexual differences; natural habits and economy; time of flight, geographical distribution, size, colour, and markings.

Now how many Lepidopterous insects have been studied in such a manner as will clearly enable us to form an opinion on all these various peculiarities and points of structure? Lyonnet spent a life in examining the goat moth, *Cossus ligniperda*, in its various states, but it is only the larval portion of his inquiry which he had time satisfactorily to complete. To affirm that any one of these peculiarities or characters is of superior importance to the rest, as affording a key to a natural system of *Lepidoptera*, until such a thorough investigation has been made of one or more species in each of the principal groups of Lepidopterous insects, seems to me to be liable to lead to error, not only from positive want of knowledge of facts, but also from a want of recognition of that principle which seems to pervade nature, namely, that characters which in one group appear to be of primary importance, become

modified so greatly in another group as to lose their primary value, which is seen to be usurped by quite a distinct set of characters. Hence I consider that we are not in a position to assert that the genus *Papilio*, either on account of its minute palpi, or the arrangement of its wing veins, forms but a single genus, especially as the larvæ of various species are so very distinct in their forms, as may be seen in the plates of Dr. Horsfield's "Lepidoptera Javanica," or, on the other hand, to regard all the species of caterpillars which have furcate heads and tails as belonging to one primary division of the *Diurna*, thus separating *Apatura* from its allies, and bringing it with *Morpho* and *Hipparchia* into one group; or, again, to strike *Parnassius* and *Thais* from *Papilio* as a distinct sub-family, because the *Apollo* butterfly spins for itself a loose cocoon in a leaf like a moth, as Mr. Swainson has done in his Nat. Arr. of Insects, p. 76; or, lastly, with an imperfect knowledge of the larva of only a single species of *Erycinidæ* to unite that extensive group of butterflies with *Lycæna* and *Thecla*. I might also dwell upon the impossibility of satisfactorily arranging all those other groups of strikingly distinct types of form amongst exotic butterflies, of whose transformations we still remain ignorant, such as those typified by *Ageronia*, *Heliconia*, *Acræa*, &c.

But if we cannot (it would indeed be a most marvellous thing if we could), with our present state of knowledge, hope for the realization of our wishes in the discovery of the System of Nature, it is the more incumbent on us to collect materials for that purpose, and, by careful examination of such materials as we actually possess, to discover the relations of affinity between species and groups, and to point out the analogies which they exhibit with other groups.

The butterflies, then, which are the objects of the present paper are natives of India and the adjacent parts of the East. They are of a large or moderate size, with wings large in proportion to the body, and rounded; the hind pair in the *Amathusiæ*, *Zeuxidiæ*, and *Kallimæ*, having the anal angle produced into a long point, or a broad short tail, and the underside of the wings, especially of the posterior pair, beautifully ornamented with eye-like spots. In a few of the species the upper side is more or less tinged with a dark metallic purple gloss; the discoidal cell in the fore wings is closed, but that of the hind wings is open; the base of the latter pair of wings not being furnished with a small supplemental cell at the base of the submarginal vein. In the males of some of the species, the hind wings are ornamented with tufts

of long hairs, which the insect can doubtless erect and depress at will. The antennæ are long and but moderately clubbed; the palpi are of moderate length and breadth, the fore legs reduced to a very small size, incapable of walking. The little that is known of the preparatory states of these insects teaches that the caterpillars are cylindrical, with the head cornuted or forked, and with the extremity of the body terminating into two points or tails.

Now there are three modes of looking at an animal with reference to the remainder of the creation. Either the species is to be considered, as completely independent of all other species, and produced for a given end, without reference to any other animal, or the species is to be regarded with especial reference to such species as are approximated to it by similarity of structure, which constitutes that relationship which has been termed affinity; or thirdly, the species is to be examined, not only with reference to its direct affinities, but also in respect to its resemblance to other and more distant tribes, which constitute the principle which has been termed analogy.

This is not the place to enter into very lengthy observations on these different relationships. The *Horæ Entomologicæ*, the latter volumes of the Introduction to Entomology, and various detached memoirs by Messrs. MacLeay, Kirby, Vigers, Horsfield, Swainson, &c., may be advantageously consulted; but I apprehend that no one will venture to deny the existence of these different kinds of relationships, although they may, and probably will, differ as to the mode of their application in reference to the discovery of the natural system.

Mr. MacLeay, indeed, regarded relations of analogy as of the highest value in testing the natural arrangement of groups; and, taking as a starting point one of his five divisions of Annulose animals, namely, his *Ametabola*, he regarded the different resemblances or analogies which exist between the types of each of the five subdivisions of the *Ametabola*, and the larvæ of different tribes of Coleopterous insects, as affording a means of dividing the *Coleoptera* into so many primary groups, arranged in a parallel series with the five groups of *Ametabola*.

The same principle was applied by Dr. Horsfield to the *Lepidoptera*, in order to test the divisions (not of the whole order, but) of the Diurnal species, and on this principle five groups of *Diurna* were established, the resemblance to the *Chilopoda* (*Scolopendra*, &c.) being supposed to exist in those caterpillars which have a series of appendages or diverging spines along the sides of the body, recalling to mind in some degree the protruded numerous legs of the centi-



pede ; the resemblance to the *Chilognatha* (*Julus*, L.) being effected by those caterpillars with cylindrical bodies and legs short ; the resemblance to the *Thysanuræ* (*Lepisma*, L.) being found in those caterpillars which have the body terminated in two elongated points ; the resemblance to the *Anoplura* (*Pediculus*, L.) being found in the larvæ of *Hesperia*, having a large head and a body terminated bluntly at its hind part, without any points or tails ; and the resemblance to the *Vermes* of MacLeay being supposed to occur in the short onisciform larvæ of the *Lycænidæ*.

Mr. Swainson extended these analogies beyond the *Annulosa*, and, adopting the five divisions of *Diurna*, he pointed out the resemblance of the caterpillars of the Thysanuriform division, to which the *Morphidæ* are referable, (to which, however, he adds the *Satyridæ*,) with the *Gallinacæ* or *Rasores* among birds, and the horned cattle, or *Ungulata*, among quadrupeds, which are the only ones in their respective classes which have horned crests or pointed appendages on their heads. So also the tails of these larvæ are indicated as pointing to the greatly elongated tails of the peacock, pheasant, and others Gallinaceous birds, as well as to the horse, which has the most beautiful tail among quadrupeds. So again the most bulky quadrupeds are found among the *Ungulata*, and the *Morphos* of South America are the giants among butterflies ; the largest birds also occur in the rasorial order, whilst on looking at the perfect insects almost all the butterflies are distinguished by the beautiful ocellate spots on the underside of their wings, just as the peacock, &c. are pre-eminently ocellated in their markings, "and the general structure of all those insects, even those of the largest, is weak."

To deny the existence of such resemblances as are here detailed would be to shut our eyes to some of the most interesting and beautiful harmonies of nature ; but on the other hand it seems to me equally unsafe to affirm, in the present state of our knowledge of the structure and transformations of insects in general, or of the *Lepidoptera* in particular, either that the characters alluded to above possess the importance here given to them, or that the relations resulting from their resemblance to the analogous peculiarities in other tribes of animals, is of itself a sufficient proof that the natural progression of the two sets of groups of animals must necessarily be parallel, the arrangement of one pointing out and testing the arrangement of the other by the existence of different points of resemblance, such as has been indicated above.

Now the genera which have the larvæ furnished either with a bicornuted head or a bifid tail are very varied, not only in the

perfect state, but also in the general character of the caterpillars themselves; thus the larva of the genus *Diadema*\* has the head armed with two erect spines, but each of the following segments has several shorter spines, which is the character of the true Chilopodiform larvæ of Dr. Horsfield. *Apatura Iris* has the larva very slug-like, being thickest in the middle of the body, the head furnished with two erect horns, the body attenuated behind and terminated by a bifid point; the surface of the body is finely shagreened, and with slender oblique pale yellow lines at the sides. The larvæ of *A. Clyton* and *Cellis* are more elongated, the head with two branches or bifid horns or spines. (Bdv. and Leconte, Icon. Lep. Amer. Septentr.) The larva of *Nymphalis Jasius* (*Charaxes J.*, Ochs., Bdv.) has the body smooth, gradually attenuated behind, and terminated by a depressed bicuspidated tail, and the head armed with four obtuse horns. That of *Nymph. Athamas* (Horsfield, Catal. Lep. Ins. E. Ind. Comp. pl. 8, f. 7, is rather more elongated than that of *N. Jasius*, but similarly furnished with horns on the head and tail. The larva of *N. Fabius*, figured in Gen. Horsfield's collection of drawings in the British Museum, is still more elongated. The larvæ of *Protogonius Hippona*, as represented by Stoll, Supp. Cramer, pl. 2, fig. 1, is subcylindrical, granulose, not spined, slightly attenuated, and apparently simple behind, the head being armed with two short obtuse horns on the hinder part; the larva of *Paphia* is elongated, scabrous and setose, with the head square, and furnished with two small conical horns, which, as well as the sides of the head, are minutely tuberculated. The anal pair of feet are large and divergent. (Stoll, pl. 6, fig. 3, *P. Polycarmes*, and pl. 6, fig. 2, *P. Eribotes*, = *Leonidas*, Cram.) In *Amathusia Phidippus*, as we learn from Dr. Horsfield's invaluable collection of drawings and descriptive Catalogue (pl. 7, fig. 10), the caterpillar is long, with a rounded head, armed on the sides above with a pair of short, broad palmated horns, the body being covered with minute setæ, and also thickly clothed with hairs, especially about the head; the body being terminated by two long setose spines. The larva of *Discophora Celinde*, on the contrary, although having the body long, cylindrical, and furnished with hairy tubercles, has the head small and simple, and the tail armed only with two short conical points. (Horsfield, Cat. Lep. E. Ind. Comp. pl. 7, fig. 11.)

According to Madame Merian's figures of the transformations of *Morpho Achilles* and *Telemachus* (the correctness of the former of which has been confirmed by M. Lacordaire), the larvæ are

\* See Gen. D. Lep. p. 280, for an account of the transformations of two species of this genus.

long and cylindrical, with several erect spines on each segment, the fore segments being furnished with small tufts of hair; the head bifid on the crown in the latter species, but apparently simple in the former, the tail being forked in both. (Merian, pl. 7 and pl. 68.) How far Madame Merian's figures of the transformations of *Morpho Menelaus*, pl. 53, and *M. Nestor*, pl. 9, be worthy of confidence, is questionable. Dr. Burmeister, indeed, in his excellent revision of M. Merian's plates, says of pl. 9, "Auf dieses Tafel ist alles unrichtig. Die Raupe gehört nicht zu ein Tagvogel, sondern wahrscheinlich zu *Sphinx Vitis*, wenigstens habe ich ähnliche Uebergangskleider bei dieser Art beobachtet; die Puppe ist ganz gewiss die verlassene Hülse eines Ritters, und scheint mir zu *Papilio Polycaon* zu gehören, der später (Tab. 31) mit ganz ähnlicher Hülse und nochmals Tab. 67 mit noch nicht verlassener Puppe verkommt" (Burmeister, Krit. Bemerk. über M. S. Merian, Met. Ins. Surin, p. 4)—whilst of Madame Merian's figures of the transformations of *M. Menelaus* (pl. 53) Burmeister thinks that neither the larva nor pupa is that of a diurnal Lepidopterous insect. Of the transformations of the genus *Caligo*, we know only those of *C. Teucer*, Merian, Ins. Sur. pl. 23, of which Burmeister remarks, "Raupe und Puppe sind zwar nicht besonders gerathen, aber doch kenntlich genug, um sich überzeugen zu können, dass sie wirklich zum Schmetterlinge gehören." The general similarity in form of this caterpillar with that of *Discophora Celinde*, Horsfield, and *Opsiphanes Cassiæ*, Merian, pl. 32, as well also as that represented in Merian's pl. 8 (which she gave as that of *Ageronia Feronia*), proves that in this respect Madame Merian was right, although the caterpillar and chrysalis of *C. Idomeneus* (pl. 60) are so unlike the former, that Burmeister has evident reason to say, that "Die Raupe passt weit eher zu einem Nachtvogel als zu einem Tagvogel," which is moreover fully confirmed by Stoll's figures of *Opsiphanes Berecynthus* and *Cassia*. (Suppl. Cramer, pl. 3, fig. 3 and fig. 4.) The caterpillars of these species in their long bodies, cornuted heads, and long bifid tails, approach certainly to the type of the *Hipparchiidae*, of which the following is the character given in the "Genera of Diurnal *Lepidoptera*."

"Larva attenuated at the extremity of the body, and almost pisciform, tomentose, terminated by two more or less prominent anal points; the head rounded, sometimes emarginate or bifid, or sometimes surmounted by two spines."

But this particular form of caterpillar extends still further, since Dr. Horsfield was fortunately successful in rearing *Melanitis undularis* in Java. This insect belongs to the family *Eury-*

*telidæ*, and has a caterpillar shorter in proportion than that of *Hipparchia Leda* (figured by Horsfield, pl. 8, fig. 9), and apparently with the body smooth, the head of moderate size, with two erect slender horns, and the tail with two long simple points (Horsfield, pl. 8, fig. 8), whilst the closely-allied *Didonis Biblis* (= *Biblis Thadana*, Godart), for a knowledge of the transformations of which we are indebted to Dr. Boisduval (Crochard's Edit. R. Animal, Ins. pl. 136, fig. 4), has the larva cylindrical, the joints rather constricted, with the anterior segments attenuated; the head armed with two long slender horns, the fourth segment of the body produced above into a conical point, hairy at the tip; each of the other segments produced above into a small slender setigerous lobe, and the tail is apparently simple; the general appearance of the larva is in fact that of a true Nymphalideous butterfly. So also the larva of *Ergolis Coryta*, although belonging to the family of *Euryletidæ*, has a larva (as we learn likewise from Dr. Horsfield's work, pl. 7, fig. 6) furnished, it is true, with two long spiny horns on the head, but also with a series of setose spines on each segment, so that it closely resembles the larvæ of such Nymphalideous genera as *Epicalia*, *Gynæcia* and *Myscelia* (especially *Myc. Ariadne*, Stoll. Suppl. Cram. pl. 4, fig. 4), and even the larvæ of some of the *fritillaries* figured by Hübner, but in these the two long porrected spines arise not from the head, but from the first segment of the body. Now this revision of the larvæ, with cornuted heads and bifid tails, comprises, I believe, the whole series of butterflies, whose transformations are known up to the present time, which could be assigned to the Thysanuriform type, were we exclusively to build our classification of butterflies upon this single character.

The late Mr. Swainson, in his highly ingenious and often successful views, has made some observations on these larvæ, and the principal variations to be met with among them which appear worthy of being borne in mind. In his latest work (*The Natural History and Arrangement of Insects*, in Lardner's *Cyclopædia*, p. 93), he has adopted a family *Satyridæ* (*Hipparchiïdæ*, nob.), which he had previously comprised amongst the *Nymphalidæ*, making it include not only the *Hipparchiïdæ* of temperate climates, but also the gigantic *Morphidæ* of the tropics, which, on account of the cornuted heads and long bodies, terminated in two processes, either assuming the appearance of tails or of two little short spines of their caterpillars, he thinks, "must of necessity represent the *Gallinacæ* or *Rasores* among birds, and the horned, cattle or ruminants (*Ungulata*) among quadrupeds.\* Now both

\* It is scarcely necessary to observe, that Mr. Swainson's classifications are entirely founded on the system of representation existing amongst various groups of animals

of these groups of vertebrate animals, in their respective classes, are the only ones which have horns, crests or pointed appendages on their heads. "Look to the whole of the order *Ungulata*, and you will find the rhinoceros, with its horned snout, and the numerous families of deer and antelopes and oxen, all decorated in this manner; turn to the gallinaceous birds, and you will find nearly all the peacocks and pheasants ornamented either with conspicuous crests or with little ear-like egrets, the different fowls with fleshy combs cresting their heads, and the front of the different guinea-hens armed with bony protuberances." So with reference to the analogies resulting from the caudal appendages of these so-called *Thysanuriform* larvæ, "if it be inquired what are the birds which have the greatest development of tail? the merest tyro will name the peacocks, the pheasants, and all the typical gallinaceous birds, as possessing this member in the highest state of development. The analogy of this order of birds with that composed of the domesticated quadrupeds, long ago pointed out by Linnæus, is unquestionable, and we accordingly find that the horse, which stands at their head, has the most beautiful tail among quadrupeds." Again, "it is notorious that the most bulky of true quadrupeds are found in the class *Ungulata*; there we have the elephant, the hippopotamus, and the whole family of antelopes and oxen; the largest birds, on the same principle, occur in the rasorial order, and in like manner the giants of the diurnal butterflies all proceed from the *Thysanuriform* caterpillars" (p. 67). In a subsequent page, he enters into the analogies exhibited by the perfect insects comprising his group of *Satyridæ* (*Hipparchiïdæ* and *Morphidæ*, nob.), and, in addition to the large size already noticed above, he observes that "the strong peculiarity which runs through all these groups is, that the under surface of the wings is invariably ornamented with beautiful ocellate spots: these spots in the large American species resemble in form, but not in brilliancy of colour, those on the tail of the peacock, but in the European examples they are smaller, more numerous, and often silvery. The general structure of all these insects, even those of the largest, is weak. The typical groups live only in the dark primeval forests, resting on the trunks of trees during the meridian heat, and show a decided partiality for shade; some, indeed, fly only towards the dusk of the evening. These habits, strikingly contrasting with those of the *Papilionidæ* and *Nymphalidæ*, show that we have reached an aberrant group of the Diurnal *Lepidoptera*, and illustrate that general habit and structure must have more weight than partial considerations drawn either from the larva, pupa or the perfect insect."

Ingenious however as these views unquestionably are, and dissatisfied as I have expressed myself to be with the various classifications of the tetrapod butterflies hitherto proposed, I am by no means satisfied of the propriety of regarding the *Hipparchiidae* and *Morphidae* as together constituting one primary section of the Diurnal *Lepidoptera*, the very minute analysis of the genera of which, required for the elaboration of the "*Genera of Diurnal Lepidoptera*," having proved that the great group *Hipparchiidae* is a very characteristic one in itself. Much less am I disposed to follow Dr. Horsfield in admitting such genera as *Apatura*, *Nymphalis*, *Protogonius* and *Paphia* into the section having the *Hipparchiides* as their chief type, on account of the cornuted head and bifid tail of the larvæ, whilst the general structure of the perfect insect is pre-eminently Nymphalideous. Mr. Swainson appears to have been fully alive to the difficulty of this question, attempting to solve it on the principle of variation in groups. The student, he says, must not believe that all the Thysanuriform larvæ, for instance, go into one division. True it is that by such an arrangement he would get a uniformity of the same shaped caterpillars, and he might flatter himself with having discovered the true arrangement of the *Lepidoptera*, but when he looked to the butterflies which proceeded from his Thysanuriform larvæ he would find that so far from exhibiting that regularity and affinity with each other, which, from looking only at their caterpillars, he had expected, he will be perfectly disappointed. He then points out five different instances, in which five different caterpillars, answering to the definition of Thysanuriform larvæ, produce butterflies which belong to the five primary divisions of the *Diurna*, instancing as one of these, which from the length of the horns of the caterpillar might be considered pre-eminently typical, the purple emperor butterfly, which, as indicated above, is given by Dr. Horsfield as one of the primary types of the *Thysanuromorpha*. The principle of variation on which Mr. Swainson endeavoured to explain this apparent difficulty was stated to be, theoretically, as follows: "every natural group of butterflies, either in the caterpillar or perfect state, contains representations of the primary types of larvæ, modified however in such a manner as to indicate the real type to which they actually belong"—hence some Juliform butterflies assume the aspect and character of Scolopendrifform larvæ, others have the Thysanuriform shape, so that, although the butterflies which stand at the head of the Juliform division, as being typical, have Juliform larvæ, "yet that the group, taken as a whole, will contain analogical representations of all the other [four] types of larvæ we have described. The Scolopendrifform butterflies (*Nym-*

*phalides*) in the very same manner contain also representations of Juliform, Thysanuriform, Vermiform and Anopluriform caterpillars, besides their own proper type, which is Scolopendriiform." In this point of view therefore the purple emperor butterfly is to be regarded as belonging to the *Nymphalidæ*, but as the type of a group of that tribe of butterflies, which represents the Thysanuriform group.

Whether or not these views of Mr. Swainson will ultimately be found true to the extent which he gave to them, it cannot, I think, be doubted that the fixing on a single character, such as that exhibited by the larvæ of any tribe of butterflies, is not sufficient to draw into that tribe every butterfly which may happen to exhibit that character under any extent of development or modification. We may easily imagine modifications in a Nymphalideous larva, which might have for their result the production of a form so much resembling that of a real Thysanuriform larvæ as to lead to an idea that it belonged to the latter primary group; and it needs only to look over the various figures to which I have above referred to be convinced that, although agreeing in one or two characters, such as the cornuted head or bifid tail, they exhibit other and more material differences inter se.

These considerations, which I have detailed rather with the view of showing the difficulties in the present state of the question as to the distribution of the Diurnal *Lepidoptera*, than of attempting to lay down any decided system of classification, will suffice to prove that the *Morphidæ*, although agreeing with the *Hipparchiidæ* in the ocellated markings of the under side of the wings, and in the pisciform character of the larvæ, cannot be associated therewith on account of the more general preponderance of Nymphalideous characters exhibited by the imago. It is true that their large size might, and indeed has been used as a proof of their being the types of the Thysanuriform group; but in my opinion this very fact of their gigantic size is of itself an evidence of aberration from a given type, and would serve rather to convince me that they should be deemed to be aberrant *Nymphalidæ*, approaching towards the *Hipparchiidæ*—if, indeed, the rank of a distinct family should be denied to them. I must, at the same time, confess that I find it next to impossible to draw any (even an artificial) line of separation between the *Morphidæ* and such genera as *Discophora*, *Zeuxidia*, *Amathusia*, *Dyctis* and *Kallima*. Having, however, detailed the characters of these groups in the "Genera of Diurnal *Lepidoptera*," I shall not enter further into the question of their position, and shall now proceed to enumerate the

Eastern species of the three oriental genera, which have been more decidedly regarded as belonging to the family *Morphidæ*, and which agree together (as well as with the South American restricted genus *Morpho*) in having the discoidal cell of the hind wings open and unaccompanied by a small prediscoidal cell, thus differing from *Pavonia*, *Dynastor* and *Opsiphanes*, which have the discoidal cell of the hind wings closed, and accompanied by a small prediscoidal cell,—a character which had not, as far I am aware, been noticed by any previous writer, and which (so far also as I am aware) is found in no other group of butterflies.

Genus THAUMANTIS, Hübner, E. Doubleday, Boisduval  
(*Morpho*, Godart, Horsfield, Zinken-Sommer).

These insects are the finest representatives of the family occurring in the East, almost vieing, in this respect, with the gigantic *Morphos* of the Western Continent, not only in their large size, but also in the brilliant patches of glossy purple or blue with which some of them are adorned. They are closely allied to *Clerome*, from which they differ in their larger size, more strongly marked colours, and the greater distance apart of the branches of the post-costal vein of the fore wings, which are either partially coalesced with the costal vein, or, if free, are only three in number.

I purposely omit the detailed generic characters of this and the following genera, as they will be found in the "Genera of Diurnal *Lepidoptera*."

The species form two marked divisions:—

1st. Those with four branches to the post-costal vein of the fore wings, two of which coalesce with the costal vein, comprising the type of the genus *Th. Odana* and its allies, and also the fine large species *Th. Aliris*.

2nd. The three species, of large size, which have only three branches to the post-costal branch of the fore wings, all of which are free, namely, *Th. Camadeva*, *Howqua*, and *Normahal*.

Sp. 1. *Thaumantis Odana*, Godart.

*Th. alis omnibus nigro-fuscis*; anticis supra fascia lata obliqua disci perpulchre cærulea, nitida medio pallidiori, puncto subapicali albo; subtus strigis disci margineque apicali griseo-seu lilacino-albidis, posticis puncto parvo marginis costalis, ocelloque magno versus angulum analem supra luteo-cincto.

Expans. alarum circ. unc. 4.



Syn. *Morpho Odana*, Godart, Enc. M. ix. p. 445, n. 16; Horsfield, Cat. Lep. Ins. Coll. East Ind. Comp. pl. 6, f. 5 and 5 a; Boisdual, Spec. Gen. Lep. 1, pl. 12 (8 B.), f. 1; Doubl., Westw. and Hewits. Gen. D. Lep., p. 336 (*Thaumantis Odana*).

*Thaumantis Oda*, Hubner, Samml. Exot. Schmett. Bd. ii. pl. —.

*Morpho Klugius*, Zinken-Sommer in Nov. Acta, xv. p. 165, pl. 15, f. 12, 13 (male mistaken for female by Z. S.)

Habitat in Java, Singapore, etc.

The costal vein of the fore wings in this species apparently extends into the pale submarginal fascia, emitting two branches to the costa, the first of which is, in fact, the real termination of the costal vein; the second, as well as the apparent termination of the costal, being the extremities of the first and second branches of the subcostal vein, of which the third and fourth branches are free.

The under surface of the wings varies considerably in the intensity of the markings, especially in specimens from Singapore, from whence it has been sent by Mr. Wallace. The male has a patch of hairs at the base of the hind wings on the upper side.

In its colours there is no difference between the sexes of this species.

### Sp. 2. *Thaumantis Diores*.

*Th. alis omnibus nigro-fuscis, singula supra macula magna disci, perpulchre cærulea, nitida; subtus strigis disci fuscis marginisque externo albidis, posticis ocellis duobus mediocribus supra luteo-marginatis.*

Expans. alar. 3 unc. 9 lin.

Syn. *Thaumantis Diores*, E. Doubleday in Ann. of Nat. Hist. xvi. p. 234 (1845); Doubl., Westw. and Hewits., Gen. D. Lep. p. 337.

Habitat Ind. Orient. septentr. Sylhet, Assam.

Above all the wings fuscous black, the anterior with a broad band-like spot, commencing near the costa beyond the middle, and extending towards the anal as far as the lowest median nerve. This spot is of a brilliant metallic changeable blue, much paler and less changeable externally. On the posterior wings is a large patch of the same rich blue, paler in the centre, occupying the whole disc of the wing. Below, all the wings less black than above, the outer margin paler; this pale portion bounded internally by an undulated pale or whitish striga, becoming brown towards its termination at the anal angle of the posterior wings; between

this and the margin is another less distinct similar striga. The anterior wings have besides two fuscous strigæ in the discoidal cell, inclosing a paler space, and a third striga commencing on the costa beyond the cell, and extending obliquely nearly to the anal angle, slightly bordered internally with whitish. The posterior wings have a transverse fuscous striga near the base, and another commencing near the middle of the costa, and reaching nearly to the anal angle. Just within the pale submarginal striga, near the costa, is a round yellowish spot inclosing a brown one, placed towards its outer margin, and between the first and second median nervule a round black spot, sprinkled with blue atoms anteriorly, and surrounded by a yellowish and black iris; anal angle with a geminate spot, composed of black and white atoms; head, thorax and abdomen fuscous. Doubleday, l. c.

The male has a patch of brown hairs capable of erection at the base of the hind wings on the upper surface. The apical angle of the fore wings and the anal angle of the hind wings is much more rounded than in the *Odana*; the body is also much less robust. The branches of the post-costal vein of the fore wings in this species are of the same number and almost identical in their arrangement with those of *Th. Odana*.

Sp. 3. *Thaumantis Ramdeo*, Moore, MSS.

This species, or perhaps more properly local variety, is closely allied to *Th. Diores*, differing from the typical specimens of that species "in being somewhat larger and in having the brilliant blue patch very large (being an inch in diameter either way), and which extends over the whole of the middle of the wings. The under side is paler than in *Diores*, and the wavy line running near the exterior margins of the wings in *Diores*, is nearly obsolete in *Th. Ramdeo*, and the two ocelli on the hind wings are very small."

Habitat Darjeeling, Upper India.

Expansion of the fore wings of the male 4 inches, of the female  $4\frac{3}{4}$  inches.

Sp. 4. *Morpho Klugius*, Zinken-Sommer.

*Th. alis maris disco atro-cæruleis fulgidis, striga tenui antica albida lineaque undata subapicali pallidiori.* Mas.

Expans. alar. antic. unc.  $3\frac{1}{2}$ .

Syn. *Thaumantis Klugius*, Zinken-Sommer in Nova Acta, xv. p. 165, pl. 15, f. 11 (male only); Doubl., Westw. and Hewits., Gen. D. Lep. p. 337.

Habitat in Insula Java.

“Beide Flügel des Mannes sind oben braunschwarz, und mit Ausnahme des Vorder und Hinterrandes, welche matt sind, von dem lebhaftesten schwarzblau schillernden Glanze; übrigens einen kleinen weisslichen Fleck am Vorderrande nahe vor der Spitze ausgenommen, ohne alle weitere Zeichnung. Unten sind alle Flügel dunkel kastanienbraun gefarbt; vor dem Hinterrande beider läuft eine blauweiss bestäubte, inwendig gerade, auswendig klein-gezahnte Binde herum; hinter welcher der Rang braunlich ist. Die Wurzel ist ungleich blauweiss bestäubt, und dadurch hell und dunkel streifig gescheckt. Am Manne sind diese Streifen kaum bemerkbar. Ausserdem zieht noch auf den Vorderflügeln, gerade auf der Stelle wo bei dem Weibe [of *Odana*] oben die blaue Binde liegt, hier bei beiden Geschlechtern eine weiss Binde quer über, welche mit einem gegen die Wurzel gekrümmtem, kleinen Haken auf die vorletzten oder sich endigt; und auf den Hinterflügeln liegen dicht hinter der weisslichen Randbinde zwei am Manne kleinere—schwarze zunächst, mit einem schwefelgelben und dann mit einem schwarzen Ringe umzogene Augenflecke, einer im Vorderwinkel, der andere in einiger Entfernung vom Innenwinkel.”—Zinken-Sommer, l. c.

The male of this species described by Zinken-Sommer was regarded by him as the male of his *Morpho Klugius*, the female of which is the *Th. Odana*. It is however perfectly distinct, and is much nearer to the species next described under the name of *Thaumantis Lucipor*.

Sp. 5. *Thaumantis Lucipor*, Westw.

(Pl. 19, fig. 1, 1 a, male; fig. 2, 2 a, female.)

*Mas.*—*Th. alis rotundatis supra nigris, apice fusciscentibus disco omnium nitidissime violascenti-cæruleo; alis infra fuscis purpureo parum tinctis; anticis striga oblique recta e medio costæ fere ad angulum analem extensa, parum lilacina; limbo communi pallidiori et e disco striga obscuriori separato; puncto luteo versus apicem marginis costalis posticarum ocelloque parvo pone medium versus angulum analem nigro, semicirculo albo circuloque tenui nigro; antennis ferrugineis.*

*Fœm.*—*Multo pallidior, colore cæruleo vix ultra medium alarum omnium extenso, fascia tenui obliqua media anticarum subalbida alteraque undata submarginali in alis posticis minus obvia, lut. scentis.*

Syn. *Thaumantis Lucipor*, Westw. in Doubl., Westw., and Hewits., Gen. D. Lep. p. 337.

Expans. alarum maris unc.  $3\frac{1}{8}$ , fœm. unc. 4.

Habitat Borneo (Sarawak), D. Wallace.

In Mus. Brit., Saunders, Wallace.

The male has the wings above black-brown, glossed with intense purple blue, most conspicuous on the anterior pair; at about one-sixth of the length of the wings from the tip is a minute pale dot scarcely visible, the outer margin of the wings from this dot to the anal angle being of an uniform brown colour, the dark glossed part terminating in a series of waves.

The female is of a much paler brown on the upper side, and the blue much less intense in its gloss; it extends also only to about half the length of the wings, being bounded in the fore wings by an oblique whitish line, extending from near the middle of the costa towards the anal angle; near the apical angle are two luteous spots, followed by a waved line, extending to the anal angle; the hind wings with a waved dark brown subapical line, the space within which is rather paler.

On the under side the male has the wings of a dark rich brown and the females of a paler brown. There is an oblique pale bar running across the middle of the wing, recurved at its lower extremity, so that it does not unite with the lower extremity of the wide dark obconical inner boundary of the broad pale apical margin, through which runs a slender dark waved line (almost obliterated in the male); there are also some patches of pale scales (most conspicuous in the female) within the discoidal cell, indicating rudimental fasciæ. The hind wings are also traversed a little before the middle by a nearly straight dark line, edged on its outer margin with pale scales, and which unites near the anal angle with the wide dark obconical inner boundary of the wide pale apical margin, through which also runs a deeply waved dusky line, between which and the dark inner boundary there is a thick sprinkling of pinkish scales. Within this dark boundary line are also two black ocelli, slightly powdered with blue scales above, and surmounted by pale yellow crescents. The basal portion of the hind wings is also powdered with patches of pale scales, indicating several dark rudimental fasciæ.

The four branches of the post-costal vein are arranged nearly as in *Th. Odana* (pl. 19, fig. 1 c), and the male has a double patch of black hairs at the base on the upper side (fig. 1 b).

Sp. 6. *Thaumantis Noureddin*, Westw.

(Pl. 20, fig. 1, 1 a, male; fig. 2, 2 a, female.)

*Mas.*—*Th.* alis anticis sub apicem parum angulatis, anguloque anali posticarum in caudam brevem latam subproductis; alis omnibus supra fuscis margine apicali paullo pallidiori, disco omnium purpureo vix tincto, singula posticarum fasciculis duobus pilorum nigrorum instructa; infra castaneo-fuscis, fascia communi submarginali magis castanea, posticis ocellis duobus, magnitudine fere æqualibus, semicirculo albo circuloque nigro circumeinctis.

*Fæminæ.*—Supra pallidior, tertia parte basali alarum cæruleo-tincta; anticis fascia abbreviata valde obliqua pone medium alarum strigaeque submarginali macularum lutearum; subtus fascia tenui albida obliqua intus, versus angulum analem, recurva et e fascia tenui recta subapicali distincta.

Expans. alarum maris unc.  $3\frac{3}{4}$ ; fæminæ unc.  $4\frac{1}{8}$ .

Syn. *Thaumantis Noureddin*, Westw., in Gen. Diurn. Lep. p. 337 ♂.

Habitat in Malacca, D. Wallace. India? in Brit. Mus.

The angulated apex of the fore wings, and the produced anal angle of the hind wings, distinguishes this insect from all the other species of the genus. The male has the upper surface of the wings of an intense dark blackish purple, with the outer limb paler brown, a few fulvous scales forming a small spot near the costa at about one-sixth of the length of the wing from its extremity; the hind wing is unspotted.

The upper surface of the wings of the female is much paler than in the male, with a rich but paler blue gloss not extending beyond the basal half of the wing; near the middle of the costa arises a very oblique abbreviated buff fascia, and parallel with the apical margin is a row of small oval dark buff dots; the hind wings are unspotted. On the under side the fore wings in the female are marked by a conspicuous pale buff oblique narrow fascia running from near the middle of the costa towards the anal angle, near which it is waved and recurved, not joining the slender pale buff nearly straight submarginal line; within the discoidal cell are several small patches of luteous scales, obsoletely indicating fasciæ. In the male the central oblique fascia of the female is indicated only by a slightly paler tint in the corresponding part of the wing. The hind wings have a pale slender striga running from within the outer angle to within the anal angle, which is outwardly marked with a pale and a black spot; across

the middle of the wing is a broad slightly darker fascia extending outwardly to the extremity of the discoidal cell.

The branches of the post-costal vein are arranged as in *Th. Lucipor* (pl. 20, fig. 2 b).

Sp. 7. *Thaumantis Aliris*, Westw.

(Pl. 17, upper and under side of the female.)

*Th. alis anticis supra fuscis basi magis ferrugineis, fascia obliqua media maculisque duabus subapicalibus albis, posticis fuscis dimidio externo plus minusve fulvis; subtus omnibus basi griseis lituris brunneis, fascia obliqua lata irregulari brunnea, anticis fascia obliqua alba paginæ superioris, linea pallida margine apicali paralella adjecta, posticis ocellis duabus magnis æqualibus pone medium apicibusque late fulvis. Mas et fœm.*

Expans. alar. maris circ. unc. 5; fœm. unc. 6½.

Habitat in insulis Borneo et Malacca, D. Wallace. Mas in Mus. Wallace; fœm. in Mus. Hopeiano, Oxoniæ (olim nostr.).

Of this noble species I have only seen a single pair,—the male in the collection of Mr. Wallace, collected by himself in Malacca; and the female now in the Hopeian Collection of the University of Oxford, which I lately obtained at a sale by auction at Mr. Stevens's Rooms. It is the female which is represented in plate 17. The male is considerably smaller, with the oblique fascia of the upper side of the fore wings about half the width of that of the female, and with two white spots near the tip of the fore wings, which are considerably suffused with ferruginous at the base; such is also the colour of the base of the hind wings, which is gradually shaded off to a rich fulvous colour; there is, however, a broad dark longitudinal patch extending to the outer margin of the wing, occupying the space between the second and third branches of the post-costal vein. On the under side the markings agree in the two sexes, except that the oblique bar of the fore wings is even rather narrower than on the upper side, and the great ocelli are also much less conspicuous than in the female. The middle of both fore and hind wings is occupied with a broad irregular chocolate-ferruginous bar. The post-costal vein of the fore wings emits four branches. The first branch arises at some distance before the extremity of the discoidal cell, and joins the costal vein before the juncture of the latter with the costa, being again emitted from below the extremity of the costal

vein, and after running a short distance joining the costa; the base of the second branch of the post-costal vein forms a short transverse veinlet between the end of the costal vein and the end of the first branch of the post-costal, its extremity being again emitted from the end of the first branch and uniting with the costa at a short distance beyond it; the third and fourth branches of the post-costal vein are free. The structure is, in fact, identical with that of the veins in *Th. Lucipor*, male, represented in plate 19, fig. 1 c, except that the lower disco-cellular connecting veinlet forms a much stronger arch towards the base of the wing. In the female, the second branch of the post-costal vein (plate 17, fig. 2 b) slightly coalesces with the outer portion of the first branch, 2 a, (more closely, indeed, than is represented in the space between the † and the letters 2 a,) thus proving most satisfactorily the real nature of these apparently supplemental branches of the costal vein.

This beautiful species is dedicated to Aliris, the youthful poet-king of Bucharia, whose love for Lalla Rookh, under his minstrel name of Feramorz, has been so charmingly told by one of the most delicious of modern poets.

Sp. 8. *Thaumantis Camadeva*, Westw.

*Th. alis anticis supra albis, plumbeo-cæruleo tinctis, basi brunneis, fascia submarginali macularum alteraque lunularum fuscis; alis posticis fuscis, basi brunneis, fascia lunularum plumbeo-albarum pone medium; alis infra basi albidis, apicibus fulvis, fascia lata communi fulva utrinque linea nigra cincta ante medium alarum ocellisque 5 (in singula ala) rubris iride nigra, pone medium strigisque duabus submarginalibus pallide fuscis.*

Expans. alar. antic. unc.  $4\frac{1}{2}$ .

Syn. *Morpho (Thaumantis) Camadeva*, Westw., Cab. of Orient.

Entomol. p. 9, pl. 4, f. 12; Doubl., Westw. and Hewits.,

Gen. D. Lep. pl. 55, f. 2, p. 337.

Habitat Himalaya, Sylhet.

In Mus. Brit., Hop. (Oxon. olim nostr.), &c.

This beautiful species, from its exquisite beauty, is dedicated to the Indian God of Love—Camadeva. (See Sir Wm. Jones.)

The general appearance of the two sexes is nearly identical. The male has a tuft of hairs at the base of the hind wings on the upper side. The post-costal vein has only three branches; the first arising before the extremity of the discoidal cell; the second

rather before the junction of the first branch with the costa; and the third slightly in advance of the row of ocelli; the terminal part of the post-costal vein being more oblique than usual.

Sp. 9. *Thaumantis Howqua*, Westw.

(Pl. 18, fig. 2, 2 a.)

*Th.* alis supra fulvis, omnium serie subapicali lunularum nigrarum valde curvata, maculis hastiformibus nigris, in alis posticis majoribus, antice adjectis; alis infra luteo-fulvis, strigis duabus obliquis irregulariter sinuatis, 1ma ante et 2nda pone medium alarum anticarum, et ante et per medium posticarum extensis, externa e costa fere ad angulum analem ducta ubi recurvata; nubila recta obliqua fusca submedia ad angulum analem extensa, macula grisea terminata; alis anticis ocellis tribus, posticis quinque rufis, pupilla alba iride tenui nigra strigisque duabus parallelis vix angulatis prope marginem apicalem. (Mas et fœm.)

Expans. alar. antic. unc. 5.

Habitat Shanghai, China. (D. Fortune.)

In Mus. Britann., Hop. Oxon., &c.

Syn. *Thaumantis Howqua*, Westw. in Trans. Ent. Soc.

Like the *Camadeva*, this insect has only three branches to the post-costal vein of the fore wings (pl. 18, fig. 2 a, 2 b, 2 c). The sexes also agree in their general appearance.

Sp. 10. *Thaumantis Nourmahal*, Westw.

(Pl. 18, fig. 1, 1 a, female.)

*Th.* alis supra castaneo-fuscis, anticis fascia latissima fulva obliqua, pone medium ad marginem et angulum analem extensa, serie communi submarginali literarum V fuscicarum alteraque lunularum ejusdem coloris, puncto albo subapicali anticarum: alis infra badio-fulvis, fasciis duabus angusti fere rectis virescenti-argenteis obliquis, 1ma per medium cellulæ discoidalis extensa, 2nda fere e medio costæ ad angulum analem currente, singula intus linea nigra marginata; margine externo lato pallidiori, in quo ocelli 2 ferrugineo-fulvi in alis anticis, 3 in posticis, singulo puncto medio lunulari albo notato; lineis duabus valde flexuosis et dentatis nigris submarginalibus maculaque nigra lilacino parum irrorata in angulo anali. (Fœm.)



Syn. *Thaumantis Nourmahal*, Westw. in Doubl., Westw. and Hewits., Gen. Diurn. Lep. p. 337.

Expans. alar. maris unc.  $3\frac{3}{4}$ ; fœm. unc.  $4\frac{1}{2}$ .

Habitatin India Orientali.

In Mus. East Ind. Comp., Saunders et Mus. Brit.

The description published by me in the "Genera of Diurnal *Lepidoptera*," was made from a female at that time unique in the collection of W. W. Saunders, Esq., F.R.S., President of our Society. The East India Company has, however, subsequently received both sexes from India. The male differs from the female, as I am informed by Mr. F. Moore, merely in wanting the white subapical spot near the extremity of the fore wings.

On the upper side the wings are of a rich chesnut brown colour, the fore ones having a very broad oblique fulvous fascia, extending from the costa to the apical margin and anal angle; the tip of the wings being dark brown, with a small white subapical spot in the female. There is also a series of submarginal brown V-shaped marks, and another of brown lunules in all the wings. Beneath the colour is paler, with a broad oblique subcentral fascia, edged with a slender black slightly irregular line on each side, the one nearest the base being internally, and the outer one externally edged with a line of pale silvery greyish green scales. The discoidal cell in the fore wings is closed by black veins, but in the hind wings the outer black striga forms its termination. The fore wings have also five ocelli, and the hind ones three, in the alternate spaces between the veins, the intervening spaces being marked by paler dots, indicating obsolete ocelli. Near the apex of the wings are two slender dentated black lines, ending at the anal angle in a black dot, slightly suffused with lilac scales.

As in the two preceding species, the fore wings have only three branches, arising from the post-costal vein of the fore wings. (Pl. 18, fig. 2 a, 2 b, 2 c.)

The charming play of colour on the underside of the wings of this species has suggested the specific name of *Nourmahal*, "The Light of the Harem" of Jehanguire, renowned for

"Loveliness, ever in motion, which plays  
Like the light upon Autumn's soft shadowy days:  
Now here and now there giving warmth as it flies,  
Now melting in mist and now breaking in gleams."—*Moore's Lalla Rookh*.

## Genus DRUSILLA, Swainson.

*Hyades*, Boisduval.*Morpho*, p., Zinken-Sommer.*Tenares*, Hübner (Verzeichniss.)

These insects differ chiefly from *Thaumantis* in the more elongated form of the fore wings; the existence of four free branches of the post-costal vein of the fore wings, the second, third, and fourth of which arise far beyond the extremity of the discoidal cell; the very large and striking eye-like spots with which the hind wings are ornamented; and the general dull colouring of the insects.

Sp. 1. *Drusilla Urania*, Linn.

Alis oblongis integerrimis fusciscentibus, disco plus minusve albidis seu albis, posticis ocellis utrinque binis externo supra fere obsoleto.

Expans. alar. antic. circ. unc. 4 $\frac{3}{4}$ .

Syn. *Papilio Urania*, Linnæus, Syst. Nat. Ed. x. p. 446, No. 48; Mus. Lud. Ulr. p. 225; Syst. Nat. ii. p. 756; Fabricius, Ent. Syst. iii. pt. 1, p. 166, No. 512.

*Papilio Jairus*, Fabricius, Gen. Ins. Mant. p. 258; Ent. Syst. iii. pt. 1, p. 54, No. 168; Cramer, Pap. pl. 6, fig. A. B., pl. 185, fig. A. B. C.; Godart, Enc. M. ix. p. 445 (*Morpho J.*); Boisduval, Voy. de l'Astrolabe, Entomol. pt. 1, p. 157; Donovan, Ins. of China, pl. 33, fig. 1, 2.

*Oreas dubia Jaira*, Hübner, Samml. Ex. Schm. Bd. pl.

*Tenaris Nysa*, Hübner, Verz. bek. Schm. n. 493.

*Papilio Cassiæ*, Clerck, Icones, f. 29, f. 3.

Habitat in Amboyna, Rawak, New Guinea.

The following is the Linnæan definition published in the Museum Reginæ Ludovicæ Ultricæ.

*Papilio* alis oblongis integerrimis fusciscentibus disco albis, posticis ocellis utrinque binis. Corpus secundæ magnitudinis. Alæ primores utrinque fusæ, discus albidus immaculatus. Posticæ utrinque fusæ disco albedo, ocelli 2 grandes flavi iride nigro cærulescente cincti nigredine, pupilla alba minima; horum alter ad marginem anteriorem, alter vero fere in disci medio.

Fabricius simply took up the species *Urania* from the writings of Linnæus as above referred to, placing it among his *Heliconii*, not being aware of its identity with his *Papilio Jairus*, which he had placed among his *Festivi*, with the following description:

“Magnus. Alæ omnes integerrimæ fuscæ, anticis fascia fere obsoleta, posticis disco albidis. Ocellus magnus cœruleus, iride flava pupillaque alba alarum posticarum et subtus duo ejusdem coloris, quorum posteriori interdum ocellis minor pupillatus adnatus.”

There is considerable diversity in the pale shade of the fascia of the fore wings, and hence Clerk's figure has a much greater extent of white than Donovan's or Cramer's. Cramer's figure also in his plate 6 exhibits a variety with a minute ocellus, joining to the large discoidal one as described by Fabricius.

Sp. 2. *Drusilla Horsfieldii*, Swains.

Alis anticis elongatis fuscescentibus, margine interno sinuato; posticis interne albis, supra ocello unico, subtus duobus, mediocribus.

Expans. alar. fere unc.  $3\frac{1}{2}$ .

Syn. *Drusilla Horsfieldii*, Swainson, Zool. Illustr. 1st Series, t. 11; Doubl., Westw. and Hewits. Gen. D. Lep. pl. 54, f. 4, p. 335.

*Hyades Horsfieldii*, Boisduval, Spec. Gen. Ins. Lep. pl. 13 (9 B.), f. 1.

*Morpho Urania*, Zinken-Sommer in Nova Acta, xv. p. 167, nec Linnæus.

Habitat in Insula Java.

Sp. 3. *Drusilla Catops*, Boisd.

*D.* alis albis, anticarum costa apiceque late fuscis, posticis albis basi pallide fulvescenti, angulo externo fusco ocellisque duobus paginæ inferæ supra parum distinctis.

*Hyades Catops*, Boisd. MS.

*Drusilla Catops*, Doubl., Westw. and Hewits, Gen. D. Lep. p. 335.

Habitat New Ireland.

Sp. 4. *Drusilla Selene*, Boisd.

*D. Uranix* major et multo pallidior; alis anticis fœminæ albo magis distincto, ocellisque posticarum maximis et supra distinctis.

*Hyades Selene*, Boisd., MS.

*Drusilla Selene*, Doubl., Westw. and Hewits., Gen. D. Lep. p. 335.

Habitat New Guinea.

Sp. 5. *Drusilla Phorcas*, Westw.

(Pl. 21, fig. 1.)

*D. alis rotundato-oblongis integerrimis fuscis, omnibus plaga magna subovali alba ex angulo anali ultra ramos venæ discoidalis extensa, posticis supra ocello unico, subtus duobus; externo lunula pallida supra instructo.*

Expans. alar. antic. unc.  $4\frac{1}{4}$ .

Habitat ———? Dom. McGillivray. In Mus. Britann.

On the upper side the hind wings have the outer angle wholly brown, without any trace of the ocellus; the white patch is rather larger and the outer brown ring of the anal ocellus is replaced by a very few brown scales.

Beneath, the white patch of the fore wings extends into the space between the third branch of the discoidal vein and the lower disco-cellular: such is also the case with the patch on the hind wings; but in these wings it is united with a white lunule surmounting the outer ocellus.

The palpi are fulvous.

Sp. 6. *Drusilla Mylæcha*, Westw.

*D. alis niveis, omnium utrinque costa nigricanti, posticis subtus ocellis duobus magnis æqualibus nigris pupilla minima alba circulo latiori fulvo alteroque tenui nigro circumcinctis, capite thoraceque subtus nigris, palpis fulvis, abdomine lutescenti (mas et fœm.)*

Expans. alar. antic. unc. 4.

Habitat in Insulis Louissiadis maris Indici (D. McGillivray).  
In Mus. Britann.

*D. Mylæcha*, Westw., in Trans. Ent. Soc., vol. 1, n. 5, p. 175;  
White in McGillivray's Travels, pl. 4, figs. 3, 4.

Genus CLEROME, Boisduval, MS.

*Faunis*, p., Hübner.

*Satyrus*, p., Godart.

This is a genus of very plain-looking butterflies, which, although united by Hübner and Godart with the *Hipparchiidae*, are most nearly allied to *Drusilla*, agreeing therewith not only in the general arrangement of the wing veins, (there being four free branches of the post-costal vein of the fore wings,) but differing in the shorter and more rounded wings, and in the more or less distinct strigæ on the under side. They are of comparatively small size, and have much the appearance of species of *Hipparchiidae*.

Two curious species, differing considerably from the types of

the genus which have been sent from the Eastern islands by Mr. Wallace, are described below, as forming distinct subgenera.

Sp. 1. *Clerome Arcesilaus*, Fabricius.

*Cl. alis* integris supra fusco-ochraceis, immaculatis, subtus fuscis, seu umbrino-fuscis, omnibus strigis tribus obscuribus (prima interdum subobsoleta), serieque punctorum flavorum.

Expans. alar. antic. unc.  $2\frac{1}{8}$ — $2\frac{3}{4}$ .

Habitat Siam, Java, Malacca, India, Sylhet.

*Papilio* (N.), *Arcesilaus*, Fabricius, Ent. Syst. iii. 1, p. 153, No. 470; Donovan's Ins. of India, pl. 30, fig. 2, Edit. Westw. p. 45 (*Hipparchia*? Arc.); Doubl., Westw. and Hew. Gen. Diurn. Lep. pl. 54\*, fig. 5 (*Clerome* Arc.); Latreille et Godart, Enc. Méth. 9, p. 497; (nec *Pap. Arcesilaus*, Cramer, pl. 294.)

*Faunis Canens*, Hübner, Samml. Exot. Schm. v. 2, pl. 294.

*Morpho Leonteus*, Zinken in Nova Acta C. L. C. Nat. Curios. vol. xv. pt. 1, p. 170, pl. xvi. fig. 14, 15.

The uniform colour of the upper side of the wings, united to the minute and uniform size of the row of pale dots on the under side, will suffice to distinguish this species from *Cl. Eumeus*. Fabricius is silent as to the row of minute pale dots, but they are represented in Donovan's figure, as well as the sub-basal dark striga.

*Faunis Canens*, Hübner, agrees entirely with *Morpho Leonteus* of Zinken; the two outer strigæ of the underside being not very distinctly indicated, while the middle one is more suffused; the pale dot being very minute.

Specimens sent from Malacca by Mr. Wallace (about  $2\frac{1}{2}$  inches in expanse) differ in the richer red-brown colour of the upper side of the wings, and in having the outer dark strigæ obsolete on the fore wings.

A specimen from Singapore, in the British Museum, about  $2\frac{3}{4}$  inches in expanse, does not differ from Javanese individuals in the same collection; whilst specimens from India and Sylhet, in the same collection, and of the same size, have the upper surface richer and redder fulvous than the Java specimens, and on the underside the middle striga is more distinct, and much more angulated, and the row of white dots small.

Sp. 2. *Clerome Eumeus*, Drury.

*Cl. alis* integris rufo-fuscis, anticis utrinque fascia lata obliqua

fulva (apice ipso fusco), omnibus subtus strigis tribus sub-æquidistantibus, gracilibus obscuris serieque communi punctorum alborum, pone medium alarum, magnitudine et numero irregularibus.

Expans. alar. antic. circ. unc. 3.

Habitat China (Drury); India (Mus. Hunter, teste Fabr.)

Syn. *Papilio* (*Dan. Festiv.*) *Eumeus*, Drury, Exot. Ins. vol. i. pl. 2, f. 3, and vol. 2, App. (1773); ditto, Edit. Westw. vol. 1, p. 5. (*Hipparchia Eum.*)

*Papilio Eumea*, Cramer, ii. p. 132, pl. 183, fig. c. D. (1779).

*Papilio* (*Nymph.*) *Gripus*, Fabricius, Ent. Syst. iii. 1, 149, No. 457; Latreille et Godart, Enc. Méth. ix. p. 497, No. 70.

An old specimen in the Hopeian Collection, purchased from that of Mr. Haworth,—by whom the attached label, with the locality “China,” was written,—was, I have no doubt, one of the individuals described by Drury, with seven spots on each of the hind wings, Drury’s figure representing a specimen with five spots on each of the four wings; his description, however, indicates the variation of five or seven spots.

Drury’s figure does not represent the sub-basal dark striga, which is, indeed, almost obsolete on the fore wings, nor does he represent the strigæ on the hind wings.

Cramer’s insect from China is evidently identical with Drury’s, although there is a difference in the intensity of the strigæ, of which the subbasal one is also not represented by Cramer.

Fabricius described the species from the collection of Dr. Hunter, and as a native of India. His description accords with Drury’s figure. He describes the spots on the underside of the hind wings as larger than those of the fore wings.

In the British Museum collection is a specimen from Hong Kong  $2\frac{2}{5}$  inches in expanse, rich brown above, with the oblique fulvous subapical fascia of the fore wings more oblique, and with the strigæ of the hind wings nearly obsolete except the middle one of the hind wings, and the spots are round, large, and whitish.

Larger specimens from Assam, and another from India, in the Hopeian Collection at Oxford, and the British Museum, measure four inches in expanse, and have the broad, oblique, fulvous fascia of the fore wings but ill-defined, and gradually shaded off to the darker ground colour of the wings. The three strigæ of the underside are distinct: the outer one more angulated: the white spots are of unequal size: the fifth in the fore wings, and the first

in the hind wings, being the largest. If these large specimens should prove to be more than a geographical variety, they may be termed *Clerome Assama*, Westw.

Their right, however, to this distinction, and even the distinction between this species and *Cl. Arcesilaus*, is rendered doubtful by a specimen from Northern India, measuring  $3\frac{1}{2}$  inches in expanse, having the wings above of an uniform fulvous brown colour, whilst on the under side they are similar to the above described individuals from Northern India.

Sp. 3. *Clerome Phaon*, Erichson.

*Cl. alis integerrimis rotundatis supra ochraceo-fuscis immaculatis, subtus umbrinis, inferioribus ocellis duobus magnis.*

Expans. alar. antic. unc. 3.

Habitat in Insulis Luçon (Manillarum) et Borneo.

Syn. *Drusilla Phaon*, Erichson in Nova Acta Acad. C. L. C. Nat. Curios. vol. xvi. suppl. tab. XL. (L.), fig. 1 and 2 a, p. 279 (401); Doubl., Westw. and Hewitson, Gen. D. Lep. p. 337 (*Morpho Ph.*)

The figures given by Dr. Erichson exhibit, in addition to the two large ocelli on the disc of the hind wings, a slender dark curved line across all the wings at about one-fourth of the length of the wing from the base; a second similar striga across the middle of the wings; a minute pale dot near the extremity of the fore wings, and two fine slightly waved lines parallel to the outer margin.

The two large ocelli on the under side of the hind wings at once distinguishes this species from the preceding; whilst it gives it a similarity to the typical species of *Drusilla*.

Mr. Wallace has sent a very small specimen from Singapore, measuring not quite two inches in the expanse of the fore wings, having the wings on the upper side of a rich reddish brown-ochre colour, the under side being nearly identical, with the three strigæ distinct; the sub-basal one rather undulated, the middle one simply curved, and the outer one at a short distance from the outer margin and much angulated. The ocelli have a row of small dots; the first, second, fourth, and fifth are simply minute white specks; the third encircled with a small black ring, whilst the sixth is a small ocellus. The spots on the hind wing are similar to those in *Cl. Stomphax*, three minute white ones being interposed between the two ocelli, which are not so large as in the Manilla specimens. It will, doubtless, be considered that this individual

is a local variety of *Cl. Phaon*, and not a distinct species. A male specimen of *Cl. Phaon*, from Borneo, in the Collection of the East India Company, measures two and a-half inches, and a female measures three inches in expanse; the fore wings beneath have three minute white dots near the apex, and the hind wings have two large ocelli, that on the anal angle being the largest, the outer circle being dull yellow, with three minute white dots between the ocelli.

Sp. 4. *Clerome Stomphax*, Westw.

(Plate 21, figs. 3 and 4.)

*Cl. alis integerrimis margine antico anticarum valde rotundato, supra fusco-ochraceis, extus paullo obscurioribus; infra fuscis, anticis striola tenuissima angulata obscura subbasali, fascia angusta alba obliqua pone medium, guttisque tribus luteis subapicalibus; posticis striolis tribus tenuibus fuscis æquidistantibus, ocellis duobus punctisque tribus luteis intermediis.*

Expans. alar. antic. unc.  $2\frac{1}{2}$ .

Habitat in Borneo, Sarawak. D. Wallace. In Mus. Hewitson and Saunders.

The white oblique fascia on the under side of the fore wings at once distinguishes this insect from *Cl. Phaon*. The specimen represented is a male.

Sp. 5. *Clerome (Melanocyma) Faunula*, Westw.

(Plate 21, fig. 2.)

*Cl. alis anticis supra pallide-fuscis, posticis albidis, harum dimidio interno fulvo, omnibus subhyalinis, strigis paginæ inferioris supra indistincte apparentibus in alis posticis, alis subtus albis, dimidio interno posticarum fulvo, strigis 4 undulatis nigris. Fœm.*

Expans. alar. antic. unc.  $3\frac{3}{4}$ .

Habitat Singapore; Mount Ophir, Malacca. D. Wallace. In Mus. Brit. et Wallace.

*Thaumantis Faunula*, Westwood in Gen. Diurn. Lep. p. 334, pl. 54, f. 1.

In the "Genera of Diurnal *Lepidoptera*" I arranged this singular insect in the genus *Thaumantis*. The arrangement of the branches of the veins of the fore wings is however unlike that of any of the species of that genus, agreeing in the circumstance of the second branch of the post-costal vein of the fore wings arising far beyond the extremity of the discoidal cell, as well as in the shortness of



the wings, with *Clerome*, in which latter respect also it differs from *Drusilla*. The fact however of its being entirely destitute of ocelli is perhaps of sufficient importance to warrant its sub-generic separation, in which case it may receive the name of *Melanocyma*. Mr. Hewitson having represented the upper surface of the insect on plate 54 of the "Genera of Diurnal *Lepidoptera*," the far more striking under surface is here only figured. The second branch of the post-costal vein of the fore wings, arises at about three-fourths of the length of the wings from the base opposite to the junction of the costal vein with the costa, and the fourth branch opposite to the junction of the extremity of the first branch with the costa. The lower disco-cellular vein closing the discoidal cell is singularly angulated, and the costal vein of the hind wings only extends to the middle of the costal margin. Another peculiarity of the species consists in the slight clothing of the wings, which enables the black undulated markings of the under surface to be partially seen from above.

The upper side of the fore wings is a pale brown, the lower ones being buff, with the inner half of a rich fulvous colour. Beneath the fore wings are still paler, being of a dirty white, the inner half of the hind wings more richly fulvous, the black bars form four irregular fasciæ independently of the submarginal line, which is dilated in the middle of the hind wings. The specimen in Mr. Wallace's collection which I have examined is a female.

Sp. 6. *Clerome (Xanthocænia) Busiris*, Westw.

*Cl.* alis supra castaneo-fuscis, anticarum dimidio apicali fusco, fascia recta obliqua flava punctoque subapicali albo; alis subtus pallidioribus; posticis strigis 4 valde undatis fuscis ocellisque 8 magnitudine irregularibus.

Expans. alar. antic. unc. 3.

Habitat in Malacca. D. Wallace. In Mus. Britann. et Wallace.

In the shortness and roundness of the fore wings, and in the upper surface being destitute of ocelli, this insect agrees with the genus *Clerome*, but differs in the broad oblique yellow fascia and subapical white spot of the fore wings, as well as the more elongated form of the hind wings and the insertion of the second branch of the subcostal vein at a short distance beyond the extremity of the discoidal cell, (opposite to the extremity of the costal vein, which only reaches to the middle of the costa,) the third and fourth branches of the post-costal vein of the fore wings rise a moderate

distance apart; the lower disco-cellular vein of the fore wings (closing the discoidal cell), although oblique, is nearly straight. The palpi are much compressed, of moderate size, thickly clothed with close adpressed hairs, the terminal joint distinct, slender, acute at the tip, and raised to the level of the top of the crown of the head. The antennæ are long, gradually but slightly clavate, the tip a little curved and acute; they are brown, the outer half ferruginous. From all these characters I have no hesitation in regarding this insect as a distinct subgenus, to which I have applied the name of *Xanthotænia*, in allusion to the yellow fascia of the fore wings. The general colour of the wings above is rich but dull chestnut-brown; the hind wings immaculate; the fore ones with the outer half dark brown, with a moderately broad, nearly straight yellow fascia, extending from the middle of the costa nearly to the outer margin (below the middle), and with a sub-apical white dot. Beneath the wings are pale brown (without any chestnut tinge), the hind wings with four deeply scalloped, slender brown strigæ, the space between the second and third being the widest, inclosing eight ocelli of unequal size, the second and sixth from the costa being the largest; they are thickly powdered with grey scales, and are surrounded by a very narrow yellow ring: the space between the third and fourth strigæ is paler than the rest of the wing, and between the first and second strigæ is a short transverse dark line, being the vein closing the discoidal cell. In the fore wings the discoidal cell is marked in the middle with a very strong angulated brown slender line, and between the white subapical dot and the extremity of the yellow oblique fascia are two small nearly rudimental ocelli similar to those of the hind wings.

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I here take the opportunity of adding a figure and description of a striking species of the genus *Discophora*, of which short characters were published in the "Genera of Diurnal *Lepidoptera*."

*Discophora Zal*, Westw.

(Plate 21, figs. 5 and 6.)

*D. alis anticis apice subfalcatis; posticis in medio marginis postici anguloque anali angulatis; supra fulvis, anticarum costa pallida, dimidioque apicali fusco triplici serie macularum, serie interna alba, alis fulvis; posticis fulvis triplici serie lunularum fuscarum nubilaque submarginali fusca:*

alis subtus luteo-albidis striga tenui punctisque prope basin fuscis, fascia parum distincta media obscuriori; ocellisque duobus minimis pone medium notatis.

Expans. alar. antic. unc.  $3\frac{5}{8}$ .

Habitat in India Orientali. In Mus. Brit. et Saunders.

This species is remarkable for the somewhat falcate form of the fore wings, and the angulated hind wings; the white colour also of the innermost row of spots on the fore wings is characteristic. In this pair of wings the ground colour is brown, the spots being pale-coloured, but in the hind wings the spots are so much increased in size as to constitute the ground colour of the wings, reducing the separating dark parts to rows of obscure lunules. The oblique vein which closes the discoidal cell is curved at its base, and marked by a dark brown spot, with a dark dot beneath it. There is also a corresponding dark dot on the discoidal cell of the hind wings, which is not closed by a discocellular transverse vein. The four branches of the post-costal vein are arranged nearly as in *Thaumantis Lucipor*; the first and second of these branches coalescing with the costal, but separated from it beyond its extremity. The antennæ are short, straight, and but slightly clavate.

The very pale buff colour of the under side of the wings, with the markings nearly obsolete, is also very characteristic.

XVI. *Characters of undescribed Diptera in the Collection of W. W. Saunders, Esq., F.R.S., &c. By FRANCIS WALKER, Esq., F.L.S., &c.—(Continued.)*

[Read 2nd February, 1857.]

Fam. 16. MUSCIDÆ.

Div. 1. CALYPTERÆ.

Sub-fam. 1. MYOPIDES.

Species few in number.

SYNOPSIS.

- \* Proboscis bigeniculata.
- † Antennarum articulus 2<sup>us</sup> 3<sup>o</sup> longior. *Myopa*, Latr.
- †† Antennarum articulus 2<sup>us</sup> 3<sup>o</sup> paullo brevior.
- ‡ Arista basalis. *Dalmannia*, Desv.; *Stachynia*, Macq.
- ‡‡ Arista subapicalis. *Stylogaster*, Macq.
- \*\* Proboscis basi geniculata. *Zodion*, Fabr.

Sub-fam. 2. TACHINIDES.

The study of this family is very difficult, owing to the abundance of species which it contains, and to the variety of characters by which they are distinguished. The number of species may be estimated at about 10,000, of which 1,000 are European. Specific descriptions of them are insufficient when they do not mention all the parts of the structure which are subject to variation, such as the following: The setæ, and especially those of the head; the frontalia; the face, whether inclined or vertical; the eyes; the antennæ; the form of the abdomen; the veins of the wings, and especially the præbrachial vein. The species are all parasitic on other insects, and almost every species has its peculiar prey, and has a corresponding variation in structure, and especially in the form of the antennæ. The length of the second joint of these organs should always be noticed, and the form of the third joint, which varies according to the sex, and according as the habit of the species varies, being the means which directs

it to its prey. The aperture on the inner side of this joint is very distinct in the *Echinomyiæ*, and probably may be discovered in all the species. The *Echinomyiæ* are the most highly developed group in the sub-family, the second joint of the antennæ having in them its greatest length, and the third joint its greatest development. The following synopsis includes most of the genera of *Tachina*, which is one of the seven groups into which this family is divided in Ins. Brit. Dipt. vol. 2:—

- \* Aristæ articulus 2<sup>us</sup> longus.
- † Antennarum articulus 2<sup>us</sup> 3<sup>o</sup> non brevior.
- ‡ Palpi thorace non breviores. *Dejeania*, Desv.
- ‡‡ Palpi non longissimi. *Echinomyia*, Dumeril.
- †† Antennarum articulus 2<sup>us</sup> 3<sup>o</sup> brevior.
- ‡ Arista recta.
- § Palpi mediocres.
- × Antennarum articulus 3<sup>us</sup> convexus. *Jurinia*, Desv.
- ×× Antennarum articulus 3<sup>us</sup> linearis. *Hystricia*, Macq.
- §§ Palpi breves, graciles.
- × Facies non inclinata, nec nuda. *Micropalpus*, Macq.
- ×× Facies inclinata, nuda. *Aprotheca*, Macq.
- ‡‡ Arista flexa.
- § Facies non inclinata.
- × Epistoma non prominens.
- Palpi non extantes. *Thryptocera*, Desv.
- Palpi extantes. *Exopalpus*, Macq.
- ×× Epistoma prominens. *Gonystylum*, Macq.
- §§ Facies inclinata. *Illigeria*, Meig.
- ×× Aristæ articulus 2<sup>us</sup> brevis.
- † Caput setis duabus longis erectis. *Heplacephala*, Macq.
- †† Caput setis nullis longis erectis.
- ‡ Corpus latum.
- § Antennæ brevis. *Trixa*, Meig.
- §§ Antennæ plus minusve longæ.
- × Abdomen brevissimum. *Trichophora*, Macq.
- ×× Abdomen non brevissimum.
- Palpi setis longis. *Lasiopalpus*, Macq.
- Palpi setis nullis longis.
- × Antennarum articulus 3<sup>us</sup> 2<sup>o</sup> non longior. *Hystricephala*, Macq.
- ×× Antennarum articulus 3<sup>us</sup> 2<sup>o</sup> vix duplo longior.
- Oculi pubescentes. *Nemoræa*, Macq.
- Oculi nudi.

- ++ Abdomen metallicum. *Chlorogaster*, Macq.
- +++ Abdomen non metallicum. *Chætoprosopa*, Macq.
- ××× Antennarum articulus 3<sup>us</sup> 2° duplo longior.
  - + Palpi breves.
  - ++ Frons setis triseriatim dispositis. *Tritaxys*, Macq.
  - +++ Frons setis non triseriatim dispositis. *Prosopochæta*, Macq.
  - ++ Palpi sat longi. *Exechopalpus*, Macq.
- ×××× Antennarum articulus 3<sup>us</sup> 2° triplo aut quadruplo longior.
  - + Tibiæ posticæ ciliatæ. *Blepharipeza*, Macq.
  - ++ Tibiæ posticæ nudæ.
    - ++ Antennarum articulus 3<sup>us</sup> convexus. *Epicampocera*, Macq.
    - +++ Antennarum articulus 3<sup>us</sup> linearis.
    - ∞ Antennæ epistoma non attingentes.
    - O = Facies non valde setosa. *Belvosia*, Desv.
    - OO = Facies valde setosa. *Polychæta*, Macq.
    - ∞∞ Antennæ epistoma sæpissime attingentes. *Eurigaster*, Macq.
    - ‡‡ Corpus plus minusve angustum.
      - § Arista nuda.
      - × Antennarum articulus 3<sup>us</sup> 2° sextus longior. *Phorocera*, Macq.
    - ×× Antennarum articulus 3<sup>us</sup> 2° triplo aut quadruplo longior.
    - + Antennarum articulus 3<sup>us</sup> 2° quadruplo longior.
    - ++ Frons fasciis nullis intermediis. *Masicera*, Macq.
    - ∞ Vena præbrachialis integra.
    - ∞∞ Vena præbrachialis incompleta.
      - O Facies erecta. *Roeselia*, Meig.
      - OO Facies obliqua. *Actia*, Meig.
    - +++ Frons fasciis duabus intermediis. *Heterometopia*, Macq.
    - ++ Antennarum articulus 3<sup>us</sup> 2° triplo longior.
      - Tibiæ posticæ non ciliatæ. *Lydella*, Macq.
    - +++ Tibiæ posticæ ciliatæ. *Blepharella*, Macq.
    - ×× Antennarum articulus 3<sup>us</sup> 2° non triplo aut non plus duplo longior.
      - + Antennæ elongatæ.
      - ++ Abdomen oviductu nullo elongato.
      - ∞ Oculi nudi; abdominis segmenta setis nullis disalibus.
      - O Antennarum articulus 3<sup>us</sup> 2° multo longior.
        - | Frons setæ minimæ. *Microtrichodes*, Macq.
        - || Frons setæ non minimæ.
        - + Frons prominens.

- O Antennarum articulus 3<sup>us</sup> 2<sup>o</sup> duplo longior. *Lamprometopia*, Macq.
- OO Antennarum articulus 3<sup>us</sup> 2<sup>o</sup> plus duplo longior.
- | Facies non inclinata. *Frontina*, Macq.
- || Facies inclinata.
- = Vena transversa discalis ad venæ discalis flexuram propior. *Metopia*, Meig.
- == Vena transversa discalis ad venæ discalis flexuram non propior. *Degeeria*, Meig.
- ++ Frons non prominens.
- ÷ Abdomen ovatum; frontis setæ vix descendentes. *Kodigaster*, Macq.
- ÷÷ Abdomen ellipticum; frontis setæ usque ad faciei medium descendentes.
- ∴ Antennarum articuli 2<sup>us</sup> et 3<sup>us</sup> longitudine fere æqualis. *Platytainia*, Macq.
- ∴∴ Antennarum articulus 3<sup>us</sup> 2<sup>o</sup> multo longior. *Tachina*, Fabr.
- ∞∞ Oculi pubescentes; corpus viride micans; abdominis segmenta setis discalibus. *Gymnocheta*, Desv.
- +++ Abdomen oviductu elongato corneo. *Teretrophora*, Macq.
- ++ Antennæ breves.
- × Caput latum. *Clytia*, Desv.
- ×× Caput vix latum.
- + Facies inclinata. *Apodacra*, Macq.
- + + Facies non inclinata.
- ++ Fascia frontalis linearis. *Senotainia*, Macq.
- +++ Fascia frontalis non linearis. *Miltogramma*, Meig.
- §§ Arista villosa aut tomentosa.
- × Corpus sæpissime flavescens-cinereum; maris frons perangusta. *Myobia*, Macq.
- ×× Corpus nigrum, nitens; maris frons latiuscula.
- + Alæ spina costali.
- ++ Vena præbrachialis costalem attingens.
- ∞ Abdomen hamulis duobus apicalibus. *Labidigaster*, Macq.
- ∞∞ Abdomen hamulis nullis.
- O Oviductus non prominens.
- | Abdomen non longum.
- + Antennarum articulus 3<sup>us</sup> 2<sup>o</sup> quintriplo longior. *Leptostylum*, Macq.
- + + Antennarum articulus 3<sup>us</sup> 2<sup>o</sup> non quintriplo longior. *Sericocera*, Macq.
- + + + Antennarum articulus 3<sup>us</sup> 2<sup>o</sup> triplo longior. *Aporia*, Macq.
- || Abdomen longum. *Megistogaster*, Macq.

- ≡OO Oviductus prominens. *Uramya*, Desv.  
 +++ Vena præbrachialis cubitalem attingens.  
 ∞ Vena præbrachialis cubitalem apicem versus attingens.  
 — Arista villosa; vena præbrachialis post flexuram arcuata.  
*Anthracia*, Meig.  
 = Arista vix tomentosa; vena præbrachialis post flexuram  
 recta. *Tryphora*, Meig.  
 ∞∞ Vena præbrachialis cubitalem longe ab apice attingens.  
 O Facies perobliqua; vena præbrachialis post flexuram  
 subarcuata. *Trichoprosopa*, Macq.  
 OO Facies vix obliqua; vena præbrachialis post flexuram  
 recta. *Scopolia*, Desv.  
 ++ Alæ spina nulla costali. *Melanophora*, Meig.  
 §§ Arista plumosa.  
 × Antennarum articulus 3<sup>us</sup> 2<sup>o</sup> triplo longior.  
 + Corpus ex parte pallidum. *Ochropleurum*, Macq.  
 ++ Corpus non pallidum. *Ebenia*, Macq.  
 ×× Antennarum articulus 3<sup>us</sup> 2<sup>o</sup> quadruplo longior. *Tricho-*  
*stylum*, Macq.

The genera *Exorista* and *Senometopia* may be associated with *Eurigaster*, *Phorocera*, and *Masicera*.

Most of the exotic genera are thus distributed geographically:—

AMERICA.—*Senotainia*, *Prosopocheta*, *Exopalpus*, *Trichoprosopa*, *Gonystylum*, *Aporia*, *Ebenia*, *Trichophora*, *Chaetoprosopa*, *Microtrichodes*.

AFRICA.—*Hoplacephala*, *Lamprometopia*, *Hystricephala*.

ASIA.—*Ochropleurum*, *Blepharella*.

AUSTRALIA.—*Trichostylum*, *Heterometopia*, *Aprotheca*, *Tritaxys*, *Exechopalpus*, *Polychæta*, *Chlorogaster*, *Teretrophora*.

### Genus ECHINOMYIA, Dumeril.

#### *Echinomyia furiosa*.

*Mas.*—Nigricans, luteo-tomentosa, subtus pallide testacea, frontalibus piceis, oculis pubescentibus, palpis antennisque rufescentibus, thorace vittis quatuor interruptis nigris, scutello pedibusque rufescentibus, abdomine rubro, alis cinereis, alulis testaceis.

*Male.*—Blackish, with luteous tomentum, pale testaceous beneath; head and thorax thickly beset with stout black bristles, head clothed behind and beneath with pale yellow hairs; frontalia piceous, widening much towards the antennæ; a few stout bristles



on each side of the epistoma, which is prominent; eyes pubescent; palpi clavate, reddish, antennæ reddish, third joint convex above, longer than the second arista, black, stout, longer than the third joint; thorax with four slight interrupted black stripes; scutellum reddish; abdomen deep red, shining, armed with numerous black spines; legs reddish; wings grey; veins black, præbrachial vein forming a right angle at its flexure, straight from thence to its tip, which is at some distance in front of the tip of the wing; discal transverse vein undulating, parted by less than its length from the border, and by hardly more than half its length from the flexure at the præbrachial; alulæ testaceous.

Length of the body 6 lines; of the wings 10 lines.

Rio Grande.

*Echinomyia platymesa.*

*Fem.*—Nigra, linearis, lurido-tomentosa, vix setosa, capite aurato subtus argenteo, frontalibus atris, facialibus nigro-lineatis, oculis nudis, scutello ferrugineo, pectore cano, abdomine ferrugineo-rufo depresso, pedibus nigris non setosis, femoribus fulvis, alis obscure fuscis apud marginem obscure cinereis, alulis testaceis.

*Female.*—Body linear, with very few black bristles; head gilded above, whitish silvery beneath, frontalia deep black, linear, facialia on each side with a black line, which is dilated towards the epistoma, the latter is slightly prominent; eyes bare; palpi short; antennæ black, third joint rounded at the tip, much longer than the second joint, arista much longer than the third joint; thorax with lurid tomentum, scutellum ferruginous; pectus hoary; abdomen ferruginous, red, rather flat; legs black, not setose, femora tawny; wings dark brown, irregularly dark grey along the hind border; veins black, præbrachial vein forming an obtuse angle at its flexure, slightly curved from thence to its tip, which joins the costal at the tip of the wing; discal transverse vein undulating, parted by less than half its length from the border, and by rather more than half its length from the flexure of the præbrachial vein; alulæ testaceous.

Length of the body 6 lines; of the wings 11 lines.

China.

*Echinomyia stolidia.*

*Mas.*—Nigra, crassa, cinereo-tomentosa, capite cervino antice subtusque albido subtus tumido, frontalibus luteis, palpis albidis, antennis rufescentibus, thorace subvittato, lateribus,

scutello pectoreque fulvis, abdomine rufescente-fulvo, vitta nigra, maculis duabus dorsalibus trigonis cinereis, pedibus fulvis, alis cinereis basi fulvis, alulis subcinereis fulvo-marginatis.

*Male*.—Black, very stout, with cinereous tomentum; head fawn colour above, whitish in front and beneath, with pale yellowish hairs behind and beneath, somewhat tumid beneath; frontalia pale luteous, widening towards the antennæ, bristles on each side irregular; facialia without bristles except towards the epistoma, which is very prominent; palpi whitish; antennæ reddish, short, third joint very convex above, not longer than the second; arista black, stout, short; thorax indistinctly striped, with numerous long bristles on each side; sides, scutellum and pectus tawny; abdomen reddish tawny, with a black stripe and with two dorsal triangular cinereous spots, armed with black spines, which are mostly towards the tip; legs tawny; wings grey, tawny at the base; veins black, tawny at the base and along the costa, præbrachial vein forming an acute angle at its flexure, near which it is curved inward and is straight from thence to its tip, which joins the costal at far in front of the tip of the wing; discal transverse vein straight, parted by less than its length from the border and by little more than half its length from the flexure of the præbrachial; alulæ slightly greyish, with tawny borders.

Length of the body 6 lines; of the wings 12 lines.

New South Wales.

#### Genus EURIGASTER, Macq.

##### *Eurigaster cuprescens.*

*Fœm.*—Nigra, lata, capite aurato, frontalibus atris, oculis pubescentibus, palpis fulvis, antennis basi rufis, thorace vittis quatuor scutelloque subcupreis, lateribus subauratis, pectore nigro-cinereo, abdomine brevi-obconico subcupreo, fasciis nigris, alis cinereis basi et apud costam fusciscentibus, alulis luridis.

*Female*.—Black, broad; head with pale gilded tomentum, frontalia deep black, widening towards the antennæ, with bristles along each side; facialia without bristles, except by the epistoma, which is slightly prominent; eyes pubescent; palpi short, tawny; antennæ red towards the base, not reaching the epistoma; third joint linear, about four times the length of the second arista, stout for one-fourth of the length, very much longer than the

third joint; thorax with four stripes of slightly cupreous tomentum, sides slightly gilded; scutellum slightly cupreous; pectus blackish cinereous; abdomen short, obconical, slightly cupreous above, with a black band on the hind border of each segment, tip somewhat bristly; wings grey, brownish at the base and along most of the costa; veins black, præbrachial vein forming a very obtuse angle at its flexure, very slightly curved from thence to its tip, which joins the costal vein at some distance in front of the tip of the wing; discal transverse vein curved inward near its hind end, parted from the border by a little less than its own length, and from the flexure of the præbrachial by a little more than its own length; alulæ lurid.

Length of the body 5 lines; of the wings 10 lines.

Hindustan.

*(Mac. Austro.) Eurigaster Tasmaniæ.*

*Fœm.*—Nigra, robusta, capite aurato-testaceo subtus tumido, frontalibus luteis, facialibus setosis, oculis pubescentibus, antennis basi rufescentibus, thorace cinereo lineis quatuor nigris, scutello ferrugineo, abdomine rufescente-nigro, apice albido, alis subcinereis basi testaceis, alulis albis.

*Female.*—Black, stout; head testaceous, tumid beneath, with gilded tomentum; frontalia dull luteous, widening towards the antennæ, the bristles descending to one-third of the length of the face; facialia with bristles along the whole length; epistoma very prominent; eyes pubescent; antennæ black, reddish at the base, extending to the epistoma; third joint linear, six times the length of the second; arista stout to its tip, rather shorter than the third joint; thorax with cinereous tomentum, which is interrupted by four slender black lines; scutellum ferruginous; abdomen reddish black, shining, pilose, and with several bristles, whitish and shining at the tip; wings slightly greyish, testaceous at the base; veins black; præbrachial vein forming an obtuse angle at its flexure, very slightly curved inward from thence to its tip, which joins the costal vein at some distance in front of the tip of the wing; discal transverse vein hardly undulating, parted by little more than half its length from the border, and by much less than its length from the flexure of the præbrachial; alulæ white.

Length of the body  $4\frac{1}{2}$  lines; of the wings 8 lines.

Tasmania.

*Eurigaster? languida.*

*Fœm.*—Nigra, robusta, cinereo-tomentosa, capite albo, frontalibus atris, oculis nudis, palpis fulvis, antennis piceis, thorace vittis quatuor nigris, scutello fulvo, abdomine ovato maculis duabus lateralibus fulvis, alis cinereis, alulis albidis.

*Female.*—Black, stout, with cinereous tomentum, beset with numerous bristles; vertex with a longer bristle on each side; head with white tomentum; frontalia deep black, linear, with two rows of bristles which extend to about one-third of the length of the face; facialia without bristles; epistoma not prominent; eyes bare; palpi tawny; antennæ piceous, not reaching to the epistoma; third joint linear, nearly thrice the length of the second; arista stout for about one-third of its length, much longer than the third joint; thorax with four black stripes; scutellum tawny; abdomen oval, a little longer than the thorax, with a tawny spot on each side of the second segment, and with two stout spines on its hind border, several stout spines towards the tip; wings grey; veins black; præbrachial vein forming a right angle at its flexure, curved from thence to its tip, which joins the costal at far in front of the tip of the wing; discal transverse vein almost straight, parted by less than its length from the border and from the flexure of the præbrachial; alulæ whitish.

Length of the body 4 lines; of the wings 7 lines.

Hindustan.

Genus *MASICERA*, Macq.

*Masicera longiuscula.*

*Mas.*—Nigra, capite albo subtus cano-piloso, frontalibus atris, oculis pubescentibus, palpis apice testaceis, thorace cano lineis quatuor nigris, abdomine elongato obconico, maculis lateralibus trigonis canis, alis subcinereis, alulis albis.

*Male.*—Black; head with white tomentum, clothed behind and beneath with hoary hairs; frontalia deep black, widening in front; facialia with bristles along the whole length, besides a few bristles which extend from each side of the frontalia; epistoma not prominent; eyes pubescent; palpi testaceous towards the tips; antennæ wanting; thorax hoary, with four black lines; abdomen elongate, obconical, much longer than the thorax, setose towards the tip, with large triangular spots of hoary tomentum on each side; wings slightly greyish; veins black; præbrachial vein

forming a nearly right angle at its flexure, near which it is slightly inclined inward, and is thence straight to its tip, which is near the tip of the cubital vein; discal transverse vein hardly undulating; parted by little more than half its length from the border, and by less than its length from the flexure of the præbrachial; alulæ white.

Length of the body 6 lines; of the wings 10 lines.

South America.

*Masicera albescens.*

*Mas.*—Nigra, cano-tomentosa, capite argenteo, frontalibus atris, palpis testaceis, oculis nudis, antennis basi rufescentibus, thorace vittis quatuor nigricantibus, abdomine obconico subtessellato lateribus ferrugineis, alis subcinereis, venis testaceis, alulis albis.

*Male.*—Black, with hoary tomentum; head with silvery white tomentum, clothed behind with whitish hairs; frontalia deep black, very slightly widening towards the antennæ; bristles descending from the front to nearly half the length of the face; facialia with a few bristles on each side towards the epistoma, which is not prominent; peristoma and palpi testaceous; eyes bare; antennæ reddish towards the base, almost reaching the epistoma; third joint linear, full four times the length of the second; arista slender, very much longer than the third joint; thorax with four indistinct blackish stripes; abdomen obconical, slightly tessellated with a few black spines towards the tip; sides ferruginous; wings greyish; veins testaceous; præbrachial vein forming an obtuse angle at its flexure, slightly curved inward from thence to its tip, which joins the costal at some distance in front of the tip of the wing; discal transverse vein undulating, parted by a little more than half its length from the border and from the flexure of the præbrachial; alulæ white.

Length of the body  $4\frac{1}{2}$  lines; of the wings 8 lines.

Hindustan.

*Masicera inclinans.*

*Fœm.*—Nigra, gracilis, cinereo-tomentosa, capite albo subtus albo-tomentoso, frontalibus atris, oculis nudis, thorace vittis quatuor nigris, abdomine longi-obconico fasciis tribus latis apiceque nigris, pedibus longiusculis, alis fuscis longiusculis sat angustis, apice margineque interiore cinereis, alulis albidis.

*Female*.—Black, slender, beset with long bristles, with cinereous tomentum; head white in front, behind, and beneath, clothed with white hairs beneath; frontalia deep black, widening towards the face, with two rows of bristles, which extend to one-third of the length of the face; facialia without bristles; epistoma not prominent; eyes bare; antennæ extending to the epistoma; third joint linear, slender, about four times longer than the second; arista slender, very much longer than the third joint; thorax with four black stripes; abdomen elongate-obconical, much longer than the thorax, with three broad black bands, which are dilated in front; tip black, shining; legs rather long and slender; wings brown, rather long and narrow, grey towards the tips and along the interior border; veins black; præbrachial vein forming an extremely obtuse angle at its flexure, from whence it is almost straight to its tip, which joins the costal at a little in front of the tip of the wing and very near the cubital; the latter is slightly curved, parted by a little less than its length from the flexure of the præbrachial, and by less than its length from the border; alulæ whitish.

Length of the body  $3\frac{1}{2}$  lines; of the wings 8 lines.

South America.

### Genus *TRIXA*, Meig.

#### *Trixa? sejuncta*.

*Fœm.*—Nigra, setosa, capite subtus cano, frontalibus striatis, facie angusta subretracta, facialibus setosis, antennis rufescentibus, articulo 3<sup>o</sup> piceo aristâ nigrâ crassâ pubescente, thorace vix vittato, abdomine longi-ovato tessellato, tibiis ferrugineis, alis cinereis, venis fulvis apice nigris, alulis albidis.

*Female*.—Black, setose; head hoary beneath; frontalia striated, linear, with a row of bristles along each side; face narrow, slightly retracted; facialia with bristles along two-thirds of the length from the epistoma, which is not prominent; eyes bare; proboscis ferruginous; antennæ reddish; third joint piceous, elongate-obconical, not longer than the second; arista black, stout, pubescent, rather longer than the third joint; thorax indistinctly striped; abdomen elongate-oval, tessellated, spinose; tibiæ ferruginous; wings grey; veins tawny, black towards the tips; præbrachial vein emitting a rather long branch and forming an obtuse angle at its flexure, slightly curved between that

and its tip, which ends at rather far in front of the tip of the wing ; discal transverse vein slightly undulating, parted by less than its length from the border and by little more than half its length from the flexure of the præbrachial ; alulæ whitish.

Length of the body 6 lines ; of the wings 11 lines.

Cape.

### Genus GONIA, Meig.

#### *Gonia æstroïdes.*

*Fœm.*—Nigra, capite testaceo albido-tomentoso, frontalibus pallidè luteis, antennis nigris, articulo 2<sup>o</sup> rufescente, thorace cinereo subvittato, callis humeralibus scutelloque fulvis, abdomine rufescente, vitta dorsali nigra, alis limpidis, venis testaceis apice nigris, alulis albis.

*Female.*—Black ; head testaceous, with shining whitish tomentum ; frontalia pale luteous, linear, with four rows of bristles along each side ; facialia with bristles along more than half the length from the epistoma, which is slightly prominent ; antennæ black ; second joint reddish ; third with hoary tomentum, reaching the epistoma ; thorax with cinereous tomentum, indistinctly striped ; humeral calli and scutellum tawny ; abdomen reddish, with a black dorsal stripe ; wings limpid ; veins testaceous, black towards the tips ; præbrachial vein hardly curved inward between its flexure and its tip ; discal transverse vein slightly undulating, parted by more than its length from the border and by more than half its length from the flexure of the præbrachial ; alulæ white.

Length of the body 5 lines ; of the wings 9 lines.

Hindustan.

### Sub-fam. 3. DEXIDES.

#### SYNOPSIS.

\* Proboscis brevis.

† Oviductus non elongatus.

‡ Abdomen non petiolatum.

§ Venæ præbrachialis et costalis conjunctæ.

× Corpus latissimum.

+ Corpus metallicum. *Rutilia*, Desv.

+ + Corpus non aut ex parte metallicum. *Diaphania*, Macq.

- × × Corpus latiusculum.
  - Antennæ non longæ. *Chitogaster*, Macq.
  - → Antennæ longæ. *Platytropesa*, Macq.
- × × × Corpus angustum aut vix latum.
  - Facies non sulcata.
  - ++ Arista plumosa.
  - ∞ Antennarum articulus 3<sup>us</sup>, 2<sup>o</sup> quadruplo longior. *Scoti-  
ptera*, Macq.
  - ∞ ∞ Antennarum articulus 3<sup>us</sup>, 2<sup>o</sup> duplo aut triplo longior.  
*Dexia*, Meig.
  - ++++ Arista nuda aut tomentosa.
    - ∞ Facies valde obliqua; antennæ brevissimæ.
    - O Abdomen ovatum. *Megaprosopus*, Macq.
    - O O Abdomen cylindricum. *Microphthalma*, Macq.
    - ∞ ∞ Facies sat obliqua. *Gnadochoëta*, Macq.
    - ∞ ∞ ∞ Facies non obliqua; antennæ sat longæ.
      - O Corpus non metallicum. *Gymnostylia*, Macq.
      - O O Corpus metallicum. *Graphostylum*, Macq.
    - → Facies sulcata. *Senostoma*, Macq.
    - § § Venæ præbrachialis et cubitalis conjunctæ. *Dinera*,  
Desv.
    - ‡ ‡ Abdomen petiolatum, clavatum. *Cordyligaster*, Macq.
    - † † Oviductus elongatus. *Trichodura*, Macq.
    - \* \* Proboscis elongata. *Prosenia*, St. Farg.

*Microtropeza*, Macq. (type, *Musca sinuata*, Donov.), may be united to *Rutilia*, and also *Ptilostylum*, Macq., of which genus *P. albomaculatum*, Macq., seems to be identical with *M. leonina*, Fabr.

### Genus DEXIA, Meig.

#### *Dexia filipes.*

*Mas.*—Fusca, gracilis, capite testaceo albo-tomentoso, palpis subclavatis longiusculis, thorace cano, pectore scutello abdomineque testaceis, apice nigro albo-tomentoso, pedibus testaceis perlongis, femoribus testaceis, alis cinereis apud costam subfuscentibus, alulis subtestaceis.

*Male.*—Brown, slender, with a few black bristles; head, proboscis, palpi and antennæ testaceous; head with shining white tomentum; facialia without bristles; epistoma not prominent; eyes bare; palpi subclavate, rather long and slender; third joint of the antennæ linear, slender, almost reaching the epistoma,



about four times the length of the second ; arista black, plumose ; thorax with hoary tomentum ; pectus and scutellum dull testaceous ; abdomen testaceous, a little longer and more slender than the thorax ; tip black, with white tomentum ; legs black, slender, very long ; femora, except the tips, knees and coxæ, testaceous ; wings grey, slightly brownish along the costa : veins black, testaceous towards the base ; præbrachial vein forming an extremely obtuse angle at its flexure, from whence it is very slightly curved to its tip, which ends at very little in front of the tip of the wing ; discal transverse vein much curved inward near its base, very slightly curved outward from thence to its tip, parted by much less than its length from the border, and by a little more than its length from the flexure of the præbrachial ; alulæ with a slight testaceous tinge.

Length of the body 4 lines ; of the wings 7 lines.

Valley of the Amazon.

*Dexia extrema.*

*Mas.*—Nigra, subaurata, capite pectoreque albidis, palpis antennisque testaceis, abdomine testaceo, apice nigro nitente, pedibus sat longis, coxis femoribusque testaceis, alis cinereis, basi costaque subtestaceis, costæ apice venisque fusconebulosis, venis testaceis apice nigris, alulis albidis testaceo-marginatis.

*Male.*—Black, with slightly gilded tomentum and a few black bristles ; head whitish in front and beneath ; facialia without bristles ; epistoma not prominent ; eyes bare ; palpi testaceous ; antennæ testaceous ; third joint full twice the length of the second, not extending beyond half the length of the face ; pectus whitish ; abdomen testaceous, elongate-obconical, much longer than the thorax, black and shining and with a few black spines at the tip ; legs slender, moderately long ; coxæ and femora testaceous ; wings grey, with a slight testaceous tinge at the base and along part of the costa, clouded with brown towards the tip of the costa and along the veins ; veins testaceous, black towards the tips ; præbrachial vein forming a rounded and extremely oblique angle at its flexure, straight from thence to its tip, which ends at some little distance in front of the tip of the wing ; discal transverse vein straight, parted by little more than half its length from the border and by rather less than its length from the flexure of the præbrachial ; alulæ whitish, with broad testaceous borders.

Length of the body  $4\frac{1}{2}$  lines ; of the wings 8 lines.

Valley of the Amazon.

*Dexia? albicans.* = *Thickaranea* Thomson

*Mas.*—Cano-tomentosa, capite subalbo, frontalibus ferrugineis, palpis testaceis, antennis nigris, articulo 2° testaceo, thorace abdomineque cinereo-trivittatis, abdomine subfusiformi, pedibus robustis, alis vix subcinereis, venis testaceis apice nigris, alulis albis.

*Male.*—Thickly covered with hoary tomentum; head almost white, rather prominent; frontalia ferruginous, linear; facialia without bristles; epistoma not prominent; eyes remote; palpi testaceous; antennæ black, third joint not reaching the epistoma, more than twice the length of the second, which is testaceous; thorax and abdomen with three slight cinereous stripes; abdomen subfusiform, longer than the thorax; legs stout; wings hardly greyish; veins testaceous, black towards the tips; præbrachial vein forming an almost right angle at its flexure, near which it is curved inward, straight from thence to its tip, which ends at somewhat in front of the tip of the wing; discal transverse vein nearly straight, parted by much less than its length from the border and from the flexure of the præbrachial; alulæ white.

Length of the body 4 lines; of the wings 7 lines.

Valley of the Amazon.

This species may perhaps form a new genus on account of the shape of its head and of its thick legs.

*Dexia spinosa.*

*Mas.*—Nigra, cinereo-tomentosa, capite testaceo albido tomentoso antice subproducto et subcompresso, frontalibus ferrugineis, palpis antennisque testaceis, thorace vittis tribus nigris, pectore cano, abdomine testaceo oblanceolato, vitta dorsali apiceque nigris, pedibus perlongis, femoribus testaceis, alis fusco-cinereis, venis nigris, alulis cinereis testaceo-marginatis.

*Male.*—Black, with cinereous tomentum; head with whitish tomentum, testaceous in front and beneath, slightly prominent and compressed in front of the eyes; frontalia ferruginous, widening in front, with a thick row of bristles on each side; face with a furrow along each side; facialia without bristles; epistoma not prominent; eyes bare; proboscis rather long; palpi testaceous; antennæ testaceous; third joint not near reaching the epistoma, full twice the length of the second; thorax with three black stripes; pectus hoary; abdomen testaceous, oblanceolate, much longer than the thorax, with black spines, which are mostly towards the tip; dorsal stripe and tip black;

legs rather slender, very long ; femora testaceous, black towards the tips ; wings brownish grey ; veins black ; præbrachial vein forming a somewhat rounded and very obtuse angle at its flexure, straight from thence to its tip, which ends at a little in front of the tip of the wing ; discal transverse vein slightly undulating, parted by half its length from the border and by less than its length from the flexure of the præbrachial ; alulæ cinereous, with testaceous borders.

Length of the body  $5\frac{1}{2}$  lines ; of the wings 9 lines.

Port Natal.

Genus SENOSTOMA, Macq.

*Senostoma ? punctum.*

*Fœm.*—Nigrum, validum, cano-tomentosum, capite ferrugineo subtus albido, frontibus nigricantibus, antennis rufescentibus, articulo 3<sup>o</sup> nigro, thorace quadrivittato, abdomine obconico subtessellato, pedibus longiusculis, alis subcinereis nigro quinque punctatis, alulis albis.

*Female.*—Black, stout, with hoary tomentum ; head ferruginous, and with whitish tomentum beneath, where it is clothed with white hairs ; frontalia blackish, widening much in front ; facialia without bristles ; epistoma not prominent ; eyes bare ; antennæ reddish ; third joint black, a little longer than the second, hardly extending beyond half the length of the face ; arista black, plumose ; thorax with four very slight stripes ; abdomen obconical, slightly tessellated, not longer than the thorax ; legs rather long and slender ; wings greyish, with four black points near the base ; veins black ; veinlet between the cubital and the præbrachial veins clouded with black ; præbrachial vein forming a right angle at its flexure, near which it is curved inward, almost straight from thence to its tip, which ends at somewhat in front of the tip of the wing ; discal transverse vein rather deeply undulating, parted by half its length from the border and by very much less than its length from the flexure of the præbrachial ; alulæ white, large.

Length of the body  $4\frac{3}{4}$  lines ; of the wings 9 lines.

Australia and New South Wales.

Genus CORDYLIGASTER, Macq.

*Cordyligaster tipuliformis.*

*Fœm.*—Nigra, pergracilis, cinereo-tomentosa, capite albido, frontibus atris, palpis antennisque fulvis, thoracis vittis tribus

abbreviatis subauratis, abdomine ferrugineo compresso longissimo basi petiolato, fasciis duabus testaceis, pedibus testaceis longis, femoribus nigro-fasciatis, coxis posticis et tarsis anticis nigris, alis cinereis longis angustis, costa venisque lurido-marginatis, alulis albidis minimis.

*Female.*—Black, very slender, with pale shining cinereous tomentum; head whitish in front and beneath; frontalia deep black, widening in front; face with a slight middle keel; facialia without bristles; epistoma not prominent; eyes bare; palpi and antennæ tawny; disk of the thorax and that of scutellum black and shining, the former with three short pale gilded stripes in front, abdomen ferruginous, compressed, petiolated towards the base, more than thrice the length of the thorax; third and fourth segments testaceous at the base; legs testaceous, long, slender; femora with black bands; hind coxæ and fore tarsi black; wings grey, long and narrow, lurid along the costa and along the veins, which are ferruginous; discal transverse vein emitting a very short branch and forming a right angle at its flexure, straight from thence to its tip, which ends at somewhat in front of the tip of the wing; discal transverse vein very slightly undulating, parted by much less than half its length from the border, and by about its length from the flexure of the præbrachial; alulæ whitish, very small; halteres testaceous.

Length of the body  $7\frac{1}{2}$  lines; of the wings 11 lines.

South America.

#### Sub-fam. 4. SARCOPHAGIDES.

##### SYNOPSIS.

- \* Vena præbrachialis extus flexuram arcuata.
- † Corpus latum; tibiæ posticæ arcuatæ. *Phrissopoda*, Macq.
- †† Corpus vix latum; tibiæ posticæ rectæ aut subarcuatæ.
- ‡ Corpus non metallicum.
- § Antennarum articulus 3<sup>us</sup>, 2<sup>o</sup> triplo longior.
- × Abdominis segmentum 2<sup>um</sup> margine setoso. *Sarcophaga*, Meig.
- ×× Abdominis segmentum 2<sup>um</sup> margine non setoso.
- + Antennæ non breves. *Agria*, Desv.
- + + Antennæ breves. *Microcerella*, Macq.
- §§ Antennarum articulus 3<sup>us</sup>, 2<sup>o</sup> quadruplo longior. *Diaugia*, Perty.
- ‡‡ Corpus metallicum, micans.
- § Caput non depressum.

- × Tarsi non arcuati. *Cynomyia*, Desv.  
× × Tarsi arcuati. *Toxotarsus*, Macq.  
§ § Caput depressum. *Catapicephala*, Macq.  
\* \* Vena præbrachialis extus flexuram recta. *Onesia*, Desv.

Genus SARCOPHAGA, Meig.

*Sarcophaga decedens*.

*Mas.*—Nigra, capite subaurato subtus cano, facie albidâ, frontilibus atris, thoracis vittis abdominisque tessellis cinereis subauratis, abdominis apice rufescente, alis subcinereis, venis nigris, alulis albis.

*Male.*—Black; head with pale gilded tomentum; hoary, and with hoary hairs beneath; face whitish; frontalia deep black, widening in front; the four stripes of the thorax, the border of the scutellum, and the tessellated marks on the abdomen, cinereous, very slightly gilded; tip of the abdomen ferruginous red; wings greyish; veins black; præbrachial vein emitting the usual branch, and forming a right angle at its flexure, near which it is curved inward, and is straight from thence to its tip; discal transverse vein straight, parted by nearly its length from the border, and by little more than half its length from the flexure of the præbrachial; alulæ white.

Length of the body 4 lines; of the wings  $7\frac{1}{2}$  lines.

Colombia.

*Sarcophaga subsericans*.

*Mas.*—Nigra, capite cano, facie albâ, frontilibus atris, thoracis vittis quatuor abdominisque maculis intermediis albidis, abdominis maculis lateralibus subauratis, apice fulvo testaceo tomentoso, alis subcinereis, venis nigris, alulis subcinereis albo-marginatis.

*Male.*—Black; head with hoary tomentum, white and shining in front; frontalia deep black, widening in front, the four stripes of the thorax, the borders of the scutellum and the two dorsal rows of abdominal spots, whitish; the lateral abdominal spots slightly gilded; tip of the abdomen tawny, with pale testaceous tomentum; wings greyish; veins black; præbrachial vein like that of the preceding species; discal transverse vein curved inward near its base, parted by much less than its length from the

border, and from the flexure of the præbrachial; alulæ slightly cinereous, with white borders.

Length of the body  $3\frac{1}{2}$  lines; of the wings  $6\frac{1}{2}$  lines.

South America.

*Sarcophaga ? punctipennis.*

*Fœm.*—Nigra, cinereo-tomentosa, capite antice argenteo, thorace vittis quatuor nigris, abdomine æneo-nigro, fasciis interruptis albis, alis cinereis nigro-quadrupunctatis, alulis albis.

*Female.*—Black, with cinereous tomentum; head silvery white in front; thorax with four black stripes; abdomen æneous black, somewhat short and depressed, with an interrupted white band on the fore border of each segment; wings grey; veins black; a black dot on the veinlet between the cubital and the præbrachial, one at each end of the discal transverse vein, and one on the flexure of the præbrachial; præbrachial vein forming an acute but rounded angle at its flexure, near which it is very much curved, almost straight from thence to the tip, which ends at very far in front of the tip of the wing; discal transverse vein curved near its base, and forming an angle near its tip, parted by much more than its length from the border and by much less than its length from the flexure of the præbrachial; alulæ white.

Length of the body  $3\frac{1}{2}$  lines; of the wings 7 lines.

Colombia.

This species differs much from the other *Sarcophagæ*, but the generic characters cannot easily be ascertained in the specimen described.

*Sarcophaga injuncta.*

*Fœm.*—Nigra, capite aurato, frontalibus atris, facie cinereâ, thorace vittis duabus dorsalibus canis duabusque lateralibus auratis, pectore vittis duabus auratis, abdomine cyaneo-nigro tessellis canis, apice fulvo, alis cinereis, venis nigris, alulis albis.

*Female*—Black; head with deep gilded tomentum; frontalia deep black, a little narrower in front; face cinereous; thorax with two hoary dorsal stripes, and with a gilded stripe on each side; pectus with two gilded stripes; abdomen bluish black, oval, not longer than the thorax, tessellated as usual with hoary spots, but less distinctly than in many species; tip tawny; wings grey; veins black; præbrachial vein forming a right angle at its flexure, near which it is much curved inward, and is thence straight to its tip; discal transverse vein straight, except a slight curve near its base,

parted by much less than its length from the border, and by hardly more than half its length from the flexure of the præbrachial; alulæ white.

Length of the body 4 lines; of the wings 8 lines.  
Brazil.

Genus CYNOMYIA, DESV.

*Cynomyia auriceps.*

*Fœm.*—Læte viridis, capite aurato antice testaceo, frontalibus nigris, antennis fulvis, thorace vittis quatuor nigris, pedibus nigris dense pilosis, alis cinereis basi obscure fuscis, venis fusco-limbatis, alulis cinereis.

*Female.*—Bright green; head gilded, testaceous in front; frontalia black, linear; epistoma rather prominent; antennæ tawny; arista black; thorax with four black stripes; legs black, thickly pilose; wings grey, dark brown at the base, brown along the borders of the veins; veins black; præbrachial vein forming a right and somewhat rounded angle at its flexure, near which it is very slightly curved inward, straight from thence to its end, which is at a little in front of the tip of the wing; discal transverse vein hardly undulating, parted by much less than half its length from the border, and by hardly more than half its length from the flexure of the præbrachial; alulæ cinereous.

Length of the body 6 lines; of the wings 14 lines.  
Quito.

Sub-fam. 5. MUSCIDES.

SYNOPSIS.

- \* Proboscis longa, gracilis.
- † Palpi proboscide non breviores. *Glossina*, Wied.
- †† Palpi proboscide breviores.
- ‡ Arista plumosa.
- § Arista supra plumosa. *Stomoxys*, Geoff.
- § § Arista supra subtusque plumosa. *Pachymia*, Macq.
- ‡‡ Arista nuda. *Gigamyia*, Macq.
- \*\* Proboscis brevis.
- † Corpus angustum; pedes longi. *Apatemyia*, Macq.
- †† Corpus non angustum; pedes non longi.
- ‡ Facies carinata.

- § Arista pilis longis.  
 × Epistoma prominens.  
 + Corpus latum. *Amenia*, Desv.  
 + + Corpus elongatum. *Silbomyia*, Macq.  
 × × Epistoma non prominens. *Bengalia*, Desv.  
 §§ Arista pilis abbreviatis.  
 × Vena præbrachialis post flexuram recta. *Diaphania*, Macq.  
 × × Vena præbrachialis post flexuram arcuata. *Amphibolia*,  
 Macq.  
 † † Facies non carinata.  
 § Frons elongata.  
 × Epistoma valde prominens.  
 + Arista supra plumosa. *Idia*, Meig.  
 + + Arista tomentosa. *Rhynchomyia*, Desv.  
 × × Epistoma non valde prominens.  
 + Vena præbrachialis post flexuram valde retracta.  
 ++ Tibiæ posticæ ciliatæ. *Blepharicnema*, Macq.  
 +++ Tibiæ posticæ non ciliatæ.  
 ∞ Thorax non tomentosus.  
 O Antennarum articulus 3<sup>us</sup> 2° quadruplo longior.  
 — Epistoma vix prominens. *Calliphora*, Desv.  
 = Epistoma sat prominens.  
 ÷ Abdomen crassum. *Ochromyia*, Macq.  
 ÷ ÷ Abdomen depressum.  
 ∴ Vena præbrachialis concava. *Lucilia*, Desv.  
 ∴ ∴ Vena præbrachialis convexa. *Pyrellia*, Desv.  
 OO Antennarum articulus 3<sup>us</sup> 2° triplo longior. *Musca*, Linn.  
 ∞ ∞ Thorax tomentosus. *Pollenia*, Macq.  
 + + Venæ præbrachialis post flexuram subretracta.  
 ° ++ Corpus crassum. *Mesembrina*, Meig.  
 +++ Corpus non crassum. *Morellia*, Desv.  
 §§ Frons transversa. *Achias*, Fabr.

## Genus PACHYMYIA, Macq.

*Pachymyia jactans.*

*Fœm.*—Nigra, cano-tomentosa, capite albo, antice testaceo, frontalibus pallidè luteis, antennis testaceis, abdominis lateribus basi rufo-fulvis, pedibus fulvis longiusculis, tarsis nigris, alis subcinereis, alulis albis, halteribus testaceis.

*Female.*—Black, with hoary tomentum; head with white shining tomentum, testaceous in front and beneath; frontalia linear, pale



luteous, with black bristles along each side; facialia without bristles; peristoma bordered with bristles; eyes bare; proboscis black, about three-fourths of the length of the body, tawny towards the base; antennæ testaceous; abdomen oval, reddish tawny on each side towards the base; legs tawny, rather long; tarsi black; wings greyish; veins black, testaceous towards the base, præbrachial vein forming an almost right angle at its flexure, hardly curved from thence to its tip, which ends at somewhat in front of the tip of the wing; discal transverse vein distinctly undulating, parted by more than half its length from the border, and by less than its length from the flexure of the præbrachial; alulæ white; halteres testaceous.

Length of the body 5 lines; of the wings 9 lines.

Genus BENGALIA, Desv.

*Bengalia depressa.*

*Fœm.*—Obscurè cervina, capite pectoreque testaceis albido-tomentosis, antennis piceis, abdomine fulvo, segmentorum marginibus posticis nigris, pedibus testaceis, tarsis apice nigris, alis cinereis basi et apud venas sub-testaceis, alulis cinereis testaceo-marginatis.

*Female.*—Dull fawn colour; head testaceous and with whitish tomentum in front and beneath; proboscis tawny; palpi testaceous; antennæ piceous; pectus testaceous, with whitish tomentum; abdomen tawny, partly covered with cinereous tomentum; hind borders of the segments black; legs testaceous; tips of the tarsi black; wings grey; veins tawny; præbrachial vein much rounded at its flexure, hardly curved inward, with a very slight testaceous tinge at the base and along the veins from thence to its tip; discal transverse vein hardly undulating, parted by less than half its length from the border, and by full half its length from the flexure of the præbrachial; alulæ cinereous, with testaceous borders.

Length of the body  $4\frac{1}{2}$ —5 lines; of the wings 8—9 lines.

Port Natal.

Genus IDIA, Meig.

*Idia extensa.*

*Mas.*—Nigra, capite anticè nitente, lateribus subtus testaceo-tomentosis, thorace vittis quatuor latis canis, pectore testaceo,

abdomine pedibusque fulvis, tibiis posticis apice genibusque nigris, tarsis nigris basi testaceis, alis cinereis apud costam fuscis, alulis subtestaceis, halteribus testaceis.

*Male*.—Black; head shining in front, with testaceous tomentum on each side beneath; thorax with four broad hoary stripes; pectus testaceous; abdomen tawny, elliptical, a little longer than the thorax; legs tawny; knees and tips of the hind tibiæ black; tarsi black, testaceous at the base; wings grey, brown along the costa; veins black; præbrachial vein forming a curve at its flexure; discal transverse vein undulating, parted by half its length from the border, and by less than its length from the præbrachial; alulæ slightly testaceous; halteres testaceous.

Length of the body  $3\frac{1}{2}$  lines; of the wings 6 lines.

Port Natal.

*Idia? simplex.*

*Fcem.*—Aureo-viridis, albido-tomentosa, capite testaceo, antennis luteis, arista nigra, thorace quadrivittato, abdomine cupreo lineâ dorsali, tibiis fulvis, tarsis piceis, alis sub-cinereis, costa apicem versus fusciscente, alulis albidis.

*Female*.—Golden green, with whitish tomentum; head pale testaceous, hardly prominent, whitish beneath; proboscis black; palpi pale testaceous; antennæ pale luteous; arista black, plumose; thorax with four stripes; abdomen cupreous, depressed, with a dorsal line; tibiæ tawny; tarsi piceous; wings very slightly greyish, brownish along the costa towards the tip; veins black, testaceous towards the base; præbrachial vein forming a rather obtuse angle at its flexure, nearly straight from thence to its tip, which almost joins the cubital vein; discal transverse vein slightly undulating, parted by much less than its length from the border, and by a little less than its length from the flexure of the præbrachial; alulæ whitish.

Length of the body  $3\frac{1}{2}$  lines; of the wings 6 lines.

Hindustan.

In this species the characters of the genus are much modified.

*Idia? varia.*

*Fcem.*—Viridis, capite testaceo maculis sex nigris, frontalibus fulvis, proboscide nigro, antennis piceis, abdomine testaceo, vitta fasciisque nigris, pedibus fulvis, alis cinereis, venis nigris basi fulvis, alulis subtestaceis.

*Female*.—Green, shining; head testaceous, with two black dots

on each side in front; frontalia tawny, widened in front and behind, where they include a lanceolate triangle; epistoma prominent, with a black streak on each side; proboscis black; antennæ piceous; abdomen testaceous, with a black stripe and with black bands; first, second and third bands widely interrupted, fifth occupying almost the whole segment; legs tawny; wings grey; veins black, tawny towards the base; præbrachial vein forming a very oblique and somewhat rounded vein at its flexure, nearly straight from thence to its tip; discal transverse vein much curved inward near its base, hardly curved outwards towards its tip, parted by rather more than half its length from the border and from the flexure of the præbrachial; alulæ slightly testaceous.

Length of the body  $3\frac{1}{2}$  lines; of the wings 7 lines.

Cape.

#### Genus LUCILIA, Desv.

##### *Lucilia pinguis.*

*Fœm.*—Purpurea, capite nigro anticè rufescente, antennis rufescentibus, thorace ex parte cyaneo, pedibus nigris, tibiis ferrugineis, alis subcinereis, venis nigris, alulis cinereis.

*Female.*—Purple; head black, reddish in front; antennæ reddish; arista black; thorax partly blue; legs black; tibiæ ferruginous; wings greyish; veins black; præbrachial vein forming a right slightly rounded angle at its flexure, slightly curved inward from thence to its tip; discal transverse vein very slightly undulating, parted by nearly half its length from the border, and by full half its length from the flexure of the præbrachial; alulæ cinereous.

Length of the body  $3\frac{1}{2}$  lines; of the wings 6 lines.

Hindustan.

##### *Lucilia basifera.*

*Mas.*—Viridis, capite nigro, thorace vittis duabus latis nigris, lateribus cyaneis, scutello abdomineque purpureis, hujus dimidio apicali viridi, illius margine cyaneo, pedibus nigris, alis subcinereis basi nigricantibus.

*Male.*—Green; head black; thorax with two broad black stripes, blue on each side; scutellum purple, with a blue border; abdomen purple; apical half green, with hoary hairs; hind border of the third segment purple; legs black; wing greyish, blackish

towards the base; veins black; præbrachial vein forming a right somewhat rounded angle at its flexure, near which it is much curved inward and is thence straight to its tip; discal transverse vein slightly undulating, parted by less than half its length from the border and from the flexure of the præbrachial; alulæ grey.

Length of the body  $3\frac{1}{2}$  lines; of the wings 7 lines.

#### GENUS PYRELLIA, Desv.

##### *Pyrellia facilis.*

*Mas.*—Purpurea, capite antico refescente, facie cinereâ, palpis antennisque fulvis, thorace vittis tribus latis canis, scutello cyaneo, pedibus nigris, alis cinereis basi obscurioribus, venis nigris.

*Male.*—Purple; head reddish in front; face cinereous; palpi and antennæ tawny; arista black; thorax with three broad hoary stripes; scutellum mostly blue; legs black; wings grey, darker at the base; veins black, præbrachial vein forming a slight curve at its flexure, very slightly curved inward near its end, which is at the tip of the wing; discal transverse vein nearly straight, parted by much less than its length from the border and by little less than its length from the flexure of the præbrachial; alulæ cinereous.

Length of the body  $3\frac{1}{2}$  lines; of the wings 7 lines.

South America.

##### *Pyrellia torpida.*

*Fcem.*—Cyaneo-viridis, longiuscula, capite nigro anticè albo, antennis piceis, pedibus nigris, tibiis ferrugineis, alis vix cinerascentibus, venis nigris, alulis albidis.

*Female.*—Bright bluish green; head black, shining white in front; antennæ piceous; thorax minutely punctured, rather long and narrow; legs black; tibiæ ferruginous; wing hardly greyish; veins black; præbrachial vein much curved at its flexure, almost straight from thence to its end, which is at a little in front of the tip of the wing; discal transverse vein very slightly undulating, parted by much less than its length from the border and by hardly less than its length from the flexure of the præbrachial; alulæ whitish.

Length of the body  $3\frac{1}{2}$  lines; of the wings  $6\frac{1}{2}$  lines.

Cape Coast.

Genus MUSCA, Linn.

*Musca ruficornis.*

*Fœm.*—Nigra, capite cinereo, peristomate ferrugineo, frontibus obscurè ferrugineis, palpis fulvis, antennis rufescentibus, abdomine nigro-viridi, alis limpidis, venis fulvis.

*Female.*—Black; head with cinereous tomentum; ferruginous about the peristoma; frontalia dark, ferruginous; palpi tawny; antennæ reddish; thorax with a tawny callus on each side in front; abdomen dark green, broader and shorter than the thorax; wings limpid; veins tawny, veinlet between the cubital and the præbrachial veins brown; discal transverse vein slightly undulating.

Length of the body  $4\frac{1}{2}$  lines; of the wings 9 lines.

Tasmania.

Genus MORELLIA, Desv.

*Morellia indecora.*

*Fœm.*—Nigra cinereo-tomentosa, capite et antennarum articulo 2° ferrugineis, thorace subvittato, abdomine viridescente nigro glaucescente, alis cinereis, alulis testaciis.

*Female.*—Black, with slight cinereous tomentum; head ferruginous in front and beneath; second joint of the antennæ ferruginous; third extending to the epistoma, full four times the length of the second; thorax indistinctly striped; abdomen greenish black, with glaucous reflections; wings grey; veins black; præbrachial vein much curved at its flexure, almost straight from thence to its end, which is hardly in front of the tip of the wing; discal transverse vein slightly undulating, parted by much less than its length from the border, and by very little less than its length from the flexure of the præbrachial; alulæ testaceous.

Length of the body  $4\frac{1}{2}$  lines; of the wings 8 lines.

New South Wales.

In the length of the third joint of the antennæ this species agrees with *Calliphora*, and not with *Morellia*.

## Sub-fam. 6. ANTHOMYIDES.

## SYNOPSIS.

- \* Alulæ amplæ aut mediocres.
- † Abdomen ovatum latum.
- ‡ Abdomen non breve.
- § Palpi sat longi. *Aricia*, Desv.
- §§ Palpi breves. *Brachypalpus*, Macq.
- ‡‡ Abdomen breve.
- § Pedes pilosi. *Brachygasterina*, Macq.
- §§ Pedes vix pilosi. *Microchylum*, Macq.
- †† Abdomen oblongum, non latum.
- ‡ Corpus nigrum et album. *Leucomelina*, Macq.
- ‡‡ Corpus non nigrum et album.
- § Palpi non dilatati.
- × Arista plumosa. *Spilogaster*, Macq.
- ×× Arista nuda aut tomentosa.
- Maris femora antica dentata. *Hydrotæa*, Desv.
- Femora antica non dentata.
- ++ Frontis setæ breves; abdomen ovatum. *Ophyra*, Desv.
- ++→ Frontis setæ elongatæ; abdomen oblongum. *Limnophora*, Desv.
- §§ Palpi dilatati. *Lispe*, Meig.
- \* \* Alulæ parvæ.
- † Pedes non valde setosi.
- ‡ Maris frons angusta.
- § Arista plumosa. *Hylemyia*, Desv.
- §§ Arista nuda aut tomentosa.
- × Maris abdomen cylindricum.
- Caput incrassatum; arista tomentosa. *Chortophila*, Macq.
- Caput non incrassatum; abdomen angustum.
- ++ Arista nuda. *Atomogaster*, Macq.
- ++→ Arista tomentosa. *Pegomyia*, Desv.
- ×× Abdomen maris et fœm. apice attenuatum. *Anthomyia*, Meig.
- ××× Abdomen filiforme. *Leptomyza*, Macq.
- ‡‡ Maris frons lata.
- § Arista plumosa.
- × Antennæ incumbentes. *Cænosia*, Meig.
- ×× Antennæ non incumbentes. *Schænomyza*, Haliday.
- §§ Arista nuda. *Craspedochæta*, Macq.
- †† Pedes valde setosi. *Macrochæta*, Macq.

Genus ARICIA, Desv.

*Aricia ignava.*

*Fœm.*—Nigra, cinereo-tomentosa, capite albo, scutelli margine pedibusque fulvis, abdomine ovato, tarsis nigris, alis sublurido-cinereis, venis nigris, alulis cinereis, halteribus testaceis.

*Female.*—Black, with cinereous tomentum; head white in front and beneath; scutellum with a tawny border; abdomen oval, very little broader and longer than the thorax; legs tawny; tarsi black; wings grey, with a slight lurid tinge; veins black; discal transverse vein very slightly curved inward, parted by more than half its length from the border, and by a little more than its length from the præbrachial transverse vein; alulæ cinereous; halteres testaceous.

Length of the body 3 lines; of the wings 7 lines.

Brazil.

*Aricia? inscia.*

*Fœm.*—Nigra, cinereo-tomentosa capite subaurato posticè albido, thorace trivittato, abdomine cyaneo basi nigro, alis limpidis, venis nigris basi fulvis, alulis albis.

Allied to *A. cæruleigaster*, Macq. *Female.*—Black, with slight cinereous tomentum; head slightly gilded, whitish behind; arista moderately plumose; thorax with three indistinct black stripes; abdomen blue, oval, not longer nor broader than the thorax; first segment black; wings limpid; veins black, tawny at the base; discal transverse vein undulating, parted by more than half its length from the border, and by very little more than its length from the præbrachial transverse vein; alulæ white.

Length of the body 3 lines; of the wings 7 lines.

Tasmania.

Genus HYLEMYIA, Desv.

*Hylemyia fasciata.*

*Fœm.*—Nigra, albo-tomentosa, thoracis fasciis duabus scutello-que atris, abdomine subaurato vitta fasciisque nigris, alis limpidis, venis testaceis apice nigris, alulis albis.

*Female.*—Nearly allied to *H. pluvialis*. Black, with white tomentum; thorax with two deep black bands; scutellum deep

black; abdomen with the white slightly gilded, with a black stripe, and with a black band on the fore border of each segment; wings limpid; veins testaceous, black towards the tips; discal transverse vein slightly curved inward, parted by more than half its length from the border, and by less than its length from the præbrachial transverse vein; alulæ white.

Length of the body  $2\frac{1}{2}$  lines; of the wings 5 lines.

Port Natal.

## Div. 2. ACALYPTERÆ.

### Sub-fam. 1. HELOMYZIDES.

The exotic genera are here enumerated, with the characters which chiefly distinguish them from the most nearly allied European genera, and the same plan is used with respect to some of the following sub-families:—

1. *Thecomyia*, Perty; facies elongata.  
*Tetanocera*, Dum.; facies non elongata.
2. *Curtonotum*, Macq.; thorax gibbosus.  
*Helomyza*, Fall.; thorax non gibbosus.
3. *Pyrzota*, Wied.; abdomen apice clavatum.  
*Otitis*, Latr.; abdomen depressum.
4. *Dichromyia*, Desv.; pedes nudi.  
*Actora*, Meig.; pedes villosi.
5. *Ectecephala*, Macq.; antennæ elongatæ.  
*Eurina*, Meig.; antennæ non elongatæ.
6. *Orthostylum*, Macq.; arista recta.  
*Cordylura*, Fall.; arista non recta.
7. *Chætura*, Macq.; tibiæ posticæ arcuatæ.  
*Cordylura*, Fall.; tibiæ posticæ non arcuatæ.

### Genus SCATOPHAGA, Meig.

#### *Scatophaga canadensis*.

*Fœm.*—Cervina, capite fulvo, subtus pallido subaurato, antennis fulvis, arista nigra subtomentosa, thorace vittis tribus fuscis, metathorace cano, abdomine cinereo apice fulvo, pedibus fulvis, alis lurido-subcinereis, venis transversis nigro-nebulosis.

*Female.*—Fawn colour; head tawny in front, pale and with slightly gilded tomentum beneath; antennæ tawny; arista black,



slightly tomentose; thorax with three indistinct brown stripes; metathorax hoary; abdomen cinereous, tawny at the tip; legs tawny; wings greyish, with a lurid tinge; veins black, tawny towards the base; transverse veins, especially the præbrachial one, clouded with black.

Length of the body  $2\frac{1}{2}$  lines; of the wings 6 lines.

Canada.

### Genus SCIOMYZA, Fall.

#### *Sciomyza terminalis.*

*Fœm.*—Cinerea, capite lato cervino subtus testaceo, antennis fulvis, arista nigra plumosa, thorace vittis duabus testaceis, pectore et metathorace canis, abdomine vitta nigricante, pedibus fulvis, tibiis tarsisque apice nigris, alis cinereis apud costam obscurè fuscis, fascia subapicali pallidiore.

*Female.*—Cinereous; head broad; fawn colour, testaceous beneath; antennæ tawny; third joint conical; arista black, plumose; thorax with a testaceous stripe on each side, pectus and metathorax hoary; abdomen with a blackish stripe; legs tawny; tips of the tibiæ and of the tarsi black; fore tarsi black, tawny at the base; wings grey, dark brown along the costa, and with a paler brown irregular abbreviated subapical band; veins black; præbrachial transverse band hardly undulating; halteres tawny.

Length of the body 3 lines; of the wings  $6\frac{1}{2}$  lines.

Hindustan.

### Genus HELOMYZA, Fall.

#### *Helomyza lata.*

*Fœm.*—Picea, valida, antennis nigris, thorace subvittato, abdomine basi maculisque duabus lateralibus fulvis, pedibus nigris, alis cinereis apud costam fuscescentibus, venis nigris.

*Female.*—Piceous, stout; antennæ black; thorax indistinctly striped; abdomen tawny at the base and with a tawny spot on each side near the base; legs black; wings grey, brownish along the costa; veins black; præbrachial transverse vein stout; discal transverse vein nearly straight.

Length of the body  $3\frac{1}{2}$  lines; of the wings 6 lines.

South America.

*Helomyza robusta.*

*Fœm.*—Fulva, valida, arista nigra plumosa, pedibus testaceis, tarsis piceis, alis luridis, apud marginem posticum subcinereis, venis fulvis.

*Female.*—Tawny, stout, with a few black bristles; arista black, plumose; abdomen a little paler than the thorax; legs testaceous; tarsi piceous; wings lurid, slightly greyish along the hind border; veins tawny; discal transverse vein straight.

Length of the body  $2\frac{3}{4}$  lines; of the wings 5 lines.

Valley of the Amazon.

*Helomyza marginalis.*

*Fœm.*—Luteo-fulva, thorace cinereo vittis tribus fulvis, abdomine fasciis nigris, femoribus tibiisque apice tarsisque nigris, alis lurido-cinereis, venis fulvis apice nigris.

*Female.*—Luteous tawny; thorax with cinereous tomentum, which is interrupted by three stripes; abdomen with a slender black band on the hind border of each segment; tarsi and tips of the femora and of the tibiæ black; wings grey, with a lurid tinge, which disappears along the hind border; veins tawny, black towards the tips; discal transverse vein straight.

Length of the body  $3\frac{1}{2}$  lines; of the wings 6 lines.

New South Wales.

## Genus DRYOMYZA.

*Dryomyza cingulipes.*

*Fœm.*—Ferrugineo-fulva, proboscide antennisque nigris, abdominis segmentis nigricanti-marginatis; femoribus, tibiis tarsisque apice nigris, femoribus tibiisque nigro-fasciatis, alis cinereis.

*Female.*—Ferruginous tawny; proboscis and antennæ black; abdomen shorter than the thorax, acuminate at the tip; borders of the segments blackish; femora, tibiæ and tarsi with black tips; femora and tibiæ with a black band on each; wings grey; veins black; tawny towards the base.

Length of the body 4 lines; of the wings 8 lines.

New South Wales.

Genus TETANOCERA, Dumeril.

*Tetanocera lateralis.*

*Mas.*—Picea, capite fulvo guttis duabus nigris, antennis nigris longis, aristâ plumosâ, thorace abdomineque vittis duabus lateralibus auratis, pedibus fulvis, alis cinereis, apud costam nigro-cinereis, halteribus testaceis.

*Male.*—Piceous; head tawny, with a black dot on each side of the vertex; peristoma produced; proboscis and antennæ black, the latter long, linear; third joint shorter than the second; arista plumose; thorax and abdomen with a gilded stripe along each side; pectus with two lateral gilded streaks; legs tawny; wings grey, blackish grey along the costa; veins black; discal transverse vein straight, upright, parted by less than its length from the border, and by more than twice its length from the præbrachial transverse vein; halteres testaceous.

Length of the body  $3\frac{1}{2}$  lines; of the wings 6 lines.

Valley of the Amazon.

Genus DORYCERA, Hoffm.

*Dorycera ? conspersa.*

*Fœm.*—Cinerea, capite fulvo conico, pectoris margine abdominisque apice fulvis, pedibus fulvis, alis albidis, guttis plurimis cinereis maculaque costali nigricante, halteribus testaceis.

*Female.*—Cinereous; head tawny, produced and narrower in front of the eyes; front small; antennæ short; pectus tawny, with a cinereous disk; abdomen tawny at the tip; legs tawny; wings whitish, with various grey dots, and with a blackish spot on the costa just before the middle; veins black, tawny towards the base; discal transverse vein straight, upright, parted by much less than its length from the border, and by a little less than its length from the præbrachial transverse vein; halteres testaceous.

Length of the body 3 lines; of the wings 6 lines.

Colombia.

Sub-fam. 2. BORBORIDES.

Genus BORBORUS, Meig.

*Borborus Amazonicus.*

*Fœm.*—Nigra, capite nitente, frontalibus atris, antennis, scutelloque piceis, pedibus validis longiusculis, tarsis dilatatis, alis nigricante cinereis.

*Female.*—Black; head shining in front; frontalia deep black; antennæ piceous, very small; scutellum piceous; abdomen dull; legs stout, rather long; tarsi dilated; wings blackish grey; veins black.

Length of the body 3 lines; of the wings 6 lines.

Valley of the Amazon.

Sub-fam. 3. LAURANIDES.

SYNOPSIS.

\* Scutellum parvum.

† Caput non transversum. *Lonchæa*, Fall.

†† Caput transversum. *Zygothrica*, Wied.

\*\* Scutellum abdomen obtegens. *Celyphus*, Dalm.

Genus LONCHÆA, Fall.

*Lonchæa albimanus.*

*Fœm.*—Nigro-ænea, scutello ferrugineo, abdomine nigro-piceo, pedibus piceis, tibiis posterioribus albido-fasciatis, tarsis posterioribus albidis, alis lurido-subcinereis, venis testaceis, halteribus albis.

*Female.*—Blackish æneous; scutellum ferruginous; abdomen piceous black, shining; legs piceous; posterior tibiæ with a whitish band; posterior tarsi whitish; wings slightly greyish, with a very slight lurid tinge; veins testaceous; halteres white.

Length of the body  $2\frac{1}{2}$  lines; of the wings 5 lines.

South America.

## Sub-fam. 4. ORTALIDES.

## SYNOPSIS.

- \* Facies convexa.
- † Caput non dilatatum.
- ‡ Palpi dilatati.
- § Caput acuminatum. *Oxycephala*, Macq.
- §§ Caput non acuminatum.
- × Abdomen ovatum.
- + Caput tumidum. *Dichromyia*, Macq.
- + + Caput non tumidum.
- ++ Femora gracilia.
- ∞ Alarum areola analis elongata. *Loxoneura*, Macq.
- ∞ ∞ Alarum areola analis brevis. *Camptoneura*, Macq.
- ++ ++ Femora crassa. *Ropalomera*, Wied.
- × × Abdomen cylindricum, thorace angustius. *Euripalpus*, Macq.
- ‡ ‡ Palpi non dilatati.
- § Antennæ epistoma attingentes; articulus 3<sup>us</sup> 2<sup>o</sup> quadruplo longior.
- × Epistoma prominens.
- + Arista villosa.
- ++ Femora postica gracilia.
- ∞ Areola analis elongata. *Eniconeura*, Macq.
- ∞ ∞ Areola analis brevis. *Cleitamia*, Macq.
- ++ ++ Femora postica crassa. *Richardia*, Desv.
- + + Arista nuda. *Senopterina*, Macq.
- × × Epistoma non prominens. *Herina*, Desv.
- §§ Antennæ epistoma non attingentes; articulus 3<sup>us</sup> 2<sup>o</sup> triplo longior.
- × Antennæ apud frontis apicem insertæ.
- + Frons non prominens.
- ++ Antennarum articulus 3<sup>us</sup> supra concavus subtus convexus. *Ceroxys*, Macq.; et *Epidisma*, Macq.
- +++ Antennarum articulus 3<sup>us</sup> ovatus.
- ∞ Oculi rotundi. *Amethysa*, Macq.
- ∞ ∞ Oculi ovati.
- O Corpus metallicum.
- Statura sat magna. *Lamprogaster*, Macq.
- = Statura parva. *Ulidia*, Meig.
- OO Corpus non metallicum.
- Venæ transversæ non approximatae. *Platystoma*, Latr.

- = Venæ transversæ approximatae. *Heterogaster*, Macq.  
 + + Frons prominens, acuminata. *Notacanthina*, Macq.  
 × × Antennæ sub frontis marginem insertæ. *Cruphiocera*,  
 Macq.  
 † † Caput dilatatum. *Plagiocephala*, Wied.  
 \* \* Facies plana.  
 † Antennæ non supra insertæ.  
 † Antennæ epistoma attingentes  
 § Areola analis non acuminata. *Odontomera*, Macq.  
 §§ Areola analis acuminata.  
 × Femora non spinosa.  
 + Epistoma prominens; palpi dilatati. *Bactrocera*, Macq.  
 + + Epistoma non prominens.  
 ++ Oviductus longus, gracilis, cylindricus. *Leptoxys*, Macq.  
 +++ Oviductus, brevis latus, depressus. *Dacus*, Fabr.  
 × × Femora spinosa. *Meracantha*, Macq.  
 † † Antennæ epistoma non attingentes.  
 § Maris frons setis duabus capitatis. *Ceratitis*, Macleay.  
 §§ Frons setis nullis capitatis.  
 × Antennarum articulus 2<sup>us</sup> apice obliquus; 3<sup>us</sup> subtus rotundatus. *Campylocera*, Macq.  
 × × Antennarum articulus 2<sup>us</sup> apice quadratus. *Trypeta*, Meig.  
 † † Antennæ supra insertæ. *Epicerella*, Macq.

Genus *ROPALOMERA*, Weid.*Ropalomerâ tibialis*.

*Mas.* et *Fœm.*—Nigro-fusca, fronte lutea, nigro-vittata, facie piceâ, strigis duabus inferioribus albis, thorace vittis septem albis, metathorace abdomineque albido-tomentosis, hujus basi fulvo, pedibus nigris pilosissimis, femoribus posterioribus incrassatis fulvo-variis, tarsis basi testaceis, alis cinereis fusco-nebulosis.

*Male* and *female*.—Dark brown; front luteous, with a black stripe; face piceous; a white streak on each side beneath; thorax with seven white stripes; pectus with a white stripe on each side; scutellum very prominent; metathorax and abdomen with whitish tomentum, the latter tawny at the base; legs black, very pilose; posterior femora very thick, partly tawny; tarsi towards the base and knees testaceous; fore tibiæ partly tawny; wings grey; veins black, tawny at the base, partly clouded with brown; præbrachial

transverse vein and exterior part of præbrachial vein clouded with dark brown; halteres whitish. *Male*.—Hind tarsi wholly black.

Length of the body 4—5½ lines; of the wings 10—12 lines.

Valley of the Amazon.

*Ropalomera nebulosa*.

*Fœm.*—Nigro-fusca, capite ferrugineo, facie convexâ nigrâ nitente, thorace cinereo vittis quatuor incompletis, abdomine e maculis albidis quadrivittato, pedibus nigris incrassatis, tarsis testaceis apice nigris, alis cinereis nigricante maculatis.

*Female*.—Blackish brown; head ferruginous on the vertex and in front; face convex, black, shining; antennæ black; thorax with cinereous tomentum, which is interrupted by four incomplete stripes; abdomen with four rows of whitish shining spots; legs black, incrassated; tarsi testaceous, with black tips; wings grey, with many blackish spots which are paler and finally obsolete towards the interior border; veins black; halteres whitish.

Length of the body 3½ lines; of the wings 8 lines.

Valley of the Amazon.

*Ropalomera substituta*.

*Fœm.*—Nigro-fusca, vertice antico fulvo, facie testaceâ, antennis fulvis, thorace vittis quatuor auratis unâque cinereâ, abdomine e maculis albidis quadrivittato, pedibus validis subpilosis, tarsis basi testaceis subauratis, alis cinereis, halteribus albidis.

*Female*.—Blackish brown; vertex tawny in front; face testaceous; antennæ tawny; thorax with four gilded stripes and with a middle cinereous stripe; abdomen with four rows of whitish spots; oviduct black, shining; legs stout, slightly pilose; not incrassated; tarsi testaceous and slightly gilded at the base; wings grey, veins black; halteres whitish.

Length of the body 3½ lines; of the wings 7 lines.

Brazil.

Genus DICHROMYIA, Desv.

*Dichromyia? punctipennis*.

*Mas.*—Nigra, nitens, capite ferrugineo, alis nigris albo-punctatis, alulis niveis maximis.

*Male*.—Black, shining; head ferruginous in front and on each side beneath, where it is tumid; wings black, with numerous minute white dots; alulæ snow white, very large.

Length of the body  $3\frac{1}{2}$  lines; of the wings 8 lines.

South Africa.

This species and a few more have the alulæ like those of the *Muscidæ Calypteræ*, but differ from them in every other character.

#### GENUS LOXONEURA, Macq.

##### *Loxoneura Perilampoïdes.*

*Fœm.*—Viridis, crebrè punctata, subtus nigra, capite antennisque rufescentibus, scutello abdomineque cyaneis, hœc dilatato, femoribus anticis spinosis, alis subcinereis, costa fasciisque duabus nigris, guttis costalibus albis.

*Female*.—Green, thickly punctured, black beneath; head and antennæ reddish; proboscis and palpi black; thorax conical; scutellum and abdomen blue, the latter much broader and shorter than the thorax; legs black; fore femora spinose; wings slightly greyish, black along the costa and with two black bands; three minute white costal dots.

Length of the body 5 lines; of the wings 12 lines.

#### GENUS LAMPROGASTER, Macq.

##### *Lamprogaster lepida.*

*Fœm.*—Læte viridis, capite rufescente, fronte ex parte piceâ, pedibus fulvis, tarsis testaceis apice nigris, tibiis anticis ex parte piceis, alis luteis, strigis transversis guttaque subcostali fuscis, alulis halteribusque fulvis.

*Female*.—Bright metallic green; head reddish; front partly piceous; legs tawny; tarsi testaceous, with black tips; fore tibiæ partly piceous; wings luteous, with brown streaks at the base, with a brown streak extending from the præbrachial transverse vein towards the costa, with a brown streak on the discal transverse vein, with a brown exterior subcostal dot, and with a brown costal and apical streak; alulæ and halteres tawny.

Length of the body 4 lines; of the wings 10 lines.

Celebes.



Genus ULIDIA, Meig.

*Ulidia? fulviceps.*

*Fœm.*—Aureo-viridis, capite antennisque fulvis, abdomine ex parte cupreo, pedibus testaceis, tarsis anticis ex parte nigris, alis limpidissimis, venis halteribusque testaceis.

*Female*—Bright golden green; head and antennæ tawny; third joint of the antennæ subfusiform; proboscis black; abdomen partly cupreous; legs testaceous; fore tarsi with black tips; wings quite limpid; veins pale testaceous; præbrâchial vein curved exteriorly and joining the cubital vein near its tip; halteres testaceous.

Length of the body  $2\frac{1}{2}$  lines; of the wings  $4\frac{1}{2}$  lines.

Hindustan.

Genus HERINA, Macq.

*Herina determinata.*

*Fœm.*—Nigra, capite supra cupreo anticè testaceo, thorace vittis abdomineque fasciis indistinctis cinereis, oviductu elongato, tarsis ferrugineis, alis albis, basi vitta arcuata postica fasciisque duabus nigris.

*Female*.—Black; head cupreous, black hindward, testaceous and with whitish tomentum in front; thorax with indistinct cinereous stripes; abdomen with indistinct cinereous bands; oviduct elongated; tarsi ferruginous; wings white,—black, with the exception of the hind border, for one third of the length from the base, with a curved black stripe extending near the hind border and connected with two black bands, which are dilated in front; veins black; subcostal and cubital veins connected by a transverse veinlet; præbrâchial vein curved.

Length of the body  $3\frac{1}{2}$  lines; of the wings 7 lines.

Valley of the Amazon.

*Herina decisa.*

*Fœm.*—Nigro-viridis, capite ferrugineo, antennis rufescentibus, abdomine pedibusque nigris, genibus tarsisque ferrugineis, alis nigris, basi fasciisque tribus albis, halteribus albidis.

*Female*.—Blackish green; head ferruginous; antennæ reddish; abdomen black; legs black; knees and tarsi ferruginous; wings

black, white at the base and with three white bands; one near the base, the second just within the discal transverse vein, the third oblique and subapical; halteres whitish.

Length of the body 2 lines; of the wings 5 lines.

Brazil.

*Herina nigrifula.*

*Fœm.*—Nigro-viridis, capite supra testaceo, antennis pedibusque nigris, abdomine attenuato, tarsis piceis, alis limpidis, vitta costali nigra, venis albidis, halteribus nigris.

*Female.*—Greenish black; head testaceous above; antennæ and legs black; abdomen attenuated; tarsi piceous; wings limpid, with an irregular black stripe along the costa; veins whitish; halteres black.

Length of the body  $1\frac{3}{4}$  line; of the wings 3 lines.

Valley of the Amazon.

*Herina intrudens.*

*Fœm.*—Nigro-cyanea, capite antice ferrugineo, abdominis apice attenuato, pedibus nigris, tarsis basi testaceis, alis albis, fasciis quatuor antice nigris posticè cinereis.

*Female.*—Bluish black; head dark blue; ferruginous in front; abdomen attenuated at the tip; legs black; tarsi testaceous at the base; wings white, with four bands which are blackish along the costa, pale grey hindward; third and fourth bands connected on the costa; halteres whitish.

Length of the body  $1\frac{3}{4}$  lines; of the wings  $2\frac{1}{2}$  lines.

Valley of the Amazon.

*Herina? divisa.*

*Mas.*—Fulva, antennarum articulo 3<sup>o</sup> lineari longiusculo, abdomine brevi lato nigro-cyaneo punctato, pedibus testaceis, alis limpidis, linea costali venisque nigris, halteribus albidis.

*Male.*—Tawny; third joint of the antennæ linear, rather long; abdomen dark blue; punctured, rather short, broader than the thorax; legs testaceous; wings limpid, with a black costal line; veins black; halteres whitish.

Length of the body 2 lines; of the wings 4 lines.

Para.

Genus TRYPETA, Meig.

*Trypeta lutescens.*

*Fœm.*—Fulva, subcervino tomentosa, antennis testaceis, aristâ nigrâ angulatâ abdomine ovato fasciis nigris, pedibus testaceis, alis nigris strigis quatuor maculisque quatuor vitreis, strigis duabus exterioribus nigris.

*Female.*—Tawny, covered above with pale fawn coloured tomentum; proboscis black; antennæ testaceous; third joint elongate; arista black, bare, bent near the base; abdomen oval; acuminate at the tip, with a black band on the fore border of each segment excepting at the base; legs testaceous; tibiæ with black apical spines; wings black, vitreous at the base and towards the tips, with three vitreous costal streaks, one longitudinal, the other two transverse, with a transverse vitreous discal streak, with four vitreous spots, and with two black exterior streaks, one extending along the costa to the tip, the other oblique and in the disk; halteres testaceous.

Length of the body 4 lines; of the wings 7 lines.

Valley of the Amazon.

*Trypeta sinica.*

*Mas.*—Fulva, capite apud oculos thoraceque subcervino tomentosis, abdomine fasciis tribus nigris, 3<sup>a</sup> subapicali latissimâ, alis nigro-fuscis, basi vitreis, fulvo-subfasciatis, maculis duabus costalibus trigonis, lituris nonnullis transversis positicis apicibusque vitreis, strigis duabus exterioribus nigro-fuscis.

*Male.*—Tawny, with stout black bristles; head, about the eyes and thorax, with pale fawn-coloured tomentum; scutellum and metathorax shining; abdomen oval, with three black bands; the third subapical, much broader than the others; wings blackish brown, vitreous, with a slight tawny band near the base, with two triangular vitreous spots on the costa and with some transverse hindward vitreous marks; tips vitreous, with two blackish-brown streaks, one extending along the costa to the tip, the other oblique and in the disk.

Length of the body 3 lines; of the wings 6 lines.

China.

*Trypeta tubifera.*

*Fem.*—Fulva, thorace subtomentoso, abdomine ovato, oviductu cylindrico longissimo apice nigro, alis vitreis, vittis tribus testaceis ex parte fusco-marginatis, 2<sup>a</sup> obliquâ extus costali, 3<sup>a</sup> angulatâ posteriore.

*Female.*—Tawny; thorax slightly tomentose; abdomen oval; shorter than the thorax, excepting the oviduct, which is slender, cylindrical, black at the tip and longer than the other part of the abdomen; wings vitreous, with three testaceous partly brown bordered stripes, the first extending from the base in the disk and ending on the costa at half its length, the second extending obliquely from near the hind border to the costa, which it accompanies to the tip of the wing, the third forming an acute angle behind the 2nd and nearly parallel to it.

Length of the body with the oviduct  $4\frac{1}{2}$  lines; of the wings  $7\frac{1}{2}$  lines.

China.

## Sub-fam. 5. SEPSIDES.

## SYNOPSIS.

- \* Pedes non longi.
  - † Antennæ epistoma superantes.
  - ‡ Abdomen non petiolatum. *Omalocephala*, Macq.
  - †† Abdomen petiolatum. *Conopsida*, Macq.
  - †† Antennæ epistoma attingentes. *Michogaster*, Macq.
  - ††† Antennæ epistoma non attingentes. *Sepsis*, Fall.
- \*\* Pedes longi.
  - † Caput elongatum.
  - ‡ Arista apicalis. *Longina*, Weid.
  - †† Arista articuli 3<sup>i</sup> apicem versus inserta. *Nerius*, Fabr.
  - ††† Arista articuli 3<sup>i</sup> basi inserta.
    - § Caput valdè elongatum. *Cardiacephala*, Macq.
    - §§ Caput subelongatum. *Toxopoda*, Macq.
    - ††† Caput rotundatum. *Setellia*, Desv.

## Genus SOPHIRA, Walk.

*Sophira distorta.*

*Mas.*—Fulva, nitens, pubesceus, capite testaceo vittâ fasciâque anticâ nigris, abdomine subfusiformi vittis duabus nigricantibus, alis subluteis, fusco quadri- aut quinque vittatis, margine postico subcinereo.

*Male*.—Tawny, shining, pubescent; head testaceous, with a black stripe, which is narrower in front, and with a black band on the face; arista black; abdomen subfusiform, longer and narrower than the thorax, with two indistinct blackish stripes; legs rather long and slender; wings slightly luteous, greyish along the hind border, with four or five irregular brown stripes, of which the darkest and most regular is along the costa, the latter is slightly dilated beyond the middle; radial vein curved towards the costa; cubital vein slightly curved towards the præbrachial, opposite the curve of the radial; tip of the præbrachial curved towards the cubital; discal transverse vein very oblique, parted by hardly one fourth of its length from the border and by a little more than its length from the præbrachial transverse vein.

Length of the body 6 lines; of the wings 4 lines.

Celebes.

Sub-fam. 6. PSILIDES.

*Cleigaster*, Macq.; *Epistoma setosa*.

*Chyliza*, Fall.; *Epistoma nuda*.

Sub-fam. 7. OSCINIDES.

Genus OSCINIS, Fabr.

*Oscinis scita*.

*Fem.*—Nigra, capite apud oculos fulvo subtus albedo, antennis testaceis articuli 3<sup>i</sup> apice nigro, pectore thoracisque lateribus testaceis, his nigro bimaculatis, abdomine basi fasciisque interruptis fulvis, alis limpidis apud costam anteriorem fuscis.

*Female*.—Black; head tawny above along the eyes, whitish beneath; antennæ testaceous; third joint at the tip and arista black; pectus and sides of the thorax pale testaceous, the latter with a black spot on each side; abdomen tawny at the base and with a tawny interrupted band on the fore border of each segment; underside pale testaceous, with interrupted black bands; wings limp; apical third part brown for half the breadth from the costa; veins testaceous, black towards the tips; halteres whitish.

Length of the body 1½ line; of the wings 3 lines.

South America.

Sub-fam. 8. GEOMYZIDES.

*Silba*, Macq.; Antennarum articulus 3<sup>us</sup> 2<sup>o</sup> plus quadruplò longior.

*Piophila*, Fall.; Antennarum articulus 3<sup>us</sup> brevis.

Genus DROSOPHILA, Fall.

*Drosophila valida*.

*Fœm.*—Pallidè fulva, facie nigro-guttata, pectore vittis quatuor fuscescentibus, abdomine e maculis nigricantibus trivittato, pedibus testaceis, alis subcinereis, venis halteribusque testaceis, venâ costali nigrâ.

*Female.*—Pale tawny, with black bristles; face with a black dot by the epistoma; pectus with two pale brown stripes on each side; abdomen with three rows of irregular blackish spots; legs testaceous; wings slightly greyish; veins testaceous; costal vein black; halteres pale testaceous.

Length of the body 1½ line; of the wings 3 lines.

United States.

Sub-fam. 9. PHYTOMYZIDES.

Genus AGROMYZA, Fall.

*Agromyza invaria*.

*Fam.*—Nigra, nitens, tarsis et tibiis anticis testaceis, alis limpidis, venis nigris.

*Female.*—Black, shining; tarsi and fore tibiæ testaceous; wings limpid; veins black.

Length of the body ¾ line; of the wings 1½ lines.

United States.

Genus PHYTOMYZA, Fall.

*Phytomyza solita*.

*Mas.*—Cinerea, capite luteo-fulvo, guttâ verticis antennisque nigris, abdominis segmentis albedo-marginatis, genibus testaceis, alis subcinereis, venis nigris, halteribus albidis.

*Male*.—Cinereous; head luteous tawny; a black dot on the vertex; antennæ black; hind borders of the abdominal segments whitish; knees testaceous; wings very slightly greyish; veins black; halteres whitish.

Length of the body  $1\frac{3}{4}$  line; of the wings 3 lines.

United States.

*Phytomyza diminuta*.

*Fœm.*—Pallidè flava, thoracis disco cinereo, abdomine supra nigricante, alis limpidis, venis nigris.

*Female*.—Pale yellow; disk of the thorax cinereous; abdomen blackish above; wings limpid; veins black.

Length of the body  $\frac{3}{4}$  line; of the wings  $1\frac{1}{2}$  line.

United States.

Sub-fam. 10. HYDROMYZIDES.

Genus EPHYDRA, Fall.

*Ephydra lata*.

*Fœm.*—Nigra, nitens, pedibus piceis, alis cinereis apud venas pallidioribus, venis transversis nigro-nebulosis.

*Female*.—Black, shining; legs piceous; wings grey, paler along the veins; transverse veins clouded with black.

Length of the body 2 lines; of the wings 4 lines.

United States.

*Ephydra brevis*.

*Fœm.*—Nigra, obscura, thorace vittis quatuor cinereis, abdomine æneo-nigro brevi latæ nitente, tarsis fulvis, alis subcinereis, venis pallidis, transversis nigris.

*Female*.—Black, dull; thorax with four cinereous stripes; abdomen æneous black, short, broad, shining; tarsi tawny; wings very slightly greyish; veins pale; transverse veins black.

Length of the body  $1\frac{1}{4}$  line; of the wings 3 lines.

United States.

*Ephydra oscitans*.

*Fœm.*—Nigra, nitens, scutello nigro-cyaneo, pedibus fulvis, alis limpidis, areolis fusco-maculatis.

*Female*.—Black, shining; scutellum blackish blue; legs tawny; wings limpid, with rows of brown spots between the veins, which are black.

Length of the body 1 line; of the wings  $2\frac{1}{2}$  lines.

United States.

*Ephydra nana*.

*Fœm*.—Nigra, nitens, pedibus flavis, femoribus nigris, tibiis-posticis nigro fasciatis.

*Female*.—Black, shining; legs pale yellow; femora black; hind tibiæ with a black band; wings very slightly greyish; veins pale.

Length of the body 1 line; of the wings 2 lines.

United States.

Fam. 17. CESTRIDÆ.

Fam. 18. PHORIDÆ.

Genus PHORA, Latr.

*Phora nebulosa*.

*Fœm*.—Nigra, capite subtus, antennis pedibusque fulvis, alis obscurè cinereis apud medium sublimpidis.

*Female*.—Black; head tawny beneath; antennæ and legs tawny; wings dark grey; middle part nearly limpid; veins black.

Length of the body  $2\frac{1}{2}$  lines; of the wings 4 lines.

Tasmania.

EPROBOSCIDÆ.

Fam. 1. HIPPOBOSCIDÆ.

The genera *Brachytarsina* (Macq. Mém. Soc. Nat. des Sci. &c. de Lille, 1850), and *Raymondia* (Frauenfeld, Akad. der Wissenschaften, 1855), may be united to Wiedemann's genus *Strebla*, which is nearly allied to *Megistopoda*. (Macq. Ann. Soc. Ent. Fr. 2<sup>me</sup> Sér. X. 332.)



Genus HIPPOBOSCA, Linn.

*Hippobosca viridipes.*

Nigra; capite, pectore thoraceque antice lividis, pedibus viridibus livido-variis, tarsis nigris, femoribus tibiisque nigro-vittatis, alis subcinereis.

Black; head, pectus and fore part of the thorax livid; legs green, partly livid; tarsi black; femora and tibiæ with black stripes; wings greyish; veins black.

Length of the body  $3\frac{1}{2}$  lines; of the wings 8 lines.  
New South Wales.

NEMOCERA.

Fam. BIBIONIDÆ.

Genus BIBIO.

*Bibio Zealandicus.*

*Fam.*—Niger, ventre ferrugineo, femoribus rufis apice nigris, alis fuscescente cinereis, stigmatе venisque costalibus nigris, posterioribus pallidis.

*Female.*—Black; abdomen ferruginous beneath; femora red, with black tips; wings brownish grey; veins and stigma black; posterior veins pale.

Length of the body  $4\frac{1}{2}$  lines; of the wings 8 lines.  
New Zealand.

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XVII. *On New Genera and Species of Longicorn Coleoptera.* Part III. By F. P. PASCOE, Esq., F.L.S., &c.

[Read 3rd August, 1857.]

*Cantharocnemis Downesii.*

*Prionus Downesii* (Moore's MS.)

C. piceus; prothorace medio sub-glabro; lateribus capiteque punctatis; elytris lineis duabus elevatis, apicem versus evanescentibus. Bombay.

Pitchy brown, head punctured, two confluent elevations on the vertex behind, with two shallow depressions in front and between the eyes; antennæ glabrous, reddish brown; prothorax smooth in the middle, thickly punctured at the sides; elytra very thickly but finely punctured, with two elevated nearly parallel lines on each, but gradually disappearing towards the apex; legs and abdomen beneath reddish brown.

Length 22 lines.

I am indebted to M. Chevrolat for having pointed out the extremely rare genus to which this fine insect belongs. It is dedicated to — Downes, Esq., of Bombay, to whom the museum at the India House is indebted for many fine insects.

*Cerambyx egenus.*

C. sub-angustatus, fuscus, parce griseo-pubescentis; prothorace sub-mutico irregulariter et leviter plicato; elytris apice rotundatis; antennis mediocribus. China Borealis.

Rather narrow, dark brown, very sparingly furnished with a greyish pubescence; prothorax about equal in length and breadth, rounded at the sides, which are nearly entire, the surface with fine irregular folds; elytra a little depressed, rounded at the apex; antennæ moderate.

Length 9 lines.

*Cerambyx fulvidus.*

C. sub-angustatus, brunneus, fulvo-pubescentis; prothorace integro leviter rugoso; elytris apice rotundatis; antennis mediocribus. China Borealis.

Rather narrow, light brown inclining to bay, with a pale buff pubescence; prothorax rather longer than broad, the sides and surface uneven, but not plicate; elytra rounded at the apex.

Length  $8\frac{1}{2}$  lines.

These two species will certainly not come into *Cerambyx*, if it be restricted to such insects as *Heros* and *miles*.

*Cerambyx micaceus*.

*C. piceus*, *angustus*; prothorace medio transverse corrugato, plagis griseo-lanuginosis aspersis; elytris gibbosulis nitidis irregulariter et leviter hirsutis; antennis pube griseâ densissime vestitis; pedibus brevibus pallidioribus. BOINEO.

Pitchy, head rather narrow, a deep groove between the eyes, which are large and almost contiguous both above and below, the groove and the eyes above furnished with a margin of yellowish hairs; prothorax elongate, nearly elliptic, corrugated irregularly at the sides, transversely in the middle, with patches of yellowish woolly hairs interspersed; elytra lengthened, parallel, the apex rounded, the disc irregularly tumid, shining, with thin lines of hairs; antennæ pubescent, about as long as the body, flattened towards the apex, with the joints dilated on one side (♀); legs short.

Length 6 lines.

This again seems a form quite apart from anything else.

EPANIA.

Head not prolonged anteriorly; eyes lateral, sinuated above; antennæ moderate, filiform; joints, except the second, nearly equal; thorax larger than broad, margined anteriorly and posteriorly; elytra very short, rounded; legs moderate, the femora clavate.

Differs from *Tomopterus*, its nearest ally, in its narrower thorax, eyes widely apart, shortness of face, and filiform antennæ. This genus is proposed for *Odontocera*? *Sarawakensis* and *O.*? *Singaporensis* of Thomson (Arch. Ent., p. 124). There are others still undescribed.

MERIONÆDA.

Head small, transverse, lengthened behind; eyes large, prominent; antennæ short, claviform, the six or seven last joints

dilated, the first, third and fourth slender, and nearly equal; prothorax uneven, attenuated anteriorly; elytra subulate, shorter than the abdomen; anterior legs short, the posterior very long, its femora clavate, tibiæ serrated and spurred, the tarsi short.

Allied to *Necydalis*, L., but abundantly distinct in its antennæ, elytra, &c. *Molorchus Indicus* (Hope), *Heliomanes nigriceps*, (White), and other undescribed species, belong to this genus.

*Merionæda puella.*

M. atra; prothorace luteo; femoribus basi testaceis. Macassar.

Black, coarsely punctured; prothorax and scutellum reddish yellow; elytra two-thirds the length of the abdomen, each with a raised longitudinal line near the apex; the shoulders prominent.

Length  $3\frac{1}{2}$  lines.

*Merionæda scitella.* (Pl. XXV. fig. 3.)

M. atra; prothorace luteo; elytris maculâ basali, antennis articulis duobus ultimis, femoribusque posticis basi testaceis. Borneo.

Black; prothorax yellow; elytra along the inner margin, two last joints of the antennæ and posterior thighs, at the base, testaceous; in other respects closely resembles the last, but the elytra are more elongate.

Length  $2\frac{1}{2}$  to  $3\frac{1}{2}$  lines.

*Psilomerus? macilentus.*

P. elongatus, obscure testaceus; prothorace elytrisque obsolete fusco-marginatis. Ceylon.

Elongate, dull testaceous; prothorax and elytra with an indistinct brown or pitchy stripe externally, and across the base of the latter; antennæ very long.

Length 5 lines.

As this genus has never been published, and I have only seen an imperfect specimen of the original species in the British Museum, it is not without a doubt that I refer this insect to *Psilomerus*; it is, however, certainly very near it.

HEMILISSA.

Head broad, very short; the eyes large, slightly emarginate; antennæ moderate, the joints subequal, compressed, carinate; thorax uneven, narrower than the head, longer than broad; elytra

lengthened, parallel, sub-depressed, apiculate; legs moderate, femora clavate; tarsi short; prosternum produced.

This genus is formed for the *Acanthoptera gummosa* of Perty. What *Acanthoptera* is intended it is difficult to say, since Latreille used the word to include *Purpuricenus*, *Callichroma* and the *Stenocori* of Fabricius, but this arrangement was never adopted. *Hemilissa* is closely allied to *Piezocera*, Serv.

*Clytus Sappho.*

*C. niger*; capite prothoraceque cinereis, hâc obscure nigro-cruciato; elytris basi lineis duabus, unâ transversâ, alterâ obliquo-longitudinali, lineâ suturali a scutello, fasciâ angustâ ante medium continuâ, fasciâ posticâ et maculâ apicali vire-scentibus. Borneo.

Black, pubescent; head and thorax dull ashy grey, the latter with an obscure black cruciate mark dividing it into four nearly equal parts; scutellum and line continuous with it across the base of the elytra, an obliquely longitudinal line below it, and another at the centre joining a band before the middle, followed by a second below, and an oblong spot at the apex, greenish yellow; four last joints of the antennæ and tarsi whitish; metathorax and abdomen with a close white pubescence; eyes pale brown.

Length 5 lines.

A *Clytus* with something of the habit of *C. plebeius*.

*Clytus cruentatus.*

*C. sub-depressus*, ater; prothorace et maculâ magnâ circa scutellum sanguineis. Malacca.

Rather depressed, black, very thickly punctured; prothorax and central portion of the elytra about the scutellum deep blood-red, under surface paler; scutellum, breast and two first abdominal segments with a silvery pubescence; antennæ stout.

Length 4 lines.

This belongs to the same group as *C. Hardwickii*, *C. lunatus*, &c.

*Clytus mustela.*

*C. niger elongatus*; capite prothorace elytrisque basi rufobrunneis; elytrorum lineâ basali arcuatâ fasciâ posticâ continuatâ et maculâ apicali oblongâ viridi-luteus. Borneo.

Elongate, pubescent; head, thorax and base of the elytra brownish red, rest of the elytra black, with a line curving down-

wards from the base, connected along the suture with a transverse fascia and an oblong apical spot, greenish yellow; first seven joints of the antennæ, femora and tibiæ black, the two latter with the pubescence of a greenish hue, rest of the antennæ and tarsi white beneath, with the breast pale red, the remainder dull white; antennæ testaceous, nearly as long as the body, the fourth joint slightly spined; prothorax oblong, elliptic.

Length 7 lines.

*Clytus viverra.*

*C. cinereus*, *elongatus*; prothorace obsolete nigro-fasciato; elytris lineâ curvatâ humerali mediâ, alterâque latâ versus apicem, nigris. Borneo.

Elongate, pubescent, cinereous grey; prothorax oblong, elliptic, with an obscure black band; elytra with a curved line near the shoulders, an arched band at the middle, and a broad one below, black; legs and antennæ black, with a sparse ashy pubescence, the latter setaceous, rather shorter than the body, with the third and fourth joints strongly spined at the apex.

Length 7 lines.

This and the above, with *C. elongatulus* and others, should probably form a distinct group, but the whole genus requires a revision.

*Rhaphuma placida.*

*R. pallide miniacea*; capite nigro; elytris apice albo-marginatis, maculis duabus nigris, altera pone medium (guttulâ albâ ante maculam), altera magna versus apicem; infra nigrâ albo-variâ. Macassar.

Pale red, inclining to orange; head black, produced anteriorly, with two rows of whitish hairs beneath the eyes; prothorax elongate, elliptic; elytra narrow, the apex truncated, bordered with white and succeeded by a large black patch, behind the middle a white spot, followed by a larger black one; beneath black, the breast covered with white hairs, the sides of the metathorax and posterior margin of the abdominal segments white; antennæ with the last six joints darker; legs pale reddish, the posterior pair nearly black.

Length 5 lines.

Very nearly allied to *Clytus quadricolor* (Lap. et Gory), and probably also to the barbarously-named *C. leucoscutellatus*. The former was the type of Dejean's genus *Rhaphium*, but as that

name has been long preoccupied by a genus of *Diptera*, I have altered it as above. It is distinguished from *Clytus* by its elongated cylindrical form, narrow thorax, and head anteriorly produced.

*Cylindrepomus peregrinus.*

*C. ater*; capite, prothorace marginibus, fasciisque elytrorum cinereis; antennis longis; pedibus mediocribus. Borneo, Java.

Dull black, with short appressed hairs; the head, margin of the prothorax, band across the base of the elytra, a line commencing near the scutellum and extending obliquely outwards, band below this and apex, ashy grey; tarsi and lower part of posterior tibiæ white; body beneath with a silvery grey pubescence; antennæ twice the length of the body; legs (for this genus) moderately long.

Length  $6\frac{1}{2}$  lines.

*Cylindrepomus lætus.*

*C. ater*; capite, prothoraceque supra, scutello, fasciisque elytrorum cinereis; antennis, pedibusque posticis longissimis. Malacca.

Black, finely punctured with short appressed hairs; upper part of the head and prothorax, scutellum, three bands across the elytra, the upper passing along the suture and spreading out so as to connect itself with the second and oblong apical spot, ashy grey; under surface leaden, with the sides white; palpi testaceous; legs slender, posterior pair and antennæ very long.

Length  $4\frac{1}{2}$  lines.

*Cylindrepomus comis.* (Pl. XXV. fig. 7.)

*C. ruber*; fronte, prothorace lateribus, elytris maculis quatuor extus (margine connexis), antennis pedibusque atris; subtus, tarsisque posticis albis. Borneo.

Pubescent, nearly impunctate, clear red, beneath but principally at the sides white; front of the head, stripe on the side of the prothorax, four large spots on the elytra externally, but connected at the margin, legs and antennæ black; posterior tibiæ at the base and tarsi white.

Length  $4\frac{1}{2}$  lines.

## ARRHENOTUS.

Head small; eyes deeply divided; antennæ distinct, slender, longer than the body, first joint shorter than the third, the fourth longest, the rest gradually diminishing; prothorax transverse, wider anteriorly (♂) than the elytra, flat, almost concave above; elytra depressed, elongate, slightly tapering towards the apex; legs slender, of moderate length; mesosternum produced, prosternum notched for its reception.

With very much the habit of *Coptomma*, this genus differs in the eyes, prosternum and other characters; from *Tmesisternus* and allied genera, it may be distinguished by its more feebly developed legs and antennæ, &c. It is geographically interesting as being, so far as we know at present, the most western representative, unless we include *Leptocera*, of a sub-family confined to New Zealand, New Guinea and the more eastern islands of the Indian ocean.

*Arrhenotus Wallacei.* (Pl. XXV. fig. 1.)

*A. niger*, nitidus, punctatus; capite prothoraceque vittis latis quatuor elytrisque guttis numerosis aureis, apice elytrorum bimucronatis. Macassar.

Black, shining, smooth, four broad stripes on the head and prothorax, and numerous spots on the elytra, formed by short golden yellow hairs; antennæ and legs pale brown; under surface with a whitish pubescence; elytra bimucronate; eye rounded above anteriorly.

Length  $7\frac{1}{2}$  lines.

*Phacellocera Batesii.*

*P. nigra*, parce flavescens-pubescent, subtus plumbea; antennis longis, articulo tertio albo-annulato, apice nodoso; elytris integris. Para.

Black, with a sparse pale yellowish pubescence, beneath plumbeous; elytra rather short, entire, punctate at the base, the pubescence here and there absent, giving them a mottled appearance; antennæ rather long, the third joint nodose at the apex, with a white ring below it.

Length, 6 lines.

I dedicate this species to Mr. Bates, to whose extensive researches and accurate observations in the valley of the Amazons, extend-



ing over a period of many years, we owe so much. It differs both from *P. plumicornis* and *P. Buquetii* in its shorter and entire elytra having none of the irregularities of surface which distinguish these, nor has it any tuft on the antennæ.

*Mesosa perplexa.*

*M. niger*, pube ochraceâ varia; elytris plagâ transversâ mediâ exteriori, albo-marginatâ. China Borealis.

Black, with an ochraceous pubescence dispersed in irregular and indistinct patches on the head and prothorax in a longitudinal direction, on the elytra more dispersed, but having about the middle a transverse larger spot towards the side, around which there is more or less of a white border; antennæ with the first joint variegated with ochre, the rest ochraceous at the base; legs varied with black and ochraceous.

Length 7 lines.

*Mesosa griseata.*

*M. fusca*, pube griseâ varia; elytris punctatis, basi granulatis, fasciâ obliquâ irregulari versus apicem, apiceque griseis; antennis annulatis. Borneo.

Dark brown, pubescent, varied with grey; space round the eye and line in front, various indistinct patches on the prothorax and elytra, and particularly an oblique band near the apex, the apex itself, and the bases of all the joints of the antennæ, a pale cinereous grey; legs and under surface with a pale pubescence, the lower parts of the tibiæ, and the last two tarsal joints, black.

Length 7 lines.

**DRIOPEA.**

Head short, vertical, narrower than the thorax; antennæ longer than the body, first joint moderate, shorter than the third, which, with the rest, are about equal; palpi short; prothorax narrower than the elytra; equal in length and breadth, broader behind, with a small tooth at the sides; elytra depressed, narrowing towards the apex; legs slender, moderate, the posterior longer.

The affinities of this curious little insect appear to be with *Leiopus*. In some respects it approaches *Mimorpha*.

*Driopæa clytina*. (Pl. XXV. fig. 2.)

*D. atra* setosa; prothorace, scutello elytrisq[ue] maculâ lunari humerali, fasciâ pone medium et apiceq[ue] cinereis, subtus argenteo-pubescente. Malacca.

Black, with a very short pubescence; prothorax and scutellum ashy grey; elytra bimucronate, finely punctured, furnished with a few erect setose hairs, and having a large semilunar patch on each shoulder, a narrower band behind, and an oblong sutural spot at the apex, ashy grey; under surface covered with short silvery white hairs.

Length  $3\frac{1}{2}$  lines.

GYARITUS.

Head narrower than the thorax, antennæ distant ciliated, the joints thick, the first very stout, the third and fourth longest, the rest subequal; thorax short, spined at the sides and back; elytra narrow, convex, rounded at the apex, and spined at the base; legs moderate, simple.

Allied to *Pogonochærus*, from which it principally differs in its thickened antennæ, and in having the fourth joint straight, not curved.

*Gyaritus hamatus*. (Pl. XXV. fig. 6.)

*G. purpureo-ater* variegatus hispidus; prothorace dorso bispinoso, lateribus utrinque unidentatis; elytris striatis basi spinosis, fasciis obliquis duabus ante medium canis, fasciâ transversâ prope apicem albâ. Borneo.

Purplish black, with long erect setulose hairs; prothorax roughly punctate, with two transverse approximate recurved spines in the centre, and a small sharp tooth on each side; elytra with a sharp hooked spine at the base, the basal half obscurely varied with grey and purplish black, below this a broad band of the latter colour, followed by a narrower white one, the apex again purplish black; legs and antennæ reddish brown.

Length 2 lines.

PHLYARUS.

Head short, rather broad in front, not narrower than the thorax; eyes large, deeply emarginate; antennæ distant, stout,

ciliated, about as long as the body, the first joint large, the third and fourth equal, the rest gradually diminishing; prothorax uneven, with a spine at the side; elytra somewhat depressed, wider than the thorax; legs moderate, the middle and posterior tibiæ strongly toothed.

The strongly toothed middle and posterior tibiæ distinguish this genus from *Exocentrus*, which appears to be its nearest ally.

*Phlyarus basalis.* (Pl. XXV. fig. 5.)

*P. fuscus* parce pilosus; elytris striatis, basi rubris; antennis pedibusque piceis. Borneo.

Dark brown, sparingly hairy above, head and prothorax paler; elytra coarsely striated, particularly at the base, which is of a brick-red colour, passing into the brown of the remainder; antennæ and legs pitchy.

Length  $2\frac{1}{2}$  lines.

*Monohammus gravidus.*

*M. fusco-piceus*, griseo-pubescent; prothorace parvo, transverso, lateribus fortiter spinosis; elytris amplis albo-irroratis, singulis plagâ magnâ mediâ albidâ. Borneo.

Pitchy brown, with a greyish white pubescence; prothorax small, transverse, with a very strong spine on each side, and a few black granulations posteriorly; elytra large, convex, apiculate, with two slightly raised lines, and sparingly covered with short hairs, the shining surface of the elytron beneath giving them a somewhat silvery lustre, here and there the hairs more densely placed, having the appearance of spots, a very large one below the middle of the elytron being very marked; under surface with a greyish metallic pubescence; antennæ scarcely longer than the body; eyes brown; tips of the mandibles and palpi pitchy; epistoma and labrum with rusty red hairs.

Length 21 lines.

Rather different in habit from other *Monohammi*, but evidently allied to *Hammaticherus marmoratus*, Westw.

*Monohammus vicinus.*

*M. olivaceo-aureus*, sericeo-undulatus; prothorace tenuiter spinoso, medio longitudinaliter impresso. China Borealis.

This is closely allied to *M. permutans*, but is smaller and narrower, with the lateral spine less produced, and arising from a

broader base, the antennæ less distinctly annulate, and the colour darker; a longitudinal impressed mark on the prothorax, not a transverse one as in *M. permutans*. It may be remarked that a little moisture permanently changes the colour of the insect into a dull brown, which is its not unfrequent state in collections.

Length  $7\frac{1}{2}$  lines.

*Monohammus curialis.*

*M.* capite prothoraceque sericeo-brunneis; elytris punctatis canescentibus, maculâ basali fuscâ pone medium, fasciâ obliquâ, extus latiore, brunneâ; antennis (♂) annulatis articulis 1—5 incrassatis. China Boréalis.

Head and prothorax rich silky brown; elytra rather sparingly punctured, without granulations at the shoulders, a dark brown spot at the base, and an oblique band behind the middle, broader at the sides on each, the apex with a slightly reddish tinge; eyes black; antennæ rich brown, the first five joints in the male thickened, the fourth to the tenth pale at the base; legs grey, thighs, lower part of the four posterior tibiæ, tarsi and claws brown.

Length 9 lines.

*Monohammus sobrius.*

*M.* obscure brunneus; prothorace subpunctato fortiter spinoso; scutello concolore; antennis annulatis. China Borealis.

Dull brown, sparingly clothed with short hairs; prothorax feebly punctured, narrow, with a strong spine on each side; elytra rather thickly punctured, not granulated; antennæ with the joints from the fourth to the ninth paler at the base.

Length 6 lines.

*Monohammus proletarius.*

*M.* fuscus, dense cinereo-pubescentis; prothorace lineâ sub-elevatâ mediâ longitudinali; elytris sub-angustis; antennis longis (♂) articulo octo incrassato. Macassar.

Brown, with a fine thickly set ashy-grey pubescence; prothorax rather narrow, with a strong spine at the side and a slightly elevated smooth longitudinal median line; elytra narrow, finely

punctured, without granulations; antennæ with the eighth joint thickened.

Length 6 lines.

This and the last are allied to *M. fistulator*, Germ.

#### ACALOLEPTA.

Head rather broad, the antennæ long, distant at the base; prothorax rounded, equal, toothed at the sides; elytra rather small; legs moderately strong.

In deference to the high authority of M. Chevrolat I propose this genus for a little insect, which, except that the antennæ are more distant at the base, and with rather a different habit, has little generically to distinguish it from *Monohammus*.

#### *Acalolepta pusio*. (Pl. XXV. fig. 4.)

A. obsкуро-brunneus; prothorace spinâ laterali minutâ; elytris apice rotundatis; pedibus flavo-brunneis; antennis 3—10 basi pallidis. Borneo.

Dull brown; prothorax rounded, the lateral spine small; elytra pubescent, regularly punctured; legs light brown; antennæ with the joints from the third to the tenth pale at base.

Length 3 lines.

#### *Ærenea trigona*.

Æ. fusca; maculâ magnâ triangulari (apice versus scutellum) prothorace verticeque communi, brunneâ; elytris basi tuberculatis, dein punctatis, parce hirsutis, maculâ laterali scutelloque brunneis. Brasilia.

Dark brown, a large triangular patch commencing between the eyes and extending over the prothorax, with the apex at the scutellum pale cinnamon brown; elytra with tubercles at the base, the rest punctured with short stiff hairs scattered over the surface, a patch at the side, and the scutellum pale brown; antennæ and legs brown, annulated; under surface dark brown, the three middle abdominal segments cinnamon.

Length 5 lines.

#### ROPICA.

Head moderate; eyes deeply divided; antennæ distant, naked, as long as the body, the third joint longest, the rest gradually

diminishing; scutellum transverse; thorax unarmed, the sides nearly parallel, and about equal in length and breadth; elytra convex, rather broader behind, and sloped towards the apex; legs very short, mesotibiæ toothed.

This genus must, I think, be referred to the vicinity of *Praonetha*.

*Ropica piperata*.

*R. grisea*, punctata; elytris nigro-irroratis, maculis parvis albis conspersis; antennis pedibusque fuscis. Borneo.

Brownish grey, thickly punctured above; elytra with numerous black points, and a few small patches, among which, principally at the suture and apex, are a few small white spots; legs and antennæ dark brown.

Length 3 lines.

*Ropica posticalis*. (Pl. XXVI. fig. 4.)

*R. fusca*; elytris striato-punctatis, maculâ magnâ apicali obscurè griseâ. Hong Kong.

Dark brown; head and prothorax thickly punctured, the latter with a longitudinal greyish spot on each side at the base; elytra punctate-striate, an obscure irregular greyish patch at the shoulder, and another larger, but more clearly defined, covering the sloping portion of the elytra.

SYNELASMA.

Head narrower than the thorax; the antennæ distant, short, the first four joints twice the length of the rest together, these last furnished beneath with a row of thickly set hairs; eyes small, deeply emarginate; thorax transverse, wider behind, uneven, with a tubercle on each side anteriorly; elytra convex, broader than the thorax, the sides parallel, apex rounded; legs stout.

This curious genus ought, I think, to be referred to the neighbourhood of *Praonetha*; it is very likely that the comb-like appendages of the antennæ are merely sexual.

*Synelasma bufô*. (Pl. XXVI. fig. 1.)

*S. fusca*, rugosa, griseo-lanuginosa; elytris tuberculatis, basi ferrugineis, lateribus ante medium plagâ magnâ ochraceâ ornatâ; antennis annulatis. Borneo.

Brown, with a grey woolly pubescence, which is very sparse, except on the elytra; head rounded above, broad and flat in front;

prothorax rough, with black irregular crowded tubercles; scutellum transverse; elytra uneven, with numerous granulated tubercles, some bearing a short stiff hair, and having three or four elevated lines on the disc and towards the shoulder, where it almost forms a crest, at the side and before the middle a large irregular ochraceous patch, the base and scutellum ferruginous brown; antennæ with the tips of the third and fourth and last seven joints black, the base of the fourth white on one side; mesosternum slightly produced.

Length  $6\frac{1}{2}$  lines.

#### MORON.

Head narrower than the thorax; antennæ short, distant, the first four joints longer than the rest together; eyes small, widely emarginate; thorax narrow in front, entire; elytra wider than the thorax, tuberos at the base, gradually diminishing at the sides; legs stout.

Near *Praonetha*, which differs in the prothorax narrowed behind, elytra, &c.

#### *Moron distigma.* (Pl. XXVI. fig. 2.)

*M. piceus*, crasse punctatus, pube griseo-ochraceâ parce vestitus; elytris basi tuberoque granulatis, maculâ rotundâ ochraceâ pone medium; antennis articulo quarto basi pallidis. Borneo.

Pitchy, with very coarse punctures, the intervals covered with short greyish yellow hairs; elytra granulated at the base and on the tubers, behind the middle a round ochraceous spot; antennæ brown, the tips of the third and fourth joints, and all of the remainder black, the fourth pale ochre at the base.

Length 6 lines.

#### *Cacia picticornis.*

*C. fusca flavo-guttata*; antennis pedibusque atris albo-maculatis, articulo quarto subtus barbato. Borneo.

Pubescent, brown; head, below the eye, with a large triangular whitish patch; prothorax and elytra with several well-defined buff-coloured spots; antennæ black, base of the third and fourth (which is strongly bearded beneath), and the whole of the fifth joint, pure white; legs black, annulated; the two first joints of

all the tarsi white; mandibles and legs black; under surface greyish.

Length 5 lines.

*Symphyletes maculicornis.*

*S. atra*, pube densissimâ griseâ fulvo-variâ; unguibus atris nitentibus; antennis albo-maculatis. Flumen Cygnorum.

Densely covered with short appressed hair, except the claws and mandibles, which are glossy black; general colour light greyish brown, with three or four fulvous yellow bands on the prothorax, and numerous irregular spots in transverse rows on the elytra, which have also two or three large whitish patches along the suture; under surface light grey, the margins of the abdominal segments yellow; eyes brown.

Length 11 lines.

*Symphyletes lateralis.*

*S. atra*, dense brunneo-pubescent, supra cano-varia; elytris lateribus argenteo-sericeis; antennis nigris albo-pilosis. Flumen Cygnorum.

Covered with a short dense pubescence; upper surface, palpi, and sides of the breast and abdomen beneath, light brown; face, patch behind the eye and one on the side of the prothorax, scutellum, a large blotch below it, and three or four spots near the apex, pale greyish; sides of the elytra rich silvery white; under part of the femora and sides of the tibiæ more or less whitish; middle of the mesosternum and abdomen silky white; antennæ whitish, with long hairs beneath.

Length 8 lines.

In both these species of *Symphyletes* the elytra have several small black shining tubercles, particularly on their basal half.

ECTHÆA.

Body oblong, sub-cylindrical; head broad but very short, concave in front (♂ horned); eyes small, deeply emarginate; antennæ distant, arising from a short peduncle, and scarcely longer than the body, the first joint moderate, the third longest, the remainder gradually diminishing; thorax rough; elytra widest at the base, decreasing slightly towards the apex, which is somewhat dilated; legs stout, short, the anterior longest; the tarsi short, with the last joint large.



This genus is founded for the reception of the *Cerambyx quadricornis* of Olivier, the *Sthenias signatifrons*, Dej. Its characters approximate it to *Oncideres* and *Eudesmus*.

*Sthenias dorsalis.*

*S. fuscus, hirtus*; elytris basi cristatis, fasciâ mediâ latâ, extus dilatatâ, albâ. India.

Dark brown, covered with short appressed hair; head between the eyes produced, with a short spine at the base of each antenna; prothorax coarsely punctured; elytra with a short longitudinal crest at the base of each and a broad white band below, much dilated towards the external margins, the apex obliquely truncate; legs short, brown; the posterior femora and tarsi varied with white; under surface brown.

Length 7 lines.

*Eumathes undatus.*

*E. fusco-piceus, griseo-pubescens*; elytris sub-depressis ad suturam concavis, punctatis, hirtis, fusco-undatis. Espiritu Santo.

Pitchy brown, with a grey pubescence; prothorax slightly pointed at the sides; elytra rather depressed and hollowed out towards the suture, irregularly punctured, the punctures with a short stiff hair arising from the bottom of each, and having the pubescence varied with dark irregular somewhat waved transverse lines or patches; antennæ longer than the body, sparingly ciliated beneath, and with the apices brown; beneath and legs hairy; prosternum produced.

Length  $5\frac{1}{2}$  lines.

*Alphitopola maculosa.*

*A. piceo-fusca, albo-pubescens*; capite prothoraceque lineolatis; elytris maculis magnis albis subconfluentibus; palpis rufo-brunneis. Natal.

Pitchy brown, pubescent; eyes, labrum and antennæ brown; palpi pale reddish brown; head and prothorax with five narrow stripes; elytra with rather obscure large tessellated and sometimes nearly confluent white spots; under surface pure white; legs pale brown, with a slight whitish pubescence.

Length 5 lines.

*Dorcadion?* *spinipenne*.

*D. nigrum*, rugosum, parce pubescens; prothorace creberrime punctato, lateribus spinâ tenui armatis; elytris basi tuberculatis, humeris bispinosis; antennis corpore longioribus. Africa Australis.

Brownish black, sparingly pubescent, the prothorax nearly as broad as the elytra, with a slender spine at the side, and very thickly punctured; elytra widest about the middle, then tapering to the apex, tuberculate at the base, with two strong spines, one at the angle, the other near the suture; legs rather slender; eyes small; antennæ longer than the body in both sexes; pro- and mesosternum simple; scutellum nearly obsolete.

Length 6 lines.

If a *Dorcadion* at all, this can only be regarded as a very aberrant species, but it will probably be eventually elevated into a genus; the *Dorcadion Indicum* of Guerin is not unlikely to be congeneric.

## BUMETOPIA.

Body oblong, oval, depressed; head very broad, low in front; eyes lateral, small, deeply emarginate; mandibles very large; palpi short; antennæ moderate, widely apart, the third and fourth joints longer than the first, the rest shorter; prothorax transverse, entire; elytra nearly ovate; legs moderate.

In many of its characters this genus accords with *Talæpora* and *Apomecyna*, but the great breadth of the head and largely developed jaws will at once distinguish it.

*Bumetopia oscitans*. (Pl. XXVI. fig. 7.)

*B. fusca*, pube grisescente tecta; elytris punctatis, versus apicem obsolete trimaculatis. Hong Kong.

Brown, with a greyish or greyish buff pubescence, and with the whole upper surface irregularly punctured; prothorax very slightly toothed at the side; elytra at its lower third with three buff-coloured obscure spots.

Length 6 lines.

*Hathlia zebrina*.

*H. alba*; capite prothoraceque vittis tribus nigris; elytris maculis albis punctisque nigris variegatis. India.

Densely covered with short thick appressed hairs; head and prothorax white, a black line behind each eye and another between, continued on the prothorax; elytra varied with black and white, on the disc a few curved white patches and small rounded spots, principally at the suture, the apex white with a few black points and impressed punctures; antennæ and legs black, under surface whitish.

Length  $6\frac{1}{2}$  lines.

*Apomecyna binubila.*

A. fusca, punctata, pubescens; capite, prothorace, elytris que ferrugineis, brunneo-variis, his plagis magnis griseis, longitudinaliter dispositis; antennis annulatis. Natal.

Dark brown, coarsely punctured with a ferruginous pubescence, varied with brownish and having two large clouded grey patches on each elytron, one near the base, the other towards the apex; antennæ and legs dull brown, the former with the joints grey at base and apex; elytra truncate at the apex.

Length 5 lines.

*Apomecyna atomaria.*

A. fusca, pube griseo-varia, obscure albo-irrorata, et crasse punctata; antennis pedibusque fuscis. Natal.

Dark brown, sparingly pubescent, strongly and coarsely punctured; the whole upper surface greyish brown, very obscurely spotted with white; elytra divaricate and obtusely pointed at the apex.

Length  $4\frac{1}{2}$  lines.

DASYO.

Head moderate, the width of the thorax; antennæ distant, not longer than the body, the joints thickened, having the first and third about equal and longest, the rest gradually decreasing; palpi short; thorax not spined, equal but wider in the middle; elytra depressed, nearly parallel, the apex rounded; legs short.

This genus should be placed near *Ptericoptus*, Dej.; it has the habit of some *Hebestolæ*.

*Dasyo lineata.* (Pl. XXVI. fig. 8.)

D. fusco-picea, hirsuto-pilosa; prothorace scutelloque lineâ pallidâ communi longitudinali; antennis valde incrassatis longe pilosis; mandibulis piceis. Natal.

Brown, inclining to pitchy, covered with short hairs and having numerous longer ones interspersed, particularly on the elytra; prothorax with a fine brownish white line extending to the scutellum; under surface with short appressed hairs; mandibles pitchy. Length  $4\frac{1}{2}$  lines.

*Dasyo improba.*

D. fusco-picea, hirsuta, pilosa; prothorace scutelloque concoloribus, antennis mediocribus parce pilosis, mandibulis fuscis. Natal.

Brown, inclining to pitchy, pubescent, with numerous semi-erect hairs; antennæ rather shorter than the body, the joints moderately thick and hairy; mandibles brown; under surface slightly hairy.

Length  $3\frac{1}{2}$  lines.

IOLÉ.

Body short, oblong; head wider than the thorax; antennæ much longer than the body, simple, with the joints sub-equal (except the second); eyes deeply emarginate; prothorax equal in length and breadth; elytra parallel, convex, wider than the thorax; legs moderate; tarsi short.

Nearly allied to *Serixia*, from which it is principally distinguished by its smooth antennæ and more convex body.

*Iole prolata.*

I. validiuscula, rubro-fulva; antennis mediocribus; prothorace marginato. Borneo.

Tawny yellow, with a reddish tint; eyes and tips of the mandibles black; antennæ from the extremity of the fourth joint brown; prothorax margined, the disc sinuated posteriorly on either side; elytra punctate-striate, pubescent, with semi-erect hairs interspersed.

Length 4 lines.

*Iole longicornis.*

I. fulvo-testacea; antennis longioribus, articulis duobus primis nigris. Malacca.

Rather dull testaceous yellow; eyes, first and second joints of the antennæ, and tips of the third to the sixth, black, the remainder brown; prothorax obscurely margined; elytra punctate-striate, slightly hairy.

Length  $2\frac{1}{2}$  lines.

*Iole literata.* (Pl. XXV. fig. 9.)

I. fulvo-testacea; prothorace vittâ laterali fuscâ; elytris lineis duabus unâ transversâ basali, alterâ ad marginem nigris; antennis longis. Macassar.

Dull testaceous yellow; eyes and tips of the mandibles black; antennæ long, becoming darker towards the end; prothorax with a broad but rather obscure stripe at the side; elytra punctate-striate, somewhat silky, particularly at the apex; a narrow black line across the base, and another united to it at a right angle, extending half way down the side and near the margin.

Length 3 lines.

*Iole nigripes.*

I. testaceo-brunnea; oculis, antennarum articulis primis tribus, corpore infra, pedibusque nigris. Malacca.

Dull testaceous brown, darker on the head; prothorax slightly margined and delicately punctured; elytra punctate-striate with a very thin pubescence; eyes, three first joints of the antennæ, legs and body beneath, black.

Length  $3\frac{1}{2}$  lines.

## ANOMÆSIA.

Body oblong, sub-depressed; head rather broad in front; antennæ longer than the body, the third joint very short, the rest, second excepted, more or less equal; eyes lateral, deeply emarginate; prothorax narrow, unarmed; elytra broader than the thorax, parallel, slightly depressed, the apex rounded; legs moderate.

A genus of the Saperdoid group, but with the remarkable character of having the third antennal joint very short.

*Anomoesia fulvida.* (Pl. XXV. fig. 8.)

A. rubro-testacea, pube subsericeâ fulvâ ; oculis, antennis, pedibusque nigris. Natal.

Pale reddish or orange, with a somewhat silky pubescence, antennæ, eyes, and legs black, under surface silvery.

Length 3 lines.

*Amphionycha albina.*

A. brunnea dense griseo-albo-pubescentis ; antennis, prothorace maculis quatuor, pedibusque nigris, his albo-pubescentibus. Guatemala.

Light brown, with a greyish white pubescence ; antennæ, four spots on the prothorax—two anterior and two posterior—and legs black ; body beneath with a white pubescence, the breast leaden.

Length  $4\frac{1}{2}$  lines.

*Amphionycha vittata.*

A. testaceo-brunnea, pube pallide-viridi-flavâ tecta ; elytris basi bivittatis, antennis piceis. Espiritu Santo.

Testaceous-brown, covered with a pale greenish yellow pubescence, on the prothorax more nearly the colour of sulphur ; elytra each with two broad stripes, caused by the absence (or nearly so) of pubescence, one sutural the other lateral, and gradually disappearing before the apex ; antennæ pitchy ; eyes black.

Length  $6\frac{1}{2}$  lines.

*Phœa acromela.*

P. nigra, nitida ; capite prothoraceque coccineis, hoc maculâ nigrâ ornatâ. Mexico.

Black, shining, with a few long hairs scattered over the body ; head and thorax bright vermilion, the latter with a central black spot ; elytra coarsely punctate.

Length  $4\frac{1}{2}$  lines.

*Phœa miniata.*

P. miniata, nitida ; oculis, antennis, articulo primo basi excepto, tibiis tarsisque nigris. Venezuela.

Bright vermilion, with a few longish hairs; eyes, antennæ, except the basal part of the first joint, tibiæ and tarsi, black; prothorax and elytra finely punctured; front below the eyes produced. Length 4 lines.

*Amphionycha cephalotes.*

A. fulvo-testacea; elytris subsericeo-grisescens, marginibus, antennis, articulis quatuor apicalibus exceptis, tibiisque posticis nigris. Para.

Head and thorax testaceous yellow; elytra somewhat silky, greyish, the external margins black; under surface and legs testaceous, except the posterior tibiæ, which, with the eyes and antennæ, are black, the four last joints of the latter, however, being pale yellow.

Length  $3\frac{1}{2}$  lines.

Head rather wider than the thorax, which is somewhat narrower than the elytra, the latter slightly contracted in the middle and rounded at the apex.

*Saperda erythaca.*

S. nigra; capite luteâ, prothoraceque subtilissime punctatis; elytris fuliginosis, disco pallidiori. Natal.

Head luteous red, and with the thorax very finely punctured, the latter, eyes, antennæ, body beneath, and legs dull black; elytra coarsely punctured, smoky black, with the disc paler.

Length 4 lines.

*Saperda Bohemani.*

S. atra, cinereo-pubescens; capite, prothoraceque mediocriter punctatis, hoc utrinque trituberculato; elytris punctatis, punctis magnis nigro-nitidis; antennis annulatis. Natal.

Black, with a cinereous pubescence; prothorax with six shining black tubercles, two near the anterior margin and two on each side; elytra covered with large black shining punctures, caused by the absence of pubescence; antennæ black, the basal half of each joint, from the third to the last inclusive, and under surface and legs, cinereous.

Length 5 lines.

This is the *S. irrorata*, Boh. of collections, but as there is already a Fabrician *Saperda* of that name, and, moreover, it has not been published, I have altered it as above, and dedicated it to the well

known Swedish naturalist. This and the *S. erythaca*, described above, differ from the true *Saperdæ* in the antennæ being claviform, with the third joint not longer than the first or following ones.

*Glenea collaris.*

*G. nigra*; fronte prothoraceque fasciâ posticâ pallide-ochraceis; elytris fusco-olivaceis sub-lævigatis, lineis duabus, una suturali altera exteriori griseis; palpis, femoribus tibiisque basi testaceis. Borneo.

Front of the head and cheeks, and broad band on the prothorax behind, pale ochre yellow; elytra olive brown, with a narrow stripe along the suture, and another from the shoulder to the apex, dull greyish; palpi, femora, and upper part of the tibiæ, testaceous.

Length 6 lines.

*Glenea extensa.*

*G. olivacea*, nigro-pubescentis; capite, prothorace elytris que lineis ochraceis, corpore subtus vittis albis ornatis; antennis articulo tertio apice albo. Borneo.

Olive, with a black velvety pubescence; head, thorax and elytra with longitudinal distinct buff yellow lines, one behind the eye, another in front ascending to the vertex, where it nearly unites with its fellow; on the prothorax five, the lowermost rather indistinct; on the elytra an interrupted line on the suture, and another from the shoulder to the apex, between these, one short and oblique at the base, and in the middle a transverse lunar mark; body beneath with two white stripes; antennæ black, apex of the third joint snowy white.

Length 8 lines.

Allied to *G. versuta*, Newm.

*Glenea relicta.*

*G. atra*, sub-nitida; capite, scutello, corpore subtus, prothoraceque lineis tribus albis; elytris olivaceis, albo-guttatis; pedibus fuscis. China Borealis.

Black, slightly shining; face, scutellum and body beneath with a white pubescence, vertex and prothorax black, the latter with three white stripes; elytra olive brown, coarsely punctured with five white spots on each; antennæ and legs dark brown, the four posterior femora testaceous at the base, tarsi with a white pubescence.

Length 4 lines.

Affinity with *G. novem-maculata*, Dj.



*Glenea blandina.*

*G. atra*, subtus parce albo-pubescentis; prothorace lineis, elytrisque maculis cæruleis ornatis; subtus pedibusque testaceis. Borneo.

Black; cheeks and stripe in front of each eye, three lines on the prothorax, and occasionally its posterior margin, scutellum and five or six small round spots on each elytron, cobalt blue; legs and under surface testaceous, the latter and tarsi with a white pubescence; antennæ with the first three joints blue internally.

Length 6 lines.

Near *G. novem-maculata*, Dj.

*Glenea despecta.*

*G. nigra*; fronte, prothorace, lineis tribus cum scutello et corpore subtus albis; elytris fuscis, sub-lævigatis, obscure lineatis; antennis nigris, articulis tribus ultimis albis; pedibus testaceis. Borneo.

Black; front, cheeks, three stripes on the prothorax, scutellum, and body beneath, white; elytra dark brown, finely punctured, nearly smooth, with an obscure line on the suture, another externally between them, a shorter one at the base, a spot about the middle, and another at the apex, all a pale greyish white; legs testaceous; antennæ black, the three last joints white.

Length 4 lines.

*Glenea detrita.*

*G. fusca*; prothorace lineis quinque elytrisque suturâ, lineâ interruptâ extus et maculis obscure-griseis; pedibus brunneis; corpore subtus pallide citrinis. Macassar.

Brown; head with the face and body beneath pale lemon yellow; prothorax with five and elytra with the suture, an external interrupted line and six or seven irregular spots, a very dull greyish white; legs pale brown, the tarsi black, but covered, as well as the lower part of the tibiæ, with white hairs.

Length 5 lines.

*Glenea rufina.*

*G. rufo-castanea*; antennis tarsisque nigris, elytris parce punctatis dense griseo-pubescentibus. Burmah.

Reddish chesnut; eyes, antennæ and tarsi black; elytra sparingly punctured, with three slightly elevated lines at the base and covered with a dense grey pubescence.

Length 7 lines.

*Glenea pulchella.*

*G. atra*, pubescens; fronte, prothorace lateribus, elytrisque basi et maculis duabus communibus sulphureis; antennis—articulis duabus primis exceptis—pedibusque testaceis. Malacca.

Black, densely pubescent; front, cheeks, sides of the thorax, scutellum, base and two large confluent spots on the elytra, sulphur yellow; sides of the mesothorax and three middle abdominal segments paler; antennæ (the first two joints black) and legs testaceous.

Length 4 lines.

*Glenea vexator.*

*G. fulvo-testacea*; annis, apice elytrorum, pedibus quatuor posticis, metathorace, abdomineque infra nigris. Ceylon.

Fulvous yellow, inclining to testaceous; antennæ, eyes, apex of the elytra, four posterior legs, and body below (except the prosternum), black. Elytra with a few scattered hairs, and punctured in about six rows; head short, broad and rounded in front, labrum nearly naked.

Length 5 lines.

*Phæbe cretifera.*

*P. fulvo-castanea*, guttis magnis niveis ornatis; annis articulo primo nigro. Brasilia.

Yellowish chesnut, pubescent; head, several large spots above and sides of breast and abdomen, snowy white; basal joint of antenna and eyes black, the former with white hairs on one side; gibbositics in front brown (♂ only); prothorax with four spots and two on each side below, each elytron with seven spots, including two also at the side and towards the base.

Length 7 lines,

A well known Rio insect, hitherto, I believe, undescribed.

*Oberea annulicornis.*

*O. elongata*, brunnea; elytris apicem versus lateribusque nigris; antennis nigris, articulo septimo carneo. Macassar.

Elongate, light brown, inclining to testaceous; head and prothorax finely punctured; elytra coarsely punctured, shading into black towards the apex, the sides wholly black; eyes and antennæ black, the latter with the seventh joint flesh-coloured; mesothorax and abdomen beneath silky, black.

Length 7 lines.

*Oberea rubetra.*

*O. elongata*, rubro-brunnea; elytris (suturâ pallidiori), antennis pedibusque nigris. Sumatra, Borneo, &c.

Elongate, light brown, with a reddish tint; head and prothorax very delicately and sparingly punctured; elytra coarsely punctured, black, lighter or smoke-coloured along the suture; eyes, antennæ, body beneath, and legs black.

Length  $8\frac{1}{2}$  lines.

*Oberea inclusa.*

*O. nigro-cinerea*; prothorace, elytris (circa scutellum) pedibusque testaceo-brunneis, oculis antennisque nigris. China Borealis.

Blackish grey; prothorax, scutellum, base of the elytra near it and legs testaceous brown; antennæ and eyes black; elytra coarsely punctured, with a faintly raised line in the middle.

Length 6 lines.

*Oberea sylvia.*

*O. testaceo-brunnea*; elytris brunneis, lateribus nigris; capite, oculis, antennisque fuscis; segmento ultimo abdomine nigro. China Borealis.

Testaceous brown; head, antennæ and eyes dark brown; elytra light dull brown, paler at the base, the external margins and last segment of the abdomen black.

Length  $6\frac{1}{2}$  lines.

All the above have the thorax about equal in length and breadth; the three species which follow have the thorax longer than wide.

*Oberea ophidiana.*

*O. elongata*, linearis, testaceo-fusca; capite antennisque nigris; prothorace cervino; pedibus nitentibus fuscis, femoribus anticis rufis. Borneo.

Long, linear and very narrow; head, antennæ and eyes black; prothorax brownish yellow; elytra and abdomen dull testaceous; legs dark brown, shining, the anterior femora brownish red; last abdominal segment black.

Length 8 lines.

*Oberea viperina.*

*O. elongata*, linearis, fusca; capite, pedibus antennisque nigris; prothorace cervino. Burmah.

Linear, elongate, narrow, blackish brown; head, legs, antennæ and last abdominal segment black; prothorax brownish yellow; elytra obscurely punctured.

Length  $6\frac{1}{2}$  lines.

*Oberea umbrosa.*

*O. linearis*, testaceo-brunnea; elytris extus nigro-limbatis; oculis anoque nigris; antennis fuscis, articulo septimo testaceo. Macassar.

Linear, testaceous brown; from the external margin of the elytron a black border, which gradually increasing in breadth, covers obliquely the apex; eyes and posterior half of the last abdominal segment black; antennæ dark brown, the seventh joint testaceous; elytra strongly punctured.

Length 6 lines.

Some of the above may be referrible to *Isosceles* Newman, but I cannot distinguish that genus from *Oberea*.

DIRPHYA.

Head vertical, narrower than the thorax, short and rounded in front; antennæ longer than the body, the joints cylindrical, the third longest, the rest sub-equal; palpi slender; prothorax equal in length and breadth, its disc uneven; elytra long and narrow, spatulate and rounded at the apex; legs robust.

Instituted for the reception of *Necydalis nigricornis* of Olivier ; with *Necydalis*, however, it has nothing to do, belonging to quite another group, and, in fact, is not far removed from *Oberea*.

*Carterica cinctipennis.*

*C. atra* ; capite lineâ frontali, prothorace vittâ laterali, elytris plagâ humerali fasciâque latâ pone medium, croceis. Para.

Deep black ; line between the eyes, stripe on the prothorax at the side extending to the shoulder, and broad band across the elytra, behind the middle, rich saffron yellow ; antennæ very slender, black, more than twice the length of the body ; elytra rounded internally towards the apex, externally produced into a spine, and with three elevated lines disappearing towards the apex.

Length 5 lines.

The *Saperda mucronata*, Ol. (1, f. 10), appears to be allied to this species.

*Onocephala picta.*

*O. fusca* ; elytris seriatim punctatis, lineis duabus, una humerali altera suturali, maculis quinque scutelloque, læte ochraceis ; antennis hirtis, articulo tertio elongato. Espiritu Santo.

Dark chocolate brown, a line of hairs on the cheek and patch on the mandibles, pale yellow ; epistome, labrum and palpi reddish brown ; antennæ hairy, particularly the third, fourth, and fifth joints, the third very long ; prothorax longer than broad, very minutely plicate ; elytra regularly punctate, stripe at the shoulder, another along the suture, three spots below and two at the sides composed of very short hairs, and scutellum bright ochre yellow ; body beneath pitchy brown.

Length 8 lines.

*Onocephala ? metallica.*

*O. viridi-ænea*, nitidissima ; elytris punctato-hirtis ; antennis chalybæis (prothorace lateribus denticulato ; scutello triangulari). Para.

Brassy, shining with a tinge of green, and more or less covered with setulose hairs ; prothorax about equal in length and breadth, with a very small but distinct tooth at the side ; elytra regularly punctate, a short stiff hair arising from each puncture ; antennæ dark blue-black, with a few short hairs ; legs and body below blueish-black ; mesosternum produced, bilobed in front ; scutellum triangular.

Length 6 lines.

In the poststernal process and triangular scutellum this species departs from the rest of the genus; the colour is also peculiar.

#### DORCASTA.

Head narrow, the face inferior, eyes deeply emarginate, the upper portion very narrow, antennæ approximate, as long as the body, the joints gradually diminishing from the first (second excepted), thickened throughout and ciliated beneath; thorax narrow, longer than wide; elytra scarcely wider than the thorax, slightly dilated at the side, apiculate externally; legs very short, meso-tarsus toothed.

Very nearly allied to *Spalacopsis*, Newman, but differs in the undivided although deeply emarginate eye. With *Systene*,\* *Aprosopus*, *Tetraglenes* and *Eucomatocera* these insects form a small natural group, distinguished by their thickened antennæ, very generally divided eyes, inferior face, and narrow linear form. *Ectatosia* is, perhaps, an aberrant genus of the same group.

#### *Dorcasta oryx*.

*D. angusta*, sub-parallela, hirsuta, fusca, albo-lineata; elytris thorace vix latioribus. Para.

Narrow, brown, pubescent; head, thorax and elytra nearly parallel, with rows of short oblique hairs; from behind the eye and extending along the sides of the prothorax and elytron two whitish lines, which on the latter are accompanied by two obscurer intermediate ones; legs and antennæ dark brown.

Length  $3\frac{1}{2}$  lines.

#### *Dorcasta crassicornis*. (Pl. XXVI. fig. 5.)

*D. validiuscula*, hirsuta, albo-lineata; elytris thorace latioribus. Brasilia?

Closely resembling the former but stouter, the elytra wider than the thorax, the antennæ very much thicker and more strongly ciliated; a longitudinal groove on the vertex, and a narrow line on the middle of the prothorax, which extends to the scutellum.

Length 4 lines.

In Mr. Saunders's collection, without a locality.

#### OCALÉMIA.

Head prolonged in front, eyes very large, round, antennæ of

\* Substituted for *Eutheia*, Guér., which had been previously used for a genus of *Scydmanidæ*.

eleven joints, the fifth to the tenth produced at the apex on one side; prothorax smooth, very narrow in front, dilated behind; elytra narrow, gradually diminishing from the base; legs long, the posterior compressed.

Nearly allied to *Strangalia*, but the antennæ will at once distinguish it.

*Ocalemia vigilans.* (Pl. XXVI. fig. 3.)

*O. atra*, nitida, prothorace iridescente; elytris subtiliter punctatis, singulis maculis tribus flavis basi longitudinaliter dispositis. Malacca.

Black, shining; eyes very large, head beneath much produced; antennæ as long as the body, the joints from the fifth to the tenth dilated on one side at the apex; prothorax iridescent, changing to blue and purple, the base with three obscure yellowish spots; elytra finely punctate, biapiculate, with three yellowish spots at the base placed longitudinally; sides of the mesothorax with an olive pubescence; abdomen and legs blue-black; posterior tarsi very much compressed, the first joint longer than the rest together and cultriform.

Length 10 lines.

*Strangalia Fortunei.*

*S. atra*, sub-nitida; capite, prothorace, elytris basi, annis et corpore subtus, luteis; pedibus discoloribus. China Borealis.

Smooth and shining; antennæ, eyes, elytra except at the base, middle tibia and tarsus, lower part of the posterior femora, tibia at the extremity, tarsus and last abdominal segment, black; the rest brownish yellow.

Length 7 lines.

A true *Strangalia*, which I am happy to dedicate to the well known Chinese traveller, to whom we are indebted for this and many other novelties.

CAPNOLYMMMA.

Head elongate, narrow; eyes nearly entire, antennæ approximate, inserted below the eyes, as long as the body; palpi long, the last joint longest, ovate and pointed; prothorax nearly entire, parallel behind, elongate in front; elytra short, pointed at the shoulder; legs long, robust, the femora mutic, pro-tibiæ serrated below.

The palpi alone will at once distinguish this genus from *Toxotus*, *Strangalia*, &c., its nearest allies.

*Capnolymma Stygia*. (Plate XXII. fig. 6.)

*C. nigra*, opaca; prothorace lineâ mediâ longitudinali et postice plagis duabus lateralibus cinereis; elytris confertim punctatis, fusco-fuliginosis, basi fasciâque mediâ pallidioribus. Borneo.

Black, opaque; head with a stripe from each antennæ, united on the vertex, a longitudinal line on the prothorax, and a patch on each side, ashy grey; elytra thickly punctured, smoky black, the base, suture, and zig-zag line across the middle, paler; eyes and lower part of the front testaceous brown; external maxillary lobes greatly developed, labrum rounded below.

Length 11 lines.

NOTE.—A genus of birds having been recently named *Iole*, the reader is requested to alter that word at pages 254-5, into *Iolea*.

DESCRIPTION OF THE FIGURES.

PLATE XXV.

- Fig. 1. *Arrhenotus Wallacei*.  
 2. *Driopea clytina*.  
 3. *Merionæda scitella*.  
 4. *Acalolepta pusio*.  
 5. *Phlyarus basalis*.  
 6. *Gyaritus hamatus*.  
 7. *Cylindrepomus comis*.  
 8. *Anomæsia fulvida*.  
 9. *Iolea literata*.

PLATE XXVI.

- Fig. 1. *Synelasma bufo*.  
 2. *Moron distigma*.  
 3. *Ocalemia vigilans*.  
 4. *Ropica posticalis*.  
 5. *Phlyarus basalis*.  
 6. *Capnolymma Stygia*.  
 7. *Bumetopia oscitans*.  
 8. *Dasyo lineata*.
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XVIII. *On the aberrant Species hitherto placed in the Genus Elachista.* By H. T. STAINTON, Esq.

[Read December 7th, 1857.]

IN my volume of the "Insecta Britannica" I placed in the genus *Elachista* three species, which at that time appeared somewhat out of place there, and further investigation has shown that these species, *Pfeifferella*, *Treitschkiella* and *Brunnichella*, must be removed. The habit and structure of the larvæ confirm the propriety of this step.

The species *Pfeifferella* and *Treitschkiella* are distinguished in the larva state by their total absence of legs, and by their peculiar form of mine; Herrich-Schäffer has constructed for these species the genus *Antispila*, which I propose to retain.

*Brunnichella* has an ordinary 16-legged larva, but it mines blotches in the leaves of a labiate plant, and constructs a cocoon, therein differing from the remaining *Elachistæ*, which mine the leaves of the *Gramineæ* and *Cyperaceæ*, and do not construct cocoons. Of *Brunnichella* I propose to form a new genus, and as the insect was once named *Stephensella*, in honour of the late J. F. Stephens, Esq., I propose for the new genus the name *Stephensia*.

ANTISPILA, Herrich-Schäffer, Frey.

This genus is readily distinguished from *Elachista* by the shorter drooping palpi, by the shorter antennæ, by the greater breadth of the posterior wings, and in the neuration of the latter by the far broader costal cell. A due consideration of these differences will show that the true position of *Antispila* is in the family *Glyphipterygidæ*, between *Perittia* and *Tinagma*.

Having arrived at this conclusion solely from a consideration of the structure of the perfect insect, we find a wonderful corroboration in the larva. The larvæ of *Pfeifferella* and *Treitschkiella*, both perfectly apodal, mine in blotches the leaves of the dogwood, and cut out flat oval cases.

The larvæ of *Tinagma resplendellum* (the only one of that genus yet known) is likewise apodal, and mines the leaves of alder, cutting out a flat oval case; the peculiarity of this latter larva

being that it does not mine a large blotch, but mines at first mysteriously down the mid-rib and up again, and only making a blotch of sufficient size to furnish the materials for its case.

The genus *Antispila*, besides the two well-known *Pfeifferella* and *Treitschkiella*, contains the still latent Maltese *Rivillei*, to which I have previously called attention.\*

### 1. *Antispila Pfeifferella*, Hübner.

In the golden brown anterior wings, with a golden fascia before, and golden opposite spots, beyond the middle, this has an extreme resemblance with *A. Treitschkiella*, being mainly distinguished by its larger size. And it is not a little singular that two species so similar should both feed on the same plant; the larvæ are, however, very different, and can readily be distinguished whilst still within the mine.

Expansion of the wings  $4\frac{1}{2}$  lines; head, face and palpi golden brown; antennæ fuscous; anterior wings glossy golden brown, towards the hind margin rather coppery; before the middle is a slender angulated bright golden fascia, broadest on the inner margin, where it is nearest the base of the wing; beyond the middle are two triangular golden spots, one on the inner margin, the other posterior to it on the costa; cilia rather coppery, the tips pale grey; posterior wings greyish purple, with paler cilia.

The larva, which mines the leaves of the dogwood in June and July, is very pale greyish green, the dorsal vessel greener; *the head is pale brown*, and the second segment of the same colour, only a little darker at the sides; there are *no black spots* on the under side.

When the larvæ are full-fed they cut out a flat oval case, formed of the two skins of the leaf, which they fortify with silk and descend to the ground; the following May the perfect insect appears, and delights to fly round the twigs of the dogwood in the bright sunshine.

### 2. *Antispila Treitschkiella*, Fischer.

Very like the preceding, only much smaller; the anterior wings rather darker, the apex less coppery, and the fascia less angulated. The larva is well distinguished by the *black head and the row of*

\* Transactions of the Entomological Society of London, vol. iii. New Series, p. 87—89; Annales de la Société Entomologique de France, Troisième série, vol. iii. p. 211—213.

*black spots beneath.* Both larva and perfect insect appear rather later in the season than those of *A. Pfeifferella*.

Expansion of the wings 3 lines; head, face and palpi golden brown; antennæ fuscous, with whitish annulations; anterior wings dark golden brown, with a faint purple tinge towards the hind margin; before the middle is a slender, oblique, hardly angulated pale golden fascia, nearest the base of the wing on the inner margin, but not expanded there; beyond the middle two triangular pale golden spots, one on the inner margin, and the other rather posterior to it on the costa; cilia purplish golden brown, at the tips grey; posterior wings brownish grey, with paler cilia.

The larva, which mines the leaves of the dogwood in August and September, is greyish white; \* *the head and the second segment are black*; all *the other segments*, except the penultimate, *have a black spot beneath*.

The habit of the larva is precisely similar to that of *A. Pfeifferella*, but the mine and case are rather smaller, as might have been anticipated from the smaller size of the insect. The perfect insect appears in June.

### 3. *Antispila Rivillei*, Stainton.

"The ground-colour of the wings is a beautiful black; each is adorned with four triangular silver spots, of which two are on the inner margin, two on the costa." Naturforscher, iv. 21. Hence this insect should be readily distinguished from its congeners by the *black* (not brown) anterior wings, by the fascia being interrupted and by the markings being *silvery* (not golden).

The larva mines the leaves of the vine in July, forming large blotches, in which it cuts out a flat oval case, which it suspends to the leaves or stems of the vine. The perfect insects make their appearance in the following month.

This insect was observed in the island of Malta prior to 1750, and has not been seen since, though M. Millière, of Lyon, believes that he has seen vine leaves blotched and with holes cut in them (as though by a larva of this genus); since, however, M. Millière's attention has been called to the subject he has not been able to meet with any indications of it.

### STEPHENSIA, n. g.

This genus is far more nearly allied to *Elachista*, but the palpi are short and drooping, and the outline of the anterior wings is

\* See figure in Annales de la Société Entomologique de France, Troisième série, vol. iii. pl. 11, fig. iii.

very peculiar, owing to the costa being slightly indented beyond the middle.

In the neuration of the posterior wings the forked apical vein is branched all the way from the cell, whereas in every *Elachista* that I have examined this vein is not forked till long after it leaves the cell, nor indeed till it is very near the apex.

This genus only contains a single species, *Brunnichella*, for much as *Elachista Magnificella* resembles *Brunnichella* in markings, the longer palpi and unindented costa of the anterior wings of *Magnificella* are reasons with me for referring it still to the genus *Elachista*.

### 1. *Stephensia Brunnichella*, Linneus.

This insect has a considerable likeness to *Elachista Gleichenella* and *E. Magnificella*. From the former it is best distinguished by the position of the apical spots; in *Brunnichella* the spot at the anal angle is placed perpendicularly, the costal spot is considerably beyond it and points backwards to the dorsal spot, whereas in *Gleichenella* the spots are almost opposite, and are united by an intermediate third spot placed a little posteriorly, with which they form an angulated fascia; in *Magnificella* the spots, it is true, are not united, the costal spot is posterior to the dorsal spot, but it is almost perpendicular, and does not slope backwards; besides, in *Magnificella* the central fascia stops short before it reaches the costa.

Expansion of the wings 3—3½ lines. Head, face and palpi golden brown; antennæ dark fuscous, with a broad white ring before the apex. Anterior wings dark golden brown, with a golden fascia close to the base, a slender bright golden fascia in the middle, and two brilliant golden spots towards the hind margin, one perpendicularly placed at the anal angle, the other beyond it and pointing inwards on the costa; cilia purplish-grey; posterior wings greyish-brown, with grey cilia.

The larva, which mines the leaves of *Clinopodium vulgare* in April and July, forming large, brown, slightly puckered blotches, is greenish-white, with dark green dorsal vessel; the head is dark brown, almost black, and the second segment bears on the back a plate of the same colour, divided in the middle by a central pale line. The six anterior legs, eight ventral and two anal prolegs, are of the colour of the body.

The perfect insect appears in May and August.

The Linnean description of *Brunnichella* (Syst. Nat. Ed. 12, i. 2, p. 898, No. 448) is as follows:—

“Corpus minutum, lineare, planiusculum, atrum. Antennæ corpore breviores, infra apicem albæ. Alæ atræ fasciis tribus violaceis sive chalybis candefacti colore, quarum prima ad basin, secunda in medio, tertia curva ad apicem. Cilia postice inter alarum apices, subulata in plures dentes.”

To this it may be objected that the antennæ, though “infra apicem albæ,” are not “corpore breviores;” that the wings are not “atræ,” and the cilia are not “subulata in plures dentes.”

The position of the markings described is in wonderful accordance with the insect we are considering, the basal fascia of which frequently, if the specimens are at all worn, assume more or less of a coppery or violet tint. I think, when it is further borne in mind how very few species there are to the antennæ of which the “infra apicem albæ” will apply, the coincidence of the agreement in that respect and in the markings of the anterior wings is more than can result from accident.

*Quadrella* is no doubt rather an aberrant species of *Elachista*, and in the larva changing to a pupa within the mine is quite singular, but the neuration of the wings and the structure of the palpi both tend to show that it ought not to be removed from the remaining species of the genus, and it is far better to admit a few semi-discordant species than to multiply genera unnecessarily.

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XIX. *On the Habits and Transformations of a Species of Ornithoptera, allied to O. Priamus, inhabiting the Aru Islands, near New Guinea.* By ALFRED R. WALLACE, Esq., Corr. Memb. Ent. Soc., London.

[Read 7th Dec. 1857.]

THIS beautiful insect is very closely allied to *O. poseidon*, Doub., of which it may be a variety. It is not uncommon in Aru, but the males fly high and rest in high trees, so that it is very difficult to capture them. The females generally fly much lower and more slowly, and it is only when the males are in pursuit of them that the former can be easily taken. It is a beautiful sight to watch a pair of these noble insects fluttering among the thick underwood, the male following every movement of his companion, generally hovering immediately over her, the golden green of his wings absolutely luminous with a brilliancy which nothing in animated nature can surpass, while the other portions are of an intense and perfect blackness in all lights, equally extraordinary and unique. The males are generally about  $6\frac{1}{2}$  to 7 inches in expanse of wings; the females 9 inches, and sometimes even  $9\frac{1}{2}$  inches. The genus is admirably named, for no insects resemble birds in their flight so much as these, and as they sail majestically over head they may often be momentarily mistaken for such. They frequent the damp and lofty forests; often, however, coming out into the open patches and pathways.

The larva exactly resembles in form that of *O. Heliakon*, figured by Dr. Horsfield, except that the fleshy processes are much longer and more acute, the two dorsal rows being half an inch long. The colour is a rich purple or vinous black. On the seventh segment is an oblique reddish-white band, from the spiracle to the base of the dorsal process, which it incloses. The basal half of all these processes is crimson. The retractile tubercles at the back of the head are short, obtuse, Y-shaped, and of a transparent blood-red colour. They are exerted as in *Papilio*, and have no *separate sheaths*, a character which has been given by Boisduval to the genus *Ornithoptera*, on Dr. Horsfield's authority, in the case of *O. Heliakon*.

The larva feeds on a climbing plant, not observed in flower, but which has the habit and foliage of an *Aristolochia*.\* It is sluggish in its movements, and feeds at intervals day and night. When about to change its form it seeks some neighbouring tree or shrub with a stronger and more rigid leaf, from the under surface of which it suspends itself in an inclined position approaching to horizontal. The two ends of the suspending thread are fastened at the same point on the midrib of the leaf, and the loop passes completely round the insect, as in all other *Papilionidæ*, and is not fastened to a tubercle on each side of the pupa, as stated by Boisduval, on the authority, I presume, of Dr. Horsfield. As the larva makes the thread and attaches it before escaping from its skin, any other mode than the usual one would seem to be impossible. The mistake has probably arisen from the weight of the pupa causing the fine sharp thread to be almost buried and hidden in its newly-formed soft skin. In the pupa case, which I have preserved, it may be distinctly traced round the back, forming a perfect loop.

The pupa is of a rich brown colour, on the back ochre-yellow, with the points and tubercles nearly black. It is very bulky, and nearly 3 inches long. Two specimens which I bred both produced females, and a third, also a female, was unable to free itself from the pupa case. Its duration in the pupa state is exactly a month (twenty-nine or thirty days), a very long period for a diurnal *Lepidoptera* in the tropics.

It would thus appear that there are no characters in the larva or pupa to separate *Ornithoptera* from *Papilio*; but the large size of the perfect insects, their long and powerful legs, the large anal valve of the males, their uniform and characteristic form, their striking colours and their limited geographical range, are, I think, sufficient reasons why the genus should be kept distinct.

\* I have, since seen the flower. It is an *Aristolochia*.

XX. *Revision of an Essay on the British Formicidæ, published in the Transactions of the Society. By*  
 FREDERICK SMITH, Esq.

[Read 7th Dec. 1857.]

SINCE the publication of my first "Essay on the British Formicidæ," several additional species have been discovered, and much interesting information obtained; it therefore appeared to me to be desirable that a revised list should be laid before the Society. Two important works on the Ants of Europe have also appeared—first, "The Ants of Austria," by Dr. Mayr: and, subsequently, a "Synopsis of the Ants of France and Algeria," by Dr. Nylander; both these works are of the highest entomological excellence. I have adopted the divisions into which Dr. Mayr has divided the genus *Myrmica*, this will very greatly facilitate the discrimination of the species.

In my former paper I particularly alluded to the fact of various *Coleoptera* being found in the nests of Ants, and I enumerated several species of the genera *Myrmedonia*, *Lomechusa* and *Claviger*; I also recorded the discovery of a specimen of *Batrisus*, which I at that time supposed to be the *Batrisus formicarius*, I have since ascertained that it is the *B. venustus*; since the publication of my observations on these Myrmecophilous Beetles a long list of rarities has appeared.

Mr. Janson has given a powerful stimulus to our researches by his observations and instructions published in the Entomologist's Annual for 1857; his researches however were confined to five species, and there are five times that number of ants in this country, therefore much has yet to be done. I would particularly direct attention to the nests of *F. sanguinea* and *F. cunicularia*: the former is not uncommon at Weybridge and in the neighbourhood of Blackwater, Hants. *F. cunicularia* is to be found on Hampstead Heath and in many places in the neighbourhood of London.

The connection between the Ant and the Beetle still remains a mystery, although I have lost no opportunity of endeavouring to penetrate and unravel the history for some years past, and have



particularly alluded to it in the former part of this Essay, in the hope of inducing others to attempt the solution. It is most probable that the ants imprison only the species of *Staphylinidæ*, and that all other beetles found there resort to the nests for the purpose of feeding upon a suitable nutriment which they contain, or for the purpose of undergoing their metamorphosis; many which are found in ants' nests during winter have undoubtedly sought that situation for the purpose of hibernation. From the various species of *Brachelytra* I think there can be little doubt the ants obtain an exudation similar in its nutritive qualities to that which they obtain from the *Aphides*; those species which we see the ants carrying into their nests, tending with such care, and which, on our disturbing their habitations, they eagerly seize and carry off with the same precipitation as their young brood, are undoubtedly conducive to an important phase of their economy. Species of *Coleoptera*, such as *Helærius sesquicornis*, various species of *Liodes*, *Cryptophagus*, *Corticaria*, *Latridius* and *Dromius*, all of which I have met with, cannot be supposed to be in any way capable of furnishing nutriment for the ants, but may still prove benefactors by feeding upon and removing substances which might otherwise render their habitations more or less foul and unhealthy.

Of all the families which compose the insect-world, there is none in my opinion, which presents such wonderful varieties—I may say eccentricities of form, as the *Formicidæ*; the organs of manducation in some species, as in *Drepanognathus* and *Eciton*, present an elongation equalling the length of the insects themselves; in *Atta*, and some other genera of that family, they are thickened and expanded to such a size as to be nearly equal to one half of the head itself; then again, as a reverse of this, in the males of some species of *Myrmecina*, the mandibles are rudimentary and in others obsolete. The antennæ partake of every variety of length and thickness, and the palpi of every number of joints between six and one; the variation in the number of the joints of the antennæ, forms perhaps one of the most remarkable deviations from what may be considered the normal number, namely, twelve in the female and worker of the social species, and thirteen in the males of the entire group of this class of insects. In the genus *Cryptocerus* and its allies, several remarkable deviations from the usual number of joints in the antennæ are met with: thus in *Orectognathus* the number is six in the worker ants, whilst in *Cryptocerus* they vary from nine to twelve in the workers. Remarkable as these deviations certainly are, they are not in my

opinion, to be compared to a deviation in excess of the normal number of joints in the antennæ of males ; indeed, so very rare is this the case, that only a single instance has been, to my knowledge, recorded ; this occurs in the genus *Pheidole* (*Æcopthora*, Heer), the male of which has seventeen-jointed antennæ. The above remarkable phenomena are quite sufficient to awaken our curiosity and beget a desire to investigate the structure of these wonderful creatures, but it forms a mere prelude to perhaps the most incomprehensible, or certainly at present impenetrable, mystery which is to be found in the entire range of the insect world ; I allude to the amazing variety in the size and situation of the eyes ; in some species these organs occupy the greater part of the head, in others they are reduced to so minute a scale that they are only perceptible under a considerable magnifying power, in many species they are entirely obliterated. If the presence or absence of the eyes proved to be an index to the habit of the species, the mystery which at present surrounds the subject would have no existence, but such is not the case : species whose habits are to a considerable extent subterranean, are furnished with these organs, whilst others, whose habit is to live and forage above ground, are without eyes. In the genus *Pseudomyrma* all the species have very large eyes, occupying in some instances the whole of the sides of the head ; in some ants the eyes are placed high on the head, in others, as in *Æcodoma*, they are situated low down near the base of the mandibles. The presence or absence of ocelli is equally remarkable : in the workers of the genus *Formica* they are usually present, but a few exceptions are to be met with ; whilst in the genus *Myrmica* and its allies the ocelli as a rule are obliterated, they are however present in the males and females of the entire family. The number of ocelli is usually three, but in many instances they are reduced to two, whilst in the genus *Atta* and *Æcodoma*, in some large-headed workers, the number is reduced to one, and this is not placed in the usual situation on the vertex, but on the face near the base of the clypeus.

These brief allusions to exotic forms, it is hoped will beget an interest in the minds of some members of the Entomological Society, and lead them to pursue the investigation of the *Formicidæ*, which, it will be seen, possesses an equal, if not superior interest to any other family of insects.

There is still another point of view in which we must briefly survey them ; the unceasing industry of these creatures has always been held up as a pattern to man for his guidance in that

respect, "Go to the ant, thou sluggard, consider her ways, and be wise; which having no guide, overseer, or ruler, provideth her meat in the summer and gathereth her food in the harvest;" this teaches us an invaluable lesson of prudence and forethought, and the sluggard is directed accordingly to "consider her ways and be wise." When, however, we glance at the habits of the entire group, we shall presently perceive, that although a lesson of prudence may be learnt from the ant, there is scarcely any of the most atrocious and fearful crimes which may not be inculcated when we investigate the habits of all the species; although numberless are the peaceful and industrious communities which we survey, we see others whose sole occupation appears to be to plunder the habitations of less warlike species, nor is their sole object confined to plunder; the species of the genus *Eciton* are the most savage and cruel of the tribe, they enter the nests of species of *Formica*, and ruthlessly drag out the peaceful inhabitants, after tearing them limb from limb, they carry off the mangled remains to their own dwellings. The system of slavery is the habit of numerous species, these plunder the nests of other communities and carry off pupa and perfect insects. Thus we see the necessity of considering the ways of those species alone to which the words of Solomon evidently direct our attention, "Go to the ant, which provideth her meat in the summer, and gathereth her food in the harvest."

The species of the genus *Formica*, discovered in this country since the publication of the Essay, are alone described here; whilst all those of *Myrmica* are enumerated under the respective subdivisions into which that group is now divided.

#### Genus 1. FORMICA, Linn.

Subdivision 1.—The anterior wings with the discoidal cells obsolete; the large workers frequently with the head greatly enlarged; the ocelli obsolete in the workers; the petiole with one node or scale, incrassate, wedge-shaped, or subglobose. None of the species of this subdivision have been discovered in this country.

Subdivision 2.—The anterior wings with one discoidal cell; the large workers only distinguished by size, not by any remarkable structural difference, the ocelli present in all the sexes, the scale of the peduncle vertical and compressed.

*Formica congerens*, Nylander.

*Female*.—Length 4—4½ lines. Very closely resembling the *F. rufa*, but distinguished by being covered with a shining cinereous pile; the eyes pubescent, and the abdomen sub-opake; not shining as in *F. rufa*.

*Worker*.—This is distinguished from the worker of *F. rufa* by the same characteristics as the female; the pubescence on the eyes is not discernible without a high magnifying power; it is however a very marked distinction.

*Male*.—Black and covered with cinereous pile; the head and thorax covered with short black pubescence; the scale of the petiole sub-quadrate, slightly and widely emarginate above.

Nylander says, this insect constructs similar nests to the *F. rufa*, and, on being disturbed, emits the same strong odour of formic-acid.

The species was taken in Scotland by Mr. Foxcroft in 1846, at Loch Rannoch;—the male only has yet been captured. The species is so very like the *F. rufa* that it would not be recognized as a distinct species by any one but an Entomologist; the most striking difference being that it is thinly covered with hair, *F. rufa* being naked.

*Formica brunnea*, Latr., Nyland., Mayr, Schenck.

*Worker*.—Length 1¼—2¼ lines. Pale ferruginous, covered with a fine cinereous silky pile; the abdomen obscure fusco-testaceous; the head much wider than the thorax, with a distinctly impressed line passing upwards from the clypeus, and extending nearly to the vertex; the scape rather paler than the head, the flagellum faintly dusky above towards the apex; the head slightly emarginate behind.

*Female*.—Length 4½ lines. Dark fuscous, with a fine cinereous pile; the mandibles, antennæ and legs pale rufous; the flagellum and femora slightly obscure; the head as wide as the thorax; the scape of the antennæ and the tibiæ without pile or pubescence; the basal half of the wings more or less fuscous; an impressed line on the front terminating at the anterior ocellus.

*Male*.—Length 2 lines. Dark fuscous: the antennæ, scape and legs brown; the flagellum and the articulations of the legs pale testaceous; a line on the front deeply impressed; the eyes not pubescent; the scale of the peduncle emarginate; the basal half of the wings fuscous.

Although this species appeared in the list of British Ants some years ago, another species, the *F. umbrata* of Nylander, was mistaken for and represented it in the Stephensian Cabinet; it was not, to my knowledge, discovered until last year, when I met with it at Deal.

### Sub-family MYRMICIDÆ.

The number of joints in the palpi differing in the species; eyes usually of moderate size, sometimes minute; males and females with ocelli, obsolete in the workers; the petiole of the abdomen with *two nodes*; the females and workers furnished with a sting; pupæ not enclosed in cocoons.

#### Genus 1. MYRMICA.

The maxillary palpi 6-jointed; the labial palpi 4-jointed; the anterior wings with the nervure at the apex of the first and second submarginal cells uniting and divided in the middle by a transverse nervure; the marginal and submarginal cells incomplete; the antennæ clavate.

- Sp. 1. *Myrmica ruginodis*, Nyl.
- Sp. 2. *Myrmica scabrinodis*, Nyl.
- Sp. 3. *Myrmica lævinodis*, Nyl.
- Sp. 4. *Myrmica sulcinodis*, Nyl.
- Sp. 5. *Myrmica lobicornis*, Nyl.
- *denticornis*, Curtis.

#### Subdivision 2. (TETRAMORIUM, Mayr.)

The maxillary palpi 4-jointed; the labial palpi 3-jointed; the anterior wings with one marginal, two submarginal and one discoidal cell; the clava of the antennæ 3-jointed.

#### Sp. 6. *Myrmica cæspitum*.

*Myrmica cæspitum*, Latr., Los., Nyland., Smith, Schenck, Fœrst.

#### Sp. 7. *Myrmica lippula*, Nyland.

*Worker*.—Length  $1\frac{1}{2}$  lines. Ferruginous: the abdomen nigro-fuscous in the middle; the head and thorax finely rugose, the thorax more strongly sculptured than the head; the mouth, antennæ, legs, and abdomen beneath, pale ferruginous; the frontal area at the base of the clypeus very smooth and shining; the eyes

very small, placed rather forward on the sides of the head; the meso- and metathorax with a deep strangulation between them; the spines on the metathorax minute and acute; the petiole of the first node of the abdomen elongate, slender and rugose; the second node globose.

*Female*.—Length  $2\frac{1}{4}$  lines. Closely resembles the worker in the form of the head, but has the eyes larger and the ocelli distinct on the vertex; thorax elongate-ovate, not so coarsely sculptured as in the worker; the wings hyaline, the nervures pale testaceous; abdomen rather more elongate, but with a similar long petiole to the first node as in the worker, in colour precisely similar.

This species is described in my Essay as the *M. graminicola* of Latrielle. The minute eyes and elongate petiole sufficiently distinguish it; it is rare, but I have occasionally taken specimens in and about London; the female is met with very late in the season: I took it at the end of October, and Mr. Wing once brought me a winged specimen he had just taken in his garden at Lambeth on the 9th of December; Mr. Reading of Plymouth also met with this species in Devonshire.

### Subdivision 3. (LEPTOTHORAX, Mayr.)

The maxillary palpi 5-jointed; the labial palpi 3-jointed; the female and worker nearly of the same size; the anterior wings with one marginal, two submarginal, and one discoidal cell; the second submarginal sometimes semi-complete; the pubescence on the female and worker subclavate, or gradually tapering to the base of the hairs; the club of the flagellum 3-jointed.

#### Sp. 8. *Myrmica acervorum*, Fabr.

*Myrmica acervorum*, Zett., Nyland., Færst., Smith.

*Myrmica graminicola*, Latr. Hist. Nat. Fourm. (*var. worker*.)

#### Sp. 9. *Myrmica Nylanderi*, Færst.

*Myrmica Nylanderi*, Færst. Hym. Stud. Form. (1850.)

*Myrmica cingulata*, Schenck, Nass. Ameis. p. 104. (1852.)

Nyland, Form. Fr. et d'Algér. p. 93, 20.

*Myrmica parvula*, Schenck, Nass. Ameis., pp. 103, 140.

*Leptothorax Nylanderi*, Mayr, Form. Austr. p. 175, 11.

*Leptothorax parvulus*, Mayr, Form. Austr. p. 176, 12.

The species named "*unifasciata*" in British collections is not that which continental authors consider to be Latrielle's species, and in one respect it hardly agrees with his description—the abdomen is fuscous, with the base and apex pale; in the species which represent *unifascia* in the collections of Nylander, Mayr, &c., the abdomen has a narrow ring on the basal segment, and the club of the antennæ is fuscous; the latter species I have not yet seen captured in this country. It may, however, be in some collections mixed with *M. Nylanderii*.

Subdivision 4. (STENAMMA, Westw.)

*Stenammas*, Westw. Intro. Class. Ins. ii. p. 266. (1840.)

*Formicoxenus*, Mayr, Form. Austr. p. 141. (1855.)

The maxillary palpi 4-jointed; the labial palpi 3-jointed; mandibles dentate; the worker and female with the second node of the petiole spined in front beneath; the club of the antennæ 3-jointed; the anterior wings with the marginal cell open, incomplete; one complete submarginal cell, and one discoidal cell.

Sp. 10. *Myrmica Westwoodii*.

*Stenammas Westwoodii* (Steph.), Westw. Intro. Class. Ins. ii. p. 226, ♂.

*Formicoxenus nitidulus*, Mayr, Form. Austr. 146, 1.

*Myrmica nitidula*, Nyland.; *Myrmica læviuscula* and *debilis*, Fœrster.

*Worker*.—Pale rufous, smooth and shining, the head of a deeper colour, more or less, above; the antennæ 12-jointed, with the club rufo-fuscous, the tip paler; the metathorax with a smooth central depression on each side, furnished with a stout tooth directed horizontally backwards; abdomen nigro-piceous in the middle; the first node of the petiole with a cariniform process beneath; the second node with a stout spine at the base pointing forwards. Length  $1\frac{1}{4}$  lines.

*Female*.—This sex differs only in having the ocelli distinct, the thorax more ovate, the wings hyaline, and the stigma fuscous. Length  $2\frac{1}{4}$  lines.

*Male*.—Nigro-fuscous, the mandibles tridentate; the antennæ 13-jointed; the legs pale; the femora more or less fuscous; the metathorax with two short erect teeth; the wings of a milky whiteness; the nervures scarcely discernible; the entire insect thinly sprinkled with pubescence. Length 2 lines.

Nylander is of opinion that the male constitutes the *Stenammina Westwoodii*, this is probably the case; I have long suspected *Stenammina* to be a male of one of the small species of *Myrmica*. The female and worker were first discovered in this country by Mr. Waterhouse, in the nest of *Formica rufa*; Nylander says it also frequents the nest of *F. congerens*. The constant habit of this species appears to be to take up its abode in the nests of *Formicidæ*, whilst *Myrmica hirtula* is only to be found in company with *Myrmica muscorum*, and *Myrmica sublævis* in the nests of *Myrmica acervorum*; the two latter species have not yet been discovered in Britain.

Subdivision 5. (PHEIDOLE.)

*Pheidole*, Westw. Ann. & Mag. Nat. Hist. vi. p. 87. (1841.)

*Myrmica*, Nylander, Addit. alt. Form. Bor. p. 42.

*Æcophthora*, Heer, Ueber die Hausameise Madeiras's.

Labial palpi 2-jointed; maxillary palpi 2-jointed; antennæ with the club of the funiculus 3-jointed; the body slender; the legs sub-elongate; the (worker major) with the head very large, much wider than the abdomen.

Sp. 11. *Myrmica pallidula*.

Sp. 1. *Myrmica pallidula*, Nyland, Addit. alt. Mon. Form. Bar. p. 42.

*Æcophthora pallidula*, Mayr, Form. Austr. p. 183.

*Æcophthora subdentata*, Mayr, Einige neue Ameis.

*Myrmica lævigata*, Smith, Mon. Brit. Form.

*Worker-minor*.—Length 1 line. Described in the Monograph on the British *Formicidæ*.

*Worker-major*.—Differs in having the head very large, sub-quadrate; the mandibles obscure; the abdomen fuscous in the middle; the head striated anteriorly, emarginate behind, and having an impressed line on the vertex; the insect slightly pubescent.

*Female*.—Length  $3\frac{1}{2}$  lines. Rufous: head, thorax and abdomen above, slightly fuscous; the head delicately striated; the meta-thorax bituberculate and with a minute tooth on the tubercles; tibiæ pubescent; wings albo-hyaline.

*Male*.—Length  $2\frac{1}{2}$  lines. Nigro-fuscous, shining; the antennæ 13-jointed; the sides of the thorax and the apex of the abdomen pale testaceous.



Since I described this species under the name of *Myrmica lævigata* I have had an opportunity of comparing it with specimens sent by Dr. Mayr, it proves to be the "*pallidula*" of his Monograph. I have also taken three more examples of the worker on a wall at Hampstead; Mr. Parfit of Exeter has sent it to me, he found it in a hothouse; I have a suspicion that it is introduced with plants or fruits, and will not prove to be indigenous.

Subdivision 6. (DIPHLORHOPTRUM, Mayr.)

The workers very minute; the labial palpi 2-jointed; the maxillary palpi 2-jointed; antennæ of the worker 10-jointed; the club 2-jointed; antennæ of the male 12-jointed; anterior wing with one marginal, one complete submarginal, and one discoidal cell.

Sp. 12. *Myrmica fugax*, Latr.

*Myrmica fugax*, Latr., St. Farg., Schenck, Smith, Mayr.

*Myrmica flavidula*, Nyland. Addit. Alt. p. 33.

*Worker*.—Length 1 line. Worker: Pale yellow, smooth, shining and slightly pubescent; the abdomen sometimes with a fuscous band in the middle; the mandibles 4-toothed; the eyes minute; head very delicately punctured; the thorax slightly constricted behind; the metathorax not spined.

*Female*.—Length 3 lines. Nigro-fuscous, smooth, shining and slightly pilose; the mandibles, antennæ and legs pale ferruginous; the head delicately punctured, with a deeply impressed channel running from the anterior stemma to the apex of the clypeus; the clypeus with a tooth on each side of its anterior margin. The first node of the petiole with a central depression above.

*Male*.—Length  $2\frac{1}{4}$  lines. Black, shining and pilose; the antennæ and legs fuscous; the mandibles, articulations of the legs, the mandibles and tarsi testaceous.

This species is one of those which presents a great disparity in the size of the sexes, the workers being the smallest, if we except *M. molesta*, found in this country; the difference in colour is also remarkable, the male and female being nearly black and the worker of a pale yellow. I first discovered workers of this species at Southend, three years ago; this autumn I took the female at Deal on the Sandhills. The male has not been taken in this country to my knowledge.

Sp. 13. *Myrmica molesta*.*Myrmica molesta*, Say, Boston Journ., Nat. Hist. i. p. 293, 6. (1834.)*Myrmica domestica*, Shuck., Mag. Nat. Hist., p. 628. (1838.)

Daniells, Proc. Linn. Soc. ii. p. 172.

Smith, Cat. Brit. Hym. p. 119; and

Essay, Brit. Form. p. 131.

Nylander, Form. Fr. et d'Algér. p. 98, 26.

Hab. Britain, North America and Brazil.

This insect may now be regarded as cosmopolitan, I have examined numerous specimens from the above localities; Say was the first who described it, and who records its habit of intruding into houses. The Rev. Hamlet Clark brought it from Brazil, with this character:—"It is found everywhere and upon everything." Its native habitat, I think from this, must be Brazil, and that it has been imported elsewhere in merchandise.

Dr. Nylander has placed this insect in his eighth subdivision, which embraces the species belonging to the *Æcophthora* of Heer, but an examination of a winged individual shows that it has only one submarginal cell, and that the discoidal cell is obsolete in the male. Should this prove to be the case in the females also, a new subdivision or genus must be established for its reception.

## Genus 2. MYRMECINA, Curtis.

Sp. 1. *Myrmecina Latreilli*, Curtis, Smith, M.*Myrmica striatula*, Nylander.*bidens*, Fœrst., Schenck.*graminicola*, Fœrst.*Latreilli*, Nylander.

XXI. *Observations on the Habits of the Dipterous Genus*  
*Conops.* By S. S. SAUNDERS, Esq.

[Read Feb. 1st, 1858.]

THE natural history of these Parasites has hitherto remained involved in much obscurity. The information bearing upon this subject, mainly of a circumstantial and conjectural character, may be summed up as follows.

Latreille, in his "Genera Insectorum" (vol. iv. p. 366), published in 1809, observes in reference to *Conops rufipes*, "Insectum, recens declaratum et alis adhuc mollibus, e *Bombi* abdomine prodiens, bis observavi."

In a paper read at the Société Philomatique of Paris in 1818, first published in the "Journal de Physique" of 1819 (tome lxxxviii. p. 228), and reprinted, with additional illustrations, in the first volume of the "Memoires de la Société d'Histoire Naturelle de Paris" in 1823 (p. 329), Messrs. Audouin and Lachat furnish a series of anatomical details of an apod larva found in the Bourdon des Pierres (*Bombus lapidorum*), which Latreille ascribed to the *Conops rufipes* noticed by him as aforesaid, four specimens of which he had also found in a box wherein he had inclosed certain humble bees of another species (*Bombus terrestris*, Fabr.).

In his "Nouveau Dictionnaire d'Histoire Naturelle" (tome vii. p. 459, Paris, 1827), M. Latreille further observes, in reference to the *Conops rufipes*,—"Il vit en état de larve et de nymphe dans l'intérieur de l'abdomen des bourdons, et en sorte, lorsqu'il a subi sa dernière métamorphose, par les intervalles des anneaux. C'est un fait dont j'ai été plusieurs fois témoin. Il m'est souvent arrivé de trouver un ou deux individus de ce diptère dans des boîtes où j'avais renfermé des bourdons."

M. St. Fargeau, in the "Encyclopédie Méthodique" (vol. x. p. 819, 1828), observes,— "Nous-mêmes avons vu des *Conops* s'introduire dans le nid de certains espèces du genre Guêpe (*Vespa*)."

In the "Comptes Rendus de l'Académie de Paris" for 1836 2de semestre, p. 688), a succinct report is given of some interest—  
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ing observations made by M. Robineau Desvoidy on the proceedings of a *Conops auripes* in overawing or fascinating a *Bombus* for the supposed purpose of depositing its eggs; stating also that a young naturalist had obtained one of these insects from a box wherein he had inclosed several "living *Bombi*." From this statement, resting upon indirect authority, it does not clearly appear that the *Conops* was actually produced from a live *Bombus*. In the other instance the *Conops* was observed to alight momentarily seven or eight times upon the *Bombus*, without any resistance or attempt to escape on the part of the latter, the result however not being ascertained, the *Conops* alone having been captured on the occasion.

In the "Annales des Sciences Naturelles" for January, 1837, M. Léon Dufour describes and figures an apod larva which he had found in the *Bombus terrestris*, and which he considered different from that of Messrs. Audouin and Lachat. He also states that he had often witnessed the ardour with which the *Conops* pursued the *Bombus* "pour insérer ses œufs dans ses entrailles;" and that he possessed in his collection a *Bombus terrestris* from the anal region of which a *Conops rufipes* was dependent, the distended extremity of whose abdomen had been retained within the ventral cavity of the *Bombus*; but he adds—"Quelle est la larve qui produit ce *Conops*? On ne nous l'a point appris."

Mr. Curtis, in the Proceedings of the Entomological Society for January, 1855,\* while calling attention to the want of information as to "the economy of this beautiful genus of flies," mentions the circumstance of a *Conops flavipes* having "been bred from the body of an *Osmia*, which had nidified in bramble stems."

The details which I am now about to supply, of the larva and pupa of a species of *Conops* reared from a large *Pompilus* (*P. audax*, Smith, Mus. Brit. Cat.),—specimens of which, together with the parasitic pupa and imago in situ, and the larvæ in spirits, are now submitted to inspection,—will serve to confirm the impression entertained by Latreille as to the nature of the apod larva described by Messrs. Audouin and Lachat; and thus definitively connect the anatomical details of that larva, so carefully elaborated, with the history of the genus *Conops*.

The *Pompilus*, subjected to the attacks of this parasite, is not unfrequently met with early in the month of August on some parts of the coast of Epirus, frequenting the flowers of a species of

\* Trans. Ent. Soc. Lond., N. S., vol. 3, Proc. cxvi.

thistle. This *Pompilus*, whose visits on such occasions would appear to be directed rather to the object of obtaining nutriment for itself, than to that of supplying ravin for its larva brood,—judging from its disinclination to rise after alighting, so unlike the quivering restlessness of the *Pompili* in general,—has already at this period, when under the influence of parasitic gestation, the *Conops* larva feeding within its abdomen, and diverting to itself all the sustenance provided by the former.

These *Pompili* soon perish after capture, rarely surviving beyond the second day. On separating the posterior portion of the abdominal region below the fourth segment, the parasite is readily perceptible, and its condition of development recognizable; nor does this operation upon the defunct *Pompilus* in any way interfere with the subsequent metamorphosis of the parasite, should the indispensable requirements of its larva growth be already fulfilled at the time.

The head of these larvæ, very much contracted in proportion to the rest of the parasite, is capable of being extended into juxtaposition with the base of the abdomen of its victim, by means of two or three telescopic tubular processes, which, on gently pressing the anterior part of the body, are projected forwards. The outer tegument of these is very slender and diaphanous; the apex has the appearance of a smooth rounded nipple, slightly impressed in the middle; at a considerable distance below which, and almost concealed within the fleshy substance of the interior, are perceived two dusky points, which, when denuded of the surrounding matter, are found to indicate the position of two corneous hooks, slightly curved, the tips acute and turned outwardly, the base dilated at the inner angle and produced into a point shorter than the main body of the hook. In one specimen these hooks were visible on first inspecting the larva, resting precisely in the centre of the anterior part of the head; but, on applying pressure, instead of being projected forwards retaining their anterior position, the telescopic tubes were protruded beyond and over them, the hooks remaining in the rear.

The anal extremity of the *Conops* larva, which at its period of greatest development is closely assimilated in dimensions to the largest diameter of the abdominal cavity, is furnished with two remarkable appendages, or reniform densely rugose lobes, deflexed side by side from the dorsal region posteriorly, concave within, and connected throughout their crenulated margin with the anal segment, the more distended portion towards the ventral

region of the larva. These reniform appendages, white in the first instance like the rest of the larva, but which assume a deep chestnut brown as the latter approaches its period of pupa metamorphosis, exercise important functions in connection with the tracheæ as organs of respiration, supplies of air being obtained from the interior of the abdomen of the *Pompilus*, through the medium of the perforated surface of the rugosities with which these appendages are invested.

The larva subsequently contracts into a compact oval form, the pupa-case so constituted being of inflexible consistency and of an uniform deep piceous hue; in which condition it remains until the exit of the perfect *Conops* towards the end of June in the following year. The anterior extremity of this pupa-case presents a somewhat flattened top, having impressed thereon two concentric rings, with a central depression corresponding, as it would seem, with the original buccal orifice, and surrounded with a distinct convex margin; these rings obviously representing the aforesaid retractile tubular segments, and suggesting the resemblance to a closed opera-glass! This flattened extremity is connected at its base with a lateral ridge, forming a longitudinal carinated division of the cap of the pupa-case, which is thrown off as an operculum on the liberation of the imago.

It is worthy of notice that these pupa-cases are turned inversely to the dorsal and ventral region of the *Pompilus*; the parasite being reversed, its head deflexed below the lateral carinæ in the direction of the dorsum of the *Pompilus*, and the reniform appendages having their more dilated portion recumbent in the same direction. This position of the *Conops* pupa would seem to be the natural result of the conformation of the abdomen in the *Pompilus*: the contracted base of which, connecting with the thorax, is on the same plane as the ventral region; so that the *Conops* larva would naturally turn in the direction of the vaulted recess of the dorsal region, on preparing for its coarctate pupa-metamorphosis.

The exit of the perfect *Conops* is effected by the separation of the first and second abdominal segments of its victim; and when such disjunction cannot readily be accomplished, as in the case of specimens desiccated for the cabinet, the *Conops* remains without the means of extricating itself, imprisoned in the abdominal cavity. Unrestricted however on such occasions by its pupa-position, the perfect *Conops*, when encountering obstacles to its egress, turns within the pupa-case in any required direction; but under ordinary circumstances it may be assumed that the *Pompilus*, on the termi-

nation of its career, exposed to atmospherical vicissitudes, becomes decomposed and disrupted in its connecting ligaments, thereby affording a ready means of escape to the *Conops* at the fitting season.

The question which now suggests itself to inquiry is that of the mode whereby the parasite obtains access to that position within the body of the *Pompilus*, upon which result the parent *Conops* is exclusively dependent for the location and sustenance of its future progeny.

That the eggs or viviparous offspring of the *Conops* are not deposited in the larva cells of the *Pompilus* would seem necessarily to follow from the fact, that at the period when the *Pompilus* is provisioning its cells in July,—or at any rate between the first appearance of the *Conops* in the imago state towards the end of June, and the capture of the *Pompilus* having the larva of the parasite feeding within its abdomen early in August,—the perfect *Conops* so produced in June from a perfect *Pompilus* of the preceding year (having hibernated in the pupa state within the inanimate body of its victim) has already found means to introduce its progeny in the body of an imago *Pompilus* of the succeeding generation, which had hibernated in its larva cell, or as a perfect insect in some other recess, during the same intervening period of pupa-coma in the *Conops*.

Under these circumstances it would seem scarcely doubtful that the *Conops* must find means to inoculate the imago *Pompilus* with its ovum or viviparous larva, by depositing these in the interstices between the abdominal segments; which is also in accordance with the observations of M. Robineau Desvoidy and M. Léon Dufour, already referred to, as to the manner in which the *Conops rufipes* and *auripes* had been seen pursuing the *Bombi* for the supposed purpose of depositing its ova.

It would moreover be contrary to analogy, that any insect in the larva state, feeding upon another larva, should continue so to feed upon its victim after the latter has assumed the imago condition. Any such attacks in fact must involve the destruction of the larvæ subjected thereto; whereas in this case it is essential that the *Pompilus* should attain the perfect state, in order to fulfil the conditions associated with the development of the perfect *Conops*.

The entire term allotted to the growth of the parasite in its larva state would appear to be of brief duration, probably not exceeding the limit of from ten to fifteen days; diminutive specimens being found simultaneously with those of the largest dimen-

sions, and with others in the pupa state, though I have never observed more than a single specimen in any one *Pompilus*. The latter moreover would hardly be likely to withstand such interference with its functions of deglutition and interception of its supplies for any long period.

The circumstance stated by Mr. Curtis of a *Conops* having been bred from the body of an *Osmia*, which had nidified in bramble stems, might seem to militate against this theory of oviposition in the perfect insect, if it be intended to imply that the *Osmia* in question, having never been at large, had been itself reared from those stems; but this would not appear to be averred, since the *Conops* alone is stated to have been bred, whereas the *Osmia* may have been observed nidifying as aforesaid at the time of capture, and not therefore exempt from attack in the imago state.

With regard to the circumstance stated by St. Fargeau, of the *Conops* being seen to introduce itself into the nest of certain *Vespidæ*, from which he was led to suppose "que les larves de ces *Conops* peuvent vivre aux dépens de celles de ces *Hyménoptères*," it may be equally probable that the perfect wasps, on first issuing from their larva cells, were the objects of attack. A general impression, however, appears to have prevailed that the attacks of these parasites were directed upon the larvæ. Thus Zetterstedt, in his "*Diptera Scandinavia*" (tome iii., p. 924, 1844), remarks under the heading of *Conops*,—"Larvæ parasiticæ, in nido *Bomborum* degunt;" and more recently in the "*Insecta Britannica*" (Dipt. vol. 1, p. 305), we find it stated, in allusion to the habits of the genus *Conops*, that "their larvæ are parasitic on those of humble bees."

Dr. Siebold, in his description of the economy of a species of sand-wasp, *Oxybelus uniglumis*, and of its dipterous parasite, *Miltogramma conica* (published at Erlangen in 1841), relates the manner in which this parasite pursues the *Oxybelus* for the purpose of depositing its viviparous larvæ, not indeed in the body of the *Oxybelus*, but in the fly conveyed by the latter as a provision for its young; following up the *Oxybelus* for this purpose to the entrance of its cells. Similar habits are also ascribed by Dr. Siebold to the *Miltogramma punctata*, in its attacks upon a species of *Ammophila*, for which it lies in wait in the vicinity of the sand-burrows of the latter.\*

\* I have had the opportunity of seeing this Mémoire in the rich collection of Entomological Works known as the Hopeian Collection at Oxford, with which those of Mr. Westwood have been incorporated.



It may readily be conceived that the *Conops* may in like manner derive some facility in assaulting this formidable *Pompilus* at the moment when the latter may be intently engaged in conveying *pabulum* into its larva-cells; or, perhaps with greater probability, that access between the dorsal folds of the latter may be obtained by the former at the period when the *Pompilus*, first appearing upon the scene of life in the imago state, may be less capable of defending itself from attack, its segments less firmly united, and their interstices more exposed to such aggression; the design accomplished by such parasites in the great scheme of Creation offering, on a comparison between the two cases, more distinct results in the latter, where no progeny of the *Pompilus* would be produced at all, nature thus imposing limitations and compensating influences, to provide against any inordinate increase of the species, whether by restrictions imposed upon larva development, or, as in this instance, by impediments to the subsequent continuity of the line of succession in the perfect insect; ever delighting in variety for the attainment of her ends, and adapting her resources according to the impalpable peculiarities and exigencies of each particular case.

I should add that I once found a specimen of the *Conops* larva, presenting no perceptible difference from the others, within the abdomen of a large *Sphex* (*S. flavipennis*), captured at the same time and place with the *Pompili*; and that I have likewise obtained a smaller species of *Conops* from the abdomen of an *Odynerus* (Div. *Ancistrocerus*, of Westmael), which had remained neglected in a pill box until the following year, as would seem to have been the case with the *Bombi* adverted to by Latreille.

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XXII. *Synopsis of the Genus Elachista.* By H. T. STAINTON, Esq.

[Read 4th January, 1858.]

THE genus of *Micro-Lepidoptera*, to which the name *Elachista* is now restricted, is as natural an assemblage of species as we could wish.

The discordant elements have gradually been removed from it, and in form, structure and habit the remaining insects are almost perfectly homogeneous.

When we reflect on the habits of these insects and the multitudes in which they generally occur, we are irresistibly reminded of the poetic phrase—

“The myriads of the peopled grass.”

These insects truly *people* the grass, not merely by residing in its neighbourhood, but in the larva state by taking up their abodes within the blades and stems of grass—the few which are not actual *grass-miners*, feeding in the allied plants *Carex*, *Scirpus*, and *Luzula*.

The perfect insects are frequently found in swarms, quite after the style of gnats, and love to disport themselves over the tufts of grass in woods and along hedge banks on sunny afternoons during the summer season.

The student is soon perplexed by the number and similarity of the species, and hitherto descriptions of the species have been so scattered that one needed to collect a small library in order to have them all at hand.

With the view of supplying what has been much wanted, I have attempted to describe briefly, yet characteristically, all the species of the genus I could collect together—the number of these species (all of which are European) is seventy-two. Many of these species, it may happen, will hereafter be found to be constituted only on aberrant specimens, but the contrary process is the more

likely to occur, and it is more probable that some of the species here described will be found constituted really of more than one species.

In the progress of my investigations two such splittings took place: as *Triatomea* and *Dispilella*, which I had always thought identical, prove quite distinct, and *Collitella* is distinct from *Subocellea*; Herrich-Schäffer had already pointed out the discrepancy between the British and German representatives of these species, previously reputed to be synonymous.

I was also startled to find that an insect I had always thought identical with *Consortella* was very different, and from the distinctness of the fascia could not be referred to the same section of the genus; for this new species I have proposed the name *Stabilella*.

It is very desirable that series of specimens of *Helvetica* and *Holdenella* should be collected to establish those species more firmly; and future investigations must prove whether *Cinctella* is a good species and quite distinct from *Adscitella*, and whether *Triseriatella* and *Dispunctella* are perfectly distinct.

It must be borne in mind that almost all the species are abundant wherever they occur, and that many are extremely local; hence a new species is quite as likely to occur by hundreds as singly.

I give in the first place a table of the genus, so that the student may have all the species at one glance before him.

Then follow descriptions of the seventy-two species enumerated, all of which I have personally examined.

The synonymy I have placed separately, that it might not unnecessarily intervene between the descriptions of the closely allied species.

In a note I have given the descriptions of three species in Tengström's "Fjäril-Fauna," which I have not been able to identify. Perhaps some reader may be more fortunate, or they may be species with which I am really unacquainted.

I have to express my thanks to Professor Zeller for his valuable loan of so many of his typical specimens of the genus, a loan which I have hitherto ill requited by so long postponing the promised synopsis of the genus; my excuse must be that the difficulties of the subject grew upon me the more I looked into the matter, and had it not been for the encouragement and valuable assistance I have received from Professor Frey, I doubt yet whether I should have grappled with the undertaking.

The following is the table of the genus I have proposed:—

- A. Anterior wings dark-coloured, with markings.
  - B. The markings metallic.
    - a. With metallic spots.
    - b. With a metallic fascia and spots.
  - C. The markings silvery-white; a fascia and spots.
  - D. The markings, neither metallic nor shining, form a fascia and opposite spots.
    - c. The fascia is distinct, but does not reach the inner margin.
    - d. The fascia is distinct, but does not reach the costa.
    - e. The fascia is distinct and entire.
    - f. The fascia is indistinct, sometimes very much so.
  - E. The markings consist of two distinct fasciæ.
  - F. The markings consist of a single fascia.
    - g. Head white.
    - h. Head whitish or yellow.
    - i. Head grey or brownish.
  - G. The markings consist of a pale streak from the costa, and a dark spot on the fold.
- AA. Anterior wings pale-coloured, or whitish.
  - H. With two dark fasciæ beyond the middle.
  - I. With a dark spot on the middle of the fold, and a dark angulated fascia.
  - K. With one dark spot on the middle of the fold, and another midway, between it and the apex of the wing.
  - L. With indistinct yellowish fasciæ.
  - M. With scattered dark scales.
  - N. Entirely spotless.
- AAA. Anterior wings dark-coloured, without markings.

A.

- |    |    |                              |    |                          |
|----|----|------------------------------|----|--------------------------|
| B. | a. | 1. <i>Quadrella</i> .        | f. | 26. <i>Obscurella</i> .  |
|    |    | 2. <i>Trapeziella</i> .      |    | 27. <i>Humilis</i> .     |
| B. | b. | 3. <i>Tetragonella</i> .     | f. | 28. <i>Arundinella</i> . |
|    |    | 4. <i>Magnificella</i> .     |    | 29. <i>Consortella</i> . |
| C. | .. | 5. <i>Nobilella</i> .        | f. | 30. <i>Subnigrella</i> . |
|    |    | 6. <i>Gleichenella</i> .     |    | 31. <i>Pullella</i> .    |
| C. | .. | 7. <i>Apicipunctella</i> .   | f. | 32. <i>Perplexella</i> . |
|    |    | 8. <i>Albifrontella</i> .    |    | 33. <i>Airæ</i> .        |
| D. | c. | 9. <i>Cinereopunctella</i> . | E. | ..                       |
|    |    | 10. <i>Abbraviatella</i> .   |    | 35. <i>Bifasciella</i> . |
| D. | d. | 11. <i>Luticomella</i> .     | g. | 36. <i>Cinctella</i> .   |
|    |    | 12. <i>Flavicomella</i> .    |    | 37. <i>Revinctella</i> . |
| D. | e. | 13. <i>Atricomella</i> .     | g. | 38. <i>Adscitella</i> .  |
|    |    | 14. <i>Kilmunella</i> .      |    | h.                       |
| D. | e. | 15. <i>Helvetica</i> .       | h. |                          |
|    |    | 16. <i>Holdenella</i> .      |    | F.                       |
| D. | e. | 17. <i>Nigrella</i> .        | i. |                          |
|    |    | 18. <i>Gregsoni</i> .        |    | i.                       |
| D. | e. | 19. <i>Stabilella</i> .      | i. |                          |
|    |    | 20. <i>Bedellella</i> .      |    | G.                       |
| D. | e. | 21. <i>Extensella</i> .      | G. |                          |
|    |    | 22. <i>Rectifasciella</i> .  |    | G.                       |
| D. | e. | 23. <i>Incanella</i> .       | G. |                          |
|    |    | 24. <i>Griseella</i> .       |    | G.                       |
| D. | e. | 25. <i>Dispositella</i> .    | G. |                          |

AA.

- |                             |                        |                               |                              |
|-----------------------------|------------------------|-------------------------------|------------------------------|
| H.                          | 47. <i>Cerusella</i> . | L.                            | 57. <i>Pollinariella</i> .   |
| I.                          | 48. <i>Utonella</i> .  |                               | 58. <i>Subocellea</i> .      |
|                             | I.                     | 49. <i>Contaminatella</i> .   | 59. <i>Collitella</i> .      |
| I.                          |                        | 50. <i>Rhynchosporrella</i> . | 60. <i>Anserinella</i> .     |
|                             | I.                     | 51. <i>Eleochariella</i> .    | M.                           |
| K.                          |                        | 52. <i>Biatomella</i> .       |                              |
|                             | K.                     | 53. <i>Disemiella</i> .       | 63. <i>Constitella</i> .     |
| K.                          |                        | 54. <i>Dispunctella</i> .     | 64. <i>Triseriatella</i> .   |
|                             | K.                     | 55. <i>Triatomea</i> .        | 65. <i>Pollutella</i> .      |
| K.                          |                        | 56. <i>Dispilella</i> .       | 66. <i>Grossepunctella</i> . |
|                             | N.                     | N.                            | 67. <i>Nitidulella</i> .     |
| 68. <i>Festucicolella</i> . |                        |                               |                              |
| N.                          | N.                     | 69. <i>Cygnipennella</i> .    |                              |
|                             |                        | 70. <i>Ochreella</i> .        |                              |

AAA.

71. *Fuscochreella*.

|

72. *Mühlgiella*.

1. *Elachista Quadrella*, Hübner.

Readily distinguished by its large size and the position of the silver spots.

Expansion of the wings  $5\frac{1}{2}$  lines. Head grey; anterior wings bronzy-brown, with four silvery spots, the first on the costa near the base; the second on the fold in the middle; the remaining two are placed opposite one another beyond the middle, that on the costa being rather the larger. At the base of the inner margin is a silvery blotch.

The larva mines the leaves of *Luzula pilosa*, making inflated, puckered mines in May, and changes to a pupa within the mine.

The perfect insect appears in June and July; it occurs in Switzerland, Bavaria and Tuscany.

2. *Elachista Trapeziella*, Stainton.

Most nearly allied to *E. Tetragonella*, but larger and paler, and the costal spot is opposite the spot on the fold.

Expansion of the wings  $4\frac{1}{4}$  lines. Head whitish-grey; anterior wings brown, with a short silvery streak along the fold at the base; in the middle are two silvery spots, one on the costa, the other on the fold; at the hind margin are two other smaller silvery spots, one at the anal angle and one at the apex of the wing.

The larva, which is spotted with red, mines the leaves of *Luzula pilosa*, making flat mines near the tip of the leaf, in June.

The perfect insect appears in July; it has occurred at West Wickham Wood, near London, and at Zürich in Switzerland.

3. *Elachista Tetragonella*, Herrich-Schäffer.

Allied to the preceding, but the costal spot placed far beyond that on the fold, and nearly opposite to that at the anal angle.

Expansion of the wing 3 lines. Head black; anterior wings black, with a faint olive tinge, with four brilliant silvery spots, the first on the fold before the middle, the second on the costa beyond the middle, the third at the anal angle, and the fourth at the apex of the wing.

The larva, greenish with grey subdorsal lines, mines the leaves of *Carex montana*, making long whitish blotches early in May. The perfect insect appears in June; it occurs in Switzerland, near Zürich, and at Engelberg.

4. *Elachista Magnificella*, Tengström.

Best distinguished from all the allied species by the central fascia stopping short long before it reaches the costa.

Expansion of the wings 4 lines. Head blackish; anterior wings rich brown, with a pale golden fascia near the base, a pale golden fascia-form spot on the middle of the inner margin, reaching only half across the wing, a smaller pale golden spot on the inner margin near the anal angle, and beyond it on the costa is a large spot of the same colour.

Larva unknown.

The perfect insect appears at the end of July and beginning of August; it occurs near Bristol, and in Finland; also at Ratisbon in Bavaria, and in Silesia.

5. *Elachista Nobilella*, Fischer.

Closely allied to *E. Gleichenella*, but the anterior wings narrower, browner, and the apical spot placed nearer the hind margin and more detached from the opposite spots, so as not to convey so much the same idea of a fascia.

Expansion of the wings  $3\frac{1}{4}$ — $3\frac{1}{2}$  lines. Head grey; anterior wings brown, with the base pale golden; in the middle is a pale golden fascia, nearer the base on the costa than on the inner margin; beyond the middle are two opposite pale golden spots, and beyond them at the apex of the wing is a third.

Larva unknown.

The perfect insect appears in June and July; it occurs in Silesia and Bohemia; also at Vienna, Freiburg, Zürich and Pisa.

*Observation.*—Frey describes the markings as silvery, rather than pale golden, and this seems indeed to be the case with a Zürich specimen I have before me; a specimen from Glogau has the markings decidedly pale golden, indeed yellower than in *Gleichenella*. Have we two species mixed as *Nobilella*?

6. *Elachista Gleichenella*, Fabricius.

Readily distinguished by the opposite spots being united by an intermediate spot placed posteriorly, so forming an angulated fascia (hence Tengström's name *Trifasciella*).

Expansion of the wings  $3\frac{1}{2}$  lines. Head bronzy; anterior wings black; the base, a slender rather oblique fascia in the middle, and an angulated fascia beyond the middle, pale golden. This last fascia is composed as it were of two opposite spots (that

on the costa being rather the posterior), united by a spot on the disc placed beyond them.

The larva, which is whitish with a faint purple tinge, mines the leaves of a species of *Carex*, making narrow whitish raised blotches in March and April.

The perfect insect appears in June and July. It occurs pretty generally in England, and has been noticed in Scotland; also in Finland, and at Zürich, Ratisbon and Vienna.

#### 7. *Elachista Apicipunctella*, Stainton.

Distinguished by the silvery white marking and the apical spot beyond the two opposite spots. The male most resembles *Albifrontella*, but is distinguished by the apical spot; the female, which has a basal silvery fascia (entirely wanting in the male), has great resemblance with *Gleichenella*, but is larger; the markings are less golden, more silvery; the opposite and apical spots are not united to form a fascia, and the apical third of the antennæ is white.

*Male*.—Expansion of the wings 5 lines. Head white; anterior wings brownish black; a curved central fascia nearest the base on the costa; two opposite spots beyond the middle (that on the costa rather posterior), and an apical spot beyond them, silvery white.

*Female*.—Expansion of the wings  $4\frac{1}{4}$  lines. Head white; antennæ fuscous; the apical third white; anterior wings dark brown-black; a basal fascia, a central slightly oblique fascia, two opposite spots beyond the middle (that on the costa rather posterior), and an apical spot beyond them, silvery white.

Larva unknown.

The perfect insect appears in June, frequenting boggy places in the south of Scotland. Herrich-Schäffer says it occurs at Glogau and Weissenfels; it also occurs at Lyons.

#### 8. *Elachista Albifrontella*, Hübner.

Distinguished from the preceding by the absence of the apical spot, and by the white head and silvery white fasciæ and spots from *Luticomella*, *Flavicomella*, *Atricomella*, &c.

Expansion of the wings 4— $4\frac{1}{2}$  lines. Head silvery-white; anterior wings brown-black, with a slightly oblique fascia before the middle, and two opposite spots beyond the middle (that on the costa decidedly posterior), silvery-white.



The larva, which is pale whitish-yellow, of a duller white on the back, feeds on various grasses, making flat whitish mines in April and the beginning of May.

The perfect insect appears in June, and seems abundant nearly everywhere. It has occurred as far north as Finland, and as far south as Tuscany.

#### 9. *Elachista Cinereopunctella*, Haworth.

By the fascia not reaching beyond the fold, and the position of the costal spot at the apex of the wing, this species may be at once recognised.

Expansion of the wings 4 lines. Head grey; anterior wings dark grey (black in the ♀); on the costa in the middle is an oblique whitish spot, reaching to the fold; beyond the middle are two whitish spots, placed one at the anal angle, the other on the costa at the apex. (In the ♀ these spots are very distinct and quite white.)

The larva is yellowish, whiter above, with a row of red spots on each side of the back; it makes long brownish mines in the leaves of *Carex glauca*, and is full fed in April.

The perfect insect appears at the end of May and in June; it commonly occurs on the chalk in the south of England, and in various localities in the north of England and in Scotland; also in Switzerland at Zürich.

#### 10. *Elachista Abbreviatella*, Stainton.

As in the preceding species the fascia sets off from the costa, and does not reach the inner margin, so in this it sets off from the inner margin and does not reach the costa. By this character, and by the unusual breadth of the anterior wings, this species may be immediately recognised.

Expansion of the wings  $4\frac{1}{2}$  lines. Head brown; anterior wings brown; on the inner margin before the middle is a small yellowish-white spot, which just reaches over the fold, but does not even attain the middle of the wing; beyond the middle are two yellowish-white opposite spots, of which that on the costa is much posterior and by far the larger of the two.

Larva unknown.

The perfect insect appears in June; it has occurred on the Austrian Alps, and at Reinerz in Silesia.

11. *Elachista Luticomella*, Zeller.

By the yellow head this is readily distinguished from all the allied species except *Flavicomella*, but *Flavicomella* has a small brown spot on the crown of the head, and is a smaller, duller insect than *Luticomella*.

Expansion of the wings  $4\frac{1}{2}$ — $5\frac{1}{2}$  lines. Head and palpi bright yellow; anterior wings dark brown; a rather curved yellowish-white fascia before the middle, and two opposite spots of the same colour beyond the middle, that on the costa slightly posterior.

The pale yellow larva mines down the leaves and stems of *Dactylis glomerata*, making linear, whitish tracks in April.

The perfect insect appears in June; it occurs generally in England and Scotland, also at Glogau and Zürich.

12. *Elachista Flavicomella*, Stainton.

Distinguished by its yellow head, with a small brown spot on the crown; it is a smaller, duller insect than *Luticomella*, and the opposite spots are more nearly opposite.

*Male*.—Expansion of the wings  $3\frac{1}{2}$  lines. Head and palpi yellow, a brown spot on the crown of the head; anterior wings greyish-brown, with a slender yellowish-white fascia, slightly oblique, before the middle, and two small yellowish-white opposite spots beyond the middle, that on the costa hardly posterior.

*Female*.—Expansion of the wings 4 lines. Head and palpi as in the male; anterior wings greyish-brown, with a broad yellowish fascia beyond the middle, and with the opposite spots prolonged into the cilia, making nearly the whole of the apical portion yellowish.

Whether this is the normal appearance of the female, or only a variety, I cannot say, having only seen one specimen.

Larva unknown.

The perfect insect appears in July; two specimens were taken by Mr. Shield on the 15th of that month at Howth in Ireland.

13. *Elachista Atricomella*, Stainton.

This is closely allied to *Kilmunella* and *Pocæ*; in the latter the fascia and spots are much less distinct. From *Kilmunella* it is best distinguished by the anterior wings being blacker, and more pointed, and the fascia is more slender, and nearer the base on the costa.

Expansion of the wings  $4\frac{1}{2}$ —5 lines. Head greyish-black; anterior wings greyish-black, with an interrupted slightly-angulated whitish fascia before the middle, nearest the base of the wing on the costa; beyond the middle are two whitish opposite spots, the costal spot being the larger and more posteriorly placed.

The pale yellow larva mines down the leaves and stems of *Dactylis glomerata* in April and May.

The perfect insect appears in June; it occurs generally throughout England, also near Edinburgh and Frankfort-on-the-Maine.

#### 14. *Elachista Kilmunella*, Stainton.

Most nearly allied to the preceding, but distinguished by the duller, blunter anterior wings, the fascia being often obsolete towards the costa, and the opposite spots duller and more nearly opposite. *Airæ* is a blacker insect, and the fascia is altogether more indistinct.

Expansion of the wings  $4\frac{1}{2}$ —5 lines. Head dark grey; anterior wings dingy dark grey, with a nearly straight whitish fascia before the middle, frequently obsolete towards the costa, and two opposite whitish spots towards the hind margin, that on the costa being rather posterior.

In the female frequently the basal portion of the wing is suffused with whitish, especially along the inner margin.

The larva, which is yellowish-grey, mines the leaves of a *Carex* in April and July.

The perfect insect appears in June and August, and occurs in various parts of Scotland and in Lancashire.

#### 15. *Elachista Helvetica*, Frey.

This appears to differ from the preceding two species by the purer white markings, and from *Holdenella* by the form of the costal spot, which in that species is somewhat quadrate; in *Helvetica* it is triangular.

Expansion of the wings  $4\frac{1}{4}$  lines. Head greyish-black; anterior wings greyish-black, with a faint brownish tinge; before the middle is a broad, rather curved pure white fascia, broadest on the inner margin; beyond the middle are two white opposite spots, that on the costa being the posterior.

Larva unknown.

The perfect insect has occurred near Zürich.

16. *Elachista Holdenella*, Edleston.

Best distinguished by the sub-quadrate form of the white costal spot.

Expansion of the wings 5 lines. Head grey; anterior wings greyish black, darker towards the apex; before the middle is an oblique whitish fascia, nearest the base of the wing on the costa; beyond the middle are two opposite spots, that on the costa being the posterior, more distinct and whiter, and not triangular, its apex being truncate.

Larva unknown.

A single specimen, taken near London, is in the collection of Mr. Edleston.

17. *Elachista Nigrella*, Hübner.

Closely allied to *Stabilella* and *Gregsoni*; *Stabilella* is best distinguished by the whiter head and more oblique fascia; *Gregsoni* is rather a blacker insect, and in the female the spots are more exactly opposite.

*Male*.—Expansion of the wings  $3\frac{1}{2}$  lines. Head grey; anterior wings dark grey, with a rather indistinct whitish fascia before the middle, placed rather obliquely, and beyond the middle are two rather indistinct whitish opposite spots, that on the costa slightly posterior; at the apex of the wing is a whitish spot in the cilia.

*Female*.—Expansion of the wings 4 lines. Head dark grey; anterior wings dark grey, blackish posteriorly with a distinct whitish fascia, very slightly oblique, before the middle, and two conspicuous whitish opposite spots beyond the middle, that on the costa slightly posterior; at the apex of the wing is a whitish spot in the cilia.

The larva, which is yellowish grey with a pale brown head, mines the upper part of the leaves of *Poa trivialis*, &c., in April and July.

The perfect insect appears at the end of May and in August; it occurs throughout England and Scotland, and in various parts of Germany.

18. *Elachista Gregsoni*, Stainton.

Distinguished from *Stabilella* by the broader anterior wings and less oblique fascia; from *Nigrella*, to which it is very closely allied, by the spots in the female being more exactly opposite, and by the black head of the larva.

*Male*.—Expansion of the wings  $3\frac{3}{4}$  lines. Head dark grey; anterior wings blackish grey, with a whitish, slightly oblique and rather indistinct fascia before the middle and two whitish opposite spots beyond the middle; at the apex of the wing is a whitish spot in the cilia.

*Female*.—Expansion of the wings 4 lines. Head dark grey; anterior wings black; before the middle is a white, slightly oblique fascia, and beyond are two white spots exactly opposite; at the apex of the wing is a whitish spot in the cilia.

The larva, which is greyish yellow, with a black head and two black spots on the second segment, feeds on a species of *Poa*, in March and beginning of April.

The perfect insect appears in May, and has occurred near Liverpool and near Edinburgh.

#### 19. *Elachista Stabilella*, n. sp.

Well distinguished by the whiteness of the head, the obliqueness of the fascia, and the spots being exactly opposite.

Expansion of the wings  $3\frac{1}{2}$  lines. Head white; anterior wings greyish black, with an oblique white fascia before and two white spots exactly opposite beyond the middle; at the apex of the wing is a whitish spot on the cilia.

Larva unknown.

The perfect insect appears in June and July, and is not uncommon in Headley Lane.

#### 20. *Elachista Bedellella*, Sircom.

Best distinguished by the broad truncate anterior wings, and the spots frequently united to form a fascia.

Expansion of the wings  $3\frac{1}{2}$  lines. Head grey; anterior wings grey, rather short and broad, with a straight whitish fascia before the middle and two whitish spots beyond the middle, exactly opposite, and sometimes united so as to form a second fascia; the apex of the wing is remarkably truncate; apical cilia whitish.

The ground colour of the female is paler, and at the base almost whitish.

The greyish-green larva mines the tips of the leaves of *Avena pratensis* in April and July, the mined place appearing white, with a purple tinge.

The perfect insect appears in May and August, and occurs generally on the chalk and limestone formations.

21. *Elachista Extensella*, Stainton.

Best distinguished by the rather broad, *brownish*-grey anterior wings, and the costal arm of the fascia rather extended along the costa towards the base.

Expansion of the wings 4 lines. Head dark grey; anterior wings brownish grey, with angulated whitish fascia before the middle, rather extended along the costa towards the base, and two triangular whitish opposite spots beyond the middle; that on the costa slightly posterior.

Larva unknown.

Taken by Herr Mann, of Vienna.

22. *Elachista Rectifasciella*, Stainton.

Larger than *Bedellella*, and with the hind margin rounded and not truncate; otherwise there is considerable resemblance to that species.

Expansion of the wings 4 lines. Head grey; anterior wings brownish-grey, with a nearly straight white fascia before the middle, and two whitish opposite spots beyond the middle, almost exactly opposite, but the apex of the costal spot reaches a little beyond the apex of the dorsal spot; apical cilia whitish.

Larva unknown.

The perfect insect appears in May and August; it occurs at Glogau, Vienna, Ratisbon and Frankfort-on-the-Maine.

23. *Elachista Incanella*, Fischer.

Allied to *Griseella*, having like that species the costal spot posterior to the dorsal spot, with which it appears to form an angulated fascia; it differs from *Griseella* in the anterior wings being narrower and of a paler grey.

Expansion of the wings  $3\frac{1}{2}$  lines. Head pale grey; anterior wings pale grey, with a slightly oblique, angulated, white fascia before the middle, and two white opposite spots beyond the middle, that on the costa decidedly posterior, and with its apex rather prolonged towards the hind margin; sometimes these spots appear to unite so as to form an angulated fascia.

Larva unknown.

The perfect insect appears in May; it occurs at Vienna, Zürich and Fiume.

24. *Elachista Griseella*, Zeller.

Intermediate between *Incanella* and *Dispositella*; larger and broader winged than *Incanella*, and the costal spot not so much posterior to the dorsal spot; smaller than *Dispositella*, the fascia not so broad, the spots less distinct; the black scales in the cilia are much more distinct both in *Incanella* and *Dispositella* than they are in this species.

Expansion of the wings 4—4½ lines. Head grey; anterior wings rather broad, brownish grey, with a nearly straight white fascia before the middle, and with two whitish opposite spots beyond the middle, that on the costa rather posterior, with its apex only a very little prolonged towards the hind margin; cilia pale grey.

Larva unknown.

The perfect insect appears in May and June; it occurs at Vienna and in Tuscany.

25. *Elachista Dispositella*, Mann.

Allied to the preceding but longer-winged, the fascia broader and the spots more distinct.

Expansion of the wings 5 lines. Head whitish-grey; anterior wings grey, with a broad whitish fascia before the middle, rather attenuated on the costa, and two whitish opposite spots beyond the middle; that on the inner margin being triangular, and that on the costa decidedly posterior, is almost straight, reaching nearly half across the wing; cilia whitish, intersected by a distinct line of blackish scales.

Larva unknown.

Collected by Herr Mann at Fiume in Croatia, in May.

26. *Elachista Obscurella*, Stainton.

A sombre looking insect, best known by its general dull appearance; the fascia is very indistinct and the spots are hardly more visible; it comes nearest to *Humilis*, but in that the spots are more distinct, especially the costal spot, which is more nearly opposite to the dorsal spot; in *Obscurella* the costal spot is posterior to the dorsal spot. The female is very different, far more like *Nigrella*, but the costal spot is more posteriorly placed than in that species, and the inner margin is white from the base to the fascia.

*Male*.—Expansion of the wings 4½ lines. Head pale grey; anterior wings grey, irrorated with darker scales, with very faint indications of a paler fascia before the middle, and two opposite

spots beyond the middle, of which that on the costa is the posterior.

*Female*.—Expansion of the wings  $3\frac{1}{2}$  lines. Head white; anterior wings white at the base, except a grey blotch along the costa with a straight white fascia before the middle, beyond the fascia the ground colour is nearly black, with two opposite triangular white spots, of which that on the costa is the posterior.

The larva is pale yellowish-grey, with a pale brown head; it makes flat whitish mines in *Holcus mollis* and other grasses, in March? and July.

The perfect insect appears in May and August; it is common in England, and occurs at Vienna.

#### 27. *Elachista Humilis*, Zeller.

A dull looking insect but for the spots, which are whitish, and the costal spot appears rather glossy; it is intermediate between *Obscurella* and *Arundinella*: from the former it is distinguished by the greater distinctness of the spots, which are more exactly opposite; from *Arundinella* it may be separated by the anterior wings being longer, and in *Arundinella* the costal spot is placed rather nearer the apex.

*Male*.—Expansion of the wings 4 lines. Head shining grey; anterior wings shining greyish fuscous, with a very indistinct paler angulated fascia before the middle, beyond the middle are two whitish opposite spots, that on the costa (hardly posterior to the dorsal spot) is remarkably conspicuous and rather shining.

*Female* unknown.

Larva unknown.

The perfect insect appears towards the end of May; it has occurred at West Wickham Wood, also at Glogau, and in Mecklenburg.

#### 28. *Elachista Arundinella*, Fischer.

Very closely allied to the preceding, but the anterior wings a little shorter, and the costal spot rather nearer the apex.

*Male*.—Expansion of the wings 4 lines. Head shining grey; anterior wings rather dark grey, with a rather indistinct nearly straight pale fascia before the middle, beyond the middle are two whitish opposite spots, of which that on the costa is the whiter and more posteriorly placed.

*Female* unknown.

Larva unknown.

The perfect insect appears in August; it occurs at Vienna.



29. *Elachista Consortella*, Logan.

The male of this is well distinguished by the fascia being limited to a spot on the fold; it is not very closely allied to any other species. The female is very like *Nigrella*, but the fascia is placed rather more obliquely.

*Male*.—Expansion of the wings  $3\frac{1}{2}$  lines. Head grey; anterior wings rather dark grey, with no further indication of the fascia than a small whitish spot on the fold, which is followed by a short black streak; beyond the middle are two whitish opposite spots, which almost form an angulated fascia, and from their union some whitish scales run towards the apex of the wing.

*Female*.—Expansion of the wings 3 lines. Head pale grey; anterior wings grey at the base, blackish before the fascia; the fascia is distinct, white and oblique; the spots are triangular, white and nearly opposite, that on the costa being slightly posterior.

Larva unknown.

The perfect insect appears in March; it occurs on Arthur's Seat, near Edinburgh.

30. *Elachista Subnigrella*, Douglas.

The male, from its very indistinct, hardly perceptible markings, can only be confounded with *Obscurella*, but it is smaller, and a blunter-winged insect; the female reminds one rather of *Bedellella* and *Nigrella*; it is however much darker than *Bedellella*, though not so dark as *Nigrella*, and the costal spot is very evidently posterior to the dorsal spot; from *Nigrella* it is further distinguished in not having a whitish spot in the apical cilia.

*Male*.—Expansion of the wings  $3\frac{1}{2}$  lines. Head grey; anterior wings rather blunt, dingy grey, with a very indistinct, rather oblique whitish fascia before the middle, and two indistinct opposite spots beyond the middle, that on the inner margin hardly perceptible; cilia grey.

*Female*.—Anterior wings blackish grey, with a distinct, slightly curved, whitish fascia before the middle, and two triangular whitish opposite spots beyond the middle, that on the costa decidedly posterior and with its apex pointed outwards; cilia grey.

The pale yellow larva mines the leaves of *Bromus erectus*, making flat, narrow, yellowish-green mines, in April and July.

The perfect insect appears at the end of May and in August; it occurs at Sanderstead, Mickleham and Guildford.

31. *Elachista Pullella*, Fischer.

This comes very close to *Subnigrella*, but in the male the fascia and spots are more distinct; in the females of the two species I find no perceptible difference.

*Male*.—Expansion of the wings 4 lines. Head grey; anterior wings rather dark grey, with a rather indistinct, slightly angulated fascia before the middle, and two whitish opposite spots beyond the middle (of which that on the costa is slightly posterior), and sometimes with a few intervening whitish scales, which appear to connect the spots and to form with them an angulated fascia; cilia grey.

Larva unknown.

The perfect insect appears in May and July; it occurs in several continental localities. It may be only a modified form of *Subnigrella*; a point which the discovery of the larva must determine.

32. *Elachista Perplexella*, Stainton.

Differs from *Pullella* and *Subnigrella* by the blacker anterior wings, and the spots more nearly opposite; closely allied to *Airæ*, but a trifle smaller, and the apex of the wing more obtuse; the larva, like that of *Airæ*, mines the leaves of *Aira cæspitosa*.

Expansion of the wings 4 lines. Head grey; anterior wings greyish-black, with an indistinct oblique pale fascia before the middle, and two whitish spots, almost exactly opposite, beyond the middle; the apex of the wing is rather obtuse; cilia grey.

The female is only a little darker in colour, with the markings more distinct.

The larva, which is whitish-yellow, mines the leaves of *Aira cæspitosa* in April and June.

The perfect insect appears in May and July; it occurs near London and at Scarborough, also near Zürich.

33. *Elachista Airæ*, Frey.

Closely allied to the preceding, but larger, and the anterior wings more pointed; from *Poæ* it may be best distinguished by the opposite spots being more distinct.

Expansion of the wings  $4\frac{1}{2}$ —5 lines. Head dark grey; anterior wings dark grey, with a rather indistinct, slightly oblique, whitish fascia before the middle; beyond the middle are two

opposite spots (exactly opposite) more distinctly whitish, the costal spot is rather the larger of the two; cilia grey.

The female is only a little darker, with the spots more distinct.

The larva, which is dull-yellowish, with a very faint greenish tinge, mines the leaves of *Aira cæspitosa*, making flat, whitish, rather broad mines in April and the beginning of May.

The perfect insect appears at the end of May and in June; it occurs near Zürich.

#### 34. *Elachista Poæ*, Douglas.

Best distinguished by its dark colour, and general dull appearance, the fascia and spots in the male being excessively indistinct.

*Male*.—Expansion of the wings  $4\frac{1}{2}$ —5 lines. Head dark fuscous; anterior wings rather glossy, dingy fuscous, darker beyond the middle; before the middle is a slightly angulated obscure pale fascia; beyond the middle are two very indistinct opposite spots; the apex of the wing is rather obtuse; cilia dark grey.

*Female*.—Expansion of the wings  $5$ — $5\frac{1}{2}$  lines. Head dark fuscous; anterior wings rather glossy, dark fuscous, darker beyond the middle, with a doubly angulated whitish fascia before the middle, and two yellowish-white opposite spots beyond the middle, sometimes with some whitish scales placed posteriorly between them; cilia dark grey.

The larva, which is pale whitish-yellow, with the dorsal vessel greenish-grey, mines the leaves of *Poa aquatica*, making long slightly-discoloured mines in April and at the end of July.

The insect appears in May and August; it occurs in the neighbourhood of London.

#### 35. *Elachista Bifasciella*, Treitschke.

By the two very distinct broad white fasciæ, this may be at once recognised from every other known species.

Expansion of the wings  $3\frac{1}{2}$  lines. Head whitish; anterior wings blackish, with a nearly straight broad fascia before the middle, and a second broad white fascia, rather curved, beyond the middle; cilia grey.

Larva unknown.

The perfect insect appears in August; it occurs at Vienna and Ratisbon, and in Bohemia and Switzerland.

36. *Elachista Cinctella*, Zeller.

In conjunction with the white head, this is best distinguished by the breadth of the white fascia and the rather pointed anterior wings.

Expansion of the wings  $4\frac{1}{2}$ — $5\frac{1}{2}$  lines. Head white; thorax grey; anterior wings greyish brown, with a broad, nearly straight, white fascia in the middle; cilia grey, with the extreme tip whitish.

Larva unknown.

The perfect insect appears in May; it occurs at Pisa and near Glogau.

37. *Elachista Revinctella*, Zeller.

Very closely allied to the preceding, but the grey thorax has white shoulders.

Expansion of the wings  $4\frac{3}{4}$  lines. Head white; thorax grey, with white shoulders; anterior wings greyish brown, with a broad, white, slightly oblique fascia in the middle, rather broadest on the inner margin; cilia grey, with the extreme tip whitish.

Larva unknown.

The perfect insect occurs in Croatia.

38. *Elachista Adscitella*, Stainton.

Resembling the two preceding in the whiteness of the head, this is distinguished by the more slender fascia, in the male almost interrupted in the middle, and by the less pointed apex of the wing.

*Male*.—Expansion of the wings 5— $5\frac{1}{2}$  lines. Head whitish; anterior wings pale greyish-fuscous, with two slender whitish opposite spots in the middle, forming an interrupted fascia, the dorsal spot is rather the larger of the two; cilia grey, at the apex whitish.

*Female*.—Expansion of the wings  $4\frac{1}{2}$ —5 lines. Head whitish; anterior wings dark greyish-fuscous, with a whitish central fascia, rather attenuated in the middle; cilia grey, at the apex (which is rather truncate) whitish.

The larva, which is dull yellowish-green, more or less tinged with grey, makes broad whitish mines in the leaves of *Sesteria cærulca* and *Aira cæspitosa*, in May.

The perfect insect appears in June; it occurs at Chesterfield,

Stockton-on-Tees, Scarborough and near Bristol, also near Zürich.

39. *Elachista Megerlella*, Stainton.

Closely allied to the preceding, but distinguished by the more yellowish-white head and fascia, and by the darker anterior wings.

Expansion of the wings 5 lines. Head whitish (but with more of a yellowish tinge than in *Adscitella*); anterior wings greyish-fuscous, darker in the female, with a whitish yellow, rather slender, nearly straight fascia, in the middle; cilia grey, at the apex pale yellowish.

The dull greenish-grey larva making long, brown, slightly puckered mines in the leaves of *Brachypodium*, *Bromus*, &c., in March, April and July.

The perfect insect appears in May, June and August; it occurs throughout England, and in Ireland near Dublin.

40. *Elachista Obliquella*, Stainton.

Best distinguished from all the allied species by the *yellowish* head. In general appearance most like *Zonariella*, but with no orange scales.

Expansion of the wings  $4\frac{1}{2}$  lines. Head yellowish; antennæ dark fuscous, annulated with white; anterior wings dark fuscous, with a nearly straight yellowish fascia, rather beyond the middle; cilia grey, at the apex pale yellowish.

Larva unknown.

The perfect insect has occurred near London. Two specimens are in Mr. Edleston's collection.

41. *Elachista Zonariella*, Tengström.

Easily recognized from all the other species with a pale central fascia, by the orange scales on the outer edge of the fascia.

Expansion of the wings 4 lines. Head brown; anterior wings dark fuscous, with a pale yellowish fascia in the middle; the fascia is nearly straight, broadest on the inner margin, and posteriorly tinged with orange; cilia greyish-fuscous, at the apex yellowish-white.

The dull grey-green larva mines the leaves of *Aira cæspitosa*, making long, rather inflated, pale brown mines, in April and in June.

The perfect insect appears in May and July; it occurs near Bristol, at Stockton-on-Tees, at Renfrew and Fochabers, likewise at Zürich, Ratisbon, Vienna, and Glogau; also in Croatia and Finland.

42. *Elachista Cingillella*, Fischer.

Distinguished from all the allied dark-headed species, by the slenderness and whiteness of the fascia.

Expansion of the wings 4 lines. Head dark grey; anterior wings dark grey, with a slender, nearly straight, whitish fascia in the middle; cilia grey, at the apex whitish.

Larva unknown.

The perfect insect appears in June and July; it occurs near Vienna, and Mr. Allis has one specimen taken in the North of England.

43. *Elachista Gangabella*, Fischer.

In the dark head and yellowish fascia this resembles *Tæniatella* and *Chrysodesmella*; from the latter it may be distinguished by its larger size, duller fascia and blunter apex of the wing; from *Tæniatella*, which it very closely resembles, it is best recognized by the extreme tips of the apical cilia being whitish; in *Tæniatella* the cilia are entirely dark.

Expansion of the wings 4—5 lines. Head dark fuscous; anterior wings dark fuscous, with a nearly straight dull yellow fascia in the middle; in the ♂ this is very narrow towards the costa, but in the ♀ it is nearly of uniform width, only a little broader on the inner margin; cilia fuscous, the extreme tip of the apical cilia whitish.

The yellowish grey-green larva mines the leaves of *Dactylis glomerata* and *Holcus mollis*, making inflated *Lithocolletiform* mines in November and April.

The perfect insect appears at the end of May and in June; it occurs in several localities near London; also at Dover and Bristol, and on the Continent at Ratisbon? and Pisa.

44. *Elachista Tæniatella*, Zeller.

Distinguished from the other species with a single fascia, by the cilia being entirely dark, not even the extreme tips being whitish; only *Chrysodesmella* agrees with it in that respect. *Tæniatella* differs from *Chrysodesmella* in being much larger, and the fascia is darker yellow and duller.

Expansion of the wings  $4\frac{1}{2}$  lines. Head dark greyish-brown; anterior wings dark brownish-black, towards the apex paler, being irrorated with yellowish scales; nearly in the middle is a straight deep yellow fascia, which gradually expands towards the inner margin; cilia entirely dark greyish-fuscous.

The larva, which is dark grey, with pale tawny head, makes large whitish-brown slightly-puckered mines in the leaves of *Brachypodium sylvaticum*, in October and November.

The perfect insect appears in May; it occurs near London and at Stockton-on-Tees; also at Frankfort-on-the-Maine, Ratisbon, Arolsen, and Zürich.

#### 45. *Elachista Chrysodesmella*, Fischer.

By the dark cilia this can only be confused with the preceding, from which it is distinguished by its smaller size, broader and brighter fascia.

Expansion of the wings  $3\frac{1}{2}$  lines. Head dark grey; anterior wings blackish, with a rather broad, shining, pale yellow fascia in the middle, broadest on the inner margin; cilia entirely dark grey.

Larva unobserved; it feeds on the leaves of *Carex montana*.

The perfect insect appears in May; it occurs at Pisa and Zürich.

#### 46. *Elachista Serricornis*, Logan.

This has certainly some resemblance with *Eleochariella* and *Biatomella*, but is distinguished by the more uniform grey ground colour of the anterior wings from both those species. The absence of the second spot distinguishes it from *Biatonella*, and the very distinct dark line in the cilia furnished a good character for separating it from *Eleochariella*.

Expansion of the wings  $3\frac{1}{2}$  lines. Head grey; antennæ, towards the apex, much serrated; anterior wings grey, with a black spot on the fold beyond the middle, and a short oblique whitish streak from the costa before the apex, pointing towards the hind margin; this streak is internally margined with dark grey; cilia grey, intersected by a black hinder-marginal line.

Larva unknown.

The perfect insect appears in June; it has occurred in Sussex and near Edinburgh.

47. *Elachista Cerusella*, Hübner.

Not very closely allied to any other species ; the darker colour of the two fasciæ, and the first fascia not being angulated, sufficiently distinguish it from *Utonella* and *Rhynchosporella*.

Expansion of the wings 5 lines. Head whitish ; anterior wings whitish, with some scattered fuscous scales ; beyond the middle is an interrupted fuscous fascia, broadest on the inner margin, and internally with a black spot on the fold, and towards the apex is another fuscous fascia, with a minute black spot internally ; sometimes there is a blackish spot on the inner margin, not far from the base.

The larva, which is pale primrose yellow, mines the leaves of the reed (*Arundo Phragmites*), making broad white mines, in April and July.

The perfect insect appears in May and August, and seems very widely distributed.

48. *Elachista Utonella*, Frey.

Closely allied to *Contaminatella* and *Rhynchosporella*. From the former it is distinguished by the broader, more obtuse anterior wings, and more distinct fasciæ ; and the black scales at the angulation of the first fasciæ are much less developed. From *Rhynchosporella* it is distinguished by its whiter ground colour, and by the much more distinct hinder-marginal line in the cilia.

Expansion of the wings 4—4½ lines. Head white ; anterior wings white, tinged with pale fuscous along the costa towards the base, and sometimes, though slightly, towards the inner margin. In the middle of the fold is an oblong black spot, beyond it is a brownish angulated fascia, which meets a paler brownish fascia, which is almost parallel to the hind margin ; cilia greyish, intersected by a distinct blackish hinder-marginal line.

The yellow-green larva, which has a black head, makes broad flat mines in the leaves of *Carex glauca* in May.

The perfect insect appears at the end of June and beginning of July ; it occurs near Zürich.

49. *Elachista Contaminatella*, Zeller.

Closely allied to the preceding, and perhaps not truly specifically distinct, but the fasciæ are much less distinct, and the small scales at the angulation of the first fascia are far more conspicuous.



Expansion of the wings  $4\frac{1}{2}$  lines. Head white; anterior wings white, tinged with pale fuscous along the costa and along the fold, with a fuscous angulated fascia beyond the middle, of which only the costal arm is distinct; it terminates in an oblong black spot; beyond it is an indistinct paler (almost tawny) fascia; on the middle of the fold is a conspicuous elongate black spot; cilia whitish, with a black hinder-marginal line, rather distinct.

Larva unknown.

The perfect insect appears in April; it was taken near Syracuse by Professor Zeller.

50. *Elachista Rhynchosporella*, Stainton.

Easily distinguished from the preceding by the darker ground colour, the smaller spot on the fold, the second spot being wanting, and by the very indistinct line in the cilia; closely allied to *Eleochariella*, but larger and paler.

Expansion of the wings  $4\frac{1}{2}$  lines. Head white, or whitish; anterior wings dirty whitish, with dirty-grey or pale tawny streaks along the costa and inner margin; beyond the middle is an angulated fascia of the same colour; two irregular spots beyond represent the second fascia; cilia whitish-grey, intersected by hardly perceptibly darker scales.

The larva mines the stems of *Scirpus cæspitosus* (*Eleocharis cæspitosa*), working downwards below the blossom in May.

The perfect insect appears in June and July; it occurs in the New Forest, in the Cambridge Fens, and on moors in the north; on the Continent it has occurred in Silesia.

51. *Elachista Eleochariella*, Stainton.

Closely allied to the preceding, but smaller and greyer, the grey, indeed, appearing as the ground colour.

Expansion of the wings  $3\frac{1}{2}$  lines. Head dark grey; anterior wings grey, with a whitish line along the fold, in which is a black spot in the middle; from the costa beyond the middle a whitish streak runs towards the hind margin, and beneath it on the inner margin is a small whitish spot; cilia grey.

Larva unknown.

The perfect insect appears in July; it occurs in Scotland, near Kilmun.

52. *Elachista Biatomella*, Stainton.

Readily distinguished from *Eleochariella* by the black spot near the end of the costal white streak; from *Disemiella* and

*Triatomea* it is distinguished by its darker ground colour, and by the distinct hinder marginal line in the cilia.

Expansion of the wings  $3\frac{1}{2}$  lines. Head greyish-ochreous; anterior wings greyish, with a whitish streak along the fold, in which is a black dot about the middle; from the costa beyond the middle is a short oblique whitish streak, at the end of which is another black spot; on the costa, just before the apex, is a small whitish spot; cilia pale grey, intersected by a blackish hinder marginal line.

The yellowish larva mines the leaves of *Carex glauca*, making broad whitish blotches in April and July.

The perfect insect appears in May and June and again in August; it occurs at Sanderstead and Box Hill, also near Bristol and at Scarborough, likewise near Zürich.

### 53. *Elachista Disemiella*, Zeller.

At once distinguished from the preceding by its whiter ground colour and larger size; in these respects it resembles *Dispunctella*, from which, however, it may be recognised by the fuscous tinge on the costa beyond the middle; this latter character will also separate it from the rather smaller *Triatomea*.

Expansion of the wings 5 lines. Head white; anterior wings of rather a dull white; the costa beyond the middle with a decided fuscous tinge, and a faint fuscous tinge along the subcostal nervure at the base; in the middle of the fold is a dark fuscous spot, and another lies midway between it and the apex of the wings; some scattered dark scales lie towards the hinder margin; cilia whitish, with the tips pale fuscous; posterior wings grey, with paler cilia.

Larva unknown.

The perfect insect appears in February, March and April, and again in July; Professor Zeller met with it near Messina.

### 54. *Elachista Dispunctella*, Fischer.

Closely allied to the preceding, but the posterior wings paler, and the cilia of the anterior wings with no dark tips; the costa, too, is without any fuscous tinge, and the whiter anterior wings have scattered dark scales all along. From *Triatomea* the presence of these scattered dark scales will always readily distinguish it.

Expansion of the wings 4— $4\frac{1}{2}$  lines. Head white; anterior wings white, rather pointed, with several scattered dark fuscous scales, and with two blackish spots, one on the middle of the fold,

and the other midway between it and the apex of the wing; cilia white; posterior wings whitish, with white cilia.

Larva unknown.

The perfect insect appears in May and August; it occurs at Vienna and Ratisbon.

55. *Elachista Triatomea*, Haworth.

Closely allied to the two preceding, but without the scattered dark scales of *Dispunctella*, and the posterior wings grey instead of whitish; from *Disemiella* it may be distinguished by the want of the fuscous tinge along the costa and by its smaller size, and the more obtuse anterior wings.

Expansion of the wings 4—4½ lines. Head white; anterior wings white (though not so pure a white as in the preceding species), with two black spots, one on the middle of the fold and the other midway between it and the apex of the wings; at the anal angle are a few grey scales; cilia whitish, with a few greyish scales; posterior wings grey, with whitish cilia.

Larva unknown.

The perfect insect appears in June and July; it occurs at Sand-erstead and Mickleham, also near Bristol.

56. *Elachista Dispillella*, Zeller.

Differs from the preceding in being smaller and yellower, the anterior wings being nearly of the colour of those of *Nitidulella*, and there are no grey scales in the cilia.

Expansion of the wings 3½—4 lines. Head yellowish white; anterior wings yellowish white, with a faint fuscous spot on the fold beyond the middle, and a darker spot midway between it and the apex of the wing; cilia pale yellowish white; posterior wings pale greyish white, with pale yellowish white cilia.

Larva unknown.

The perfect insect appears in June; it occurs near Glogau.

57. *Elachista Pollinariella*, Zeller.

In the pale tawny fascia and the scattered dark scales this resembles the two following species, but from both it is distinguished by the more pointed anterior wings, and the less distinct hinder marginal line in the cilia; *Subocellea*, which it most nearly resembles, has the basal fascia much less distinct, and the scattered dark scales are less numerous.

Expansion of the wings 4—5 lines. Head white; anterior wings

white, with three dirty ochreous fasciæ, darkest towards the costa; the first is near the base, the second in the middle, and the third towards the apex; on the disc and along the fold are some scattered dark scales; cilia whitish, with a rather indistinct dark hinder marginal line, the extreme tips greyish.

The larva makes long *Lithocolletiform* mines in *Brachypodium sylvaticum* in May.

The perfect insect appears in June and July; it occurs at Sanderstead, Mickleham, Bristol and Scarborough; also at Glogau, Zürich, Vienna and Ratisbon.

#### 58. *Elachista Subocellea*, Stephens.

Intermediate between *Pollinariella* and *Collitella*; distinguished especially from the former by the truncate anterior wings and distinct dark hinder-marginal line in the cilia; besides the basal fascia is generally very indistinct, and the central fascia is placed rather beyond, than in the middle; from *Collitella* it may be distinguished by the anterior wings being broader, not so white, and with fewer dark scales.

Expansion of the wings 4 lines. Head white; anterior wings white, with three dirty ochreous fasciæ, the first near the base, very indistinct, the second rather beyond the middle, the third and darkest towards the apex, on the disc are a few scattered dark scales; cilia whitish, intersected by a distinct black hinder marginal line, the form of which imparts to the wings their peculiarly truncate appearance, the extreme tips of the cilia grey.

Larva unknown.

The perfect insect appears in June and July; it occurs at Ripley, Bristol and Sanderstead.

#### 59. *Elachista Collitella*, Fischer.

Smaller and whiter than either of the two preceding, differs from *Subocellea* in the basal fasciæ being more indistinct (so that it may almost be considered obsolete) and in the more central position of the second fascia, and both the second and third fasciæ are more slender, the scattered black scales are more numerous and distinct.

Expansion of the wings  $3\frac{1}{2}$  lines. Head white; anterior wings white, with a faint fuscous cloud at the base; in the middle is a tawny fascia, followed by another towards the apex; on the disc are numerous scattered black scales; cilia white, intersected by a

rather distinct blackish hinder-marginal line, the extreme tips pale greyish.

Larva unknown.

The perfect insect appears in June ; it occurs near Vienna.

60. *Elachista Anserinella*, Fischer.

Readily distinguished from the three preceding species by the entire absence of any scattered dark scales on the anterior wings ; at the same time the ochreous fasciæ, though sometimes rather indistinct and vague, serve to distinguish it from every other species of the genus.

Expansion of the wings 4—4½ lines. Head whitish ; anterior wings whitish, with a faint fuscous tinge along the costa at the base ; near the base is a faint ochreous fascia rarely distinct ; beyond the middle the apical portion of the wing is almost entirely ochreous, leaving only two or three small patches of the pale ground colour ; cilia yellowish white, intersected by a fuscous hinder marginal line ; posterior wings dark grey, with yellowish grey cilia.

Larva unknown.

The perfect insect appears in May and June ; it occurs in Bohemia and at Vienna, also in Tuscany.

61. *Elachista Rufocinerea*, Haworth.

This species is intermediate between *Anserinella* and *Rudectella*. The female, which alone approaches to *Anserinella*, is distinguished by the darker, coarser scales, forming rather longitudinal streaks than fasciæ ; from *Rudectella*, *Rufocinerea* is abundantly distinguished by its longer anterior wings, the dark scales being brownish instead of grey, and there being no indication of a pale central fascia.

*Male*.—Expansion of the wings 4½—5 lines. Head whitish ; anterior wings whitish, much suffused with brown, the inner margin and a streak along the disc alone remaining of the paler ground colour.

*Female*.—Expansion of the wings 4—4½ lines. Head white ; anterior wings whitish, with numerous scattered scales of a yellowish-brown tint, leaving the inner margin and a streak along the disc entirely whitish.

The pale dull yellow larva, which has the dorsal vessel greenish grey, makes long brown inconspicuous mines in *Holcus mollis* and other grasses during the winter months.

The perfect insect appears in April and May, and is abundant throughout England and Scotland; and occurs on the shores of the Mediterranean, in Tuscany and Croatia.

62. *Elachista Rudectella*, Fischer.

Not very closely allied to any other species; the darker grey-brown colour of the scattered scales at once distinguishes it from *Rufocinerea*, and in sharply marked specimens we see clearly a pale angulated fascia before the middle, and indistinctly a pair of pale spots beyond the middle.

Expansion of the wings 4—4½ lines. Head whitish; anterior wings white, with numerous scattered dark greyish-brown scales, sometimes leaving a rather distinct angulated white fascia before the middle, and a faint indication of a white spot at the anal angle, and another beyond it on the costa; in the whitish cilia is a blackish hinder-marginal line.

Larva unknown.

The perfect insect appears from May to July; it occurs at Ratisbon and Vienna.

63. *Elachista Constitella*, Zeller.

The almost entire absence of dark scales on the wings readily distinguishes this from the preceding, whereas the occurrence of a few dark scales, and the whiter cilia, serve to separate it from *Anserinella*.

Expansion of the wings 4—4½ lines. Head white; anterior wings white, faintly clouded with pale ochreous, with a few scattered dark scales towards the hind margin; cilia white, intersected by a pale grey hinder marginal line; posterior wings pale grey, with pale whitish-grey cilia.

Larva unknown.

The perfect insect appears in April and May; it has occurred at Fiume, in Croatia.

64. *Elachista Triseriatella*, Stainton.

This has some resemblance to *Dispunctella*, but wants the two larger black spots of that species.

Expansion of the wings 3½ lines. Head white; anterior wings white, with three rows of black scales on the disc; cilia whitish.

Larva unknown.

The perfect insect appears at the end of June; it occurs near Bristol and in North Wales, also at Howth, in Ireland.

65. *Elachista Pollutella*, Fischer.

A large species, reminding one of *Cygnipennella*, but with scattered fuscous scales, which the latter species wants.

Expansion of the wings 6—6½ lines. Head white; anterior wings white, with numerous scattered fuscous scales; cilia white.

Larva unknown.

The perfect insect appears in April and May; it occurs at Vienna.

66. *Elachista Grossepunctella*, Herrich-Schäffer.

Not closely allied to any other species in the tendency to a tawny fascia near the apex and another beyond the middle of the anterior wings; it reminds one slightly of *Collitella*, but the grey head and basal portion of the wings abundantly distinguish it from that species.

Expansion of the wings 3—3¼ lines. Head grey; palpi white; anterior wings white, with the basal half almost entirely greyish-fuscous; beyond the middle is a tawny blotch on the costa, in which are some coarse dark scales, and a tawny fascia at the apex; has also some scattered dark scales; cilia white, intersected by a dark fuscous hinder marginal line.

Larva unknown.

The perfect insect appears in June; it occurs near Ratisbon.

67. *Elachista Nitidulella*, Fischer.

The colour of the anterior wings in this species reminds one of *Dispilella*, but *Nitidulella* is entirely destitute of spots; the pale lemon colour is more decided in *Nitidulella* than in *Festucicolella*, which latter is nearly as big again.

Expansion of the wings 3 lines. Head pale lemon colour; anterior wings pale lemon colour, entirely without markings; cilia rather whiter.

Larva unknown.

The perfect insect appears in May and June; it occurs at Vienna and near Zürich.

68. *Elachista Festucicolella*, Zeller.

Intermediate between *Nitidulella* and *Cygnipennella*; resembles the former in the faint yellowish tinge on the anterior wings, but at once distinguished by its larger size and broader anterior

wings; on the other hand, the faint yellowish tinge distinguished it from *Cygnipennella*, and it is also smaller than that species.

Expansion of the wings  $4\frac{1}{2}$  lines. Head whitish; anterior wings whitish, with a very faint pale yellowish tinge; cilia slightly paler.

Larva unknown.

The perfect insect appears in July; it has occurred near Glogau.

#### 69. *Elachista Cygnipennella*, Hübner.

Distinguished from the preceding by its large size and pure white anterior wings, and from *Pollutella* by the entire absence of dark scales.

Expansion of the wings  $5-6\frac{1}{2}$  lines. Head white; anterior wings white, entirely spotless, with white cilia; posterior wings fuscous, with whitish cilia; in the *female* whitish, with white cilia.

The dull greenish-grey larva mines the tips of the leaves of *Dactylis glomerata* and other grasses, making rather broad mines in April.

The perfect insect appears at the end of May and in June; it seems to be very generally distributed throughout Europe.

#### 70. *Elachista Ochreella*, Stainton.

Readily recognised by the ochreous anterior wings, which are frequently clouded with fuscous along the costa.

Expansion of the wings 5 lines. Head yellowish ochreous; anterior wings yellowish ochreous, unspotted, but sometimes clouded with fuscous along the costa, especially at the base; cilia yellowish ochreous.

Larva unknown.

The perfect insect appears in June; it occurs in various parts of England; also at Weimar and near Zürich.

#### 71. *Elachista Fuscochreella*, Frey.

Much darker than the preceding species, with remarkably broad anterior wings.

Expansion of the wings  $4\frac{3}{4}-6$  lines. Head greyish ochreous; anterior wings ochreous brown, unspotted; cilia ochreous brown, with the tips darker.

Larva unknown.

The perfect insect appears in July; it has occurred near Zürich.



72. *Elachista Mühligiella*, Frey.

Closely allied to the preceding but darker, the anterior wings hardly so broad and more roughly scaled.

Expansion of the wings 5 lines. Head greyish brown; anterior wings blackish brown, rather roughly scaled; cilia of the same colour, with a pale brownish line at their origin.

Larva unknown.

The perfect insect appears in August; it has occurred near Zürich.

NOTE.—The three following descriptions appear in the "Bidrag till Finland's Fjäril-Fauna" of Tengström; I have been unable to reconcile them with any known species.

*Tristictella*. Nylander manuscript. "Fusca cinerascenti obsoletius conspersa, maculis alarum anticarum tribus parvis albidis, prima paullulum ante medium discoidali, posterioribus pone medium oppositis. Longit. alæ ant. 4 millim.

"Secundum litteras Celeberrimi Zeller nova, *Nigrellæ* affinis. Caput antice squamis cinerascens obsitum; palpi fuscis supra albidis. Alæ ut in diagnosi dictum fundo coloratæ vel, si mavis, cinerascens creberrime fusco-squamosæ, macula discoidalis inæqualis transversa, indeterminata tertiam partem latitudinis alæ occupans, maculæ anteapicales subtriangulares haud omnino oppositæ, nam externa (stigmatalis) paucillimum posterius est sita; fimbriæ squamulis fuscis immixtæ. Pedes tibiæ apicibus et tarsi annulis articulorum apicalibus albis."

*Bistictella*, n. sp. Fusca, capite metallico subnitente abdomine subtus et fasciculo anali (apparatum genitalem maris luteum circumdante) cinerascens micantibus, fasciaque alarum anticarum ante apicem interrupta albida valde indiscreta, puncta duo opposita sæpissime formante; tarsi pedum albedo-annulati. Long. alæ ant.  $3\frac{3}{4}$  millim.

Species nova teste Cel. Zeller, *Nigrellæ* quoque affinis. Præcedente valde similis, at paullo minor, colore fusco alarum anticarum ob squamas albidas subtiliter immixtas magis in cinereum vergente, punctis tantum duobus oppositis albidis (vel interdum fascia subinterrupta), fimbriisque subunicoloribus obscure cinereis ab illa dignota.

*Salicis*, n. sp. Alæ anticæ albidæ squamis fuscis crebre inspersæ, fascia quasi in medio et maculis duabus obsoletis oblique oppositis albidis tantum relictis, fimbriis sordide albidis serie punctorum fuscorum ad marginem posticam ornatis; caput, palpique alba. Longit. alæ ant. 4 millim.

Ad præcedentem proxime accedit, ab illa colore lætiori albedo statim dignota.

## SYNONYMY OF THE GENUS.

## 1. QUADRELLA.

*Tinea Quadrella*, Hübner, Sammlung Europ. Schmett. v. fig. 293.

*Elachista Quadrella*, Zeller, Isis, 1839, 212, 21—(*Id.* Ent. Zeitung, 1850, p. 199)—(Lienig, Isis, 1846, 299)—Frey, Tineen und Pterophoren der Schweiz, 288.

*Pæciloptilia Quadrella*, Herrich-Schäffer, Schmett. v. Europa, v. 309, fig. 953.

*Elachista Guttella*, Reutti, Lepid. Faun. Baden, 197.

## 2. TRAPEZIELLA.

*Elachista Trapeziella*, Stainton, Cat. Brit. Tineidæ, p. 26—(*Id.* Zoologist, 1850, p. 2894)—*Id.* Ins. Brit. Lep. Tin. 254—Frey, Intelligencer, ii. 126.

## 3. TETRAGONELLA.

*Pæciloptilia Tetragonella*, Herrich-Schäffer, Schmett. v. Europa, v. 308, fig. 1010.

*Elachista Tetragonella*, Frey, Tineen u. Pteroph. der Schweiz, 287.

## 4. MAGNIFICELLA.

*Elachista Magnificella*, Tengström, Finland's Fjäril-Fauna, 147, 8—Stainton, Ins. Brit. Lep. Tin. 251.

*Elachista Regificella*, Sircom, Zoologist, 1849, App. xlii. (Stainton, Zoologist, 1850, p. 2894)—(*Id.* Supplem. Cat. p. 9.)

*Pæciloptilia Geminatella*, Herrich-Schäffer, Schmett. v. Europa, v. 309, fig. 1015.

## 5. NOBILELLA.

*Elachista Nobilella*, Zeller, Isis, 1839, 213, 28—(*Id.* Ent. Zeitung, 1850, p. 201)—Frey, Tineen u. Pteroph. der Schweiz, 287.

*Pæciloptilia Nobiliella*, Herrich-Schäffer, Schmett. v. Europa, v. 309, fig. 1012.

## 6. GLEICHENELLA.

*Tinea Gleichnella*, Fabricius, Species Insectorum, ii. 303, 81—*Id.* Mantissa, ii. 252, 110.

*Elachista Gleichenella*, Stainton, Ins. Brit. Lep. Tin. 251—

*Id.* Ent. Annual, 1855, p. 56 [2nd edit. p. 78]—Frey, Tineen u. Pteroph. der Schweiz, 286.

*Tinea Gleichella*, Fabricius, Entom. System, iii. 2, 323, 158; Haworth, Lepidop. Britain. 582.

*Microsetia Gleichella*, Stephens, Illustr. Haust. iv. 270.

*Elachista Gleichella*, Stainton, Cat. Brit. Tineidæ, p. 26—

*Id.* Zoologist, 1850, p. 2894.

*Elachista Trifasciella*, Tengström, Finland's Fjäril-Fauna, 148, 9.

*Pæciloptilia Fractella*, Herrich-Schäffer, Schmett. v. Europa, v. 309, fig. 1013, 1014.

#### 7. APICIPUNCTELLA.

*Elachista apicipunctella*, Stainton, Cat. Brit. Tineidæ, p. 26

—(*Id.* Zoologist, 1850, p. 2894)—*Id.* Ins. Brit. Lep. Tin. 252.

*Pæciloptilia apicipunctella*, Herrich-Schäffer, Schmett. v. Europa, v. 309, fig. 951.

#### 8. ALBIFRONTELLA.

*Tinea Albifrontella*, Hübner, Sammlung Europ. Schmett. v. fig. 432.

*Elachista Albifrontella*, Zeller, Isis, 1839, 212, 22—(*Id.* Ent. Zeitung, 1850, 199)—(Lienig, Isis, 1846, 299)—(Tengström, Finland's Fjäril-Fauna, 148, 10)—Stainton, Cat. Brit. Tineidæ, p. 25—(*Id.* Zoologist, 1850, p. 2893)—*Id.* Ins. Brit. Lep. Tin. p. 252—*Id.* Ent. Annual, 1855, p. 56 [2nd edit. p. 78]—Frey, Tineen u. Pteroph. der Schweiz, 288.

*Pæciloptilia Albifrontella*, Herrich-Schäffer, Schmett. v. Europa, v. 306.

*Tinea Quadrella*, Haworth, Lepidop. Britann. 582.

*Microsetia Quadrella*, Stephens, Illustr. Haust. iv. 265.

? *Tinea Gleichella*, Thunberg, Insecta Suecica, 7, 90.

? *Amaurosetia Albifrontella*, Stephens, Illustr. Haust. iv. 355.

#### 9. CINEREOPUNCTELLA.

*Tinea cinereopunctella*, Haworth, Lepidop. Britann. 581.

*Microsetia cinereopunctella*, Stephens, Illustr. Haust. iv. 265.

*Elachista cinereopunctella*, Stainton, Cat. Brit. Tineidæ, p. 27—(*Id.* Zoologist, 1850, p. 2893)—*Id.* Ins. Brit.

Lep. Tin. 254—*Id.* Ent. Annual, 1855, p. 56 [2nd edit. p. 78]—Frey, Tineen u. Pteroph. der Schweiz, 290.  
*Pœciloptilia cinereopunctella*, Herrich-Schäffer, Schmett. v. Europa, v. 306, fig. 1009.

## 10. ABBREVIATELLA.

*Elachista Abbreviatella*, Stainton, Supplem. Cat. App. p. 26.  
*Pœciloptilia Latipennella*, Herrich-Schäffer, Schmett. v. Europa, v. 308, fig. 955.

## 11. LUTICOMELLA.

*Elachista Luticomella*, Zeller, Isis, 1839, 212, 23—(Lienig, Isis, 1846, p. 299)—Stainton, Cat. Brit. Tineidæ, p. 25—(*Id.* Zoologist, 1850, p. 2893)—*Id.* Ins. Brit. Lep. Tin. p. 253—Frey, Tineen u. Pteroph. der Schweiz, 289.  
*Pœciloptilia Luticomella*, Herrich-Schäffer, Schmett. v. Europa, v. 335, fig. 1011.  
 ? *Tinea Stipella*, Hübner, Samml. Europ. Schmett. v. fig. 138.  
 ? *Tinea Guttella*, Haworth, Lepidop. Britann. 582.  
 ? *Microsetia Guttella*, Stephens, Illustr. Haust. iv. 265.

## 12. FLAVICOMELLA.

*Elachista Flavicomella*, Stainton, Ent. Annual, 1856, p. 39.

## 13. ATRICOMELLA.

*Elachista Atricomella*, Stainton, Cat. Brit. Tineidæ, p. 25—(*Id.* Zoologist, 1850, p. 2893)—*Id.* Ins. Brit. Lep. Tin. p. 253.  
*Pœciloptilia Atricomella*, Herrich-Schäffer, Schmett. v. Europa, v. 307, fig. 952.  
 ♀ *Elachista Alienella*, Stainton, Supplem. Cat. p. 9.  
 ? *Microsetia Exiguella*, Stephens, Illustr. Haust. iv. 264.

## 14. KILMUNELLA.

*Elachista Kilmunella*, Stainton, Cat. Brit. Tineidæ, p. 25—*Id.* Ins. Brit. Lep. Tin. p. 253—*Id.* Ent. Annual, 1855, p. 56 [2nd edit. p. 78].  
*Pœciloptilia Kilmunella*, Herrich-Schäffer, Schmett. v. Europa, v. 307, fig. 1008.  
*Elachista Alpinella*, Stainton, Ins. Brit. Lep. Tin. 254.

## 15. HELVETICA.

*Elachista Helvetica*, Frey, Tineen u. Pteroph. der Schweiz, 289.

## 16. HOLDENELLA.

*Elachista Holdenella* (Edleston), Stainton, Ins. Brit. Lep. Tin. 252.

## 17. NIGRELLA.

*Tinea Nigrella*, Hübner, Samml. Europ. Schmett. v. fig. 285—Haworth, Lepidop. Brit. 583.

*Elachista Nigrella*, Treitschke, Schmett. v. Europa, ix. 2, 182—Zeller, Isis, 1839, 212, 24—*Id.* Isis, 1847, 892—(*Id.* Ent. Zeitung. 1850, p. 201)—(Tengström, Finland's Fjäril-Fauna, 148, 11)—Stainton, Cat. Brit. Tineidæ, p. 26—(*Id.* Zoologist, 1850, p. 2894)—*Id.* Ins. Brit. Lep. Tin. 254—Frey, Tineen u. Pteroph. der Schweiz, 293.

*Microsetia Nigrella*, Stephens, Illustr. Haust. iv. 267.

## 18. GREGSONI.

*Elachista Gregsoni*, Stainton, Ent. Annual, 1855, p. 48 [2nd edit. p. 70].

? *Pæciloptilia Exactella*, Herrich-Schäffer, Schmett. v. Europa, v. 304, fig. 960.

? *Elachista Consortella*, Frey, Tineen u. Pteroph. der Schweiz, 294.

## 19. STABILELLA.

*Elachista Stabiella*, n. sp.

(*Elachista Consortella*, Stainton, Ent. Annual, 1855, p. 56 [2nd edit. p. 79]—*Id.* Ent. Annual, 1857, p. 128.)

## 20. BEDELLELLA.

*Microsetia Bedellella*, Sircom, Zoologist, 1848, p. 2037.

*Elachista Bedellella*, Stainton, Cat. Brit. Tineidæ, p. 26—*Id.* Ins. Brit. Lep. Tin. p. 257—*Id.* Ent. Annual, 1857, p. 128.

*Pæciloptilia Truncatella*, Herrich-Schäffer, Schmett. v. Europa, v. 309, fig. 942 (*Nigrella*).

*Elachista Truncatella*, Frey, Tineen u. Pteroph. der Schweiz, 297.

? *Elachista Nigrella*, Duponchel, Lép. de France, Supp. iv. 473, pl. 86, fig. 9.

21. EXTENSELLA.

*Elachista Extensella*, Stainton, Supplement Cat. App. p. 26.

22. RECTIFASCIELLA.

*Elachista Rectifasciella*, Stainton, Suppl. Cat. App. p. 26.

*Pœciloptilia Pullicomella*, Herrich-Schäffer, Schmett. v. Europa, v. 305, fig. 945—947 (*Furvicomella*).

? *Elachista Pullicomella*, Zeller, Isis, 1839, 212, 25.

23. INCANELLA.

*Pœciloptilia Incanella* (Fischer), Herrich-Schäffer, Schmett. v. Europa, v. 308, fig. 957.

*Elachista Incanella*, Frey, Tineen u. Pteroph. der Schweiz, 297.

? *Æcophora Squamosella*, Duponchel, Lép. de France, Supp. iv. 334, pl. 78, fig. 2.

24. GRISEELLA.

*Elachista Griseella* (Fischer), Zeller, Ent. Zeitung, 1850, p. 199.

*Pœciloptilia Griseella*, Herrich-Schäffer, Schmett. v. Europa, v. 308, fig. 948.

25. DISPOSITELLA.

*Elachista Dispositella*, Mann in litt.

26. OBSCURELLA.

♂ *Elachista Obscurella*, Stainton, Cat. Brit. Tineidæ, p. 26—(*Id. Zoologist*, 1850, p. 2894)—*Id. Inst. Brit. Lep.* p. 257—*Id. Ent. Annual*, 1855, p. 56 [2nd. edit. p. 79], —Frey, Tineen u. Pteroph. der Schweiz, 296.

♀ *Elachista Pulchella*, Stainton, Cat. Brit. Tineidæ, p. 26—(*Id. Zoologist*, 1850, p. 2894)—*Id. Ins. Brit. Lep. Tin.* 256.

? *Pœciloptilia Squamosella*, Herrich-Schäffer, Schmett. v. Europa, v. 305, fig. 958.

? ♀ *Tinea Pulchella*, Haworth, Lepidop. Britann. 582.

? ♀ *Microsetia Pulchella*, Stephens, Illustr. Haust. iv. 266.

## 27. HUMILIS.

*Elachista Humilis*, Zeller, Entom. Zeitung, 1850, p. 201 ;  
Frey, Tineen u. Pteroph. der Schweiz, 297.

*Elachista Occultella*, Douglas, Proc. Entom. Soc. 1850, p.  
7 ; Zoologist, 1850, p. 2806—Stainton, Suppl. Cat. p.  
9)—*Id.* Inst. Brit. Tin. 255.

## 28. ARUNDINELLA.

*Elachista Arundinella* (Fischer), Zeller, Ent. Zeitung, 1850,  
p. 200.

*Pæciloptilia Arundiniella*, Herrich-Schäffer, Schmett. v.  
Europa, v. 308, fig. 1029.

## 29. CONSORTELLA.

*Elachista Consortella*, Stainton, Suppl. Cat. p. 9—*Id.* Ins.  
Brit. Lep. Tin. 256.

## 30. SUBNIGRELLA.

*Elachista Subnigrella*, Douglas, Trans. Ent. Soc. ii. N. S.  
p. 210, pl. xviii., fig. 1—Stainton, Inst. Brit. Lep. Tin.  
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## 31. PULLELLA.

*Pæciloptilia Pullella* (Fischer), Herrich-Schäffer, Schmett.  
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## 32. PERPLEXELLA.

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*Elachista Subnigrella*, Frey, Tineen u. Pteroph. der Schweiz,  
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## 33. AIRÆ.

*Elachista Airæ*, Frey in litt.

## 34. POÆ.

*Elachista Poæ* (Douglas), Stainton, Ent. Annual, 1855, p.  
47 [2nd edit. p. 69].

## 35. BIFASCIELLA.

*Elachista Bifasciella*, Treitschke, Schmett. v. Europa, ix-  
2, 182—Duponchel, Lép. de France, xi. 532, pl. 308,

fig. 5—(Zeller, *Isis*, 1839, 213, 26)—Frey, *Tineen und Pteroph. der Schweiz*, 298.

*Pæciloptilia Binella*, Herrich-Schäffer, *Schmett. v. Europa*, v. 310, fig. 959.

36. CINCTELLA.

*Elachista Cinctella*, Zeller, *Ent. Zeitung*, 1850, p. 201.

*Pæciloptilia Cinctella*, Herrich-Schäffer, *Schmett. v. Europa*, v. 303, fig. 944.

? *Elachista Cinctella*, Zeller, *Isis*, 1839, 213, 29—(Tengström, *Finland's Fjäril-Fauna*, 150, 15)—Frey, *Tineen u. Pteroph. der Schweiz*, 298.

37. REVINCTELLA.

*Elachista Revinctella*, Zeller, *Ent. Zeitung*, 1850, p. 202.

*Pæciloptilia Revinctella* (Herrich-Schäffer, *Schmett. v. Europa*, v. 303).

38. ADSCITELLA.

*Elachista Adscitella*, Stainton, *Suppl. Cat.* p. 10—*Id.* *Ins. Brit. Lep. Tin.* 259—*Id.* *Ent. Annual*, 1857, p. 128.

*Pæciloptilia Adscitella*, Herrich-Schäffer, *Schmett. v. Europa*, v. 303, fig. 956.

♀ *Elachista Abruptella*, Stainton, *Ins. Brit. Lep. Tin.* 258.

39. MEGERLELLA.

*Elachista Megerlella*, Stainton, *Cat. Brit. Tineidæ*, p. 27—(*Id.* *Zoologist*, 1850, p. 2894)—*Id.* *Ins. Brit. Lep. Tin.* 258—Zeller, *Ent. Zeitung*, 1850, p. 202—Douglas, *Trans. Ent. Soc.* ii. N:S. p. 211, pl. xviii. fig. 2.

*Pæciloptilia Megerlella*, Herrich-Schäffer, *Schmett. v. Europa*, v. 303, fig. 954.

? *Amaurosetia Megerlella*, Stephens, *Illustr. Haust.* iv. 355.

40. OBLIQUELLA.

*Elachista Obliquella* (Edleston), Stainton, *Ins. Brit. Lep. Tin.* 258.

41. ZONARIELLA.

*Elachista Zonariella*, Tengström, *Finland's Fjäril-Fauna*, 150, 16—Stainton, *Ins. Brit. Lep. Tin.* 257.—*Id.* *Ent. Annual*, 1855, p. 56 [2nd edit. p. 79].



*Pæciloptilia Zonariella*, Herrich-Schäffer, Schmett. v. Europa, v. 303, fig. 939 (*Bisulcella*).

*Elachista Bisulcella*, Zeller, Entom. Zeitung, 1850, p. 203—Stainton, Suppl. Cat. p. 9.

42. CINGILLELLA.

*Pæciloptilia Cingitella* (Fischer), Herrich-Schäffer, Schmett. v. Europa, v. 303, fig. 940.

43. GANGABELLA.

*Elachista Gangabella* (Fischer), Zeller, Ent. Zeitung, 1850, p. 202—Stainton, Suppl. Cat. p. 10—*Id.* Ins. Brit. Lep. Tin. 258—*Id.* Ent. Annual, 1855, p. 57 [2nd edit. p. 79], non Frey.

♀ *Elachista Albinella*, Stainton, Ins. Brit. Lep. Tin. 257.

44. TÆNIATELLA.

*Elachista Tæniatella* (Zeller), Stainton, Ent. Annual, 1857, p. 109.

*Elachista Gangabella*, Frey, Tineen u. Pteroph. der Schweiz, p. 299.

? *Pæciloptilia Gangabella*, Herrich-Schäffer, Schmett. v. Europa, v. 304, fig. 941.

45. CHRYSODESMELLA.

*Elachista Chrysodesmella*, Zeller, Ent. Zeitung, 1850, p. 203.

*Pæciloptilia Chrysodesmella* (Herrich-Schäffer, Schmett. v. Europa, v. 303).

46. SERRICORNIS.

*Elachista Serricornis* (Logan), Stainton, Ins. Brit. Lep. Tin. 260.

47. CERUSELLA.

*Tinea Cerusella*, Hübner, Samml. Europ. Schmett. v. fig. 183—Haworth, Lepidop. Britann. 567.

*Amaurosetia Cerusella*, Stephens, Illustr. Haust. iv. 355.

*Elachista Cerusella*, (Zeller, Isis, 1839, 213, 30)—(Stainton, Cat. Brit. Tineidæ, p. 27)—(*Id.* Zoologist, 1850, p. 2894)—*Id.* Ins. Brit. Lep. Tin. p. 259.

*Pæciloptilia Cerusella*, Herrich-Schäffer, Schmett. v. Europa, v. 310.

## 48. UTONELLA.

*Elachista Utonella*, Frey, Tineen u. Pteroph. der Schweiz, 300.

Under *Pœciloptilia Rhynchosporella*, Herrich-Schäffer, Schmett. v. Europa, v. 310.

## 49. CONTAMINATELLA.

*Elachista Contaminatella*, Zeller, Isis, 1847, p. 892.

*Pœciloptilia Contaminatella*, Herrich-Schäffer, Schmett. v. Europa, v. 312, fig. 1027.

## 50. RHYNCHOSPORELLA.

*Aphelosetia Rhynchosporella*, Stainton, Zoologist, 1848, p. 2165.

*Elachista Rhynchosporella*, (Stainton, Cat. Brit. Tineidæ, p. 27)—*Id.* Ins. Brit. Lep. Tin. 259—*Id.* Ent. Annual, 1855, p. 57 [2nd edit. p. 79].

*Pœciloptilia Rhynchosporella*, Herrich-Schäffer, Schmett. v. Europa, v. 310, fig. 1017 (*Uliginella*).

? *Elachista Albidella*, Tengström, Finland's Fjäril-Fauna, 150, 17.

## 51. ELEOCHARIELLA.

*Elachista Eleochariella*, Stainton, Suppl. Cat. p. 10—*Id.* Ins. Brit. Lep. Tin. 260.

*Pœciloptilia Eleochariella*, Herrich-Schäffer, Schmett. v. Europa, v. 310, fig. 107.

## 52. BIATOMELLA.

*Aphelosetia Biatomella*, Stainton, Zoologist, 1848, p. 2165.

*Elachista Biatomella*, (Stainton, Cat. Brit. Tineidæ, p. 27)—*Id.* Ins. Brit. Lep. Tin. 260—*Id.* Ent. Annual, 1855, —p. 57 [2nd Edit. p. 80]—Frey, Tineen u. Pteroph. der Schweiz, 301.

*Pœciloptilia Biatomella*, Herrich-Schäffer, Schmett. v. Europa, v. 310.

## 53. DISEMIELLA.

*Elachista Disemiella*, Zeller, Isis, 1847, p. 893.

? *Pœciloptilia Disemiella*, Herrich-Schäffer, Schmett. v. Europa, v. 313, fig. 1028.

## 54. DISPUNCTELLA.

*Æcophora Dispunctella*, Duponchel, Lép. de France, Suppl. iv. 333, pl. 78, fig. 1.

*Elachista Dispunctella*, Zeller, Isis, 1847, p. 893 (under *Dissemiella*)—Frey, Tineen u. Pteroph. der Schweiz, 302.

*Pæciloptilia Dispunctella*, Herrich-Schäffer, Schmett. v. Europa, v. 312, fig. 1024.

## 55. TRIATOMEA.

*Porrectaria Triatomea*, Haworth, Lepidopt. Brit. 535.

*Aphelosetia Triatomea*, Stephens, Illustr. Haust. iv. 288.

*Elachista Triatomea*, (Stainton, Cat. Brit. Tineidæ, p. 27)

—*Id.* Ins. Brit. Lep. Tin. 261.

*Pæciloptilia Triatomea*, Herrich-Schäffer, Schmett. v. Europa, v. 312.

*Elachista Dispilella*, Stainton, Cat. Brit. Tineidæ, p. 27—

—(*Id.* Zoologist, 1850, p. 2894).

? *Elachista Bipunctella*, Treitschke, Schmett. v. Europa, ix. 2, 181.

## 56. DISPILELLA.

*Pæciloptilia Dispilella*, Herrich-Schäffer, Schmett. v. Europa, v. 312, fig. 1023.

? *Elachista Dispilella*, Zeller, Isis, 1839, 213, 32.

## 57. POLLINARIELLA.

*Elachista Pollinariella*, Duponchel, Lépid. de France, xi.

508, pl. 307, fig. 5—Zeller, Isis, 1839, 213, 31—(*Id.* Ent.

Zeitung, 1850, p. 203)—(Liénig, Isis, 1846, 299)—

(Tengström, Finland's Fjäril-Fauna, 151, 18)—Stainton,

Suppl. Cat. p. 10—*Id.* Ins. Brit. Lep. Tin. 261—*Id.*

Ent. Annual, 1857, p. 128.

*Pæciloptilia Disertella*, Herrich-Schäffer, Schmett. v. Europa, v. 311, fig. 1018 a.

*Elachista Disertella*, Frey, Tineen u. Pteroph. der Schweiz, 299.

? *Pæciloptilia Pollinariella*, Herrich-Schäffer, Schmett. v. Europa, v. 311, fig. 1022.

## 58. SUBOCELLEA.

*Aphelosetia Subocellea*, Stephens, Illustr. Haust. iv. 290.

*Elachista Collitella*, (Stainton, Cat. Brit. Tineidæ, p. 27)—

(*Id.* Zoologist, 1850, p. 2894)—*Id.* Ins. Brit. Lep. Tin. 261.

Under *Pæciloptilia Collitella*, Herrich-Schäffer, Schmett. v. Europa, v. 311.

## 59. COLLITELLA.

*Cecophora Collitella* (Fischer), Duponchel, Lépid. de France, Supp. iv. 327, pl. 77, fig. 9.

*Pæciloptilia Collitella*, Herrich-Schäffer, Schmett. v. Europa, v. 311, fig. 1019.

## 60. ANSERINELLA.

*Elachista Anserinella*, Zeller, Isis, 1839, 213, 34—*Id.* Ent. Zeitung, 1850, p. 203—Duponchel, Lépid. de France, Supp. iv. 474, pl. 86, fig. 10.

## 61. RUFOCINEREA.

♂ *Porrectaria Rufocinerea*, Haworth, Lepidop. Britann. 535.

♂ *Apheloesetia Rufocinerea*, Stephens, Illustr. Haust. iv. 289.

*Elachista Rufocinerea*, (Stainton, Cat. Brit. Tineidæ, p. 27)—*Id.* Ins. Brit. Lep. Tin. 262—*Id.* Ent. Annual, 1855, p. 57 [2nd edit. p. 80]—Zeller, Ent. Zeitung, 1850, p. 204.

*Pæciloptilia Rufocinerella*, Herrich-Schäffer, Schmett. v. Europa, v. 312, fig. 1021.

♀ *Porrectaria Floslactis*, Haworth, Lepidop. Britann. 535.

♀ *Apheloesetia Floslactis*, Stephens, Illustr. Haust. iv. 289.

## 62. RUDECTELLA.

*Elachista Rudectella* (Fischer), Stainton, Suppl. Cat. App. p. 26.

*Pæciloptilia Rudectella*, Herrich-Schäffer, Schmett. v. Europa, v. 311, fig. 1020.

## 63. CONSTITELLA.

*Elachista Constitella*, Zeller in litt.

## 64. TRISERIATELLA.

*Elachista Triseriatella*, Stainton, Ins. Brit. Lep. Tin. 261—(*Id.* Ent. Annual, 1855, p. 57 [2nd edit. p. 80.])

## 65. POLLUTELLA.

*Pæciloptilia Pollutella*, Herrich-Schäffer, Schmett. v. Europa, v. 313, fig. 1026.

## 66. GROSSEPUNCTELLA.

*Pæciloptilia Grossepunctella*, Herrich-Schäffer, Schmett. v. Europa, v. 312.

## 67. NITIDULELLA.

*Pæciloptilia Nitidulella*, Herrich-Schäffer, Schmett. v. Europa, v. 314, fig. 1025.

*Elachista Nitidulella*, Frey, Tineen u. Pteroph. der Schweiz, 302.

## 68. FESTUCICOLELLA.

*Elachista Festucicolella*, Zeller, Entom. Zeitung, 1853, p. 415.

*Pæciloptilia Festucicolella*, Herrich-Schäffer, Schmett. v. Europa, v. 313.

## 69. CYGNIPENNELLA.

*Tinea Cygnipennella*, Hübner, Samml. Europ. Schmett. v. fig. 207.

♀ *Aphelosetia Cygnipennella*, Stephens, Illust. Haust. iv. 288.

*Elachista Cygnipennella*, Zeller, Isis, 1839, 213, 33—(*Id.* Isis, 1847, 38)—*Id.* Isis, 1847, 893—*Id.* Ent. Zeitung, 1850, p. 205—(Léinig, Isis, 1846, 299)—Douglas, Trans. Ent. Soc. ii. N. S., pl. xviii. fig. 3—Stainton, (Cat. Brit. Tineidæ, p. 27)—*Id.* Ins. Brit. Lep. Tin. 262—*Id.* Ent. Annual, 1855, p. 57 [2nd edit. p. 80]—Frey, Tineen u. Pteroph. der Schweiz, 303.

*Cynodia Cygnipennella*, Herrich-Schäffer, Schmett. v. Europa, v. 211.

*Porrectaria Cygnipennis*, Haworth, Lepidop. Britann. 536.

*Adela Cygnella*, Treitschke, Schmett. v. Europa, ix. 2, 117.

*Elachista Cygnella*, Duponchel, Lép. de France, xi. 543, pl. 309, fig. 1.

♂ *Aphelosetia semialbella*, Stephens, Illust. Haust. iv. 288.

? *Tinea Farinella*, Thunberg, Insecta Suecica, 7, 88.

## 70. OCHREELLA.

*Elachista Ochreella*, Stainton, Cat. Brit. Tineidæ, p. 27—*Id.* Ins. Brit. Lep. Tin. 262—(*Id.* Ent. Annual, 1857, p. 128)—Frey, Tineen u. Pteroph. der Schweiz, 303.

*Pæciloptilia Ochreella*. Herrich-Schäffer, Schmett. v. Europa, v. 313, fig. 1008.

*Elachista Nebulella*, Stainton, Suppl. Cat. p. 10.

*Elachista Subalbidella*, Schläger, Bericht des lep. Tauschvereins, 241.

71. FUSCOCHREELLA.

*Elachista Fuscochreella*, Frey, Tineen u. Pteroph. der Schweiz, 304.

Under *Pæciloptilia Ochreella*, Herrich-Schäffer, Schmett. v. Europa, v. 313 (*Fuscochreella*).

72. MÜHLIGIELLA.

*Elachista Mühligiella*, Frey, Tineen u. Pteroph. der Schweiz, 304.

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XXIII. *Descriptions of some New Species of Chrysomelidæ.* By J. S. BALY, Esq.

[Read 2nd March, 1857.]

THE present paper contains principally descriptions of insects lately added to my collection, in addition are a few others well known to collectors, but hitherto bearing only manuscript names.

GENUS DORYSTERNA, Guér.

Sp. 1. *Dorysterna tibialis.*

Ovata, valde convexa, nitida, fulvo-testacea, antennis extrorsum nigris, elytris viridi-æneis, margine postico rufo-testaceo, tibiis anticis curvatis, apice dilatatis.

Long. 5 lin.

Ovata, valde convexa, fulvo-testacea, nitida. Caput tenuissime punctatum, mandibulis apice antennarumque articulis ultimis quatuor, nigris. Thorax transversus, longitudine triplo latior, apice late concavo-emarginatus, lateribus rotundato-explanatis, basi emarginatis; supra convexus, utrinque leniter excavatus, tenuiter punctatus. Scutellum læve. Elytra thorace vix latiora, valde convexa, apice late rotundata, lateribus infra basin paullo explanatis, obsolete angulatis; distincte punctata, punctis in striis plurimis dispositis; læte viridi-ænea, marginis lateralis dimidio postico rufo-fulvo. Tibiæ anticæ elongatæ, ultra medium curvatæ, apice dilatæ.

Upper Amazons.

Sp. 2. *Dorysterna cruentata.*

Oblonga, convexa, rubra, elytris metallico-olivaceis, suturâ limboque anguste rubris, antennis extrorsum nigris.

Long.  $4\frac{1}{2}$  lin.

Caput indistincte punctatum; oculis, mandibularum apice antennisque extrorsum, nigris. Thorax transversus, apice valde subquadrato-excavatus, lateribus basi ad apicem angustatis, angulis anticis obtusis; supra convexus, punctatus, utrinque vix excavatus. Elytra oblongo-ovata, convexa, subopaca, tenuiter punctato-striata, striis ad apicem fere obsolete; viridi-olivacea, limbo suturâque rubris. Corpus subtus nitido-rufo-testaceum.

Brazil.

Sp. 3. *Dorysterna festiva*.

Ovata, valde convexa, obscure fulva, antennis (basi exceptâ) nigris, thoracis disco fusco-æneo, elytris læte viridi-æneis, nitidis, puncto basali margineque laterali postice, flavis.

Long.  $4\frac{1}{2}$ —5 lin.

Caput tenuiter punctatum; antennæ (articulis basalibus tribus exceptis) nigræ; labrum flavum. Thorax transversus, longitudine triplo latior, apice valde emarginatus, lateribus rotundatis, basi emarginatis; supra modice convexus, utrinque leniter excavatus, tenuiter punctatus; fusco-æneus, margine apicali lateribusque obscure fulvis. Scutellum læve. Elytra thorace vix latiora, valde convexa, apice rotundata, lateribus infra basin vix productis, medio sinuatis; distincte punctata, punctis antice in striis, lateribus apiceque confuse dispositis; læte viridi-ænea, nitida, puncto humerali marginisque lateralis dimidio postico, flavis.

Peru.

Sp. 4. *Dorysterna pretiosa*.

Ovata, convexa, picea, capite, thoracis lateribus maculâque apicali, scutello, abdominis apice pedibusque, fulvis, elytris nitidissimis, punctato-striatis, metallico-purpureis, utrisque maculis quatuor flavis; antennis (basi exceptâ) nigris.

Long.  $4\frac{1}{2}$  lin.

Caput tenuiter punctatum; antennæ fere corporis dimidii longitudine, articulis duobus basalibus totis tertioque infra, fulvis, cæteris nigris. Thorax longitudine plus triplo latior, apice valde emarginatus, lateribus rotundatis, angulis anticis acutis; tenuiter punctatus, subopacus, piceus, lateribus maculâque parvâ triangulari, ad marginem apicalem adfixâ, fulvis. Scutellum trigonum, pallide fulvum. Elytra thoracis basi vix latiora, ovata, convexa, lateribus ante medium paullo productis et obtuse angulatis, apice rotundata; fortiter punctata, punctis in striis plurimis confuse-dispositis; purpurea, nitidissima, utraque maculis quatuor flavis, unâ angulo humerali, duabus alteris prope medium, parallelis, quartâ transversâ, ad marginem apicalem adfixâ, positis. Subtus obscure piceus, thorace, abdominis apice pedibusque rufo-fulvis.

Ega, Upper Amazons.

## Genus DORYPHORA, Illig.

Sp. 1. *Doryphora spectabilis*.

Ovata, convexa, supra rufo-picea, nitida, thoracis margine laterali elytrorumque limbo, vittâ brevi prope suturam, maculisque duabus, flavis.

Long. 5 lin.

Caput crebre punctatum, rufo-piceum, antennarum articulis duobus basalibus infra, ultimoque apice, fulvis. Thorax longitudine plus duplo lator, apice valde excavatus, lateribus rectis, antice rotundato-angustatis, angulis anticis acutis; supra leniter convexus, fortiter et sat crebre punctatus; rufo-piceus, utrinque obscurior, margine laterali anguste flavo. Elytra thorace paullo latiora, convexa, sat crebre et fortiter punctata, punctis ad apicem minus fortiter impressis, basi et prope suturam, obsolete subseriatim dispositis; rufo-picea, marginibus basali et laterali, vittâ pone medium disco interiori positâ, maculisque duabus, unâ ante—alterâ pone—medium positis, flavis. Corpus subtus piceum, nitidum.

Mexico.

Sp. 2. *Doryphora mirabilis*. (Pl. XXVII. fig. 4.)

Oblongo-ovata, convexa, nigro-ænea, nitida, elytris fulvis, margine, suturâ, fasciis duabus communibus, et utrisque maculâ triangulari, subapicali, rufo-piceis, æneo-micantibus.

Long. 5½ lin.

Caput tenuiter punctatum. Thorax longitudine fere triplo lator, apice valde excavatus, lateribus leniter rotundato-ampliatis, antice paullo angustatis, angulis anticis mucronatis; supra convexus, lateribus leniter excavatus, sub crebre, disco tenuissime et sparse punctatus. Scutellum læve. Elytra thorace paullo latiora, illo plus quadruplo longiora, ovata, convexa, tenuiter subseriatim punctata, fulva, nitida, utraque suturâ, margine exteriori, fasciis duabus communibus, unâ infra basin, extrorsum abbreviatâ, alterâ prope medium, ad marginem connexâ, maculâque triangulari, subapicali, rufo-piceis, æneo-micantibus.

Venezuela.

Sp. 3. *Doryphora bella*.

Ovata, convexa, supra cuprea, nitida, elytris fulvis, suturâ,

limbo exteriori, apice late, fasciisque duabus extrorsum abbreviatis, cupreis.

Long.  $5\frac{1}{2}$  lin.

Ovata, valde convexa. Caput tenuiter punctatum; antennæ nigræ. Thorax longitudine plus duplo latior, apice valde excavatus, lateribus subrectis, antice rotundato-angustatis, angulis anticis subacutis; supra convexus, utrinque excavatus, fortiter punctatus, punctis sparsis, irregulariter congregatis. Scutellum læve. Elytra subquadrato-ovata, valde convexa, fortiter punctata, punctis in striis irregulariter dispositis; fulva, apice late, suturâ, margine exteriori, maculâ basali parvâ, suturâ confluenti, fasciisque duabus, extrorsum abbreviatis, cupreis; his discum fere amplectentibus, unâ ante—alterâ pone—medium positis, marginibus, etsi margine apicali, irregulariter crenatis. Corpus subtus nigro-æneum, nitidum.

Mexico.

Sp. 4. *Doryphora Javeti*.

Quadrato-ovata, convexa, cuprea, nitida, antennis elytrisque fulvis, his suturâ, marginibus basali et exteriori, maculâ subcordatâ communi ante medium, et utrisque punctis duobus nigro-æneis; tarsis fusco-fulvis.

Long. 6 lin.

Quadrato-ovata, valde convexa. Caput tenuiter punctatum; antennæ fulvæ. Thorax longitudine fere triplo latior, apice valde excavatus, lateribus rotundatis, postice subrectis, angulis anticis acutis; supra convexus, irregulariter punctatus, utrinque late excavatus. Scutellum subtrigonum, læve. Elytra subquadrata, apice rotundata, dorso ante medium valde-, postice declivo-convexa; fulva, fusco-punctata, limbo toto, vittâ suturali, maculâ communi subcordata ante medium, et utrisque punctis duobus, oblique positis, unâ ante—altera pone—medium, nigro-æneis. Corpus subtus obscure æneum, pedibus cupreis, coxis, femoribus infra, tibiis apice tarsisque fusco-fulvis.

Napo.

Named after my friend, M. Javet, of Paris.

Sp. 5. *Doryphora flexuosa*.

Ovata, convexa, cuprea, nitida, elytris lineis duabus, basi apiceque connexis, unâ margine exteriori, alterâ flexuosâ, discoidali flavis.

Long.  $4\frac{1}{2}$  lin.

Caput vage punctatum, cupreum, antennis extrorsum nigris,

basi infra et labro fulvis. Thorax longitudine plus duplo latior, apice valde excavatus, lateribus rotundatis, antice paullo angustatis, angulis anticis et posticis acutis; supra convexus, crebre sed tenuiter punctatus. Elytra subovata, valde convexa, punctata, punctis ad basin in striis indistinctis dispositis, ad apicem confusis et ibi minus fortiter impressis; cuprea, utraque elytra lineâ basali, dimidio exteriori positâ, vittisque duabus, lineâ basali connexis, flavis; unâ marginali, alterâ discoidali, hâc ante medium introrsum ad suturam flexuosâ, hinc ad apicem juxta suturam prolongatâ, et ibi lineâ marginali confluenti. Corpus subtus nitidum; pedibus cupreo-æneis.

Ecuador.

Sp. 6. *Doryphora Sheppardi*. (Pl. XXVII. fig. 6.)

Ovata, valde convexa, subgibbosa, postice angustata, obscure cupreo- aut viridi-ænea, nitida, elytris flavo-albis, fasciâ transversâ latâ ante medium et utrisque plagâ magnâ triangulari postice, viridi-æneis.

Long. 7—8½ lin.

Caput inter oculos subtilissime canaliculatum, utrinque obsolete foveolatum, tenuiter punctatum, clypeo magis distincte punctato. Thorax transversus, apice valde quadrato-emarginatus, lateribus basi sinuatis, antice paullo ampliatus et rotundatus, angulis anticis mucronatis; supra fortiter sed subremote punctatus. Elytra thorace latiora, apicem versus angustata, valde convexa, dorso ante medium subgibbosa, fortiter punctata, punctis magnis, antice prope suturam in striis, ad latera et apicem versus, confuse dispositis; flavo-alba, fasciâ transversâ latâ, ante medium positâ, margine exteriori angustata, et utrisque pone medium plagâ magnâ triangulari, cupreo aut viridi-æneis. Corpus subtus nigro-æneum, nitidum.

Guatemala.

Sp. 7. *Doryphora Batesei*. (Pl. XXVII. fig. 3.)

Oblongo-ovata, valde convexa, subtus nigra; supra nigro-cuprea, nitida; elytris nigris, fasciis crenatis tribus, maculâque subapicali antice crenatâ, fulvo-testaceis, pedibus obscure chalybeis.

Long. 9 lin.

Oblongo-ovata, valde convexa. Caput nitidum, tenuiter punctatum. Thorax longitudine plus duplo latior, apice valde excavatus, lateribus rotundatis, angulis anticis submucro-

natis; supra convexus, lateribus leniter concavo-excavatus; sparse sed fortiter punctatus, punctis irregulariter congregatis. Scutellum trigonum, læve. Elytra quadrato-ovata, dorso valde convexa, ante medium obsolete gibbosa, punctata, nigra, nitida, fasciis tribus crenatis, suturâ anguste abbreviatis, maculâque subtriangulari ante apicem positâ, antice crenatâ, fulvo-testaceis. Corpus subtus nigrum, pedibus obscure chalybeis.

Ega, Upper Amazons. Collected by H. W. Bates, Esq.

This insect, one of the most beautiful in the genus, I have named after its discoverer, Mr. H. W. Bates.

Sp. 8. *Doryphora Wollastoni*.

Oblongo-ovata, viridi-cuprea, nitida, elytris viridibus, limbo suturâque viridi-cupreis; antennis nigris.

Long.  $8\frac{1}{2}$  lin.

Caput tenuiter sed sparse punctatum, fronte medio foveolata. Thorax transversus, longitudine plus duplo latior, apice valde excavatus, lateribus rotundatis, angulis anticis mucronatis; supra convexus, tenuiter punctatus, utrinque foveolatus. Elytra minus tenuiter punctata, punctis in striis irregulariter dispositis; viridia, limbo anguste, suturâque viridi-cupreis. Corpus subtus læte cupreum.

This fine insect, which was kindly presented to me by T. V. Wollaston, Esq., is unfortunately without locality.

Sp. 9. *Doryphora Hebe*.

Oblongo-ovata, convexa, nigro-ænea, elytris obscure cæruleis, utrisque margine exteriori maculisque tribus, flavis.

Long.  $5\frac{1}{2}$  lin.

Caput tenuiter punctatum; antennæ nigræ, basi deorsum flavæ. Thorax longitudine plus duplo latior, apice valde excavatus, lateribus subrectis, antice rotundato-angustatis, angulis anticis acutis; supra modice convexus, utrinque depressus, crebre punctatus, disco sparse punctatus. Scutellum læve, nitidum. Elytra ovata, convexa, dorso non gibbosa, crebre punctata; obscure cærulea, utrisque margine exteriori maculisque tribus flavis, primâ basali, oblongâ, transversâ, secundâ prope medium, transversâ, tertiâ subapicali, subtrigonâ. Corpus subtus nigro-æneum, nitidum.

Napo.

Sp. 10. *Doryphora vespertina*.

Ovata, convexa, supra pallide viridis, nitida, vertice, antennis elytrorumque vittis tribus, nigro-æneis; subtus obscure fusco-fulva, pleuris, thoracis medio, abdominisque segmentis basi, nigro-æneis.

Long. 5 lin.

Caput evidenter punctatum; clypeus obscure fulvus, vertice et antennis nigro-æneis, his articulis basalibus deorsum piceis. Thorax longitudine duplo latior, apice valde excavatus, lateribus rotundatis, antice angustatis; tenuiter punctatus, pallide viridis, disco fusco-æneo-notatus. Scutellum læve. Elytra convexa, utraque striis decem e punctis distinctis, striâ primâ abbreviatâ; punctis in striis confuse dispositis; pallide viridia, vittis tribus nigro-æneis, primâ communi, prope medium dilatâtâ, postice angustâtâ, ante apicem abbreviatâ, alteris utroque disco positâ, curvatis, submaculariformibus, latis, ante apicem abbreviatis. Corpus subtus obscure fulvum, thoracis medio, pleuris abdominisque segmentorum basi, nigro-æneis; pedes sæpe fusco-notati.

Peru.

Sp. 11. *Doryphora trivittata*. (Pl. XXVII. fig. 1.)

Ovata, convexa, nigro-ænea, nitida, thoracis lateribus elytris que pallide viridibus; his vittis tribus nigro-æneis.

Long. 5 lin.

Caput nitidum, indistincte punctatum. Antennæ nigræ, basi deorsum pallide piceæ. Thorax longitudine duplo latior, apice valde excavatus, lateribus rotundatis, antice angustatis, angulis anticis acutis; nigro-æneus, tenuiter et subremote punctatus, lateribus pallide viridibus, vage punctatis. Scutellum læve. Elytra convexa, distincte striato-punctata, punctis in striis irregulariter dispositis; pallide viridia, nitida, lineâ suturali communi, ante medium ampliâtâ, hinc ad apicem gradatim angustâtâ, et utroque disco vittâ latâ, basi apiceque abbreviatâ, nigro-æneis. Corpus subtus nigro-æneum, femorum basi spinâque pectorali piceis.

Peru.

Nearly allied to the last species, but nevertheless I think quite distinct.

Sp. 12. *Doryphora subglobosa*. (Pl. XXVII. fig. 8.)

Subglobosa, nitida, supra viridis, ore antennisque fulvis, his extrorsum piceis; elytris distincte punctato-striatis, vittâ submarginali flava; subtus flavo-viridis; pedibus fulvis.

Long.  $5\frac{1}{2}$  lin.

Subglobosa, viridis, nitida; caput vertice tenuiter punctatum, utrinque inter oculos leviter impressum; ore antennisque fulvis, his extrorsum piceis. Thorax transversus, apice quadrato-excavatus; lateribus rotundatis, angulis anticis submucronatis; supra convexus, tenuiter punctatus. Scutellum pallide viride. Elytra thorace paullo latiora, breviter ovata, valde convexa, regulariter punctato-striata; viridia, vittâ submarginali flavâ; striæ læte virides, intersticiis tenuissime punctatis, alternis flavo-viridibus. Corpus subtus flavo-viride, thorace viridi, pedibus fulvis.

Para.

A single specimen in my own collection, also another in the British Museum.

This insect may be at once distinguished from all the known pale green species by its short convex form; the Museum specimen is one-third larger than mine.

Sp. 13. *Doryphora Bohemanni*.

Subglobosa, valde convexa, flava, nitida, capite thoraceque subopacis, illo puncto verticali, hoc punctis sex, fuscis, elytris punctato-striatis, utrisque maculis 18 oblongis rufo-fulvis.

Long.  $5\frac{3}{4}$  lin.

Subglobosa. Caput subopacum, tenuiter punctatum, antennis extrorsum, oculis punctoque verticali, piceis; mandibulis apice nigro-piceis. Thorax longitudine plus duplo latior, apice valde excavatus, lateribus rotundato-angustatis, angulis anticis subacutis; supra convexus, subopacus, sordide flavus, margine basali punctisque sex, quatuor antice, transversim positus, et utrinque uno prope angulum posticum, fuscis. Scutellum trigonum, læve, pallide fuscum. Elytra valde convexa, minus tenuiter punctato-striata, intersticiis transversim strigosis; flava, nitida, vittâ suturali postice abbreviatâ, et utraque maculis 18 oblongis, seriebus transversis quatuor dispositis, rufo-fulvis.

Brazil.



Sp. 14. *Doryphora simulans*.

Breviter ovata, valde convexa, nigra, thorace elytrisq̄ flavo-albis, illo maculis duabus, his margine, suturâ anguste, fasciâ lineariformi pone medium vittulisq̄, fasciâ interruptis, nigris; antennis, tibiis tarsisque, fusco-fulvis.

Long.  $5\frac{1}{2}$  lin.

Caput nigrum, tenuiter punctatum; labro flavo, palpis antennisq̄ fusco-fulvis. Thorax longitudine fere triplo latior, apice valde excavatus, lateribus rotundato-angustatis, angulis anticis obtusis; supra convexus, flavo-albus, margine basali maculisq̄ duabus discoidalibus, basi conuexis, nigris, tenuiter punctatis. Scutellum trigonum, læve. Elytra breviter ovata, valde convexa, flavo-alba, margine, basi et suturâ anguste, fasciâ lineariformi pone medium, suturâ abbreviatâ, vittulisq̄ nigris; utraq̄ elytra horum octo ante—septem post—medium; vittulis tenuiter punctatis, intersticiis lævibus, sparse et obsolete transversim strigosis; antice prope suturam, punctorum striâ disco concolori, alterâ que juxta marginem medio nigrâ. Corpus subtus nigrum; coxis, tibiis tarsisque fusco-fulvis.

Brazil?

This species in colouring bears a striking resemblance to the insects belonging to the genus *Deuterocampta*.

Sp. 15. *Doryphora Thomsoni*.

Subrotundata, valde convexa, rufo-fulva, nitida, thoracis disco elytrisq̄ metallico-viridibus, oculis antennisq̄ extrorsum nigris.

Long.  $5\frac{1}{2}$ — $6\frac{1}{2}$  lin.

Breviter ovata aut subrotundata, valde convexa. Caput obsolete punctatum, rufo-fulvum, oculis antennisq̄ extrorsum nigris. Thorax longitudine plus duplo latior, apice valde excavatus, lateribus basi subrectis, antice rotundato-angustatis, angulis anticis acutis; supra convexus, tenuiter punctatus, metallico-viridis, lateribus rufo-fulvis. Scutellum triangulum, læve. Elytra thoracis basi paullo latiora, breviter ovata, valde convexa, minus tenuiter punctata; tota metallico-viridia. Corpus subtus rufo-fulvum.

Ega, Upper Amazons. Collected by H. W. Bates, Esq.

Sp. 16. *Doryphora catenulata*, Oliv. (Pl. XXVII. fig. 7.)

*Var. A.*—Cupreo-ænea, elytris cæruleo-æneis, utrisque plagâ magnâ discum exteriorem fere amplectenti, fulvâ, fusco-notatâ.

*Var. B.*—Elytris læte cupreo-æneis, utrisque fasciis tribus submaculariformibus, margine suturâque abbreviatis, fulvis.

Ega, Upper Amazons. Collected by Mr. H. W. Bates.

Long. 6—7 lin.

The two insects described above are remarkable local varieties of *Doryphora catenulata*, Oliv. They are so dissimilar to the type, that without the possession of a long chain of intermediate varieties I should have hesitated at uniting them with it.

Sp. 17. *Doryphora Whitei*.

Ovata, convexa, rufo-nitida; antennis fuscis, thoracis margine, maculisque quatuor æneis; elytris fulvis, vittâ latâ suturali, margine exteriori anguste maculisque duabus, fusco-æneis.

Long.  $4\frac{1}{2}$  lin.

Caput tenuiter punctatum, maculis duabus vertice æneis; oculi nigri; antennæ fuscæ, articulo basali infra rufo. Thorax transversus, apice concavo-emarginatus, lateribus subparallelis, antice rotundato-angustatis, angulis anticis acutis; supra subconvexus, tenuiter punctatus; margine, maculisque quatuor, transversim positis, æneis. Elytra magis distincte punctato-striata, punctis in striis confuse dispositis; fulva, vittâ latâ suturali, margine exteriori anguste plagisque magnis duabus, unâ ante medium ad vittam suturalem adfixâ, alterâ pone medium, subtrigonâ, extrorsum emarginatâ, margine exteriori confluenti, fusco-æneis. Corpus subtus rufo-testaceum, nitidum.

Upper Amazons.

Sp. 18. *Doryphora irrorata*.

Ovata, convexa, læte cuprea, nitida; elytris flavis, fusco-æneo-irroratis, margine exteriori, suturâ, maculâque communi ovata, ante medium positâ; cupreis.

Long.  $5\frac{1}{2}$  lin.

Caput tenuiter punctatum. Thorax transversus, longitudine fere duplo latior, lateribus subrectis, antice rotundato-angustatis, angulis anticis submucronatis; supra convexus, utrinque leniter excavatus, fortiter punctatus. Elytra fortiter sed irregulariter punctato-striata; flava, maculis parvis læte

fusco-æneis irrorata, margine exteriori et suturâ anguste, maculâque ovatâ communi ante medium cupreis.

Nepo.

Sp. 19. *Doryphora flavo-cincta*.

Ovata, valde convexa, fusco-ænea, nitida, elytrorum vittâ submarginali flavâ.

Long. 5 lin.

Caput tenuiter punctatum, antennæ nigro-piceæ, basi fulvæ, labrum obscure fulvum; oculi nigri. Thorax longitudine plus duplo latior, apice valde excavatus, lateribus leniter rotundatis, antice angustatis, angulis anticis mucronatis; supra convexus, tenuissime punctatus, subopacus. Elytra valde convexa, nitida, regulariter punctato-striata; fusco-ænea, vittâ submarginali flavâ. Corpus subtus nitidum, pallide fusco-æneum.

Brazil.

Sp. 20. *Doryphora 18-guttata*.

Ovata, convexa, supra cupreo-ænea, nitida; elytris metallico-viridibus, guttis 18 fulvis; subtus rufo-picea, pedibus æneo-micantibus.

Long. 5 lin.

Ovata, convexa, supra nitido-cupreo-ænea. Caput punctatum; antennis nigris, basi fulvis. Thorax transversus, lateribus rotundatis, postice sinuatis, angulis anticis submucronatis; apice valde excavatus; supra punctatus, utrinque obsolete impressus. Scutellum læve. Elytra convexa, distincte punctata, punctis in striis confuse dispositis, metallico-viridia, maculis subrotundatis 18, seriebus transversis quatuor positus, instructa. Corpus subtus rufo-piceum; pedibus cupreo-æneo-micantibus.

Columbia.

Genus CRYPTOSTETHA.

(Details, Pl. XXVII. fig. 9.)

*Antennæ* (fig. 9 a) subfiliformes, ad apicem leniter incrassatæ, subcompressæ.

*Labrum* transversum.

*Mandibulæ* magnæ, apice dentatæ.

*Palpi maxillares* (fig. 9 b) articulo primo parvo, duobus sequentibus clavatis, tertio incrassato, ultimo subcylindrico, paullo compresso, truncato; *labiales* articulo ultimo conico.

*Labium mento* transverso, *ligulâ* corneâ, obtusâ.

*Mesosternum* (fig. 9) breve, transversum, obtusum, prominens, sed vix productum.

*Thorax* transversus, apice valde emarginatus.

*Scutellum* triangulare.

*Elytra* oblongo-ovata, convexa.

*Pedes* simplices.

*Corpus* oblongum. Type *Cryptostetha marmorata*.

*Cryptostetha marmorata*.

Oblonga, convexa, obscure cupreo- aut nigro-ænea; elytris fortiter punctatis, fulvis, nigro-marmoratis.

Long. 6 lin.

Caput tenuiter punctatum, vertice maculâ sub-cordatâ fulvâ; antennæ dimidio corporis breviores, articulis tribus basilibus subtus piceis. Thorax transversus, apice valde emarginatus, lateribus postice subrectis, antice rotundatis, angulis anticis dente obtuso, fulvo, armatis; supra convexus, disco fere impunctatus, lateribus excavatis, fortiter sed sparse punctatis. Scutellum læve. Elytra oblongo-ovata, convexa, thorace latiora, fortiter punctata, punctis valde impressis, irregulariter confluentibus, intersticiis, præsertim ad latera et ad apicem convexis; lutea, nigro-marmorata.

Brazil.

Genus *ELYTROSPHÆRA*, Blanch.

*Elytrosphæra vittata*. (Pl. XXVII. fig. 5.)

Ovata, convexa, metallico-purpurea, nitida; elytris sulcato-striatis, flavis, utrisque suturâ vittisque duabus basi apiceque connexis, purpureis.

Long.  $4\frac{1}{2}$ — $5\frac{1}{2}$  lin.

Antennæ dimidii corporis longitudine, articulis quinque basilibus nitidis, glabris; cæteris opacis, nigris, pilis brevibus adpressis, hirsutis. Thorax transversus, apice concavo-excavatus, lateribus rotundatis; supra fortiter punctatus, punctis irregulariter confluentibus. Scutellum triangulare, apice obtusum. Elytra ovata, valde convexa, sulcato-striata, sulcis fortiter punctatis, intersticiis convexis, lævibus; flava, utraque suturâ vittisque duabus, basi et apice confluentibus, et rarius striâ secundâ a suturâ purpureis. Corpus subtus nitidum, abdominis segmentis duobus, utrinque flavo-punctatis.

Brazil.

Genus *PROSEICELA*, Erichs.Sp. 1. *Proseicela spectabilis*.

Oblongo-ovata, nigro-ænea, nitida, thoracis margine (basi exceptâ) elytrisque flavis, his suturâ vittisque tribus, duabus antice, tertiâque obliquâ pone medium, nigro-æneis.

Long.  $5\frac{1}{2}$  lin.

Oblongo-ovata, convexa, nitida. Caput tenuiter punctatum, fronte obsolete bis impressum; antennæ dimidio corporis vix longiores, obscure nigro-æneæ, articulis sex primis nitidis. Thorax longitudine duplo latior, lateribus basi subrectis, antice rotundato-angustatis, apice valde emarginatis; supra convexus, sat fortiter sed sparse punctatus, nigro-æneus, lateribus apiceque late flavo-marginatus, margine apicali postice in maculam trilobatam productâ. Scutellum læve, obscure nigro-æneum. Elytra ovata, convexa, sat fortiter punctato-striata, punctis in striis confuse dispositis; flava, utraque suturâ, vittis duabus ante medium, unâ subsuturali, paullo—alterâ juxta marginem, extrorsum medio emarginatâ, vix ultra—medium abbreviatis, fasciâque obliquâ brevi, paullo ante apicem positâ, nigro-æneis. Corpus subtus obscure nigro-æneum, nitidum.

Ecuador.

Sp. 2. *Proseicela Chevrolatii*.

Oblongo-ovata, convexa, cupreo-ænea, nitida; elytris obscure fulvis, cupreo-æneo-signaturis.

Long. 6 lin.

Caput punctatum, inter oculos tenuiter canaliculatum. Thorax transversus, lateribus rotundatis, postice subsinuatis; nitidus, tenuiter sed remote punctatus, utrinque foveis duabus impressus. Scutellum læve. Elytra thorace latiora, illo quadruplo longiora, convexa, punctato-striata, punctis in striis irregulariter dispositis; obscure fulva, utraque suturâ, maculâ communi basali, maculis brevibus sublineariformibus quatuor, disco interiori positis, vittulisque tribus obliquis, subflexuosis, disco exteriori longitudinaliter positis, cupreo-æneis. Corpus subtus nigro-æneum.

Guatemala.

Genus *LEPTINOTARSA*, Blanch.Sp. 1. *Leptinotarsa vittata*.

Ovata, convexa, nitida, æneo-viridis; palpis, antennarum articulis quinque basalibus, tibiæ apice tarsisque, pallide fulvis, elytris flavis, margine suturali piceâ, utrisque vittis quatuor nigro-æneis.

Long.  $5\frac{1}{2}$  lin.

Caput nitidum, punctatum. Antennæ nigræ, articulis quinque basalibus, labri margine, palpisque fulvis. Thorax transversus, lateribus rotundatis; tenuiter marginatus, nitidus, utrinque foveâ magnâ rotundatâ impressus, disco tenuiter, subremote-, lateribus densius subvariolo-punctatus. Scutellum læve, trigonum. Elytra convexa, thorace paullo latiora, irregulariter punctato-striata; flava, suturâ pallide piceâ, utraque vittis quatuor nigro-æneis instructa, primâ paullo infra medium abbreviatâ, cæteris longioribus, apice sæpe confluentibus. Pedes viridi-ænei, tiliarum apice tarsisque fulvis.

Mexico.

Sp. 2. *Leptinotarsa signatipennis*. (Pl. XXVII. fig. 2.)

Oblongo-ovata, convexa, viridi-ænea, nitida; palpis, antennarum basi, tiliarum apice tarsisque fulvis, elytris flavis, nigro-signatis.

Long.  $4\frac{1}{2}$ —6 lin.

Caput nitidum, viridi-æneum, labri margine palpisque fulvis; antennæ dimidii corporis longitudine, articulis basalibus tribus totis, duobusque sequentibus apice, fulvis, cæteris nigris, opacis. Thorax transversus, antice valde excavatus, lateribus postice fere rectis, antice rotundatis, angulis anticis acutis; supra convexus, punctatus, lateribus subvariolus. Scutellum triangulare, subtilissime punctatum. Elytra convexa, irregulariter punctato-striata; flava, suturâ et lineis duabus ante medium, strigâque flexuosâ postice, interdum distinctâ, pleurumque cum præcedentibus connexâ, nigris. Corpus subtus nitidum, punctatum, tibiis apice tarsisque fulvis.

Mexico.

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#### EXPLANATION OF PLATE XXVII.

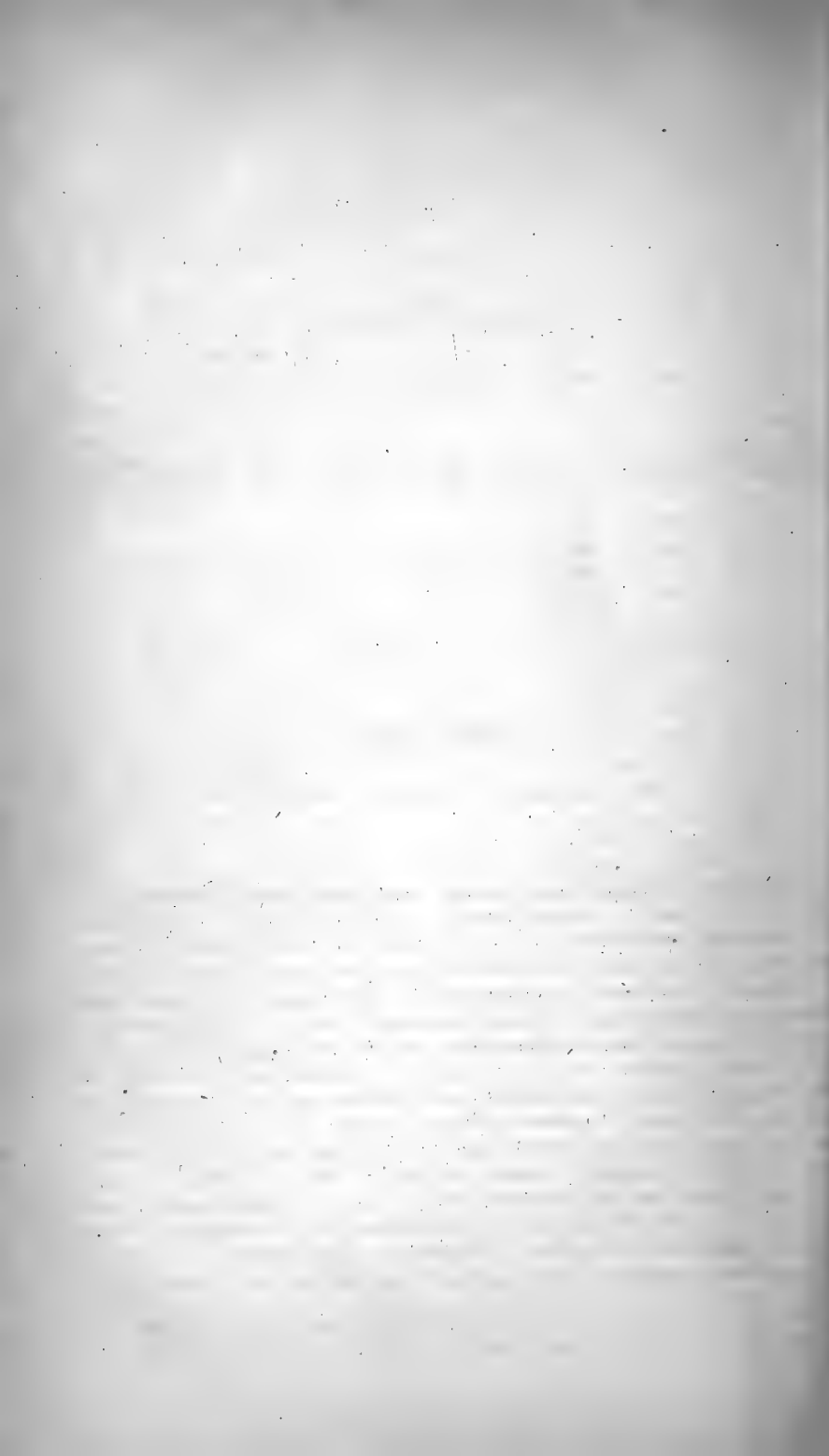
- Fig. 1. *Doryphora trivittata*.  
 2. *Leptinotarsa signatipennis*.  
 3. *Doryphora Batesei*.  
 4. *Doryphora mirabilis*.  
 5. *Elytrosphæra vittata*.  
 6. *Doryphora Sheppardi*.  
 7. *Doryphora catenulata*, var. A.  
 8. *Doryphora subglobosa*.  
 9. *Cryptostetha marmorata*, under surface, showing the mesosternum.  
 9a. Antennæ of ditto.  
 9b. Maxillary palpi of ditto.

## DESCRIPTION OF PLATE XXVIII.

Illustrating Mr. S. S. SAUNDERS'S *Memoir on the Habits of the Dipterous Genus Conops*.—Vol. IV. p. 285—291.

- Fig. 1.—*Pompilus audax*, Smith, of the natural size seen from above, the fourth and following segments of the abdomen removed, showing the extremity of the abdomen of the inclosed parasitic imago of the *Conops* (*a*).
- Fig. 2.—The three basal segments of the abdomen of the same *Pompilus* detached and seen sideways.
- Fig. 3.—The cavity of the abdomen of the same seen from behind, showing the parasite lying, rather obliquely on its back, within the abdomen of the victim.
- Fig. 4.—Another specimen of the *Pompilus* seen from beneath; the fourth and following ventral segments of the abdomen removed, showing the two rugose lobes at the extremity of the body of the larva of the *Conops*.
- Fig. 5.—The second, third and fourth segments of the abdomen of another specimen of the *Pompilus* separated, showing the two lobes at the extremity of the body of the puparium of the *Conops in situ* (*a*), and the head and the legs of the *Conops* perfect (*b*), already disengaged within the base of the abdomen of the *Pompilus*.
- Fig. 6.—The larva of the *Conops* magnified.
- Fig. 7, *a, b, c*.—The anterior segments of the larva in different positions.
- Fig. 8.—The puparium of the *Conops* magnified and seen sideways, and lying on its side within the abdomen of the *Pompilus*.
- Fig. 9.—The anterior part of the puparium.
- Fig. 10.—The anal lobes of the puparium.
- Fig. 11.—The puparium seen from above, with the head piece (*11 a*) detached, and with the delicate white envelopes of the real pupa of the *Conops* seen protruding from the aperture, the *Conops* itself having escaped.
- Fig. 12.—The *Conops* dead, taken from the interior of the abdomen of the *Pompilus*, with its wings unfolded.
- Fig. 13.—The perfect *Conops*.
- Fig. 14.—*Odynerus* (?) (p. 291), with the third and following segments of the abdomen detached.
- Fig. 15.—Two detached segments of the abdomen of the same (*a, b*), showing a portion of the puparium of the parasitic *Conops* (*c* and *d*), which extends into the basal segments of the abdomen of the *Odynerus*, as well as the two rugose anal lobes of the puparium of the *Conops* at (*e*).
- Fig. 16.—The immature *Conops* hatched from the *Odynerus*.

J. O. WESTWOOD.





# PROCEEDINGS

OF THE

ENTOMOLOGICAL SOCIETY OF LONDON,

1856.

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February 4, 1856.

W. W. SAUNDERS, Esq., President, in the chair.

## *Donations.*

The following donations were announced, and thanks ordered to be presented to the respective donors:— 'Exotic Butterflies,' Part 17; by W. W. Saunders, Esq. 'Revue et Magasin de Zoologie,' 1855, Nos. 10 and 11; by the Editor, M. Guérin-Méneville. 'Proceedings of the Royal Society,' Vol. vii. No. 16; by the Society. 'Entomologische Zeitung' for December, 1855; 'Entomologische Zeitung, Sechszehnter Jahrgang' (1855); 'Linnæa Entomologica,' Vol. x.; by the Entomological Society of Stettin. 'List of the Specimens of Lepidopterous Insects in the Collection of the British Museum. Part vi.—Lepidoptera Heterocera'; by the Author, F. Walker, Esq., F.L.S. 'The Journal of the Society of Arts' for January; by the Editor. 'The Literary Gazette' for January; by the Editor. 'The Athenæum' for January; by the Editor. 'The Zoologist' for February; by the Editor. 'Memorias de la Real Academia de Ciencias de Madrid,' Tomo ii. 1a Serie; 'Ciencias Exactas,' Tomo i. Parte 1a.; The same, Tomo i. 3 Serie; 'Ciencias Naturales,' Tomo i. Parte 3; 'Resumen de las Actas de la Academia Real de Ciencias de Madrid,' 1852 à 1852; The same, 1852 à 1853; by the Royal Academy of Sciences of Madrid. 'Swammerdam's Historia Insectorum Generalis,' 4to; by John Curtis, Esq.

The President returned thanks for his election, and nominated as Vice-Presidents for the year, Messrs. J. O. Westwood, G. R. Waterhouse, and Frederick Smith.

*Election of Members.*

A. H. Haliday, Esq., 23, Harcourt Street, Dublin, was balloted for and elected a Member of the Society.

*Exhibitions.*

Mr. Samuel Stevens exhibited a splendid new Lamellicorn beetle, of the genus *Odontolabris*, from Borneo.

Mr. Moore exhibited a number of cocoons of *Megachile lanata*, found in an old buffalo's horn from Northern India; one of these contained an immature parasite, probably a *Hedycrum*.

Mr. Baly exhibited a specimen of the rare *Cryptonychus porrectus*, *Gyll.*, received from Old Calabar by Mr. Murray, being the only specimen known in Britain; this species is extremely interesting, from the fact of being an American form, though found in Africa.

Read the following note by Mr. Hewitson, dated the 28th of January:—

*Sound produced by the Peacock Butterfly.*

“One morning about a fortnight ago, whilst dressing, I noticed something upon the floor, which I took to be a dead leaf driven in by the wind, and was surprised when I picked it up and placed it on the table, to find that it was a peacock butterfly (*Vanessa Io*). They had been cleaning out my room and had driven it from its winter quarters; I had handled it rather roughly, which it resented, by spreading out its wings horizontally to their fullest extent and rubbing them rapidly together; it produced a distinct sound like the friction of sand-paper: this it continued to repeat for some time and seemed greatly exasperated. It might be partly in my own imagination, but its palpi, the position of its legs, every motion seemed to express passion. I brought it down stairs and placed it on a table in the drawing-room, where Mr. Westwood, who was with me at the time, heard the noise faintly, but we tried in vain to excite it again to anger.

“I intended to examine the base of the wings and try to ascertain the means by which it produced the noise, which has never yet been done with the living insect, but it stole away and hid itself so effectually as to elude our search.

“M. Lacordaire mentions a similar sound produced by butterflies of the genus *Ageronia*, whilst on the wing, which he compares ‘a celui d’un parchemin très sec qu’on froisserait entre les mains.’

“The clicking noise mentioned by Mr. Darwin was produced by a butterfly of the same genus.

Mr. Douglas observed that the Rev. Joseph Greene had noticed a very similar circumstance in hibernating specimens of the same species, *Vanessa Io*, of which he communicated a note to this Society, and which is published in the ‘Proceedings’ for 1853, page 98.

Mr. Baly thought the sound was produced by respiratory action, which, doubtless, is suspended during hibernation, and suddenly called into action on the insect being disturbed; he considered it might be analogous to that produced by the first inspirations of air by a newly born infant.

Mr. Newman read the two following notes :—

*The Lost Spider.*

“‘The Rev. Revett Sheppard has often noticed in the fen ditches of Norfolk a very large spider, which actually forms a raft for the purpose of obtaining its prey with more facility. Keeping its station upon a ball of weeds about three inches in diameter, probably held together by slight silken cords, it is wafted along the surface of the water upon this floating island, which it quits the moment it sees a drowning insect; not, as you may suppose, for the sake of applying to it the process of the Humane Society, but of hastening its exit by a more speedy engine of destruction. The booty thus seized, it devours at leisure upon its raft, under which it retires when alarmed by any danger.’—*Introduction to Entomology*, i. 428, Edition of 1828. There is good ground for giving implicit credence to the foregoing statement; Mr. Sheppard was an acute entomologist, a careful observer, and a gentleman of unquestionable veracity. It is therefore remarkable that this large spider should, even at the present hour, remain unknown to arachnologists. I shall be greatly obliged to any Norfolk entomologist who will seek it, and, if successful, send me specimens, together with any additional notes on its interesting economy.”

*The Silk Spider of St. Helena.*

“‘The silk spider of St. Helena is very handsomely marked and banded: it spreads its web in the warm valleys, and the fibres of its cocoon are so strung as readily to admit of being spun: indeed, they might be used as a substitute for silk.’—*Foster’s Voyage*, i. 373. There is scarcely a statement in the volumes where this is extracted but has been verified by subsequent writers. Can any entomologist give further particulars of this silk spider?”

Mr. Newman read a paper entitled ‘Characters of apparently undescribed Australian insects, collected at Moreton Bay by J. Gibbon, Esq., including the following species of various orders,—*Dorcostoma Jansoni*, *Alaus Gibboni*, *Stenoderus quietus*, *Euplœa Lycophron*, *Pangonia Walkeri* and *Dasyopogon Grantii*.’

Mr. Stainton read a paper entitled ‘How may the onward progress of the Study of Entomology be best furthered?’

Part 7, Vol. iii., n. s., of the Society’s ‘Transactions,’ recently published, was on the table.

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March 3, 1856.

W. WILSON SAUNDERS, Esq., President, in the chair.

*Donations.*

The following donations were announced, and thanks ordered to be given to the donors:—‘*Journal of the Royal Agricultural Society of England*,’ Vol. xvi. Part 2;

by the Society. 'Proceedings of the Zoological Society of London,' Parts 18 to 22, being for the years 1850 to 1853 and part of 1854; 'Reports of the Council and Auditors of the Zoological Society of London,' for the years 1852 to 1855; by the Society. 'Proceedings of the Royal Society,' Nos. 17 and 18; by the Society. 'Revue et Magasin de Zoologie,' 1855, No. 12, and 1856, No. 1; by the Editor, M. Guérin-Méneville. 'The Athenæum' for February; by the Editor. 'The Literary Gazette' for February; by the Editor. 'Journal of the Society of Arts' for February; by the Society. 'Insecta Saundersiana,' Diptera, Part V.; presented by W. W. Saunders, Esq. 'The Zoologist' for March; by the Editor. 'Entomologische Zeitung,' Nos. 1 and 2, January and February, 1856; by the Entomological Society of Stettin. 'A Manual of British Butterflies and Moths,' by H. T. Stainton, No. 1; by the Author.

#### *Exhibitions.*

Mr. Stevens exhibited a specimen of *Epischnia diversalis*, a reputed British species, taken in October, 1855, by Mr. Mitten, "flying in a thin wood near Hurstpierpoint, Sussex."

Mr. Stevens also exhibited a few very remarkable insects sent from Borneo by Mr. Wallace. Mr. White took occasion to make some remarks upon these insects, and urged the members to pay more attention to exotic Entomology.

The President exhibited a new Longicorn beetle from N. India, in which were combined several anomalous characters, rendering its relationship very doubtful.

The President also exhibited an amphipod crustacean, from a well at Wandsworth. Mr. Westwood identified it as *Gammarus subterraneus*, *Leach*, belonging to the blind genus *Niphargus*, *Schiödte*. Mr. Lubbock remarked that he had seen a similar example from a well near Bromley, which unfortunately was not preserved. He took this opportunity to mention that he would be glad to receive fresh-water Entomostraca from any part of the world.

Mr. Stainton exhibited a Lepidopterous larva, probably of an *Ephestia*, said to have been vomited by a gentleman.

Mr. Hudson exhibited a *Dorcus parallelipedus* and a living larva of the same species, dug out of an old ash tree at Coombe Hurst, Croydon.

The Rev. W. H. Hawker sent for exhibition a singularly pale variety of *Arctia Caja*, bred at Horndean.

Mr. Douglas exhibited living larvæ, probably of *Oenerostoma piniariella*, feeding within the foliage of the Scotch fir.

Mr. Walker exhibited a *Necrophorus Vespillo* and a cockchaffer, dug up last month.

Mr. Wollaston exhibited some of the Coleoptera captured by him last summer, at Madeira.

#### *Acari and "Fogging" of Daguerreotypes.*

Mr. Tapping exhibited a drawing of an *Acarus*, of which many dead examples were found by Mr. Fedarb, of Dover, beneath the glass of a Daguerreotype ten years old; and as this picture was affected by what is technically termed "fogging," it had been thought there might be some connection between *Acari* and this obscuration of Daguerreotype pictures, a subject which had recently excited much attention.

Mr. White said this *Acarus* was very like, and probably identical with, *Cheyletus cruditus*, the common paste mite; that its presence was due to paste having been

used in mounting the picture; and that the destruction of the Daguerreotype was in no way referrible to the Acari.

It appeared, however, from the reading of a long correspondence between Mr. Fedarb and Mr. Tapping, that the picture was mounted in a tin tray, and that the plate and glass were so tightly pressed together that the edge of a pen-knife could not be inserted between them, that the whole was in a morocco case with silk lining, and there was no paste, glue or cement used in the mounting.

*Destruction of growing Corn by Dipterous Larvæ.*

Mr. Westwood said the Society had received from Mr. Botting, of Poynings, Hurstpierpoint, Sussex, some larvæ, accompanied by a letter stating that they existed in the fields in that neighbourhood in vast numbers, destroying the growing corn to a great extent, and enquiring how they might be exterminated. The larvæ appeared to be those of a *Tipula* in a young state, and they would consequently continue to feed for some months, so that there was little chance of any side shoots being left: but he was unwilling to advise that the crop should be merely ploughed up, for as the larvæ were so numerous they would not be much thinned by birds, and a second sowing would have but a poor chance of succeeding. He had recently been consulted respecting some corn crops destroyed by the larvæ of a Muscoid fly, probably *Oscinis vastator*, and had advised his correspondent to have the ground turned up and burnt, and he would recommend a similar course in the present instance.

Read the following note by Mr. Newman:—

*On the Parturition of Dorthesia Characias.*

“‘The smallest contribution thankfully received.’ So says every true lover of insect economy: it matters not a straw to him that some one says the subject has been exhausted years and years ago; he still keeps on prying into Nature’s secrets, poking his nose into holes and corners, noting with his own eyes and jotting down in his own manner those little domestic scenes which are sure to reveal themselves to every one who is master of that most simple, most commonplace, but most valuable accomplishment ‘how to observe.’ Our Secretary gave me, one day last June, a lady specimen of *Dorthesia Characias*: she was evidently in that interesting state in which it is said ‘all ladies wish to be who love their lords.’ She was confined in a pill-box, without provender, and so was eventually starved to death. *Dorthesia Characias*—the lady, I know nothing of the gentleman of that name which has been obligingly supplied by Mr. Walker—looks for all the world like a little lump of the very purest and snowiest wedding-cake sugar, cast in a mould that Bernini himself might have designed: the moulds of *Dorthesiæ* are always elegant, but always deliciously incomprehensible; always cut in open defiance of those little check-strings and chains which entomologists have manufactured as a means of restraining the vagaries of Nature or of fettering her to their systems: not only is there no prothorax or mesothorax or metathorax, but there is no thorax at all,—nothing but the little lump of immaculate frosted sugar aforesaid, out of which grow two black antennæ and six black legs; and yet all is perfect symmetry, the neatest workmanship that can be imagined: one would think that Nature, in her simplicity, had never heard of Leon Dufour or Audouin, De Haan or Strauss-Durckheim, Orismology or Entomology, Comparative or Transcendental Anatomy. What the frosted-sugar-like surface really is I cannot presume to say, but

it is thus arranged: first, there is a series of short lamellations or foliations, which commence close behind the head and reach to the middle of the back; and these, considered as a whole, constitute a very respectable little larva, not much unlike the larva of a glowworm when two or three days old: close at the end of this series of scales is the anal aperture; and, as the series itself is only half as long as the insect, it follows that this aperture is exactly in the middle of the back: on each side of the first series of plates are four other plates, not touching each other, but placed at regular distances; these are small, short and rounded, in fact almost semicircular: beyond these again, on each side, are ten longer plates, symmetrically arranged; these are soldered together with exquisite exactness, their sides curved, their ends rounded, and each of their connecting sutures having a slightly altered angle, so that, although the first suture is placed transversely to the mesial line of the body, the last is longitudinal, and therefore parallel to the mesial line. These various scales or plates constitute a sculptured oval shield of the most elegant design and finish; and, out of respect to entomological usage, I would at once call it the thorax, but then the rest of the body must be the abdomen, and thus the anal aperture, or more properly the external opening of the oviduct, would be placed in the thorax, a situation indeed assigned to it by the illustrious Newport in the case of *Stylops*, but otherwise unknown throughout the insect world. Well! from beneath this shield, which we may compare to the body of a lady's dress, emerges an ample skirt, having fourteen plates, lamellations or folds, long, longitudinal and parallel: this skirt is about as long as the body, and is entirely posterior to the aforesaid opening of the oviduct. The under side of the insect is not folded or lamellated, but is smooth, tumid, and gradually sloped off towards the end, just like a ship's bottom: it is perfectly undivided, exhibiting not the slightest indication of abdominal segmentation.

“Now what I am going to narrate may or may not be the economy of the genus, or even of the species; it was the economy of this individual female: the lady may have been crossed in love, like oysters, whose liability to the same misfortune was discovered by Shakspeare; again, she may have remained permanently and pertinaciously a spinster, like Diana, or like the entomologically-familiar *Aphis*-mother: in fact one may speculate *ad infinitum* on causes,—I have only to deal with results. Certain it is that parturition took place through the aperture in the middle of the back: out of this the young ones sallied one after another, and ran about over their mother's body, just as I have seen rabbits issue from their burrow and course one another over the frost-hardened surface of the snow: they looked exactly like little *Acari*, and, contrasted with their very quiet, sedate, and almost lethargic mother, were eminently ‘fast young men’ scampering over the body of their parent, clustering about her head and performing all manner of gymnastic exercises on her antennæ: indeed, greatly to the credit of such restless beings, it must be allowed that, by all kinds of fondling, they seemed determined to exhibit the most ardent filial affection; but this highly demonstrative exhibition was not apparently returned by any maternal *storgé*, for nothing could have been more stolid or apathetic than the demeanour of the mother under all this fondling. However, the scene lasted but a short time: mother and children were starved to death, and the latter were placed under the microscope. It only remains to say a few words descriptive of the young, and first as to size and proportions. Measured longitudinally and transversely I found the body was .024 inch, so that it was nearly a circular disk, presenting, however, a number of elevations, depressions and irregularities, which possibly resulted from drying: the colour was

pitchy red, but attached to the dermal envelope, in various places, and without any semblance of regularity, were a number of minute flattened bodies, perfectly white, and having the appearance of little flakes of snow: these are so numerous as to give the little creatures quite a dusty appearance: the legs are six; their attachment approximate; their length  $\cdot 035$  of an inch, or equal to a diameter and a half of the body: they consist of the four ordinary parts; a well-developed coxa, a femur, tibia and tarsus, so equal in length that there was no discrepancy measurable by the micrometer; the tarsus is exarticulate or composed of a single piece, and armed with a single, terminal, slightly curved, and apparently immovable claw. This mononyeous character of the foot does not appear the very best for prehension, yet the prehensile power of the legs is beyond all question, for the little ones crawled about their mother's body with the most perfect *nonchalance*, never tumbling, even by chance, from the dizzy elevation of her antennæ. Each of them had a head, which, however, was a fixture, having no power of motion, but being closely ankylosed to the trunk, and its presence only to be detected when viewed from above, by a line of demarcation; below, on the contrary, it bore a large, straight, and really formidable beak, which Savigny would doubtless have resolved into the constituent parts of an ordinary insect-mouth, but which I could make nothing more of than a beak: its very connexion with the head seemed problematical, and yet I take *that* for granted; but as a matter of *appearance*, mind I am very particular not to say a matter of *fact*, this suctorial instrument seemed to come out of the stomach; indeed, supposing its office that of a pump, for pumping out the sap, one might aptly call it a 'stomach-pump.' The head, moreover, bore—and these were very evident personal property, whatever the pump might be—two very conspicuous seven-jointed antennæ, which gradually, almost imperceptibly, decreased in size from the base to the apex: the fourth, fifth and sixth joints were each marked by a scarcely perceptible ring or indentation at half their length, thus indicating the subcutical existence of three more joints, making ten in all, the number which the mother actually possessed."

Mr. Westwood remarked that the female of the *Dorthesia*, so accurately described by Mr. Newman, was figured by Burmeister in his 'Handbuch.' With regard to the snow-white covering of the insect, he had no doubt it was a modification of the waxy secretion common to many of the Homoptera.

Mr. Waterhouse observed that the fine powder on the Coleopterous genus *Lixus* had also been regarded as a waxy secretion.

Mr. Curtis communicated the following extracts from a letter addressed to him by Dr. Maclean, of Colchester:—

*Economy of Gonepteryx Rhamni.*

"*Gonepteryx Rhamni* assumes its perfect state in the end of July or beginning of August. I have bred numbers of them. In a fortnight or month, according to the state of the weather, they become very fat, containing within them also a large bag of honey, and in a short time afterwards but very few are to be seen. For several seasons in succession I imprisoned some of these fat specimens, and placed them in a northern aspect in cases of wood and earthenware, in which I placed rough pieces of old decayed bark of trees, &c. Several specimens lived through the winter: they appeared to be dead during cold weather, but after being in a warm room for an hour or much less I believe, they began to crawl about and expand the wings. If fine, that is very

mild, weather sets in for a few days during the winter months these insects become quite active, endeavouring to escape from their prison. Who has not occasionally seen a specimen either in November, December or January? The female places her eggs on the buds of *Rhamnus Frangula*, just before they begin to expand, in the spring of the year. The larva is full grown by the beginning of July, and when not feeding rests on the midrib of the leaf, which is first covered with delicate shining silk. Old worn specimens of the perfect insect may be seen occasionally as late as the end of June."

*Economy of Bryophila perla.*

"I discovered a larva in tolerable abundance last spring, feeding on minute lichens, on our old walls, which turned out to be that of a beautiful little moth, *Bryophila perla*. The economy is singular. It lives in a tent during the day, and comes out to feed at night and on wet and dull afternoons. It has a room at the back of its tent also, in which it ultimately turns to a chrysalis."

*Longevity of a small Lepidopterous Larva.*

"About three or four years ago I found some very minute larvæ in silken cocoons, amongst some bran and old paper, in which I kept meal-worms. One of these larvæ lived in a glass phial for three years, as nearly as I can guess, having attached its cocoon to the bottom of the phial, so that I could see the creature from without. The cocoon was composed of silk, bran and paper, and fresh bran was occasionally put into the phial."

The name of the moth produced from this larva was not mentioned.

*Memoirs read.*

Mr. Pascoe read some descriptions of new genera and species of Longicorn beetles from Borneo, Malacca and China.

Mr. White read a description of a new Longicorn beetle, brought from Ceram by Madame Pfeiffer.

Mr. Westwood read a description of *Thaumantis Aliris*, a splendid new species of *Morphidæ*, from Borneo.

Mr. Baly read descriptions of two species of *Pseudomela*, a new genus of *Chryso-melidæ*.

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April 7, 1856.

W. WILSON SAUNDERS, Esq., President, in the chair.

*Donations.*

The following donations were announced, and thanks ordered to be given to the donors:—'Entomologische Zeitung,' Nos. 3 and 4, for March and April, 1856; by the Entomological Society of Stettin. 'A Manual of British Butterflies and Moths,'



by H. T. Stainton, No. 2; by the Author. 'The Entomologist's Weekly Intelligencer,' No. 1; by the Editor. 'Journal of the Proceedings of the Linnean Society,' Vol. i. No. 1; by the Society. 'Proceedings of the Royal Society,' Vol. viii. No. 19; by the Society. 'The Natural History Review,' No. IX.; by the Dublin University Zoological Association. 'The World of Insects: a Guide to its Wonders,' by J. W. Douglas; by the Author. 'The Zoologist' for April; by the Editor. 'The Journal of the Society of Arts' for March; by the Editor. 'The Literary Gazette' for March; by the Editor. 'The Athenæum' for March; by the Editor. 'Papers and Proceedings of the Royal Society of Van Diemen's Land;' 'Tasmanian Contributions to the Universal Exhibition of Industry at Paris;' by the Royal Society of Van Diemen's Land. Fifty copies of 'An Address delivered at the Anniversary Meeting of the Entomological Society of London, held on the 28th of January, 1856,' by Edward Newman, Mem. L. C. Acad. (nom. Latreille), F.L.S., Z.S., &c.; by the Author. A small box of remarkable Coleoptera, Hymenoptera, &c., from Ceylon, received from Mr. Thwaites, M.E.S.; by W. Spence, Esq.

#### *Prize Essay for 1856.*

The President announced that the Council had determined to offer a prize of £5, for an Essay on the Natural History of *Gelechia terrella*, and whether this common little moth was injurious to Agriculture or not. The Essay to be illustrated by figures of the insect in all its stages, and to be delivered on or before the 31st of December next.

#### *Exhibitions.*

Mr. A. F. Sheppard exhibited a specimen of *Ennomos Alniaria*, taken sitting on a post, near Margate, in September, 1855. This is the third specimen of this species known to have been captured in Britain.

#### *The Nuisance of Acari.*

Mr. Westwood read a note, addressed by a lady residing at Lyme Regis to Dr. John Lee, of Hartwell House, Aylesbury, and communicated by that gentleman, giving an account of the appearance in the writer's house of a vast quantity of Acari. They proceeded, in the first instance, from some Egyptian palm-leaves which were shut up in a dark closet, whence they spread through three rooms, and were seen in thousands in crevices of wood, on chairs, tables, books, paintings and cabinets of shells, so that they became a complete nuisance. Cold had no effect on them; and tobacco, turpentine, colocynth and Sir W. Burnett's disinfecting fluid had been tried as remedies, with but little effect. Sulphur and nitre had been more efficacious; but in consequence of their use the polish of the furniture and shells had been destroyed, and the colours of the paintings had been damaged.

Mr. Westwood thought the palm-leaves had probably been affected by Ptini or Anobia, whose excrement and the *débris* made by them had afforded a nidus for the Acari, in which they were for some time unmolested. He suggested as a cure the employment of corrosive sublimate in solution; but several members said that, however fatal this preparation of mercury was to insect life, it was also destructive to any metals with which it came in contact, as proved by the rotten state of the pins in insects and the wires in bird-skins which had been dressed with it, and a white film was deposited on the surface of anything to which it was applied.

The President said a case had come under his notice in which cockroaches had been destroyed in a drawing-room, under the floor of which they had taken up their quarters, by the use of chloride of lime; and he thought it possible this preparation might be of service in the case now under consideration.

Read the following note by Mr. Newman:—

*On the Genus Synemon.*

“There is scarcely a genus of Lepidoptera more interesting than the Australian Synemon. With the general habit and abruptly clavate antennæ of a butterfly, it has other very important characters of a moth; and it will be fresh in the recollection of our Lepidopterists that our never-to-be-forgotten and most talented Secretary, Edward Doubleday,\* wrote quite an Essay to show that it was a moth and not a butterfly. Well! I have gleaned a few more grains of information about Synemon from Mr. Oxley, who constantly saw it and often took it at the diggings. It is strictly diurnal, flitting about in the hot sunshine, among the tufts of grass and low scrub, with all the restless activity of a skipper: when it settles it rests for a minute with deflexed wings, but with the fore wings spread out nearly at right angles with the body, so as to display the more gaily-coloured hind wings. At night and in cloudy weather it rests on blades of grass, with the wings erect, meeting vertically over the back. Thus, in the combination of characters, these antipodeans unconsciously annihilate the distinction between butterflies and moths, between Rhopalocera and Heterocera: the gradations from Hesperia to Synemon, from Synemon to Castnia, from Castnia to Sphinx, and so on to the normal Heterocera, are easy and natural, and seem to bridge over the gulf which formerly existed in our minds between butterflies and moths.”

Specimens of two species were exhibited in illustration.

*New Genera of Coleoptera.*

Mr. Westwood read descriptions of two beetles especially remarkable for the lateral dilation of the head, a character of great rarity in insects. They would constitute new genera, and he described them under the names of *Enotiophorus vestitus* and *Triplacodes Guineensis*, the former from Ceylon, the latter from Guinea.

Mr. Stevens communicated the following note from Mr. H. W. Bates, Corr. M.E.S.:—

*On the Sexual Distinctions in the South-American Coleopterous Genus Agra.*

“Lately I captured a pair, *in copulâ*, of a species of the genus *Agra*, and profited by the fortunate circumstance to examine if there were any external differences between the sexes. I found several characters very strongly marked, in fact so obvious that I think it scarcely possible they have escaped the notice of entomologists to the present time. The chief distinction is the pubescence of the under surface of the body in the male. Examining afterwards other species, with this guide, I have paired satisfactorily five or six. The amount of pubescence varies according to the species: whilst in one the central parts of the metasternum and all the abdominal segments

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\* See Appendix, by Edward Doubleday, to Lort's *Discov. Austral* i. 516.

are densely clothed with a thick woolly pile, in others the metasternum and basal segment of the abdomen only has a thick short erect pubescence. The other characters are less obvious, and chiefly comparative: one is the great thickness of the femora, especially the anterior, in the male; this character, however, is marked only in part of the species: another is the relative length of the apical abdominal segment, and the shape of the notch in its posterior edge. In the male this segment is shorter than in the female; the notch is deeper and more rounded; in the female it is always shallow and angular. The last character appears in those species in which each elytron is doubly sinuate at the apex: when this is the case the sinuation is stronger in the female, the central tooth being much more prominent than in the male. In one species I have noticed the male has only a single sinuation, whilst the female is doubly sinuate-truncate at the apex of each elytron."

*Society's 'Transactions.'*

Part 8, completing Vol. iii. n. s. of the 'Transactions,' was on the table.

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May 5, 1856.

W. W. SAUNDERS, Esq., President, in the chair.

*Donations.*

The following donations were announced, and thanks ordered to be given to the donors:—'Insecta Britannica,' Diptera, Vol. iii.: by Francis Walker, F.L.S.; presented by the publisher, Lovell Reeve, Esq. The 'Natural History Review,' No. 9; by the Dublin University Zoological Association. 'Revue et Magasin de Zoologie,' 1856, Nos. 2 and 3; by the Editor, Monsieur F. E. Guérin-Méneville. Hewitson's 'Exotic Butterflies,' Part 18; by W. W. Saunders, Esq., F.R.S., &c. The 'Literary Gazette' for April; by the Editor. The 'Athenæum' for April; by the Editor. The 'Journal of the Society of Arts' for April; by the Society of Arts. The 'Zoologist' for May; by the Editor. The 'Entomologist's Weekly Intelligencer,' Nos. 2, 3, 4 and 5; by the Editor, H. T. Stainton, Esq. 'A Manual of British Butterflies and Moths,' No. 3; by the Author, H. T. Stainton, Esq. Four specimens of *Acidalia degeneraria*, and four specimens of *Heliothis dipsacea*; by O. Pickard-Cambridge, Esq.

*Election of Members.*

Edward Armitage, Esq., 4, Grove End Road, St. John's Wood, was balloted for, and elected a Member of the Society.

The President stated that the Entomological Society of France had elected Mr. John Curtis one of its Honorary Members; he felt that this recognition of the valuable entomological labours of our late President would be as gratifying to the Society as to Mr. Curtis himself.

*Exhibitions.*

Mr. Janson exhibited three specimens of a Histerideous beetle, hitherto unnoticed as British, *Heterius quadratus*, *Kug., Eric.*, which he had captured in the society of ants at Hampstead, a single individual, on the 21st of April, 1848, in a nest of *Formica flava*, since which period he had assiduously searched for it every year, but unsuccessfully: on the 4th inst., however, he again met with two examples beneath a stone in the company of *Formica fusca*: he remarked that this insect, which was of great rarity on the Continent, appeared to be truly Myrmecophilous, and he called the attention of the meeting to the great similarity of form which exists between it and the anomalous genus *Thorictus*, likewise ants'-nest insects, and of which four species were in the box; this resemblance he observed appeared, however, to be rather one of analogy than of real affinity. Mr. Janson added that his mode of obtaining these ants'-nest insects was by placing large stones or bricks in the vicinity of the nests, and carefully examining their under surfaces from time to time.

Mr. S. Stevens exhibited a fine male specimen of *Petasia nubeculosa* recently taken by Mr. Foxcroft in Perthshire, and a remarkably fine specimen of *Aleucis pictaria*, which he had lately taken on Dartford Heath; also *Pentaplatarthrus Natalensis*, male and female, sent by Mr. R. W. Plant from Natal, and observed that these specimens were extremely interesting, from the fact that the sexes of the Paussidæ were not previously known; he also exhibited several pairs of a singular *Brenthus*, described by Mr. Westwood in the fifth volume of the 'Transactions' of the Society, p. 206, under the name of *Taphroderes distortus*, and figured on the 22nd Plate of that volume, the left mandible of the male being much larger than the right, and singularly distorted.

Captain Cox exhibited a very large specimen of *Acherontia Atropos* taken in the Hospital at Scutari; also some drawings of the larvæ of British Lepidoptera, beautifully executed by Mrs. Cox: he expressed his intention, on the series becoming more complete, of making arrangements for their publication.

Mr. Bond exhibited specimens of the case-bearing larva of *Coleophora Wockeella*, found on *Betonica officinalis*, in a wood near Canterbury: only five British specimens of this species have hitherto been detected, all found by Mr. Weir near Pembury.

Mr. Stainton exhibited, on behalf of Mr. John Scott, a specimen of *Elachista Tæniatella*, (*Zeller*), a new British species bred from a larva found last autumn in the leaves of *Brachypodium sylvaticum*; he also exhibited a most beautifully executed engraving of *Lithocolletis tenella*, engraved on steel by Mr. Edward Robinson.

Mr. Newman communicated the following:—

*Note on Hemerobius variegatus.*

I am indebted to Mr. Dorville for the opportunity of offering to the notice of the Society a singular instance of deviation from normal economy in a very familiar genus of insects: he found the pupa shell of *Abraxas Grossularia* filled with a beautifully white silken cocoon, which he very logically supposed that of a parasite which had destroyed the pupa; but lo! and behold! when the tenant, and indeed the artificer, of the delicate fabric burst its sere-clothes and emerged as an imago, it proved to be a specimen of *Hemerobius variegatus*, an insect in which parasitic propensities are utterly unknown. The inference is that the larva of the *Hemerobius* simply availed itself of

the cavernous recesses of the exuviae of the currant-moth as a cosy corner in which to spin its web and undergo its metamorphosis.

Mr. John Curtis communicated the following notes, by Dr. Maclean, of Colchester, dated 1st May, 1856:—

*Economy of Gonepteryx Rhamni.*

“On Friday last the bright sunshine tempted me to the woods in search of the eggs of *G. Rhamni*, and not without success, you will say, when I tell you I have above a score of eggs of this insect in my possession: it is my intention to acquire the most intimate acquaintance with the economy of this *Papilio*. I have no doubt respecting the following account: the eggs are laid in succession from the middle of April to the end of June, but the larger portion during the months of April and May; the larva may be found during the whole of the months of May, June and July: a fine specimen of the perfect insect appears at the end of July, but the greater number during the month of August, then (or many of them at least) live till the following spring, and deposit their eggs on the buds and terminal shoots of *Rhamnus frangula*, so that it is clear the perfect insect occasionally lives a twelve-month; the females have at the present time well developed eggs within them.”

*Memoirs read.*

Mr. Douglas read a paper, by Mr. Adam White, entitled “Descriptions of an apparently Nondescript Species of *Necrodes*, from Borneo, with brief descriptions of three other species from Northern China and India.”

Mr. Smith read a paper entitled “Observations on the Difficulties attending the discrimination of the Species of the Genus *Stylops*,” in which he stated that all parts of the body of the male *Stylops* are of so soft and delicate a nature, that in a few hours after death the entire appearance of the insect is changed, becoming a mere shrivelled mass, and in consequence nearly all the published figures of these insects, having been drawn from cabinet specimens, are mere “miserable caricatures:” he expressed his opinion that it may hereafter appear that we have but one species of *Stylops* in this country.

Mr. Westwood thought Mr. Smith’s strictures on the published figures of *Stylops* rather too severe; he might at least have made an exception in favour of his (Mr. Westwood’s) figures of *Stylops Spencei* in the third volume of the ‘Transactions,’ which were drawn from the living insect.

Mr. Douglas read from Guérin’s ‘Revue de Zoologie,’ for December last, the following part of a communication made to the Editor by Dr. Richard:—

*Epeira Senegalensis.*

“The spiders upon which I experimented were taken on a Baobab tree placed in the courts of Gorée, where there was a deal of noise: their number on the tree is such that they are seen from afar when the tree is stripped of its leaves; they appear to live by preference near inhabited places, either, as I have reason to believe, because they like noise, or, more probably, they are kept near to man by the abundance of the insects on which they prey, and which are attracted by the *débris* of human aliments:

moreover, it is an extraordinary fact that they persist in remaining upon this Baobab, notwithstanding they may be constantly disturbed by the blacks who collect its leaves (*aloo*) for couscous.\* This spider neither stings nor bites: it is only when pressed by hunger that it is disposed to take the flies that are given to it; it swallows them body and wings entire; one of those that I reared swallowed three of them consecutively in less than five minutes, (it had been starved several times): it required some time to teach them to take the living flies that I presented to them on the end of a cleft stick, and to acquire the dexterity of disengaging them without breaking: when at liberty they rush upon the flies caught in their nets, and if they are eatable they carry them to one part of their web where they unite together in enlacing them with their threads. I have made some experiments upon the limit of fasting among these creatures, in order to see if I might hope to transmit them alive to France. Contrary to my expectation, and to the habits of hunting animals, the spiders experimented upon were unable to seize a fly after the fourth day: one of them was put upon the balcony of the house I live in, but its weakness was so great that it could no longer use its feet; thus I left it, hanging by one of its hinder feet: I do not know if it found upon its thread a prey more appropriate to its feeble state than flies, but it recovered and spun its web at the place in which I had put it. I followed with interest the fabrication of this web; I saw that at first the silk was more viscid, dried less readily, was consequently more liable to be soiled, and was lighter coloured than the silk spun at a later period. I studied their movements in order to endeavour to discover in the secret of the web the means of winding off the thread: the large size of the silk, and a ray of the sun, permitted me to follow at a distance this interesting work, but the spider became lost to view when it passed behind the pillars of the balcony, and these interruptions overcame my patience. I learned, however, that it always rests on the same side of the web, and that the latter is composed of two parallel cables formed of several threads (eight or ten), not adhering to each other: these cables serve as a support to a light net-work, as in the web of our river spiders. I remarked that in its work the spider uses its hinder feet in the same manner that the thread-maker and spinner use their fingers; it draws them alternately over the thread which it makes, in order to give it regularity, whilst its fore feet serve to move its body upon the threads already dry. The cocoon was made in a very few days in the month of August: looking at it in the month of January I found two very little spiders, which had very large bodies, and very short and slender feet. I think that it would not be difficult to transport these spiders in such condition that it would be possible to wind off their silk; but even when this result could not be attained absolutely, or within such limits of cost as industrial application admits, it is probable that commerce could use profitably a substance so resistant as this silk, spun like waste silk, and to obtain which all the labour required at the places of its production consists in a simple gathering unattended with danger. Industry, maritime especially, requires a thread which has the qualities of silk, great tenacity within a small compass, less alterable by atmospheric

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\* The leaves of the Baobab are emollient, as in the greater part of the Malvaceæ, to which Order this kind of vegetables belongs: they are used in medicine under the name of *aloo*, and the blacks make use of them in the preparation of couscous, to which they add a certain *goût*, and especially the property of gliding more easily, by setting their mucilage at liberty.

agencies and humidity than vegetable cords, and of which the price would not exceed the requirements of its utility. The spider's silk can be used to supply this want, inasmuch as all hot countries would very soon furnish an important quantity of the rough produce for the requirements of this new industry. We should remember, in this expectation, the predilection of the spider for inhabited places, and its harmlessness to the trees where it establishes itself. Besides, its enemies, the musquitoes and flies, are also ours, and it is in order to free us from them that it loves to be in our neighbourhood, which is shunned by other animals in a state of nature. This consideration is not so trifling as might be thought: the spiders distributed among the ornamental trees that surround habitations would do much to abate this nuisance in hot and moist countries. M. Margain put a spider upon a young Baobab in his court-yard, and he could tell you the result of this experiment. The silk of the cocoon, by its durability and the brightness of its pale colour, might be employed in fabricating peculiar ornamental stuff, which would be difficult to imitate: the winding off would not be difficult, since the smallness of the meshes of the net-work that it forms is opposed to that in which the spider has been able to entangle its threads in passing to the centre. If the *Epeira* is reared in sight of the cocoon it will compensate for the drawbacks of a small yield, the space occupied, and the special difficulties of winding, by the beauty of the produce, the quickness of realisation (three or four days), and the absence of care and food during the continuance of the work. The silk of the spider of Gabon excels that of Senegal by the beauty of its deeper colour and by its elasticity, which are in harmony with the frequency and force of the rains of the country. I steeped a piece of the sample I collected in a concentrated solution of azotic acid, without the consistency or the colour being altered: I have not found this spider in society, but it is in the neighbourhood of man, in the garden of M. Reston, an American Missionary, at Bakélé, that I gathered the sample in question."

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June 2, 1856.

W. WILSON SAUNDERS, Esq., President, in the chair.

*Donations.*

The following donations were announced, and thanks ordered to be given to the donors:—‘An Introduction to Entomology, or Elements of the Natural History of Insects,’ by the Rev. William Kirby, M.A., F.R.S., &c., and William Spence, Esq., F.R.S., &c., 7th edition; presented by W. Spence, Esq., F.R.S., F.L.S., &c. ‘The Variation of Species with especial reference to the Insecta, followed by an Inquiry into the Nature of Genera,’ by T. Vernon Wollaston, M.A., F.L.S.; by the Author. ‘A Natural History of the Animal Kingdom, being a Systematic and Popular Description of the Habits, Structure and Classification of Animals,’ by W. S. Dallas, Esq., F.L.S., &c.; by the Author. ‘Third Report of the Commissioners for the Exhibition of 1851;’ by Her Majesty’s Commissioners. ‘Proceedings of the Royal Society,’ Vol. viii. No. 20; by the Society. ‘Revue et Magasin de Zoologie,’ 1856, No. 4;

by the Editor, M. Guérin-Ménéville. 'The Zoologist' for June; by the Editor. 'The Journal of the Society of Arts' for May; by the Society. 'The Literary Gazette' for May; by the Editor. 'Entomologiska Anteckningar under en Resa i Södra Soerige ar 1854,' af Ang. Emil Holmaren; by the Author. 'The Entomologist's Weekly Intelligencer,' Nos. 6, 7, 8 and 9; by the Editor, H. T. Stainton, Esq. 'A Manual of British Butterflies and Moths,' No. 4, by H. T. Stainton; by the Author. 'List of the Specimens of Lepidopterous Insects in the Collection of the British Museum,' Part VII. Lepidoptera Heterocera; by the Author, Francis Walker, Esq., F.L.S.

#### *Resignation of Officers.*

The President announced that in consequence of the resignation of Mr. Pascoe, as a member of the Council of the Society, and of Mr. Douglas, of the office of Secretary, the Council, in conformity with the By-laws, recommended Mr. Janson to fill both vacancies, and that the ordinary meeting in July next would be made special for the purposes of the election.

#### *Exhibitions.*

Mr. Bond exhibited a specimen of *Biston hirtarius*, having the wings and abdomen of the female, but the antennæ were both deeply pectinated, that on the right side as much so as in the male insect: this singular monstrosity was taken by Mr. Mitford in the Regent's Park, in April last.

Mr. S. Stevens exhibited recently hatched larvæ of *Petasia nubeculosa*, *Notodonta carmelita* and *N. dictæoides*, the first-named species from eggs sent from Perthshire by Mr. Foxcroft, the others from eggs laid by specimens taken by Mr. Stevens at Addington Park during the past month.

Mr. S. Stevens also exhibited a box of insects lately sent home by Mr. Bates from Ega, Upper Amazons, containing, amongst other fine species, *Papilio Pausanias*, *Callicha Batesii* and *Hætera Andromeda*, also *Megacephala Klugii* and *Megacephala n. s.*, together with a remarkable species of *Cicada*.

Mr. Douglas exhibited *Cryptocephalus Coryli*, taken at West Wickham Wood, May 29th; also *Lebia Crux-minor*, taken by Mr. Hemmings at Holme Bush, near Brighton, May 25th; *Endomychus coccineus*, taken from a dead beech tree, by Mr. G. Harding, at Stapleton, near Bristol; and *Platyrhinus latirostris* and *Biphyllus lunatus*, from Fungi at the same place.

Mr. Douglas also exhibited the case-bearing larva of an apparently new species of *Coleophora*, found by Mr. Wailes, of Newcastle, feeding on *Genista anglica*.

Mr. F. Smith exhibited *Platyrhinus latirostris*, received from Mr. Foxcroft, in Perthshire, where it appeared to have been met with in abundance.

Mr. Westwood wished the Fungi in which this species was found to be examined for the larva, which is yet unknown.

Mr. Smith also read an extract from a letter received by him from a correspondent at Bristol, who stated that a London collector had recently taken five new species of bees in that neighbourhood, which he had sold for £1 each.

Mr. S. Stevens stated that he took a singular larva on *Statice Limonium*, at Sheerness, two years ago, which produced *Agdistes Bennettii*, *Curt.* On the 25th ult. he found four more nearly full-fed larvæ at the same place, and read the following description of the larva and pupa, of which he also exhibited a drawing:—



“*Larva* green, with two sharp projections on the head and one on the tail, of a pink colour. Feeds on *Statice Limonium* on the coast, and changes to pupa in May.

“*Pupa* of a dull lead-colour, attached to the plant; changes to imago in about three weeks.”

Captain Cox stated that some time since he found a pupa, apparently of *Smerinthus Tiliæ*, in a cocoon formed of silk and particles of wood, under the loose bark of a plane tree, at a distance of about eight feet from the ground: from the fact of the pupa-case being much smoother than usual, and the above-mentioned singular deviation from the normal economy of this species, he had some doubts as to its identity until the perfect insect emerged.

Mr. Armitage exhibited a box of Coleoptera which he had recently taken in the South of France, containing, amongst other interesting species, *Bolbocerus Gallicus* and *Callicnemis Latreillei*.

The President exhibited some drawings of larvæ and pupæ of Lepidoptera, made in Natal by Mr. Plant, from which he had prepared Plates for publication in the ‘Transactions: of one, a fine new species of *Libesia*, he read a description.

Mr. Adam White communicated descriptions of some apparently undescribed species of Homoptera, from Borneo and Celebes, with drawings of the insects.

Mr. Westwood read some notes on the wing-veins of insects, in which he opposed the views maintained by Mr. Newman on this subject in his paper read before the Society at the June meeting last year.

Some discussion took place on the subject, in which Captain Cox, Messrs. Waterhouse, Baly and others took part.

#### *Field Excursion.*

The President expressed his intention to invite the members of the Society to a field excursion at Reigate, during the present month.

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July 7, 1856.

*Special General Meeting.*—W. WILSON SAUNDERS, Esq., President, in the chair.

The meeting was made special pursuant to notice for the election of a Secretary and one member of Council, in consequence of the resignations of Messrs. Douglas and Pascoe.

Mr. E. W. Janson was elected to both offices.

Dr. J. E. Gray moved a vote of thanks to Mr. Douglas, the retiring Secretary, whose able discharge of the duties, during the seven years he had filled the office, he was sure every one would acknowledge.

The motion was seconded by Mr. Westwood, and carried unanimously.

*Ordinary General Meeting.*—The minutes of the last meeting having been read and confirmed,

Mr. Douglas feared he was rather out of order in rising at that time to address the meeting; but the cause of his doing so was not an ordinary one. On the occasion of the Society's excursion to Reigate, on the 21st ult., the members had been most hospitably entertained by the President at the 'Swan' hotel. He much regretted that business engagements had prevented him from being present; but had heard from more fortunate persons that they never spent a more pleasant day. He thought, therefore, the present was a fitting opportunity for proposing a vote of thanks to the President for his liberality on this and all other occasions.

Dr. Gray, as one of those present on the occasion alluded to, most cordially seconded this motion, which was submitted to the meeting by Mr. Douglas, and carried by acclamation.

#### *Donations.*

The following donations were announced, and thanks ordered to be given to the donors:—'Die im Bernstein befindlichen organischen Reste der Vorwelt gesammelt in Verbindung mit Mehreren bearbeitet und herausgegeben von Dr. Georg Carl Berendt, Erster Band, Erste & Zweite Abtheilungen, Zweiter Band, Erste Abtheilung;' presented by Madame Berendt. 'Abhandlungen der Mathemat. Physikalischen Classe der Koeniglich Bayerischen Akademie der Wissenschaften,' Vol. xvii. Part 3; 'Dr. F. B. W. von Hermann, Ueber die Gliederung der Bevölkerung des Königreichs Bayern;' 'Denkrede auf die Akademiker Dr. Thaddäus Siber und Dr. Georg Simon Ohm;' 'Almanach der Koeniglich Bayerischen Akademie der Wissenschaften für das Jahr, 1855;' presented by the Royal Bavarian Academy of Sciences. Hewitson's 'Exotic Butterflies,' Part 19; by W. W. Saunders, Esq. 'Journal of the Proceedings of the Linnean Society,' No. 2; by the Society. 'Jubilé Semi-Seculaire de la Société Imperiale des Naturalistes de Moscou le 28 Decembre, 1855;' by the Society. 'Genera des Coléoptères,' Tome iii.; by the Author, M. Th. Lacordaire. 'Revue et Magasin de Zoologie,' 1856, No. 5; by the Editor, Monsieur F. E. Guérin-Méneville. The 'Zoologist' for July; by the Editor. The 'Journal of the Society of Arts' for June; by the Society. The 'Literary Gazette' for June; by the Editor. The 'Athenæum' for June; by the Editor. 'A Catalogue of British Ichneumonidæ in the Collection of the British Museum,' by Thomas Desvignes; by the Author. 'A Manual of British Butterflies and Moths,' No. 5; by the Author, H. T. Stainton, Esq. The 'Entomologist's Weekly Intelligencer,' Nos. 10—14; by the Editor. 'Entomologische Zeitung,' 1856, Nos. 5 and 6; by the Entomological Society of Stettin. An engraving on steel of *Lithocolletis tenella*; by Edward Robinson, Esq.

Mr. Westwood read a translation of Madame Berendt's letter accompanying the donation of her late husband's 'Organischen Reste in Bernstein,' which stated that on the completion of the work it is her intention to dispose of the cabinet left by Dr. Berendt at his decease, in which the greater part of the original specimens figured and described in the work are contained. He observed that such a collection was extremely interesting, from the fact that while in very few instances fossil insects could be decyphered in all their parts so as satisfactorily to determine their structure and relations, these amber insects, being enclosed in a transparent substance, are quite

visible and easily examined. Supposing the collection to have been formed from specimens of amber collected on the shores of the Baltic (the chief source of supply for this material), it would show that the climate of Prussia had undergone many changes; for it contained a great number of forms quite analogous or even identical with existing European groups, intermingled with others of a tropical character, and others, again, quite distinct, especially among the Neuroptera, where so many gaps in the natural series exist in the known forms. The volume published contained the plants, Aptera of Linnæus, Hemiptera and Neuroptera, the latter very carefully worked out by Dr. Hagen; the Coleoptera, Lepidoptera, Hymenoptera and Diptera remaining to be treated upon in the fourth volume, now in course of publication. As the collection was eventually intended for sale, he trusted that it would be secured for the British Museum, and supposed it would be regarded as an appendage to the zoological rather than to the palæontological collection.

Dr. Gray did not wish to detract from the merit of the elaborate work on the table, but considered great caution was necessary in the investigation of these organic remains in amber, as a large portion of the article sold for Baltic amber was in fact gum animé, and brought from Africa; and instanced many frauds practised by dealers in specimens on the Continent. He imagined there could be no doubt that a collection of this kind was a zoological one, and not palæontological.

#### *Election of a Member.*

The Rev. G. W. Braikenridge, of Broomvill House, Brislington, near Bristol, was balloted for and elected a Member of the Society.

#### *Exhibitions.*

Mr. Douglas exhibited bred specimens of *Lamprosetia Verhuellella* and *Buccatrix maritima*, from Mr. Hemmings, of Brighton; also specimens of *Laverna Raschkiella* and *L. conturbatella*, two species of *Tineæ*, hitherto unrecorded as British, both taken at Box Hill, by Mr. F. O. Standish.

Mr. Foxcroft sent for exhibition some Coleoptera taken in Perthshire, including a single example of *Dendrophagus crenatus*, *Payk.*; and some living specimens of *Chrysomela cerealis* from Wales.

The President observed that *C. cerealis* appeared to be plentiful in Wales this season. Mr. Brewer had shown him a great number recently taken there.

Mr. Stevens exhibited a living specimen of *Lebia crux-minor*, taken by himself near Brighton; *Adgestes Bennetti*, bred from the larva described at the last meeting; and a pair of *Heterogenea Asellus*, lately taken in the New Forest.

Mr. Stevens also exhibited larvæ of *Petasia nubeculosa* and *Notodonta Carmelita*, nearly full-fed, being the same as he exhibited at the last meeting, then a few days old; and a box of beautiful Lepidoptera, taken by Mr. Bates at Ega, containing *Papilio Bolivar* and some fine species of *Charaxes*, *Leptalis*, &c.

Mr. A. F. Sheppard exhibited *Gastropacha Ilicifolia* from Cannoch Chase, and specimens of *Laverna Raschkiella* and *L. conturbatella* from Box Hill.

Mr. Adam White exhibited a box of insects, of various orders, taken by Mr. Bowring at Hong-Kong, Siam, &c., including a new species of *Monohammus*, of a fine bluish green colour, with black spots, for which Mr. White proposed the name of *M. Bowringii*; also a new butterfly, of the singular genus *Cyrestis*, from Siam, and some curious spiders from Java, &c.

Mr. Bowring exhibited the larva of a Chinese Elater, and the pupa-cases of *Sagra femorata*, apparently formed of excrement. He made the following communication respecting the *Sagra* and the *Monohammus* :—

“The pupa-cases of *Sagra*, now exhibited, were discovered by Lieut.-Col. Dunlop, R.A., in the interior of the stem of a large climbing species of *Ipomæa*, which trails over a fine row of bamboos in the rear of Head-Quarters House. In clearing away the creeper he observed that the stem was considerably thickened in some places; and on cutting open the swellings the pupæ were found. The larva I have not yet met with; but, being now acquainted with the habitat of the insect, I have little doubt of falling in with it on my return to China.

“The beautiful species of *Monohammus*, to which Mr. White has called the attention of the members present, is found upon a species of oak not uncommon in Hong-Kong; but the species is by no means of frequent occurrence. I first met with it in 1848, since which time, until the spring of the present year, I have found it only during one season. On each occasion the appearance of the insect was limited to a few days, and every specimen captured was taken on the oak already mentioned.

“During the summer of 1855 *Agestrata chinensis* appeared in considerable abundance in the Happy Valley, Hong-Kong, flying in the evening about the tops of some large mango trees, and, from its great size, having more the appearance of a bat than an insect. In the mornings I not unfrequently found the beetle hanging on the under side of the leaves of the mango.”

Mr. Westwood wished the interior of the cocoons of the *Sagra femorata* to be examined, to see if they contained the cast skins of the larvæ, in order to ascertain if the insect was provided with legs in the larva state.

Mr. Wilkinson exhibited a bred specimen of *Opadia funebrana* and the pupa-case; also several living specimens of a species of *Pyrophorus*, probably *P. noctilucus*, L., one of the fire-flies of the West Indies. On the meeting-room being rendered as dark as possible, the luminosity of these insects was observed with much interest by the members present. Mr. Wilkinson remarked that these specimens had been brought from Cuba *viâ* New York, but that their luminosity was not so great as on their first arrival in this country.

Mr. Baly exhibited specimens of eight species of *Cryptocephalus*, taken this season, including *C. nitens*, *C. Coryli*, and other rare species.

Mr. Westwood brought for distribution amongst the members the case-bearing larvæ of *Porrectaria hemerobiella* and *P. laricella*. The latter species had done so much damage to a plantation of young larches this season that the owner feared he should have to cut the trees down. He also exhibited some empty pupa-cases of a *Tortrix*, apparently a species of *Sericoris*, found in curled-up leaves of wheat.

Mr. Westwood also exhibited a specimen of the imago and two cocoons of a species of *Saturnia*, sent to the Society of Arts from California, where attempts were being made to render the silk of the cocoons an article of commerce. He observed that these cocoons were flask-shaped, like those of our British species, *S. Carpini*,—a matter of great importance in a commercial point of view, for, the threads being all divided at the orifice formed for the exit of the perfect insect, it would, he conceived, be quite impossible to unwind the silk; and he therefore feared the speculation would

prove a failure. He added that in the classification of the Saturniæ the structure of the cocoons had received less attention than it seems to deserve.

Dr. Gray said that at the Paris Exhibition, last year, there were exhibited cocoons of many species of Saturniæ, with specimens of silk produced from them. It appeared the cocoons were in the first place beaten perfectly flat, and then subjected to a spinning process.

Mr. Buxton sent for exhibition specimens of *Scopula decrepitalis*, taken by him, last month, in Ross-shire; also singular varieties of *Orthosia gothica*, from the same locality. In these specimens the conspicuous dark marks usually surrounding the stigmata in this species were quite obsolete.

Dr. Calvert exhibited larvæ of *Caradrina Cubicularis*, which species had been described by Mr. Curtis in the 'Agricultural Journal' as injurious to wheat crops. He had found it very injurious to grasses, especially the *Festucæ*, although one species, *F. loliacea*, did not appear to be attacked by it.

Mr. Adam White observed it was a curious fact that the larvæ would not attack *F. loliacea*, as this grass was considered by eminent botanists as a mere variety, and not a distinct species.

Mr. Stainton read a paper entitled 'On the Recent Progress of Micro-Lepidoptero-logy on the Continent.'

*Society's 'Transactions.'*

Part 1 of Vol. iv. n. s. of the 'Transactions,' was on the table.

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August 4, 1856.

J. O. WESTWOOD, Esq., Vice-President, in the chair.

*Donations.*

The following donations were announced, and thanks ordered to be given to the donors:—'A Manual of British Butterflies and Moths,' No. 6; 'The Entomologist's Weekly Intelligencer,' Nos. 15, 16, 17 and 18; presented by H. T. Stainton, Esq. 'Genus Familiæ Apidarum Heriades, quod Synopsi Monographica exponit;' by the author, Dr. W. Nylander. 'Proceedings of the Royal Society,' Vol. viii. No. 21; by the Society. 'The Zoologist' for August; by the Editor. 'The Natural-History Review' for July; by the Editors. 'Revue et Magasin de Zoologie,' No. 6; by the Editor. 'Eine neue Oesterreichische Phryganea' and 'Eine neue mäheische Nycteribia; by the Author, Dr. Kolenati. 'Journal of the Society of Arts' for July; by the Society. 'The Literary Gazette' for July; by the Editor. 'The Athenæum' for July; by the Editor. 'Report of the Committee on the "Cane-borer;"' by the Author, Prof. Bojer.

*Election of a Subscriber.*

John Sang, Esq., High Row, Darlington, was balloted for and elected a Subscriber to the Society.

*Exhibitions.*

Mr. Douglas exhibited, on behalf of Mr. Bolt, a specimen of *Drepana Sicula*, taken at Leigh Wood, near Bristol, in June last: there had previously only been one known British specimen, taken in the same locality many years since by Mr. Mitford, and now in the collection of the Rev. H. Burney.

Mr. Hunter exhibited *Spilodes palealis* and *Trochilium Chrysidiforme*, taken near Folkestone in July last; also a specimen of *Eriopus Latreillii*, a *Noctua* new to Britain, which he had recently bred from a larva believed to have been taken at Black Park, and specimens of the summer brood of *Ennomos illustraria*, bred from eggs laid by the vernal female.

Mr. Weir exhibited some specimens of *Macaria notataria*, in all of which the under wings were more or less imperfectly developed, to which malformation he had noticed this species was particularly subject, especially this season; one specimen, in which the under wings were merely rudimentary, flew with as much apparent ease as those in which they were perfectly developed.

Mr. S. Stevens exhibited *Harpalyce Galiata*, in which one under wing was quite wanting. Mr. Bond observed that such malformation was not at all uncommon among the Geometridæ. Mr. Smith remarked that in the female of the common wasp the wings were frequently not developed at all.

Mr. Stevens exhibited two specimens of *Deilephila Galii*, bred from larvæ taken last autumn by Mr. Smith near Deal, and some Tortrices resembling female varieties of *Lozotania Viburnana*, which he believed might prove a distinct species; also four specimens of *Trochilium Chrysidiforme* and a specimen of a new British species of Phycidæ, probably *Nyctegretes achatinella*, taken in July near Folkestone.

Mr. Waterhouse exhibited some specimens of *Myrmedonia*, which he had found in the vicinity of a nest of the black ant (*Formica fuliginosa*), at Brockenhurst, in the New Forest: they consisted of *Myrmedonia funesta*, *M. lugens*, *M. humeralis*, *M. cognata* (?), and *M. laticollis*. Of these all the species furnished but few specimens, excepting the *M. laticollis*, which was plentiful. Mr. W. further stated that of these species three (*M. cognata*, *M. laticollis* and *M. lugens*), he believed, had not found a place in the list of British Coleoptera, but that the *M. cognata* had been previously discovered by Mr. Janson. One other new British species of Staphylinidæ was exhibited by Mr. W., viz. the *Oxypoda vittata*: it was found in company with the species of *Myrmedonia* above noticed.

Mr. Tompkins exhibited a specimen of the *Nyctegretes*? previously exhibited by Mr. Stevens, which he had taken at the same time and place, on the *Echium vulgare*.

Mr. Bond exhibited six beautiful specimens of *Graphiphora ditrapezium*, taken near Blandford, Dorsetshire, about the middle of July.

Mr. Wollaston exhibited some Coleoptera recently taken in Leicestershire, including a single specimen of *Scraptia fusca*.

*Poison with Laurel Leaves.*

Under this title, the Secretary read the following note from Mr. Newman:—

“ I have two favourite theories with regard to insect-killing: *first*, that man, not being constructed on the same plan as an insect, has very little chance of judging correctly as to the extent or quality of its sufferings under any circumstances: *secondly*, that man has no right whatever to inflict unnecessary suffering on any creature, and may not assume that sensation exists not, because he perceives it not. Entertaining these views, I have watched with much interest the effects of laurel-leaf poison on divers insects subjected to its agency: these are very similar in all insects; a state of coma is speedily induced, and this gradually assumes the phase of peaceful unsuffering death. I will try to pourtray the scene in the instance of a perfectly vigorous female of *Arge Galathea*. Immediately on being placed beneath the inverted tumbler, it settled on the gauze covering of the bruised laurel-leaves, and walked about very sedately, occasionally opening and shutting its wings, as if under the influence of genial sunshine. It soon ceased walking, but the wings still moved occasionally; and the convolute maxillæ were unrolled, and their tip seemed to be feeling about in search of food: presently the said tip was immersed in a drop of fluid exuding from a recent wound in the laurel stem; a very small quantity was imbibed, and more was sought very assiduously, but seemingly without success. I once observed the first pair of legs porrected, and being held close together, the maxillæ were introduced between them and withdrawn several times in succession: this was new to me, as I do not recollect having before seen the fore-legs of a pseudo-tetrapod butterfly used for any purpose whatever: in this case they appeared as cleansing instruments, and reminded me a little of the velvet-cushioned paws of a cat, as used after her lips had been sprinkled with milk, a constant result of lapping that favourite beverage. A state of rest succeeded this cleansing, during which the butterfly inclined on one side, as though unable to maintain an erect position; and the angle of inclination increased very gradually, until in about an hour and a half the insect fell on its side; the slight shock of the fall was followed by a few gentle movements, the most notable of these being the reversal of the wings, the under sides of which were brought into approximation, not contact, beneath the body; the legs being, by the same movement, quite deprived of their *locus standi*. Life was extinct, and from first to last there had not been the slightest indication of suffering. I do not theorise as to the immediate cause of death: I do not assert that, because the insect sipped the laurel-juice, it committed either intentionally or unintentionally an act of *felo-de-se*: the very atmosphere of a tumbler inverted on bruised laurel is impregnated with deadly poison in a gaseous state, and this enters the system through the spiracles as readily as a liquid through the conjoined maxillæ.”

Mr. Smith always found the bruised laurel-leaves killed Hymenoptera very speedily. He could not agree with Mr. Newman, that, in the case of the butterfly alluded to, the process which took an hour and a half to destroy life was not attended with suffering.

Mr. Douglas said that a short time since he had placed a number of Coleoptera, amongst which was a specimen of *Necrobia ruficollis*, in a bottle containing bruised laurel-leaves: after a lapse of several days he had found the *Necrobia* still alive.

Mr. Weir remarked that *Eupisteria hepararia* seemed less affected by the laurel poison than any other Lepidoptera he had observed.

Mr. Hudson found the fumes of the bruised laurel-leaves very powerful for the first day or two, but the strength was gradually lost.

Mr. Walker had found the laurel-leaves much more powerful in hot than in cold weather.

Mr. Douglas remarked on the immense numbers of small insects, especially Coleoptera, lately seen on the wing at sunset, which he attributed to the great heat and stillness of the atmosphere.

Mr. Stevens had noticed this circumstance in previous years during very hot and dry weather.

Mr. Westwood called attention to Dr. Schaum's continuation of the late Dr. Erichson's '*Naturgeschichte Deutschlands*,' which had just been placed in his hands by Mr. Wollaston, and adverted to the fact that the Ciciindelidæ had in it again been raised to the rank of a family.

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September 1, 1856.

W. W. SAUNDERS, Esq., President, in the chair.

*Donations.*

The following donations were announced, and thanks ordered to be given to the donors:—'The Journal of the Royal Agricultural Society of England,' Vol. xvii. Part I.; presented by the Society. 'Proceedings of the Zoological Society,' Nos. 299 to 309, both inclusive; by the Society. 'The Zoologist' for September; by the Editor. 'The Literary Gazette' for August; by the Editor. 'The Journal of the Society of Arts' for August; by the Society. 'The Entomologist's Weekly Intelligencer,' Nos. 19, 20, 21, 22; 'Manual of British Butterflies and Moths,' No. 7; by H. T. Stainton, Esq.

*The late William Yarrell, Esq.*

The President stated he had received intelligence that Mr. William Yarrell had died that morning suddenly at Yarmouth. Mr. Yarrell had been one of the original members of the Society, and soon after became its Treasurer, which office he resigned four years since, when our present estimable Treasurer succeeded him. Though not an entomologist, he had taken great interest in the Society: no man had done more for the Natural History of this country, and his loss would be severely felt.



*Election of a Member.*

Ernest Adams, Esq., of Great Camden Street, Camden Town, was balloted for and elected a Member of the Society.

*Dr. Erichson's 'Naturgeschichte Deutschlands.'*

Mr. Westwood remarked that, in the continuation of Dr. Erichson's 'Naturgeschichte Deutschlands,' to which he had briefly called attention at the last meeting, opinions were advanced which, if carried out, were likely to introduce great modifications in our views regarding species: very many recently made species have been therein sunk into local varieties, the principle identical with that enunciated in Mr. Wollaston's recent work having been applied to a much greater extent in the present than in any previous publication. He thought that entomologists would do well to consider how far these views are applicable to the Lepidoptera and other orders, as well as to the Coleoptera: if extended to the Micro-Lepidoptera, he had no doubt that the present enormous list of species would be reduced one half.

*Exhibitions.*

Mr. Edwin Shepherd exhibited, on behalf of Mr. E. Wallace, specimens of *Laphygma exigua* and *Botys silacealis*, taken this season in the Isle of Wight: he observed that Haworth's specimen of the latter species, the "*Pyralis glabralis*" of '*Lepidoptera Britannica*,' was obtained by that author from Francillon's collection, and had for many years been placed amongst the reputed British species, the collection of Francillon having been considered a most doubtful authority: the last season, however, had furnished single examples of two of Francillon's doubted species, *viz.*, the present insect and *Trochilium chrysidiforme*, and several specimens of each had been captured during the present year.

Mr. Stevens said he had lately seen a specimen of *Laphygma exigua* in the collection of Mr. H. Cooke, taken at Worthing.

Mr. E. W. Janson exhibited the following Coleoptera, recently captured by him in the vicinity of Highgate:—

*Dinarda Maerkelii*, *Kiesenw.* Three specimens taken in a nest of the large wood-ant (*Formica rufa*), one on the 13th of July, the other two on the 24th ultimo. He remarked that the only previously known indigenous example of this insect is in the British Museum collection, and was taken by Dr. Leach many years since, it is said, near Swansea: this individual is admirably represented by Mr. Curtis (*Brit. Ent. tab.* 410), and is given by Mr. Stephens, in the '*Illustrations*' and '*Manual*,' under the specific appellation of *dentata*, *Grav.*, but Herr v. Kiesenwetter, long ago (*Ent. Zeit. Stett.* 1843), pointed out that the Gravenhorstian *dentata* (*Lomechusa*) was specifically distinct from the insect exhibited, and in this view all subsequent writers appear to coincide. British specimens of the true *dentata*, *Grav.*, had not come under Mr. Janson's notice.

*Dendrophilus pygmæus*, L. Two specimens, likewise an inhabitant of, and found on the 20th of July in, nests of *Formica rufa*. One other individual only of this insect is extant, he believed, in British cabinets, namely in that of our late respected honorary President, the Rev. W. Kirby, who applied to it the trivial name of Sheppardi, under which it has been beautifully figured by Mr. Curtis (Brit. Ent. tab. 131), and described in the works of Mr. Stephens. Dr. Aubé has likewise described and delineated it (*Annales de la Soc. Ent. de France*, tome ii.) as *Hister formicetorum*, *Sibi*. Dr. Erichson (*Kaefen der Mark Brand*), having before him a Swedish example, refers it without doubt to the *Hister pygmæus* of Linnæus, Paykull and Gyllenhal, remarking that "the descriptions of the two last-named writers being somewhat indefinite, it might well happen that such accurate entomologists as Aubé and Curtis failed to recognise it."

*Dorcatoma rubens*, *Ent. Hefte, Steph.* One specimen taken a day or two since in a decaying oak, and which, it would appear, was an extraordinarily precocious individual, as no others were to be found, although the larvæ, evidently about to assume the pupa state, were in abundance: on these he would bestow occasional attention, and hoped at no distant period to be able to furnish his friends with this species, whose allotted space in our cabinets had remained so long almost universally vacant.

*Cryphalus binodulus* (*Weber*), *Ratzeburg*. Four specimens, both sexes, taken a day or two back in the bark of an aspen (*Populus tremula*). This genus (a dismemberment of *Bostrichus*), of which no member had hitherto been recorded as British, was erected by Dr. Erichson for the reception of those species in which the antennæ have the funiculus consisting of four articulations (in *Bostrichus*, as restricted by the same author, the funiculus is 5-jointed). For a beautifully characteristic figure of the male of this species, from the accurate pencil and graver of S. Weber, he referred the student to the first volume of *Ratzeburg's 'Forst-Insecten,'* tab. xiii. fig. 18.

Mr. Stevens stated that, amongst a quantity of plants lately received from Mr. Mason at Madeira, he had found several Lepidopterous larvæ, which had produced a species of *Plusia* allied to *P. Gamma*, and several specimens of a curious *Pyralis*, both of which he exhibited: he observed that no doubt many reputed British species had been brought into this country in a similar manner.

Mr. Hunter took this opportunity of stating that some doubts existed as to the claims of the specimen of *Eriopus Latreillii*, which he exhibited at the last meeting, to be considered a British insect; it was found on the outside of one of his breeding-cages, and as there was a quantity of foreign plants in the house at the time, it probably had been imported therein: he certainly had had no larva bearing any resemblance to the descriptions given by Continental writers of that of *Eriopus Latreilli*.

Mr. Douglas exhibited, on behalf of Mr. Turner, an apparently new species of *Depressaria*, probably *D. Libanotidella*, taken near Newhaven, Sussex.

Mr. Newman sent for exhibition some curious *Cocci*, covered with a downy substance, found on grass at Darenth Wood.

Mr. Westwood had found an allied species at Walton: the insect exhibited by Mr. Newman appeared to him to be identical with, or very closely allied to *C. Festucæ*, described by M. Boyer de Fonscolombe in the 'Annales de la Société Entomologique de France,' 1854, pl. 3, f. 9.

Mr. Westwood stated he had received some curious masses of eggs, found on yew trees in Sir Walter Trevelyan's woods, in Northumberland: the masses were of the size of a large bean, and the eggs were arranged in transverse rows in gelatinous matter; some of these had hatched, and produced larvæ of a *Phryganea*. He observed that Kolenati, in his 'Genera et Species Trichopterorum,' makes no allusion to the deposition of the eggs of any species of *Phryganea* on the leaves of trees or out of the water; and Professor Pictet, in his 'Recherches pour servir à l'Histoire et à l'Anatomie des Phryganides,' merely observes, "Quelques auteurs en ont vu hors de l'eau, sur les feuilles des plantes mais je n'ai jamais trouvé dans cette position." The only author who appears to have made any observations upon the subject is De Geer, who has represented the masses of eggs and young larvæ of *Phryganea grandis* upon a leaf, and which appear to be identical with those which he had received. De Geer's observation has, however, been overlooked by most subsequent systematic writers upon these insects; Pictet, indeed, entirely omits *Phryganea grandis*, from not being a Swiss species, whilst Kolenati and Stephens, both of whom quote De Geer, omit all notice of this curious fact. Mr. Curtis, indeed, notices De Geer's observations of the deposition of the double masses of jelly inclosing the eggs of *P. grandis* upon willow-leaves which hung over a stream, but adds an observation of Mr. Hyndman, of Belfast, in which the female *P. grandis* was seen to descend down the stem of an aquatic plant to the depth of a foot beneath the surface of the water, for the purpose of depositing its eggs; possibly the eggs now communicated may be those of a distinct species, as its habit of depositing its eggs out of water seems uniform: the masses of eggs were found not only on yew trees, but also on firs, as well as on the water dock. Mr. Westwood added that several years ago he had received precisely similar masses of eggs, found on the leaves of a tree at the same place.

Mr. Walker said that he had observed the common species of *Limnephilus* was especially partial to yew trees: the eggs in question might be of that species.

The President remarked on the vast quantities of *Phryganæ* he had seen at Windermere during the recent hot weather.

The Rev. J. Greene sent for exhibition some varieties of *Lepidoptera*, including a singular orange-coloured specimen of *Cleora Lichenaria*.

Mr. Stevens exhibited living larvæ of *Macroglossa stellatarum*, taken near Deal; also living larvæ of *Agrotis Ashworthii*, about three weeks old, bred from eggs received from Wales.

Mr. Dutton exhibited a curious variety of *Argynnis Adippe*, taken in July last near Brockenhurst; also some rare *Lepidoptera* from the Isle of Wight, including *Heliopsis armigera*, *Agrotis lunigera*, *Xylophasia sublustris*, &c.

Mr. Moore exhibited a box of *Coleoptera* and *Hemiptera* lately taken at Southend.

Mr. Walker observed that he had recently found *Aphodius rufipes* flying to a light at night; it was, he believed, the only night-flying species of the genus.

Mr. Douglas had also found *A. fossor* attracted by a light.

Mr. Stevens stated he had lately taken four or five specimens of *Helops pallida* at Deal.

Mr. Smith read a paper, by Mr. Frederick Bates, intituled "Description of a New Species of the Genus *Myrmecilla*."

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October 6, 1856.

J. O. WESTWOOD, Esq., Vice-President, in the chair.

*Donations.*

The following donations were announced, and thanks ordered to be given to the donors:—'Proceedings of the Royal Society,' vol. viii. No. 22; presented by the Society. 'Mémoires de la Société de Physique et d'Histoire Naturelle de Genève,' Tome xiv. 1re Partie; by the Society. 'Exotic Butterflies,' Part XX; by W. W. Saunders, Esq., F.R.S. 'List of the Specimens of Lepidopterous Insects in the Collection of the British Museum,' Part VIII., Sphingidæ; by the Author, F. Walker, Esq., F.L.S. 'Revue et Magasin de Zoologie,' 1856, Nos. 6 and 7; by the Editor, M. F. E. Guérin-Méneville. 'The Zoologist' for October; by the Editor. 'The Entomologist's Weekly Intelligencer' for 1856; the same work, Nos. 23, 24, 25 and 26; 'Elements of Entomology: an Outline of the Natural History and Classification of British Insects,' by W. S. Dallas, F.L.S.; 'A Manual of British Butterflies and Moths,' by H. T. Stainton; by H. T. Stainton, Esq. 'The Athenæum' for August and September; by the Editor. 'The Literary Gazette' for September; by the Editor. 'The Journal of the Society of Arts' for September; by the Society. 'Kritische Bemerkungen über M. S. Merian's Metamorphosen Insectorum Surinamensium'; 'Untersuchungen über die Flügeltypen der Coleopteren'; by the Author, Dr. H. Burmeister. A box of minute Coleoptera from Ceylon; by Wm. Spence, Esq., F.R.S.

*Exhibitions.*

Mr. Stevens exhibited a fine specimen of *Carabus intricatus*, which had lately been picked up dead near Plymouth; also a pair of *Monohammus Sutor*, found in an old ash tree near Yaxley, Hunts; and a bottle containing a quantity of liquorice powder, which, although the cork had not been taken out for five years, contained several living specimens of *Endrosis fenestrella*, the larvæ of which had evidently subsisted on the powder, and on the end of the cork inserted in the neck of the bottle.

Mr. Stevens also exhibited a box of beautiful Lepidoptera, chiefly minute species of *Pyralidæ* and *Tineidæ*, taken by Mr. Diggles at Moreton Bay. Many of these species were bred from the larva. Mr. Stevens observed that Mr. Diggles, who is an

artist by profession, would be happy to enter into engagements with any persons who might require drawings of the larvæ of any species bred by him.

Mr. Stainton exhibited some cases, formed by the larvæ of various South Australian Lepidoptera, including curiously ribbed cases of a species of *Psyche*.

Mr. Lubbock exhibited some blind *Gammari*, from a well at Brighton. He observed that the eyes were absent or very rudimentary, as in *Niphargus spelæus*, from which species, however, the present specimens appeared to differ in the form of the posterior legs. They are probably identical with *Gammarus subterraneus* of Leach. That naturalist, however, does not describe his specimens, and even suggests that they might be only the young of the common freshwater species, which is evidently not the case with those exhibited. The interesting fact of the presence of blind Amphipods has now been ascertained in four different localities in this country, *viz.*, London, Maidenhead, Bromley (in Kent), and Brighton, and would probably be found to be more common if those who observe them in their well-water would send them to this Society or to any naturalist.

Mr. Stainton exhibited some larvæ of Lepidoptera preserved in hermetically sealed glass tubes containing spirits, which had been forwarded to him by a glass-tube manufacturer in Hatton Garden, who, he stated, would be happy to exchange similar tubes for examples of British Lepidoptera.

Mr. Westwood stated he had lately received some curious pale varieties of the larvæ of *Acherontia Atropos*, similar to that figured in Fuessly's 'Archives.' It would be interesting to know whether that variety had occurred generally this season, and whether it was owing to any peculiarity in the food of the larvæ, or to the circumstance that the insect was near the period of its transformation, and had undergone a change in its colour.

Mr. Stainton remarked that several of his correspondents had taken the larvæ this autumn, but all appeared to be of the ordinary colours.

Mr. Dutton exhibited a curious variety of the female *Polyommatus Adonis*, having the under side very dark and the ordinary ocelli nearly obsolete. He stated that he lately noticed *Stenopteryx hybridalis* in great profusion on the cliffs at Eastbourne, although on the previous and following days not a single example was to be seen. He added that there was no perceptible atmospheric change during the three days to account for this circumstance.

Mr. Westwood brought for distribution amongst the members specimens of *Lophyrus rufus*. He had received a great quantity of larvæ from one locality, all of which produced females; from others, obtained near Weybridge, he had bred both sexes. He observed that these instances of the occurrence of one sex in insects were extremely interesting. It was a well-known fact that the queen bee at times only laid male eggs, which caused great derangement in the internal economy of the hive, and frequently the destruction of the stock. A correspondent of his had lately purchased some seeds of the *Wellingtonia gigantea*, from every one of which he had bred females of a Chalcideous insect of the genus *Callimome*, which evidently had been parasites of some Lepidopterous larvæ feeding in the seeds. Mr. Parfitt, of Exeter, had also only obtained females of the British ink-gall *Cynips*, from the galls which he had kept in order to obtain the perfect insects; he had also obtained a great number of females of the species of *Callimome* parasitic on the *Cynips*, and only a single male.

Mr. Westwood also brought for distribution specimens of the small honey-moth (*Achroea alvearia*). He stated that at the Trade Museum, formed in the spring of 1855, by the Society of Arts, he had exhibited two cases illustrative of the history of beneficial and injurious insects. The former contained numerous illustrations of the economy of the hive-bee, including various specimens of honeycomb, in one of which the eggs of *A. alvearia* must have been introduced, as recently nearly all the contents of the case had been devoured by the larvæ. It was interesting to notice that the bodies of several queen bees were entirely, and those of the drones partially, exempted from the general destruction, doubtless owing to their containing no wax, whilst the bodies of the worker bees were devoured; also that a piece of bees' wax, which had been obtained by immersing the comb in boiling water, was scarcely touched. He added that the case also contained specimens of different species of Coccidæ, used both for dyeing and for the production of wax. The former had not been touched; but amongst the latter were some fine examples of the wax-insect of China (*Coccus Pela*); and in the inside of each specimen was a cocoon and pupa of the alvearia. Had these specimens and the empty pupa-case therein been found at a future time by any one ignorant of the circumstances, it might very naturally have been inferred that it was the pupa-case of some Lepidopterous insect parasitic on the *Coccus*. The larvæ had also burrowed deeply into the cork lining of the box; they seemed, however, to have avoided attacking newly developed worker bees, and also comb filled with honey.

Mr. Waterhouse stated, as an instance of the voracity of the larvæ of *A. alvearia*, that, having a number of them in a glass jar, on the top of which he placed a thick book, in a short time the larvæ ate completely through the book, and made their escape.

Mr. Moore exhibited specimens of *Lophyrus rufus*, reared by him from larvæ taken near Mickleham.

Mr. Westwood read a letter on the unusual scarcity of the May-fly this season, which had been addressed to him by the late Mr. Yarrell a short time previous to his death. He thought it probable the scarcity alluded to might be owing to the perfect insects having been developed, in the previous season, during wet weather, and thereby destroyed before depositing their eggs.

Mr. Shepherd exhibited, on behalf of Mr. Buxton, a series of specimens of *Noctua festiva*, taken in the North of Scotland, last summer. Some of these specimens, he remarked, approached very closely to the *Noctua conflua* of Iceland, which probably is only an extreme northern variety of *N. festiva*.

Mr. Westwood stated he had lately received from Mr. Parfitt a very small cornuted species of *Bledius*, which was evidently new to the British list. It had been taken beneath marine *rejectamenta* at Exmouth.

Mr. Stainton stated that Mr. Newnham had lately discovered the larva of *Hypnometia vigintipunctatus* on *Sedum Telephium*, at Guildford; he (Mr. S.) had found the larva in a garden at Lewisham twenty years ago, on a plant of the *Sedum*, brought from the neighbourhood of Tunbridge Wells: this was the only previously known instance of the capture of the larva in this country.

Mr. Syme exhibited larvæ of *Deilephila Galii* preserved in spirits: he stated that he had recently captured several on the sand-hills near Deal. When young the larvæ are bright green, and very difficult to find; as they approach maturity they become

olive-coloured: they appear to feed in the early morning, concealing themselves in the tufts of long grass during the rest of the day, and are then only to be traced by their excrement.

Mr. Smith observed that the specimens which he found at Deal last year were crawling in the warm sunshine.

Mr. E. W. Brayley remarked, with reference to the statement made by Mr. Dutton respecting the abundance of *Stenopteryx hybridalis* on one day and its nonoccurrence on the preceding or following ones, that such facts appeared to throw great light on the circumstance alluded to by Mr. Westwood, in his 'Memoirs on Fossil Insects,' recently published by the Geological Society, of great masses of insects' remains being occasionally found in close juxtaposition, whilst in the immediately adjoining layers there were no such deposits. Another fact bearing on the same subject had been stated with regard to vast quantities of dead ants which had occurred along the shores of the rivers of South America, extending for many miles: these would naturally be covered with a layer of sand or other deposit, and it would be evident that the latter and all future layers would be destitute of insect remains until a fresh swarm of ants had been overtaken by the water, and washed up as before.

Mr. Westwood said it was interesting to observe that facts such as those noticed by Mr. Dutton, which at first sight seemed trivial, might possess considerable importance, and even occasionally afford a satisfactory solution to a great scientific question.

Mr. Frederick Smith read the following description of a most extraordinary aculeate Hymenopterous insect recently received from Australia:—

“*LAMPROCOLLETES BIPECTINATUS.*”

“Black; the head punctured and shining; the face and cheeks clothed with hoary pubescence, distinctly plumose under a high power of the microscope; the mandibles ferruginous at their apex; the antennæ bipectinate, the pectinations irregularly toothed. Thorax shining and punctured, thinly clothed with hoary pubescence; wings hyaline and iridescent, the nervures rufo-testaceous; the claw-joint ferruginous; the calcarisæ pale testaceous. Abdomen sub-ovate, shining and finely punctured; the margins of the segments constricted; clothed above with a thin short hoary pubescence.

“Male. Length  $4\frac{1}{4}$  lines.

“Habitat: Australia. Taken by W. Stutchbury, between Sydney and Moreton.

“In the collection of the British Museum.”

“This remarkable bee belongs to the family Obtusilingues, and is, in fact, an Australian Colletes: the pectination of the antennæ can only be regarded as a sexual character, or rather distinction, of this particular species; several analogous instances occur in the fossorial genus *Crabro*: the present is the first which appears to have been noticed amongst the *Apidæ*.”

*Preparation of the Larvæ of Lepidoptera.*

Mr. Stainton read the following communication from Dr. Collingwood:—

“The preparation of the larvæ of Lepidopterous insects has long been a desideratum: while the imago requires but little management, being, with the exception of those that ‘run greasy,’ little prone to decay, the caterpillar form, on the other hand, being soft and juicy in the extreme, cannot possibly be preserved in our cabinets without undergoing some process, which, however effectually it may preserve it, as certainly destroys the symmetry of form and delicacy of colour of these perishable, though often beautiful subjects of entomological study.

“In my frequent visits to the Imperial Cabinet of Zoology at Vienna, I could not fail to be struck with the extremely beautiful preparations illustrative of the transformations of insects, exhibited in the upper story of that establishment. In glass cases suspended against the walls is a most instructive series of insects in every stage of their remarkable career, and preserved in a perfection of beauty I have nowhere seen paralleled. This series appeared to be very attractive, and was generally thronged with humble admirers, who probably saw, for the first time, and to their great astonishment, the various changes which insects undergo. But among the forms thus preserved, the caterpillars were pre-eminent; their unchanged forms, delicate colours and characteristic attitudes, looking exactly like life.

“Thinking that British entomologists would be glad to be able to add to their collections similar specimens, I determined, before quitting Vienna, to learn the process by which they were prepared. Unfortunately, however, I found that the director, Herr Redtenbacher, to whom I looked for information, was absent; but this circumstance was, to a great extent, remedied by the kindness of my friend Dr. Ernst Brücke, Professor of Physiology in the University of Vienna, who, in a letter lately received, has given me the following information, derived from Herr Redtenbacher:—

“The caterpillars, he says, are eviscerated through the anus, and the skin is then blown out, being fixed upon a tube (‘man blöss sie an einen Tübülüs befestigt aüf’), and carefully held all the while over a pan of hot coals, until they become quite dry, and are no longer liable to change their form. Caterpillars with peculiarly delicate colours, such as green or pale rose, are liable of course to lose their colours in this drying process. To replace them, a mass of wax, of the natural hue of the insect, is poured in through the opening by which it was eviscerated.

“The Professor adds, that the beauty of these preparations, as seen in the Imperial cabinet, depends less upon the nature of the method than upon the manual dexterity of the operator, assisted by long practice. I doubt not, however, that many members of the Entomological Society possess this dexterity to an extent quite great enough to produce specimens equal to those I have described, especially when the hope of enriching their cabinets has induced the practice necessary to the attainment of perfection.”

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November 3, 1856.

W. W. SAUNDERS, Esq., President, in the chair.

*Donations.*

The following donations were announced, and thanks ordered to be given to the donors:—‘Papers and Proceedings of the Royal Society of Van Dieman’s Land,’ Vol. iii. Part I.; presented by the Society. ‘Journal of the Proceedings of the Linnean Society,’ Vol. i. No. 3; by the Society. ‘Entomological Papers, being Descriptions of new Ceylon Coleoptera, with such Observations on their Habits, &c., as appear in any way interesting,’ by John Nietner, Colombo, Ceylon, Nos. 1 and 2; by G. H. K. Thwaites, Esq. ‘Bericht über die Oesterreichische Literatur der Zoologie, Botanik und Palæontologie aus den Jahren 1850, 1851, 1852, 1853;’ ‘Verhandlungen des Zoologisch-Botanischen Vereins in Wien,’ Band V.; by the Society. ‘The Natural History Review,’ No. 12; by the Dublin Natural History Society. ‘Entomologische Zeitung, 1856,’ Nos. 7, 8, 9 and 10; by the Entomological Society of Stettin. ‘A Manual of British Butterflies and Moths,’ No. 9; ‘The Substitute,’ Nos. 1 and 2; ‘Elements of Entomology,’ by W. S. Dallas, F.L.S., No. 2; by H. T. Stainton, Esq. ‘The Athenæum’ for October; by the Editor. ‘The Literary Gazette’ for October; by the Editor. ‘The Zoologist’ for November; by the Editor. ‘The Journal of the Society of Arts’ for October; by the Society. A specimen of *Belostoma* sp.—? by James Weston, Esq.

*Election of a Member.*

George Edwards, Esq., of 24, Acacia Road, St. John’s Wood, was balloted for and elected a Member of the Society.

*Exhibitions.*

Mr. A. F. Sheppard exhibited *Acronycta Alni* and *Phibalapteryx gemmaria*, taken near Brighton.

Mr. Stevens exhibited a fine specimen, in its natural state, of the wax secreted by *Coccus pela*, or wax-insect of China, sent to him by Mr. Fortune.

Mr. Westwood said this *Coccus* was a subject of considerable interest, as we thus were able to see from what the Chinese wax is produced; it is the covering formed by the female of a species of *Coccus* called by the Chinese *pela*, whence the specific name applied to it: its chemical properties had lately been investigated by Mr. Daniel Hanbury, who had recently exhibited some very fine specimens. In some of the wax sent home by Mr. Fortune he (Mr. W.) had found the remains of male insects, and also two species of *Chalcidæ*, which were doubtless parasites of the *Coccus*.

Mr. Bowring observed that this wax was used in China to coat over the outsides of the candles made from the candle tree, in order to give them a hard surface.

Mr. Stevens exhibited a full-grown larva of *Agrotis Ashworthii*, remarking that it was one exhibited by him at a previous meeting, when but a few days old; also the bottle containing liquorice-powder exhibited at the last meeting, in which were specimens of *Endrosis fenestrella* still alive.

Mr. Stainton exhibited, on behalf of Mr. H. Cooke, a specimen of *Leucania vitellina*, a *Noctua* new to Britain, taken by him in his own garden at Brighton; also *Phlogophora empyrea*, *Leucania musculosa* and *Laphygma exigua*, all taken near the same locality during this season, and a specimen of *Cucullia Verbasci*, reared from larva which had been found feeding on *Buddlæa globosa*.

Mr. Douglas exhibited two specimens of *Brontes planatus*, *Lin.* (*Uleiota planata*, *Steph. Man.*), which he had taken on the previous day under the loose bark of a beech tree, in the neighbourhood of Lee, which had been felled about a year ago; and observed that the species is given by Stephens as "very rare, Hermitage, South Lambeth," and that Shuckard says, "very rare, query indigenous," so that the capture is of interest in more ways than one.

Mr. Stainton exhibited the cocoon of a species of *Tinea*, from Ceylon, attached to a footstalk about half-an-inch long, the cocoon itself being composed of network, similar to those of the European genus *Plutella*.

Mr. Westwood observed that a much more remarkable instance of the cocoon of a Lepidopterous insect being attached to a footstalk occurs in the *Saturnia Cynthia* of India, in which species the footstalk of the cocoon is two inches long.

Mr. Stevens exhibited the following Coleoptera, recently taken by Mr. Arthur Adams:—*Polistichus fasciolatus*, at Sheerness; *Trechus nanus*, at Mickleham; also six specimens of *Drypta emarginata*, and a larva which he presumed pertained to the latter species.

Mr. Westwood observed that the larva referred to *Drypta* was, in reality, that of a species of *Silpha*.

Mr. Weir exhibited a specimen of *Anthrribus albinus*, captured at Pembury, Kent.

Mr. Foxcroft exhibited some Coleoptera and Lepidoptera, taken in Scotland and Wales during the past summer, including a single specimen of *Otiorhynchus septentrionis*, from Perthshire.

Mr. F. Smith exhibited a specimen of *Cybister limbatus*, having the head of the larva instead of that of the perfect insect; it was found alive and swimming, in apparent health, by Mr. Bowring, at Hong Kong.

Mr. Westwood said this was the first recorded instance in Coleoptera of the imago being found with the head of the larva; in Lepidoptera, however, instances had occurred: a specimen of *Nymphalis Populi* was recorded in the 'Mémoires de l'Académie Royale de Bruxelles,' having the head of the larva instead of that of the perfect insect.

Mr. Gregson sent for exhibition a pair of *Coleophora vitisella*, and the case of the larva of this species.

Mr. Stevens read an extract from a letter received by him from Mr. A. R. Wallace, written from Lombock, in which he remarked the paucity of insects of all orders in that locality, attributable to the greater part of the island being now devoted to the cultivation of rice.

The Secretary read the following extract from a letter from G. H. K. Thwaites, Esq., Director of the Botanic Garden, Peradenia, Ceylon, to William Spence, Esq.:—

"I have often observed, on the whitewashed walls of the houses here, a whitish-coloured spider stationary for hours, with its head downwards and its legs extended

(a pair of intermediate ones much shorter than the others), and two long spinnerets; but it was only a short time ago I had an opportunity of observing the curious mode in which it entraps its prey. When an insect makes its appearance on the wall near it, it commences running round and round it with the greatest rapidity, spinning a web all the time, which confines the legs, wings, &c., of the poor victim most effectually, and has just the effect of a lasso thrown over its limbs. With this knowledge of the spider's habits we can understand the use of the long spinnerets, and that the short pair of legs enable it to make a more rapid and smaller series of turns round its victim."

Mr. Westwood had great pleasure in stating that it was the intention of Messrs. Saunders and Hewitson to commence the publication of a second volume of their splendid work on 'Exotic Butterflies.'

Part II. of Vol. iv. of the New Series of the Society's 'Transactions,' published in October, was on the table.

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December 1, 1856.

J. O. WESTWOOD, Esq., Vice-President, in the chair.

*Donations.*

The following donations were announced, and thanks ordered to be given to the donors:—'Annales des Sciences Physiques et Naturelles d'Agriculture et d'Industrie,' Deuxième Série, Tome vii. Ire Partie; presented by La Société Impériale d'Agriculture, &c., de Lyon. 'Annales de la Société Linnéenne de Lyon,' Années 1854, 1855, Tome ii.; by the Society. 'Mémoires de l'Académie Impériale des Sciences, Belles-lettres et Arts de Lyon,' Classe des Sciences, Tome v., Classe des Lettres, Tome vi.; by the Society. M. B. P. Perroud, 'Mélanges Entomologiques,' 3ième Partie; by the Author. 'Proceedings of the Boston Society of Natural History,' Nos. 12 to 21, inclusive; by the Society. 'Report of the Commissioner of Patents for the year 1854,—Agriculture;' by the United States' Commissioner of Patents. 'Proceedings of the Academy of Natural Sciences of Philadelphia,' Vol. viii. Nos. 1 and 2; 'A Notice of the Origin, Progress and Present Condition of the Academy of Natural Sciences of Philadelphia,' by W. S. W. Ruschenberger, M.D., Surgeon U.S. Navy; by the Academy of Natural Sciences of Philadelphia. 'Smithsonian Contributions to Knowledge,' Vol. viii.; by the Smithsonian Institution. 'Transactions of the Linnean Society of London,' Vol. xxii. Part 1; List of the Linnean Society of London, 1856; by the Society. 'Proceedings of the Literary and Philosophical Society of Liverpool, during the forty-fifth Session, 1855-56,' No. 10; by the Society. 'Remarks on the Habits and Distribution of Marine

Crustacea on the Eastern Shores of Port Philip, Victoria, Australia, with Descriptions of Undescribed Species and Genera,' by John Robert Kinahan, M.B., T.C.D., M.R.I.S., Acting Professor Natural History Department of Science and Art, &c. &c.; by the Author. 'Revue et Magasin de Zoologie,' 1856, No. 9; by the Editor, M. F. E. Guerin-Méneville. 'The Substitute,' Nos. 3, 4, 5 and 6; 'A Manual of British Butterflies and Moths,' No. 10; 'Elements of Entomology,' by W. S. Dallas, F.L.S., No. 3; by H. T. Stainton, Esq. 'List of the Specimens of Lepidopterous Insects in the Collection of the British Museum,' Part 9, Noctuidæ; by the Author, Francis Walker, F.L.S. 'The Zoologist' for December; by the Editor. 'The Journal of the Society of Arts' for November; by the Editor. 'The Literary Gazette' for November; by the Editor.

#### *Election of a Subscriber.*

J. V. Yatman, Esq., 2, Bombay Place, Amersham Park, New Cross, was balloted for and elected a Subscriber to the Society.

Mr. Westwood called attention to the excellent descriptions of New Holland and other exotic insects published by M. Perroud in the Transactions of the Lyons Society, and expressed a wish that some of our young entomologists would furnish similar papers, which really are a step in advance of Science: he was also desirous of knowing whether the recent discovery of the larva of *Agrotis Ashworthii* had contributed in any way to the settlement of the disputed question as to the genus to which this species should be referred.

#### *Exhibitions.*

Mr. Stevens exhibited a box of Lepidoptera and other insects, taken by Mr. Diggles at Moreton Bay, including *Papilio Anactus*, *M'Leay*; *Eurycus Cressida*, a fine *Bombyx*, allied to *Laria*, of which the female is apterous; *Deilephila Celerio*? and *Deiopeia pulchella*? apparently identical with the European species; and a fine Neuropterous insect, the *Stilbopteryx costalis* of Newman.

Mr. Douglas exhibited specimens of *Gelechia paupella*, bred from the flowers of *Inula dysenterica*: he observed that this species is closely allied to *G. inopella*, and when he discovered it he supposed it was the summer brood of that species; but, being larger, it would have been an exception to the general rule in Lepidopterous insects, in which the æstival specimens are usually smallest, as in the well-known instance of *Ennomos illunaria*: he added that the species exhibited was probably the *Apheloseitia*? *Inulella* of Curtis.

Mr. A. F. Sheppard sent for exhibition specimens of *Ypsipetes elutaria* and a specimen of *Agrotis cursoria*, received from Mr. J. B. Hodgkinson, who considered they might prove to be distinct species.

Mr. Waterhouse observed that he had received from Liverpool a pill-box containing a quantity of *Aræocerus coffæ* (*Phlœobius griseus*, Steph.), which had been very destructive to nutmegs: the species had been erroneously included in British lists: he added that he had received it from various parts of both the old and new world, India, Africa and South America.

Mr. Douglas said he had found this species in mace in the London Docks.

Mr. Westwood observed that the *Ptinus rubellus*, *Marsh.*, was very destructive to various condiments.

Mr. Lubbock made some remarks on the reproduction of the *Daphnia*, observing that the females laid two sorts of eggs, one kind being fertile without impregnation: he knew similar cases occurred in Aphides, &c., and wished to hear from the Members present of any instances in Lepidoptera or other orders.

Mr. Westwood said *Lasiocampa Quercus* and *Orgyia antiqua* had been known to produce fertile eggs without male intercourse. Mr. Ingpen had found unimpregnated females of *Psyche fusca* produce fertile eggs, as recorded in Stephens' 'Illustrations.'

Mr. Douglas had known instances of the eggs laid by unimpregnated females of *Fumea nitidella* having hatched.

Mr. Stainton said that Mr. Robinson had had a brood of larvæ hatched from the eggs laid by a virgin female of *Arctia Caja*, but the larvæ did not live many days: in answer to a question, put by Mr. Waterhouse, as to the grounds on which this particular female was asserted to have been destitute of sexual intercourse, Mr. Robinson stated that the fact was most indisputable, as he only had one larva of the species, which was bred alone, and had produced the female in question.

Mr. Hudson said that two of his friends had observed *Liparis dispar* to produce fertile eggs without copulation.

Mr. Westwood stated that a most valuable paper had been published by Herr Lederer in the Vienna Transactions, four years ago, on the investigation of the larva of the *Geometræ*, he considered it would be a great addition to our knowledge of the British *Geometræ* to go through the list and note the characters by which Lederer's genera differed from those of Stephens, and publish the same in our own 'Proceedings' or 'Transactions.'

Mr. Douglas believed that M. Guenée's great work on the *Geometræ* was ready for publication, and might answer the purpose suggested by Mr. Westwood.

Mr. E. Sheppard observed that M. Lacordaire's fourth volume of the 'Genres des Coléoptères' was nearly ready for publication, and that the plates of the first three volumes would be published with the fourth.

Mr. Armitage exhibited some Coleoptera, mostly from the Dardanelles and Mount Olympus, including a *Lethmo*, allied to, but apparently distinct from, *cephalotes*; a beautiful species of *Cardiophorus*; and a fine series of minute *Malachii*.

Mr. Westwood made some observations on the approximation of genera, and remarked that, on the separation of *Megacephala* from the *Cicindelidæ*, the latter became a group by itself.

Mr. Waterhouse denied that any real links existed in Creation between any two well-defined genera. In Mammalia a great many animals were pointed out as links between various groups; but when such animals, with their superficial resemblances, came to be really examined, they were invariably thrust further away from each other: it was, he contended, the same through the whole of Creation.

Mr. Lubbock could not admit that such links never occurred, and mentioned the two large genera of Crustacea, *Calanus* and *Pontella*, as affording species which apparently militated against Mr. Waterhouse's views.

Mr. Wollaston observed that, a few years ago, *Carabus* and *Calosoma* were

considered as well-defined genera, but of late the discovery of new species had so linked them that it now was impossible to separate them.

A conversation ensued on the variation of species, as apparently produced by climate and lapse of time, in the course of which Mr. Westwood observed that it would be interesting to know whether the animal remains found in mummies, &c., were the same species as at present exist in a living state.

M. Milne-Edwards said that the Ibis found embalmed with mummies was identical with the existing species.

Mr. Stainton read a paper intituled 'Observations on Genera.'

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January 5, 1857.

W. W. SAUNDERS, Esq., President, in the chair.

*Donations.*

The following donations were announced, and thanks ordered to be given to the donors:—'Entomological Papers,' by John Nietner, Nos. 3 and 4; presented by the author. 'Revue et Magasin de Zoologie,' 1856, Nos. 10 and 11; by the Editor, M. Guérin-Méneville. 'The Journal of the Society of Arts' for December; by the Society. 'The Literary Gazette' for December; by the Editor. 'The Athenæum' for November and December; by the Editor. 'A Manual of Butterflies and Moths,' No. 11; 'Elements of Entomology,' No. 4; 'The Substitute,' Nos. 7, 8, 9, 10 and 11; 'The Entomologist's Annual' for 1857, Library edition; by H. T. Stainton, Esq.

*Election of Members, &c.*

The Rev. D. J. Drakeford, M.A., Churton Mendip, Somersetshire, and H. S. Digby, Esq., Fenstanton, St. Ives, Huntingdonshire, were balloted for and elected Members of the Society.

Edward William Robinson, Esq., 42, Harneson Street, Kentish Town, was balloted for and elected a Subscriber to the Society.

*Exhibitions.*

Mr. Stevens exhibited a box of Lepidoptera, chiefly Pyralidæ, taken at Sarawak by Mr. Wallace, amongst which was a beautiful species of *Cerura*, allied to *C. liturata* of India; a singular *Bombyx*, allied to the *Megasoma pardale* of Java; and several *Pyralidæ*, remarkable for the extraordinary development of the palpi, in one species the terminal joint of the palpi being turned back over the head of the insect, and equal in length to the abdomen.

Mr. Hunter exhibited, on behalf of Mr. Reading, of Plymouth, four living specimens of *Carabus intricatus*, recently found in moss in that neighbourhood; and a specimen of *Glæa erythrocephala*, taken on ivy blossoms, in November last, at the same place, being the second recorded British specimen of that species.

Mr. Smith read an extract from the 'Entomological Magazine' for 1837, in which Mr. Shuckard recorded a specimen of *Carabus intricatus* sent to Mr. Smith amongst a large number of *Carabi*, collected on Hawley Flat, near Blackwater, Hants, not Horsley Downs, as stated by Mr. Shuckard. Mr. Smith had frequently searched the locality without success, in May and June; but, not knowing the habit of the species, had not thought of hunting for it in the wood which skirts the south-east end of that locality.

Mr. Waterhouse said Mr. Digby had informed him that he found this species in Germany, in the moss and rotten wood on the stumps of trees which had been cut off nearly level with the ground.

Mr. Stevens remarked that he had searched for this species in June in the locality, in Devonshire, mentioned by Dr. Leach, but without success.

Mr. Wollaston said the natural habitat of the species seemed to be in moss during the winter; it probably would be more frequently found, if searched for at this season.

Mr. Stevens exhibited a most beautiful *Callithea*, taken by M. De Gand at Tabalinza, in Peru; and a *Cureulio* from Burmah, allied to *Pachymerus*, having very remarkable hind legs.

Mr. Waterhouse observed it was a singular fact that four or five Brazilian species were closely allied to this Indian insect.

Mr. Wollaston exhibited a large box of minute Coleoptera, being a portion of his captures during his last visit to Madeira.

Mr. Lubbock called attention to a remarkable paper lately published by Professor Siebold, entitled 'Wahre Parthenogenesis bei Schmetterlinge und Bienen,' containing some extraordinary theories on the generation of bees and other insects: he stated that an English translation of the work would shortly be published.

The President read an extract from a letter addressed to Mr. W. Marshall by Mr. Monteith on the reported capture of six specimens of *Pieris Daplidice* near Glasgow.

Mr. T. V. Wollaston read a paper on the British *Atomariæ*, in which twenty-three species are described as natives of this country.

Mr. Pascoe read a paper on Longicorn Coleoptera, being a continuation of that read by him at the Meeting in March last.

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January 26, 1857.

W. W. SAUNDERS, Esq., F.R.S., President, in the chair.

The 23rd Anniversary Meeting was held on the 26th inst., at the rooms of the Society, 12, Bedford Row.

Messrs. J. E. Gray, F. Grut, F. P. Pascoe, and T. V. Wollaston, were elected members of the Council, in the room of Messrs. J. Curtis, J. W. Douglas, F. Smith, and J. O. Westwood. W. W. Saunders, Esq., F.R.S., &c., was re-elected President; S. Stevens, Esq., F.L.S., Treasurer; and Messrs. E. Shepherd and E. W. Janson, Secretaries.

The Report of the Council for the year 1856 was read and received; the abstract of the Treasurer's accounts, as furnished by the auditors, showed a larger balance in hand than on any former anniversary.

The President delivered an Address on the affairs of the Society and the progress of Entomology, for which, and his courteous conduct in the chair, and on all other occasions, the Meeting passed a cordial vote of thanks, with a request that he would allow the Address to be printed.

Votes of thanks were also passed to the Treasurer and Secretaries, and the retiring Members of Council.

Part 3 of Vol. iv., n. s., of the Society's 'Transactions' was on the table.

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## ANNIVERSARY ADDRESS.

GENTLEMEN,

We have now reached another anniversary; and, in looking back at the last year's operations, the Entomological Society will be found quietly moving forward in the right direction, and carrying out the objects for which it was originally formed. Our meetings have been well attended, and rendered interesting by a great variety of objects relating to Entomology exhibited by our members. Our 'Transactions' have been regularly published, and the papers read at the meetings have been, without unnecessary loss of time, made public. The number of our members remains unaltered. We have to lament the death of three members, two ordinary and one foreign, and we have had some withdrawals; but against these we have had several names added to our list; and the vigour of the Society to do good work never appeared greater than at present. Our Treasurer,



to whom we are greatly indebted for the careful way our funds are superintended, reports a good balance in favour of the Society remaining in his hands, after the payment of all demands: so that there is good reason to be satisfied with the present position of the Society, and there seems to be a fair prospect that the Science for which we are associated may be still further advanced through its instrumentality.

One of the members whose death I have alluded to requires more than ordinary notice, as he was so well known to many of us, was so universally respected, had gained such reputation as a naturalist, and had for many years so well filled the Treasurership of this Society,—I refer to Mr. William Yarrell, whose sudden death was the subject of deep regret through the scientific world of this country, and whose memory will be long cherished by those who had the great advantage of a more intimate acquaintance with him. He was elected Treasurer on the 22nd of May, 1834, the year after the formation of the Society, and he continued to serve the Society faithfully during the long period of eighteen years, and until the year 1853, when he resigned his office, much to the regret of the members of the Society, and was succeeded by the gentleman who now so well fills the place of our lamented colleague. Mr. Yarrell, by his excellent judgment, conciliatory manner, and truly business-like habits, did good service to the Society and the Science of Entomology. His love for Natural History, and the careful way he noted all facts which came under his observation, gave him a certain knowledge of Entomology, although his brilliant talents had never been turned to the study of insects in the same way he devoted them to other branches of Zoology. So many around me esteemed Mr. Yarrell, and had a like admiration for his character and abilities that he scarcely requires praise at my hands; but still, as an old friend, I feel a pleasure in bearing testimony to his worth and to the great loss Science sustained in his unexpected death.

The name of Dr. Klug, honorary foreign member, deceased since the last anniversary, must not either be passed over without comment: his numerous contributions to Science have shown him to have possessed very first-rate talents as an entomologist, and his name will be handed down to posterity as one of the leaders in the ranks of Entomology during the first half of the nineteenth century.

The other member whose death we have to regret is Mr. C. Lamb, who was an ardent admirer of insects, and who possessed a very interesting collection, containing many rare and beautiful forms.

The three deaths named, with seven resignations, form a total of ten members and subscribers lost to the Society during the last year, and, in their stead, we have elected seven ordinary members and three subscribers, so our number of members and subscribers remains the same.

ELECTED IN 1856.	RESIGNED.	DEATHS.
Edward Armitage	Frederick Grant	William Yarrell (Life)
Ernest Adams	H. W. Newman	C. Lamb (Life)
Rev. G. W. Braikenridge	W. J. Wild	Dr. Klug (Hon. For. Member)
Rev. D. J. Drakeford	s. B. Labry	
H. S. Digby	s. H. V. Tebbs	
George Edwards	s. F. T. Hudson	
Alexander Haliday	s. J. Ingall	
s. E. W. Robinson		
s. J. Sang		
s. J. V. Yatman		
Members ..... 7	Members ..... 3	Life Members ..... 2
Subscribers ..... 3	Subscribers ..... 4	Hon. Foreign Member .... 1
—	—	—
10	7	3

Now, turning to our financial position, it will be perceived, by referring to the Treasurer's account, that the balance at present in the Treasurer's hands is £85 14s. 9d., with other monies due to him, reckoned at £10 10s., making a total of £96 4s. 9d., against which must be placed bills due £52, leaving a clear balance in favour of the Society of £44 4s. 9d. If we compare this with the position of the Treasurer's account at the last anniversary, we arrive at the fact that the balance in the hands of the Treasurer then was £74 19s. 5d., and a real balance in favour of the Society of £38 0s. 11d., so that, in both respects, we are a few pounds better off this year than last, which is a favourable state of the funds, seeing that an expenditure of £10 has been incurred during the past year in printing and colouring plates to make up a stock of the old series of the 'Transactions:' only

one set of the eleven thus made up has yet been added to the receipts of the Society.

The resignation of our late Secretary, Mr. Douglas, was received with much regret by the members of the Society, as, during the time he filled this important post, which imposed so much labour and trouble upon him, he made himself acceptable to all, and carried out the duties devolving upon him greatly to the advantage of the Society: he received the well-merited and cordial thanks of the Society for his services, and I trust he may long remain among our numbers, to be welcomed by his friends, and continue his entomological labours for the benefit of Science.

In the room of Mr. Douglas the Society has chosen Mr. Janson, a gentleman well known to us all as possessing great talents as an entomologist, and the qualifications of a good man of business, and who will, I feel sure, well fill the post allotted to him. The Society in electing Mr. Janson have done well.

It will be perceived, by referring to the Report of the Library and Cabinet Committee, that progress is making in carrying out the recommendation of the Committee, which was approved of by the Council and adopted by the Society at the last anniversary: this recommendation was to the effect that the foreign collection of insects belonging to the Society be sold, all typical specimens having been previously selected therefrom to be retained by the Society for reference, if necessary. It is in the making of these selections that some progress has been made, and yet much remains to be done, as the operation is a work of some labour, and requiring research and entomological knowledge to determine the specimens to be selected. The Committee ask the aid of those members who can render them assistance, and I trust their call will be responded to. Many valuable additions have been made to the Library during the last year, and as the Library must be regarded by all as of great importance to the welfare of the Society, it is to be hoped that no effort will be spared to render it as complete as opportunity and our means will afford. The additional space which will be available to the Library when the foreign collection of insects is parted with will materially assist in giving a better arrangement of the books, and rendering them of more easy reference. A good Library must be looked upon as one of the best means which can be adopted for pro-

viding entomological information to our members; and to be of use to the working entomologist, it should be supplied with books, especially periodicals, as soon after they are published as practicable: this latter point requires attention, as the present method of sending books to the Society from the Continent and other parts of the world is often a tardy process, and, looking to the accelerated means of transport now existing, it is clear that, by proper arrangement, much time might be gained, and an earlier delivery obtained.

In the 'Transactions' of the Society, published during the last year, will be found papers by Messrs. Baly, Newman, Westwood, Stainton, Lubbock and Pascoe.

Mr. Baly continues his descriptions of the Australian species of *Chrysomela* and *Phyllocharis*, and gives us characters of twenty-two new species and six new sub-generic divisions.

Mr. Newman treats on two undescribed species of Thrips, *viz.* *Idolothrips Halidayi* and *Phlæothrips Anacardii*, and on the characters of a few Australian Lepidoptera collected by Mr. Thomas R. Oxley: in this paper will be found descriptions of two new genera, *Bondia* and *Boydia*, dedicated to two zealous Lepidopterists, members of this Society, and of thirty new species.

Mr. Westwood contributes a paper on various species of the family *Pselaphidæ*, in which will be found descriptions of sixteen new species of this interesting family, illustrated with excellent characteristic figures. He also furnishes a paper on the Australian Lamellicorn genus *Cryptodus*, in which three new species are described, and all the known species brought together, forming a short monograph.

Mr. Stainton gives us descriptions of three species of Indian Micro-Lepidoptera, and a paper on "How the Onward Progress of the Study of Entomology may be best furthered."

Mr. Lubbock describes twenty-three new species of *Entomostraca*, collected by Dr. Sutherland in the Atlantic Ocean, and supplies figures in illustration of the specific differences.

Mr. Pascoe has a paper on various interesting Longicorns, giving characters of six new genera and sixteen new species.

It will be seen that the papers are on descriptive Entomology, except one by Mr. Stainton, and that the other branches of Entomology have not been touched upon, although such an extensive

field for investigation, and so full of interest, is open to entomologists.

If we look to what has been done for the advance of Entomology since the last anniversary, out of the Society, we must first turn to the National Collection at the British Museum, where we shall find great energy displayed, both in the publication of catalogues and in the continual addition of specimens to a collection which I believe to be unequalled for extent and richness. Feeling anxious to obtain the best information on this subject, I requested my friend Dr. Gray to give me a sketch of what had been doing in the collection under his charge, and he has kindly furnished me with the following details and observations. I give his report at length, rather than make any extracts from it, as it contains important information for entomologists, and I quite enter into Dr. Gray's views as to the great value and utility of the catalogues which have been published.

“The following additions have been made to the National Collection during the year:—

“Collection of insects from the banks of the Amazon, made by Mr. Bates.

“Insects of Borneo and other Eastern Islands, collected by Mr. Wallace and Captain Brooke.

“Insects from Hong Kong and Siam, collected and presented by J. Bowring, Esq.

“Many fine insects from N. India.

“Insects from the banks of the Euphrates, collected and presented by W. K. Loftus, Esq.

“Insects from Port Natal, collected by Messrs. Gueinzus and Plant.

“Insects of Moreton Bay, collected and presented by — Gibbons, Esq.

“Insects and Crustacea of Australia, collected by Mr. Stutchbury.

“Insects and Crustacea of Fiji Islands, New Hebrides, &c., collected during the voyage of H.M.S. Herald.

“Insects of Mexico, collected by M. Sallé.

“Insects of Columbia, collected by the late Mr. Stevens, of Bogotà.

“ Collection of minute Coleoptera, named by Dr. Maerkel.

“ Specimens of European Curculionidæ and other Coleoptera, named by Schœnherr and Germar; presented by John Walton, Esq.

“ Type specimens of Diptera described by Mr. Walker in the 3rd vol. of the ‘*Insecta Britannica*,’ and minute Diptera described by M. Winnertz; presented by F. Walker, Esq.

“ A series of parasites on bats, described and presented by Dr. Kolenati.

“ Insects of Fiji Islands, New Hebrides, &c.; presented by Sir John Liddell.

“ The following entomological catalogues have been published during the year :—

“ Mr. White: Catalogue of Longicorn Coleoptera.

“ Professor Boheman, of Stockholm: Catalogue of Cassidæ. List of all the species and descriptions of new species which he discovered (since the publication of his work in three volumes) in the British Museum and other English collections.

“ Mr. Smith: A Catalogue (illustrated with figures of the genera) of Sphegidæ, Larridæ and Crabronidæ.

“ Mr. Walker: Catalogue of Sphingidæ.

“ Mr. Walker: Catalogue of Noctuidæ, two parts, with descriptions of many new species. We may observe that the Museum collection contains most of the European and exotic species described by M. Guenée, and a large number of exotic species not known to that author.

“ Mr. Walton: Catalogue of British Curculionidæ, with the verification of the synonyms by actual comparison with Continental specimens or the opinions of the Continental authors themselves, from British specimens sent to them for examination.

“ Mr. Desvignes: Catalogue of British Ichneumons, being the first list of the species published from the examination of British specimens, the lists hitherto published being only a copy of Gravenhorst’s species, indicating by some mark those which were thought to be likely to inhabit this country.

“ There has been published also a second edition of Mr. Stephens’ List of British Lepidoptera, revised by Mr. Stainton and Mr. Shepherd, and a second edition of the Myriapoda, by the late Mr. Newport.

“ The collection is every day increasing in value, from the number of original types which are being collected together by that institution; this number being also daily increased by the publication of the catalogues, which renders all the specimens now existing in the collection, as the catalogues appear, to be type specimens of the species indicated or described in these catalogues. I consider them, and this is the light in which they are regarded by many zoologists both here and abroad, as one of the most important contributions to zoological science, and as being the nearest approach to a ‘*Systema Naturæ*’ that can at the present time be undertaken. The best men that can be procured, each working on the subject which he best knows, having at his command the largest and best arranged collection of all classes in Europe, and access to almost every work that has been published on the Science. They are not only labours of love, but works for which each author gets all the credit of his exertions, as the name of the author is always given, and he is encouraged to do his best and not hurry the work, by being paid a fair remuneration for his labour.”

The Society having resolved, at the last anniversary, to give up their collection of foreign insects, as before alluded to, the National Collection is now the chief and only really available one which entomologists have to refer to, and, looking upon it in this light, as well as that of its permanent character, while private collections may be said to be evanescent, I think it desirable that all lovers of our Science should do all in their power to make the National Collection as complete as possible, and there especially to deposit typical specimens, for the benefit of students in Entomology. I feel deeply the necessity of private collections to the working entomologist, and my observations must not be thought in any way to be directed against them: my only wish has been to call your attention to the claims the National Collection has upon us for our aid and assistance, as far as practicable. It would be a great boon to the entomologist if the collection now under consideration could be opened once a week, or once even every fortnight, during the evening, for a great many entomologists are occupied during the day in business, and are almost precluded from making any use of its treasures: what difficulties may be in the way of obtaining this result I do not know, but I feel sure those who have charge of the collection have every desire to render it as useful as possible to Science.

In the newly enlarged 'Journal of Proceedings of the Linnean Society' will be found a series of papers by Francis Walker, on the Diptera and Homoptera collected by Mr. Wallace in the Malay Peninsular of Borneo. These papers contain descriptions of various new genera and of new species to a considerable amount. The journal also contains a "Notice of a Poisonous Spider of New Zealand," by Thomas Ralph; "Some Observations on a supposed Species of *Pelopæus*," by E. Newman; "The Natural History of the Glowworm," by the late George Newport; "Description of a new Species of *Paussus* from Western Africa," "Notice of the Borer, a Caterpillar very injurious to the Sugar-cane," and "Notes on Insects producing Wax, from Port Natal and China," by J. O. Westwood; "Notice of a Specimen of Insect and Wax from China," by D. Hanbury; "On a New Organ of Insects," by J. B. Hicks, M.D.; "Remarks on some Habits of *Argyroneta aquatica*," by Thomas Bell.

In the 'Annals of Natural History' the following papers appear:—"Descriptions of three new Species of *Araneida*," by John Blackwall; "On the British *Diastylidæ*," by C. Spence Bate, with three plates in illustration of these small anomalous Crustaceans; "Monograph of the genus *Catops*," by Andrew Murray: sixty-three species are described and fifty-six outline figures are given: the paper concludes with the description of a new genus allied to *Catops* called *Caloptrichus*.

In the pages of the 'Zoologist,' beside the numerous interesting observations on the habits and localities of British insects which usually are to be found in this publication, is a paper by the Rev. Hamlet Clark, M.A., giving a "Synonymic List of the Species of British *Philhyrida*;" also papers on "Entomological Botany," by H. T. Stainton; "A List of British *Eupithecia*, with Notes on some of the Species," by H. Doubleday; "On the manner in which *Vespa rufa* builds its Nest," by F. Smith; "Notes on the Genus *Haliplus*," by J. A. Power, M.D.; "On Crustacea new to the British Fauna," by R. Q. Couch, with outline figures: the species described are *Axius sterynchus*, *Mysis Oberon* and *M. Lamornæ*.

The 'Natural History Review' contains papers by A. H. Haldy:—"On the Affinities of the *Aphaniptera* among Insects;" "Descriptions of the Larvæ of *Ochthebius punctatus* and *Diglossa*



Mersa;" "Notice on Larvæ infesting the Horns of *Oreas Canina*," with a plate; "Notice of two Irish Dipterous Insects;" "Remarks on Moths which cause destruction in Granaries," by J. Haughton, jun.; and other entomological information.

Mr. Hewitson has concluded his first volume of *Exotic Lepidoptera*, and I am happy to state that, notwithstanding the great labour such a work entails upon him, he has been persuaded to go on with a second volume, which I have no doubt will be as well worthy of praise as the first. The editing of the *Exotic Lepidoptera* is such a work of love with Mr. Hewitson, that his labours cannot fail of being acceptable to all who are interested in the study of the *Lepidoptera*. The plates are unequalled for fidelity and beauty of finish, and treating as the work does almost entirely of new species, the entomologist sees before him in its pages a life-like representation of most of the finer forms of *Lepidoptera* which have been lately received from collectors, and done so much to enrich our cabinets.

The exertions of Mr. Stainton to render the study of British Entomology more popular is deserving of notice and praise. He has devoted the pages of a weekly periodical to this purpose, and, under the name of the 'Intelligencer,' has opened a rapid means of communication between entomologists, and much information regarding the habits, economy, and the localities of insects especially, has been spread far and wide. The 'Intelligencer' was only continued during the summer months, and had a very extensive circulation. It will be resumed again, I understand, when the season opens for entomological exertions in the field.

With the same view, Mr. Stainton publishes another 'Entomologist's Annual,' with a good plate and much useful information. The work is published very cheaply, so as to give it a wide circulation: it contains "Observations on the Aculeate Hymenoptera," by F. Smith; "Synopsis of British Dragon-Flies," by Dr. Hagan; "Notes on British Geodephaga," by Mr. Dawson; "New British Species of Coleoptera and Observations on the Myrmecophilous Coleoptera," by Mr. Janson; "New Species of British Lepidoptera in 1856," by Mr. Stainton; "How Insects Breathe," by Mr. Lubbock; and other minor matters of interest.

The 'Educational Sheet of Butterflies'; "a cheap set of figures of British Lepidoptera for the use of schools and beginners," published also by Mr. Stainton, being another step in the popular move, requires a notice, as the figures are well executed and very characteristic. The method of teaching through the eye is good, if the representations of objects are faithful, and the idea of such good and cheap figures as are given by Mr. Stainton deserves praise: in the sheet under consideration there are twenty-seven figures of Lepidoptera for the small sum of twopence.

Mr. Stainton's 'Manual of British Butterflies and Moths' is likely to be a good and cheap assistant to any one studying the Lepidoptera of these Islands. Such a work was much wanted, and when completed will detail the author's views on the nomenclature of our species, which are somewhat at variance with those of other authors who have treated on the Lepidoptera.

The 'World of Insects,' by Mr. Douglas, is a work conceived in the same spirit as those of Mr. Stainton, just noticed, and contains a great variety of information on insects generally, conveyed in such a pleasing and popular way as likely to make Entomology agreeable to the world at large, and to induce many to look more deeply into Entomology as a charming pursuit, capable of giving much mental pleasure.

Here should also be mentioned Mr. Shield's 'Practical Hints respecting Moths and Butterflies, with Notices of their Localities;' a little work full of information on the subject of the Lepidoptera, and very useful to any one who wishes to become a good collector of our butterflies and moths.

In the same series of popular works, the 'Substitute' also ranks: it is a weekly paper, looking very like a continuation of the 'Intelligencer,' but by another editor, whose name has not transpired. It is published professedly as a "substitute" for the 'Intelligencer,' and will be discontinued when the latter paper again resumes its place. It contains, like the 'Intelligencer,' much information on the localities, habitats, &c. of British insects.

Mr. Wollaston's 'Treatise on the Variation of Species, with especial reference to the Insecta,' is a work of no ordinary merit.

It is an excursion, if I may say so, into a new field of entomological research, well treated, philosophical, and with many valuable facts bearing on the science of Entomology, and especially that much-neglected branch of the study of insects, namely, their geographical distribution, and the changes effected in species by the various differences of habitat, food, temperature, light, and other circumstances. Mr. Wollaston's work should be carefully read by all entomologists, those who study specific differences especially.

Mr. Dallas's 'Popular Introduction to Entomology' is progressing, and when finished will be found a useful and readable volume. Mr. Dallas's capabilities as an entomologist are well known, and he will, doubtless, conduct his labour so as to produce a work which will be both popular, and, at the same time, scientific.

There are many works for young people, especially on the subject of Entomology, containing so-called instruction, which is worse than useless, leading the reader altogether astray and filling the mind with false ideas and wrong impressions. It is only quite recently that a little work was given to one of my children, beautified with green and gold externally, published by Darton and Co., Holborn Hill, and called 'Natural History; or, a Short Introduction to Animated Nature.' The arrangement of the subjects treated is very remarkable among the insects; the spider being placed next the flea; the bug next the woodlouse, and then comes the arborescent water-flea, which is followed by the scorpion, centipede and leach: further on we find earwig, ephemera and butterfly, in consecutive order, and the common fly placed between the Ichneumon fly and the ant. The article Insects is illustrated with two plates; the second containing five figures, three of which are wrong: two Diptera are given as representations of the bee, and a third Dipterous insect is called "wasp." A good and cheap popular introduction to insects is surely much wanted.

The Entomological Society of London has now been established twenty-two years; the first General Meeting having taken place on the 22nd of May, 1834. It has, during this period, brought out eight volumes of 'Transactions,' and done other good service to the cause of Entomology, of which it may be proud; but still in these moving times when more is expected of men than heretofore, and

Science is looked upon, not merely as a dry system of facts classed and well arranged, but as aiding and assisting in the various labours of the bulk of mankind, the Society must render itself useful to be valued by the public. Taking this view of the case, and in no way wishing to see a discontinuation of the valuable papers on descriptive Entomology, so many of which will be found in our 'Transactions,' I am anxious to direct the attention of our members to the importance of attending more to the natural-history of insects; their habits and economy; their bearing upon man, as injuries effected or beneficial results produced; to show, in fact, that the entomologist is capable of working for the good of those around him. This branch of Entomology will be found to possess peculiar charms, drawing the student into the fields, and there, with the great book of Nature open before him, he will find much to interest, much to observe, much to instruct, and he will, moreover, with observations, well directed, be able to bring home a store of knowledge useful to himself and his fellow-men.

I cannot conclude, without offering to the officers of the Society and the members at large my best thanks for the kindness I have experienced at their hands during the last year, and proffering my best wishes for the prosperity of the Entomological Society and the advance of that Science to which I have been so many years devotedly attached.

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*Report of the Library and Cabinet Committee, received and adopted  
by the Council, January, 1857.*

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WE beg to report the Collections and Library remain in good preservation; while the important additions made to the latter renders it necessary that additional book-cases should be provided.

The selection of the type specimens from the Collection of Exotic Insects, with the view of preparing the remainder for sale, as recommended by this Committee in their Report of last year, and approved by the Council and Society at the Anniversary Meeting, has been proceeded with, and many of them were drawn from the Collection; great difficulty is, however, experienced in this task, and we most earnestly solicit the assistance of those Members who may be conversant with the various groups and orders, so as to insure the preservation to the Society of all the types extant in the Collection, feeling that, without such aid, it will be impossible to guarantee that all type specimens have been selected.

(Signed)

W. WILSON SAUNDERS, President.

J. W. DOUGLAS.

FRANCIS P. PASCOE.

FREDERICK SMITH.

EDWIN SHEPHERD.

*Abstract of the Treasurer's Accounts for 1856.*

## RECEIPTS.

	£	s.	d.
By Balance on hand, January 1, 1856 .....	74	19	5½
„ Arrears of Subscriptions .....	4	4	0
„ Subscriptions for 1856 .....	112	7	0
„ Admission Fees .....	12	12	0
„ Compositions .....	15	15	0
„ Tea Subscriptions .....	10	4	0
„ Sale of 'Transactions' at Rooms, &c. .... £24 2 7			
„ „ „ at Longmans' ..... 39 13 10			
			<hr/>
	63	16	5
„ Cash of Mr. Lubbock, share in paper .....	0	18	0
			<hr/>
	£294	15	10½

## PAYMENTS.

	£	s.	d.
To paid arrears for 1855:—Mr. Smith, for Plates .....	£4	10	0
Mr. Westwood, for Plates .....	4	0	0
Messrs. Roworth, for Printing .....	10	3	0
Mr. Dunn, for Oil .....	4	11	6
Mr. Yates, for printing Plates .....	2	16	3
Rent to Christmas, 1856 .....	20	0	0
			<hr/>
	46	0	9
„ Rent to Midsummer last, two Quarters .....	20	0	0
„ Insurance to Lady-day, 1857 .....	2	10	0
„ Curator for attendance .....	18	4	0
„ „ Sundry small payments .....	0	8	1
„ Tea, thirteen Meetings .....	13	13	0
„ Attendance, Coals, Cleaning, &c. ....	5	6	9
„ Postage, Parcels, Stationery, &c. ....	5	16	1
„ Printing 'Transactions,' two parts .....	28	6	6
„ „ 'Proceedings,' &c. ....	14	7	9
„ „ Plates, &c. ....	20	2	9
„ Colouring ditto .....	15	0	11
„ Engraving ditto .....	19	4	6
Balance in hand .....	85	14	9½
			<hr/>
	£294	15	10½

*Liabilities and Assets of the Society.*

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<i>Liabilities.</i>	<i>£ s. d.</i>	<i>Assets.</i>	<i>£ s. d.</i>
Messrs. Roworth, for Printing, two parts .....	15 16 0	Arrears of Subscriptions, good .....	10 10 0
Mr. Standish, for Colouring	2 1 0	Ditto, doubtful £18 18 0	
„ Day, for Plates.....	5 0 0	Add balance in hand .....	85 14 9½
„ Bright, for cleaning Lamps .....	0 13 0		<hr style="width: 10%; margin-left: auto; margin-right: 0;"/> £96 4 9½
„ Dunn, for Oil .....	4 3 0	Less Accounts due at Xmas.	52 0 0
„ Clyde, for Bookbinding	4 7 0		<hr style="width: 10%; margin-left: auto; margin-right: 0;"/>
Rent to Christmas .....	20 0 0	True Balance in favour of the Society .....	£44 4 9½
	<hr style="width: 10%; margin-left: auto; margin-right: 0;"/> £52 0 0		<hr style="width: 10%; margin-left: auto; margin-right: 0;"/>

February 2, 1857.

H. T. STANTON, Esq., V.P., in the chair.

The Secretary read a letter from the President of the Society, W. Wilson Saunders, Esq. (who was absent through indisposition), in which he nominated as Vice-Presidents for the year Dr. J. E. Gray, H. T. Stainton, Esq., and T. V. Wollaston, Esq.

*Donations.*

The following donations were announced, and thanks ordered to be given to the donors:—‘Memoirs of the Royal Academy of Sciences of Madrid,’ Natural Sciences, Tome ii. Part I.; Physical Sciences, Tome i. Part I.; presented by the Academy. ‘Exotic Butterflies,’ Part XXI.; by W. W. Saunders, Esq., F.R.S. ‘Proceedings of the Zoological Society,’ Nos. 310—313 inclusive; by the Society. ‘Monograph of the Genus *Catops*,’ by Andrew Murray, Member of the Royal Physical Society of Edinburgh, &c.; by the Author. ‘The Natural History Review,’ 1857, No. 1; by the Dublin University Zoological Association. ‘Bibliotheca Historico-Naturalis,’ Vol. v. Part II.; by the Editor, Herr Ernst A. Zuckold. ‘List of the Specimens of Lepidopterous Insects in the Collection of the British Museum,’ by Francis Walker, Esq., F.L.S., Part X. Noctuidæ; by the Author. ‘The Zoologist’ for February; by the Editor. ‘The Literary Gazette’ for January; by the Editor. ‘The Journal of the Society of Arts’ for January; by the Society. ‘A Manual of British Butterflies and Moths, No. 12; ‘Elements of Entomology,’ No. 5; ‘The Substitute,’ Nos. 12—15; by H. T. Stainton, Esq.

*Election of a Subscriber.*

C. J. Biggs, Esq., of Blenheim Cottages, South Hackney, was balloted for and elected a Subscriber to the Society.

*Exhibitions.*

Mr. Stevens exhibited some beautiful Lepidoptera, which had lately arrived in this country, taken by Mr. Bates in the Upper Amazons; and observed that although the box containing them had been despatched by Mr. Bates in July last, from Ega, more than 1500 miles from the mouth of the Amazon, yet the insects were in the most excellent condition. Of these he called attention to *Callithea Batesii*, and to a splendid undescribed species, closely resembling it in colour and markings, but presenting a striking difference in the form of the club of the antennæ; also to the extraordinary dissimilarity in the sexes of a beautiful species of *Epicalia*, and to a fine female *Agrias*, probably the female of *A. Phalcidon*, *Hewitson*. In the box were also a fine series of *Erycinidæ*, and some remarkable species of *Tortrices* and *Tineæ*, being the first specimens of these two last-named families which have reached this country from that far-distant locality.



Mr. Janson exhibited specimens of *Bledius unicornis*, *Germar*, from the collections of Messrs. Parfitt and Wollaston, and read the following notes:—

“I beg to exhibit *Bledius hispidus*, *Parfitt* (*Zool.* 5409), the pair from which Mr. Parfitt drew up his description, and which he has obligingly transmitted me for examination. This is the insect alluded to by Mr. Westwood at the October Meeting of the Society; and I must express my regret and surprise that the information supplied by Mr. Westwood should have induced Mr. Parfitt to describe it as a new species, when it has been well figured, some thirty years since, by Germar in ‘*Fauna Insectorum Europæ*,’ fas. xii. tab. 3, and unmistakeably described by Dr. Erichson in his ‘*Genera et Species Staphylinorum*,’ both of which standard works doubtless grace the shelves of Mr. Westwood’s splendid entomological library. Complaint is frequently made that the entomologists of this country, satisfied with determining their insects from named collections, never or seldom refer to books, and that thus error is perpetuated. But if those occupying the foremost rank in our Science, with every facility at their command, evince such manifest disinclination to consult books, what can be expected of those who are deprived of these facilities? I would enjoin, at all events, those who, prefixing an asterisk to their names in the authorized ‘*List of Entomologists*,’ proclaim themselves teachers, to bear steadfastly in mind the hackneyed adage, ‘*Example is better than precept*.’

“I may perhaps be permitted to adduce the present insect as a proof of the disinclination to furnish, if not actual disposition to conceal, that information which all must be very well aware is of primary importance to the successful accomplishment of the task which I have undertaken, of drawing up a Synonymic List of the British Coleoptera, and which, I regret to state, has been most unmistakeably evinced by those who were most clamorous for the publication of that List, the most invective at the delay in its appearance, and, above all, by those who had promised me their hearty and unreserved co-operation, for which I pledged myself they should have at least the full share of credit, and, failing which, I should certainly not have entered on that arduous, and, I must admit, now odious, task. Of the insect now exhibited Mr. Parfitt captured five individuals, of which he presented three to London entomologists; yet when preparing my notice of new species for this year’s ‘*Annual*’ I was unable to ascertain anything relative to the ‘*new British Bledius*,’ and had not Mr. Parfitt consented to commit his only pair (and which, as the types of his description, were very valuable to him) to the ruthless custody of the post-office, I should not even now have been able to bring under your notice the following illustration of the fate which appears to be the almost inevitable attendant on the ascertained indigenoussness of a species, namely, condemnation to trail evermore behind it an unsightly, trouble-giving train of synonyms. The nomenclature of the present insect will now stand thus:—

*Bledius unicornis*, *Germar*, *Erichson*, *Gen. et Spec. Staph.* vii. 764, 7 (1840).

*Oxytelus unicornis*, *Germar*, *Fauna Insect. Europ.* fas. xii. f. 3 (1828).

*Bledius hispidus*, *Parfitt*, *Zoologist*, 5409 (1857).

*Bledius cornutus*, *F. Smith*, *in litteris*.

Hence it is seen that a species universally recognised abroad during upwards of a quarter of a century, well figured and admirably described, is no sooner found in Britain than, in a few short weeks, it is shackled with two synonyms,—a fact which certainly reflects no credit on the entomologists of this country, and which cannot tend

to augment the respect of our Continental brethren, or to raise Entomology from the low level in the scale of the Sciences which she is doubtless doomed to occupy until her votaries consent to devote some share of that shrewdness and zeal which they so conspicuously manifest in the acquisition of specimens to the arrival at and adoption of a correct and legitimate nomenclature, and the higher objects to which collections should be subservient, and to which this is assuredly the true prelude. In conclusion, I will observe that *Bledius unicornis* was captured by Mr. Wollaston at the Chesil Bank and Exmouth Warrens several years back, and that I long since thus designated the specimens in that gentleman's collection."

Read the following, by Mr. Newman:—

*Note on Pairs of Species of British Lepidoptera which are Heterocampous and Isomyious.*

"I have endeavoured to prove that Nature has a tendency to assimilate, in the external characters of the adult, certain beings, which, in the earlier, or, as we may express it, preparatory stages of their existence, have little or no apparent similarity to each other. Such assimilations, when they do occur, are always in pairs, and familiar examples will occur to every one in the placental and marsupial sucklers, the hesthogenous and gymnogenous birds, the metamorphic and immutable reptiles, the viviparous and spawning fishes. Descending from larger to smaller groups, we find such pairs becoming still more pronounced, and the supposed law or principle still more strikingly exhibited. It has occurred to me that such a law or principle cannot be partial: if it exist in Nature it must be general, and must descend even to species. After a moment's reflection it struck me, further, that the European, and perhaps even the British, Lepidoptera might afford a ready means of testing the value of my theory. I argued to myself that if such pairs existed in Europe they must be known to a Guenée; if in Britain they must be familiar to a Doubleday, a Shepherd or a Douglas. Both on the Continent and in Britain, Lepidoptera have been studied with a perseverance and a success that has far outstripped the results arising from attention to any other insects; bees, ichneumons, Brachelytra, Rhynchophora, although the objects of especial research, are literally unknown in comparison with our indigenous Lepidoptera, and this principally because Lepidoptera are studied in all their stages, the others only in one: the study of Macro-Lepidoptera has become deeply philosophical; that of other insects at present remains comparatively superficial. Hence I can only appeal to the lepidopterist: the general (another term for the superficial) entomologist cannot comprehend my drift. Let a lepidopterist open his breeding-cages, and exhibit to a general entomologist the larvæ of *Acronyeta Psi* and *A. tridens* (to him 'familiar as household words'), of *Calocampa vetusta* and *C. exoleta*; and let the lepidopterist tell the entomologist that these four larvæ produce two pairs of moths, of which the individuals composing each pair are so similar that he (the entomologist), with all his knowledge, with all his book-learning, could not distinguish between them; that it required the utmost subtlety in the eye of the lepidopterist himself to distinguish them, and defied the powers of his pen to differentiate them: the entomologist would simply exhort the lepidopterist to greater care in his observations, and caution him against adopting theories which could not be supported by an appeal to Nature; the entomologist, in the most friendly spirit, would point out the differences of form and structure in the larvæ; would probably select *Psi* and *tridens*; would call the lepidopterist's particular attention to the dorsal column on the larva of

Psi, absent altogether from tridens; and, indulging benignantly in improving platitudes about general principles, affinity and analogy, extended range of observations, and so forth, would probably leave the bewildered lepidopterist under the idea that there was something, some unknown property, in Science that entirely superseded truth and fact, and that was far beyond the reach of his limited capacity. To go a step further, if the lepidopterist pertinaciously adhered to the truth, and exhibited the perfect insects of Psi and tridens, then the entomologist would infallibly turn on his heel, 'more in sorrow than in anger,' and leave the lepidopterist in his error, convinced that it was useless to argue with one whose ignorance was so 'crass.' In all this the lepidopterist is right; he has assiduously worked mines of knowledge, the very existence of which are unknown to the entomologist. Even in our British Lepidoptera there are numbers of pairs which require the most highly educated eye to separate them correctly. Let the inquiry be instituted; and from this inquiry must be eliminated *in toto* all questionable species, all instances of abnormal form and colour; all seasonal, climatal, altitudinal, latitudinal, geographical, geological or other acknowledged sources of variation; all second generations in the same year: those natural witnesses only should be examined which, living on the same spots, at the same time, and under the same conditions, originate from different eggs, differ totally in the larva, and approach almost to identity in the imago. I think it is absolutely impossible to examine a rich collection of British Lepidoptera without being struck with the constant recurrence of such pairs. I will cite a few examples.

Argynnis Adippe and A. Aglaia	Tæniocampa Populeti and T. instabilis
Argynnis Selene and A. Euphrosyne	Glæa Vaccinii and G. spadicea
Sesia bombylifformis and S. fuciformis	Dianthecia capsicola and D. Cucubali
Anthrocera Loniceræ and A. Trifolii	Xylina petrificata and X. semibrunnea
Procris Statices and P. Globulariæ	Calocampa exoleta and C. vetusta
Lithosia complana and L. complanula	Cucullia Scrophulariæ and C. Lychnitis
Porthesia auriflua and P. chrysoorrhœa	Catocala promissa and C. sponsa
Clisiocampa neustria and C. castrensis	Brephos Parthenias and B. notha
Notodonta dictæa and N. dictæoides	Tephrosia crepuscularia and T. laricaria
Acronycta Psi and A. tridens	Ypsipetes ruberaria and Y. impluviaria
Caradrina blanda and C. Alsines	Cheimatobia dilutaria and C. autumnaria

I have a list of seventy-four other pairs; but these are sufficient for my purpose, and I think it will be difficult to explain away their teaching. I have already anticipated some objections: I will allude to others. It is said, in the instance of Psi and tridens, that on the North-American continent four, that is two pairs, of Acronyctæ exist which approach our British ones so closely that a complete series is thus established; there is also a solitary European species, *cuspis*, which seems to be allied to all the others. These facts do not appear to me to militate against the view I have taken of the prevalence of pairs: perhaps one of the North-American pairs may be identical with our Psi and tridens, and the other pair quite distinct; but I learn that no pains have been yet taken to distinguish the larvæ of these species: the continental *cuspis* standing somewhat isolated is no objection, as I do not say that all species are associated in pairs, but only that some are so. Again, I cannot admit the doctrine of chance, that the correspondence between two species is a mere matter of accident. Finally, to the question of the general entomologist, 'Are these pairs really composed of two

distinct species?' I reply that this is established beyond all question by the difference of the larvæ."

Mr. Stainton observed that this theory of pairs would be completely upset if the list were extended to European Lepidoptera, as there would be found in many instances Continental species quite as closely allied to the pairs mentioned as these British species are to each other.

Mr. Westwood said that he had heard, for the first time, a theory proposed, capable, as was asserted, of being tested by the productions of a limited geographical range like Great Britain. He had supposed it to be generally admitted that a knowledge both of existing and extinct forms was requisite for the proposition of natural laws. Was it intended that in each country throughout the world these double species should occur? Was it only in the Lepidoptera they were to be looked for? Was it intended that each species should be thus divided, as it were, into two sub-species? Moreover, in the instances cited, it was evident Mr. Newman had adduced relations of analogy, supposing them those of affinity. No one could support such a theory. Was it intended that each species should be attended by another species intimately allied to it? No one ever doubted such a principle. In the opening part of his paper Mr. Newman had alluded to the binary divisions of the highest groups, such as Vertebrata and Invertebrata, Ptilota and Aptera, &c.; but in the latter part he had confused these relations (vague as they often were) with the closest possible affinity that could exist in Nature, exclusive, of course, of that between individuals of the same species.

Mr. Lubbock considered that binary divisions in classification resulted from the convenience arising to classifiers, and not from any law of Nature, and that the "pairs" mentioned by Mr. Newman could only prove that each species has some one other species more nearly allied to it than are the rest of its congeners.

#### *New Crimean Carabus.*

Mr. Douglas read the following paper, intituled 'Characters of an apparently undescribed Crimean Carabus, taken by Lieutenant Thomas Blakiston, of the Royal Artillery; by Mr. Newman:—

#### "CARABUS BLAKISTONI, *Newman.*

*"Niger, prothoracis elytrorumque marginibus chalybeo-purpureis: prothorax fere quadratus, lateribus subconvexis paullo dilatatis, paullo reflexis, marginibus antico et postico excavatis, angulis posticis paullo productis, dorso scabro inæquali: scutellum reconditum: elytris latis, amplis, convexis, utroque 13striato, spatioque laterali intus marginem reflexum scabro, striis profunde punctis, interspatiis elevatis carinaformibus, 3tio, 7mo, 11moque foveis nonnullis magnis interruptis. (Corp. long. 1·2 unc. elytrorum lat 55 unc.)*

"Colour black, slightly shining, with a steel-blue tint in the furrow, caused by the reflexed margin of prothorax and elytra. The prothorax is almost square, the lateral margins slightly convex, slightly dilated and slightly reflexed, the anterior margin concave, its angles rounded, the posterior margin also concave, each of its angles produced into an obtuse tooth. Scutellum hidden. Elytra ample, convex, each with 13 deeply and regularly punctured striæ, the interspaces distinct, elevated and shining: they are entire, with the exception of the 3rd, 7th and 11th, counting from the suture, and each of these is interrupted by 7 or 8 large deep fovæ.

“Taken in the Crimea, by Lieutenant Thomas Blakiston, of the Royal Artillery, an officer whose exertions in the cause of Natural History are above all praise, and whose admirable papers on the birds of the Crimea are now in course of publication in the ‘Zoologist.’ The specimens will be placed in the cabinet of the British Museum, with the fine series of Russian Carabi, with which they have been already carefully compared.”

Mr. Waterhouse hoped this insect had been very carefully compared with closely allied species, to ascertain if really new, before venturing to describe it under a new name. He considered such descriptions no advancement to Science.

Mr. Wollaston observed that some time since he had discovered, by a mere accident, that black lacquered pins would not corrode when used to pin insects liable to grease, and that Mr. Bond had also used them with an equally satisfactory result. Mr. Baly had received some ants from Vienna impaled with varnished pins; none of these had corroded, although, as was well known, no insects were more likely to cause corrosion than ants.

Mr. Stainton remarked that lacquered pins had for some time past been in very general use in Germany, and, he believed, were found to answer the desired end.

Mr. Westwood made some observations on mouldiness in insects, and referred to a communication, read at a Meeting of the Society a few years back, on the difficulty or impossibility of preserving entomological specimens in some parts of North America, owing, as was alleged, to everything preserved in closely shut receptacles becoming covered with mould during certain states of the atmosphere. In contradiction of this statement Mr. Westwood observed that the North-American insects collected by Dr. Abbott reached this country in most admirable order.

Mr. Wollaston said he could not keep insects in Madeira shut up in boxes, even for a month, without becoming covered with mould; nothing would prevent it but constant exposure to the air. He believed this was more likely to occur in small islands than far inland.

Mr. Walker read a paper entitled ‘Characters of undescribed Diptera in the Collection of W. W. Saunders, Esq.’

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March 2, 1857.

W. WILSON SAUNDERS, Esq., President, in the chair.

*Donations.*

The following donations were announced, and thanks ordered to be given to the donors:—‘The Journal of the Royal Agricultural Society of England,’ Vol. xvii. Part 2; presented by the Society. ‘Proceedings of the Royal Society,’ Vol. viii. Nos. 23 and 24; by the Society. ‘Entomologische Zeitung,’ 17th Annual Part (1856), and Nos. 11 and 12 for November and December of the same year; ‘Linnæa Entomologica,’

Vol. xi.; by the Entomological Society of Stettin. 'Monographia Cassididarum,' auctore Carolo H. Boheman, Tomus tertius; by the author. 'Anniversary Address delivered to the Berwickshire Naturalists' Club, at Berwick, January 30th, 1856, by Robert Embleton, Surgeon, President;' by the Club. 'Nouvelles Considérations sur la Nidification des Guêpes,' par H. De Saussure; by the Author. 'Über eine neue Fliegengattung: Raymondia, aus der Familie der Coriaceen, nebst Beschreibung Zweier Arten derselben, Von Georg Frauenfeld; by the Author. 'The Zoologist' for March; by the Editor. 'The Journal of the Society of Arts' for March; by the Editor. 'The Literary Gazette' for March; by the Editor. 'The Athenæum' for January; by the Editor. 'Elements of Entomology,' No. 6; 'A Manual of British Butterflies and Moths,' No. 13; 'The Substitute,' Nos. 16—19; by H. T. Stainton, Esq. 'Revue et Magasin de Zoologie,' 1856, No. 12; 1857, No. 1; by the Editor, M. F. E. Guérin-Méneville. A cabinet containing British and foreign insects; by T. F. Dillon Croker, Esq.

#### *Election of a Member.*

T. F. Dillon Croker, Esq., F.G.S., of 6, Strand, was balloted for, and elected a Member of the Society.

#### *Exhibitions.*

Mr. Wallace exhibited two specimens of *Laphygma exigua*, bred from eggs laid by a female taken in the Isle of Wight, in July last; and read the following description of the larvæ:—

"Pinkish brown on the back, pinkish yellow underneath; a row of black spots down the back, two rows on each side, between which are white spiracles, or rather a darker ground than that outside the rows of black spots; head and tail greenish. Length, when full-grown, about 1 inch. Fed on plantain, remaining during the day rolled up in the leaves or roots. The eggs were laid about July 18, and hatched in three weeks; larvæ full-fed about September 12; and the perfect insects now exhibited emerged October 20."

Mr. Douglas exhibited some small lepidopterous larvæ found at the roots of grass. He stated that he had lately taken a number of larvæ and Coleoptera, especially Staphylinidæ, in marshy ground at Hammersmith, by cutting off grass below the surface of the ground, and shaking it over a sheet of paper. Great numbers of insects appear to hibernate in such situations. Amongst the Coleoptera thus taken were several specimens of the rare *Anchomenus Thoreyi*.

Mr. Stevens exhibited some drawings of larvæ of Natal Lepidoptera, made by Mr. R. W. Plant, and also the perfect insects bred from the larvæ represented, amongst which were several fine species of Bombyces and a new species of *Acræa*, the larva of which was represented armed with long, branched spines, and is interesting from the fact of the larvæ of this genus having hitherto been unknown.

Mr. Were read the following, by Mr. Newman, exhibiting the specimen described:—

#### *Remarkable Variety of Arctia Caja.*

"Sex male. Head, antennæ, tippets and abdomen have the normal colouring; all the other parts and colours abnormal; the prothorax, mesothorax, fore wings and entire disk of the hind wings a uniform brown, of that character which is frequently

called mouse-coloured; there is not the slightest trace of the four colours (velvety unber-brown, cream-colour, intense purple-black and bright red) which usually adorn this beautiful insect; at the base of the hind-wings and along the abdominal margin are long, hair-like scales, of the normal red colour; beneath, the same uniform mouse-colour pervades the entire surface of the wings, except the base of the hind-wings, which is paler, and has the same long, red hairs which I have described on their upper surface. The wing-rays are remarkably prominent, and appear of a darker brown than the interspaces; but this apparent difference of colour I attribute solely to their prominence."

Mr. Westwood exhibited a large larva (apparently of a Sphinx) preserved in spirits. The species is said to cause great injury to the maize crops on the Parania River, in South America. He also exhibited a *Nonagria*, from the collection of Mr. Wollaston, the larva of which is very injurious to the sugar-cane in Madeira. Mr. Westwood observed that this insect is quite distinct from the species which damages the cane in the West Indies, which latter was originally introduced from Ceylon.

#### *Structure of the Tarsi in Insects.*

Mr. Westwood exhibited an extremely minute species of Coleopterous insect, of which several specimens were captured in the Island of Madeira by T. V. Wollaston, Esq., who had placed them in his hands for examination. The species belonged to the same small group as the genus *Orthoperus* of Stephens, and several other minute genera illustrated in Mr. Wollaston's '*Insecta Madeirensia*,' all of which were interesting on account of the structure of their tarsi. After referring to the additional interest attaching to the study of the modifications of structure of insects, or indeed of any other tribe of animals, consequent upon the investigation of homologies and the tracing of various structures to some normal type, Mr. Westwood referred to the modifications in the structure of the tarsi of Coleopterous insects, which he considered typically to consist of five joints; it was consequently interesting to know how one or other of these joints became lost in certain beetles whose tarsi possessed fewer than five joints, and whether this loss was effected either by the absolute want of a joint, or by its existence, in a coalesced state, with one or other of the existing joints. The great division of pseudotetramerous Coleoptera was then referred to by Mr. Westwood, who considered it an excellent and natural division, sufficient of itself to prove the excellence of the tarsal system. This division contains the great mass of vegetable-feeding insects, consisting of the three great families of Longicorns (*Cerambyx*, *Linn.*), with a long body and long, straight antennæ; the weevils (*Curculio*, *Linn.*), with a short body and generally elbowed antennæ; and the Phytophagous beetles (*Chrysomela*, *Linn.*), with a short body and short, straight antennæ. The intimate connexion between the families Curculionidæ and Chrysomelidæ was proved by such genera as those described by Lacordaire, as *Phytophagous*; and by Schönherr, as *Curculionideous*; as well as by *Carpophagus* and *Rhæbus*; whilst the connexion between the Longicorns and Chrysomelidæ was effected by the Australian genus belonging to the *Acrocerides*, but having entirely the appearance of the *Lepturides*, as well as by *Donacia* and its allies. All these insects, from the nature of their mode of life on plants, require a firm footing, and their tarsi are consequently dilated, and furnished beneath with pads. This is the case with the three basal joints; but the fourth joint, either on account of the large size of the three preceding joints, or in order to

strengthen the terminal claw-joint, was of a very small size, and was generally soldered to the base of the claw-joint. Here, then, could be no doubt that the fourth joint was becoming, as it were, obliterated; so that it would be easy to conceive a pseudotetramerous insect in which the soldering of the two terminal joints had become so close that all trace of the articulation would be lost; and if this occurred simultaneously with the narrowing of the basal joints we should have before us the hind-foot of a heteromerous insect. The insect under examination presented a different mode of the gradual top of a joint. The tarsi consisted of a short joint, rather swollen at the base of the foot, having several bristles placed obliquely at its extremity beneath. This is followed by a long, simple joint, obliquely truncated at its tip, with several bristles inserted obliquely at its extremity beneath, and having a very indistinct trace of articulation across the middle; it is nevertheless, however, furnished on the under side, at the point where this central articulation should take place, with one or two fine bristles, like those at the extremity of the basal joint. There then follows a small but distinct joint, at the end of which the long claw-joint is fixed. Here, therefore, the apparent loss in the number of joints was caused by the soldering together of the second and third normal joints. In its general form, and the number of joints and form of the antennæ, the insect is closely allied to the genus *Orthoperus*; there are, however, certain modifications of structure in the palpi which require further examination before we can definitely refer the insect to that genus. It was, however, important to determine what bearing this structure of the tarsi would have upon that of the genus *Orthoperus*, more especially since it was from various observations on this part of the structure of that genus that it had been regarded as a separate genus by Heer, who had named it *Pithophilus*, and by Redtenbacher, who called it *Microsphæra*. On examining some specimens of the legs of the common British species of *Orthoperus*, mounted in Canada balsam by Mr. Wollaston, we found the same general proportion of the joints; but the articulation between the short basal joint and the long second joint was almost lost; whilst the almost obsolete articulation in the middle of the long second joint, in the Madeira species, was quite distinct, the two terminal joints being alike in both. Although, however, the basal joint appeared lost by coalition with the second joint, there still remained evidence of its existence, in the presence of a small, oblique bristle on the under side of the foot, just where the extremity of the basal joint might be looked for. The two structures, therefore, illustrated each other, proving that these insects, and also leading to the belief that many other anomalous and supposed tetramerous beetles, are in truth pentamerous insects disguised by the soldering together of two of the adjacent joints of the tarsi.

Mr. Waterhouse said that in some *Coleoptera* he had frequently observed bristles, such as Mr. Westwood had spoken of, in the middle of an articulation, more especially of the claw-joint in *Homalota*; and that therefore the presence of a bristle must not be taken as a certain indication of the existence of a joint.

Mr. Wollaston said that the bristles alluded to by Mr. Waterhouse, which occurred in the middle of the articulations, were very different from those at the joints. A moderate magnifying power would at once show the difference.

#### *Effects of the Sting of a Scorpion.*

Mr. Westwood communicated an extract from a letter of a correspondent in India relative to the effects of a sting of a scorpion. It is described as very severe, resembling the pain of a dozen wasp-stings concentrated in the same spot. The finger



began to swell, and the whole arm pained excessively, with a feeling of sickness. Ipecacuanha powder was applied, in the form of a paste, to the sting, and brandy and water taken liberally. A native doctor, on being sent for, after rubbing the arm, at length suggested a native remedy, namely, a small pan of live charcoal, upon which were occasionally, as they melted, thrown pieces of wax, the smoke from which was allowed to arise over the wound, and which allayed the pain to such a degree that in about an hour and a half the patient was able to smoke. The stung finger was still insensible to the touch and very much swollen, the arm cold as ice, although it had been rubbed for two hours, whilst the sound hand and arm were hot. More brandy and water, with cigars, were tried. The patient fell into a long sleep, and awoke next morning with but slight remains of the pain of the sting.

Mr. Stainton called attention to a paper by F. Bashford, Esq., read before the Meeting of the Society of Arts, on the 4th ult., on certain experiments made with a view to improve the present silk yieldings of India.

Mr. Douglas read the following:—

*Cicada hæmatodes.*

“In the December number of the ‘Entomologische Zeitung’ is a note by Dr. Hagen, supplementary to his former papers in that journal on the singing Cicadæ. As the following has especial reference to English entomologists, I have translated it, with the hope that it may fall under the notice of some one who will render the desired service:—

“Concerning the types of *C. hæmatodes*, Herr Baron von Osten-Sacken wrote to me on the 27th May, as follows,—

“Three examples stand under this name in Linné’s collection. The one bearing the ticket, and the second, agreeing with the first, are both, to my view, not *C. montana*. Both of them are unspread, and have on the fore margin of the upper wings a brown cross vein, which is wanting in the examples of *C. montana* to be seen near them. Otherwise it seems to me the size is much the same, but the abdomen, as in *C. montana*, with reddish margined rings; the base of the upper wings yellowish. The third example is different from both of the others. All the veins are broadly brown, which gives the wings a variegated appearance; the abdomen on both sides broadly red. In Mr. Westwood’s collection is an English *C. montana*. He at first described it as new, but afterwards named it *C. hæmatodes*, though he did not recollect whereon he had founded the name.’

“It is not unlikely, according to this communication, that the two first specimens belong to the above-mentioned variety of *C. montana* with brown-bordered subveins, or to *C. adusta*. About the third I abstain from making any conjecture. Extremely desirable is it that some English entomologist would undertake a new examination and determination of the Cicadæ in Linné’s collection.”

Mr. Westwood considered that *C. hæmatodes* ought not to be placed amongst the singing Cicadæ, as it appeared that no one had ever heard it sing.

Dr. Gray observed that a lady of his acquaintance had captured two examples on the window of a house in the New Forest, which were quite mute.

Mr. Stevens said he had entomologized a great deal in the locality for the species, but never heard any sound produced by it.

Mr. Douglas had made particular inquiries of residents in the New Forest, where the species occurred, and all agreed that the insect never sung nor produced any sound whatever.

Mr. Baly read descriptions of twenty new species of *Doryphora*, &c., and exhibited some beautiful drawings of the insects.

Mr. Smith made some remarks in reply to Mr. Janson's observations on *Bledius*, read at the February Meeting.

Mr. Westwood and Mr. Janson spoke on the same subject.

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April 6, 1857.

DR. J. E. GRAY, V.P., in the chair.

*Donations.*

The following donations were announced, and thanks ordered to be given to the donors:—Dr. Jacob Sturm's 'Deutschland's Fauna,' *Die Insecten*, Vol. xxiii.; presented by Dr. J. K. C. F. Sturm and Dr. J. W. Sturm, through W. Spence, Esq. 'Exotic Butterflies,' Part XXII.; by W. W. Saunders, Esq. 'Revue et Magasin de Zoologie,' 1857, No. 2; by the Editor, M. F. E. Guérin-Méneville. 'The Zoologist' for April; by the Editor. 'The Athenæum' for March; by the Editor. 'The Literary Gazette' for March; by the Editor. 'The Journal of the Society of Arts;' by the Society.

*Election of a Subscriber.*

G. Lewis, Esq., of 6, Kidbrook Place, Blackheath, was balloted for, and elected a Subscriber to the Society.

*Exhibitions.*

Mr. Foxcroft sent for exhibition two pairs of *Petasia nubeculosa* recently taken at Rannoch.

Mr. Stevens observed that last autumn he had reared some larvæ of this species from the eggs, but none of the perfect insects had yet emerged, although the pupæ appeared to be healthy.

Mr. Douglas exhibited a specimen of *Ancylocheira auralenta*, taken alive at Forest Hill, but a native of North America, and not unfrequently sent in collections from Canada.

Mr. Syme exhibited two specimens of *Deilephila Galii* which he had lately bred. The pupæ had been exposed by him to a heat of 57°, during the day time, from the 26th January last; and the moths emerged on the 20th and 23rd of March.

Mr. Fortune exhibited samples of the article known as "mosquito tobacco" in China. He stated the composition to be the saw-dust of pine and juniper, with the powdered roots of a species of *Artemisia* and a small quantity of arsenic. These are formed into a paste, and coated over slender sticks, of about two feet in length, which

are burnt as candles, and never fail in driving the musquitos from the room. Mr. Fortune added that the *Artemisia*, which is a species growing wild on the Chinese hills, is employed to fumigate bee hives, in order to take the honey without killing the bees.

Mr. Westwood remarked that he could do almost anything with bee hives without danger, by merely smoking a cigar during the operation; indeed, he had occasionally cut combs from a hive without even that protection.

Mr. Newman read the following paper, intituled

*What is the Scutellar Depression?*

“Every day we meet with people astonished at the vastness of their own knowledge. From old ‘Katterfelto, with his hair on end, at his own wonders wondering for his bread,’ to the modern pedagogue, whom we find in every ‘twopence-a-week’ day school, paralyzed by the idea ‘that one little head could contain all that he knew,’ there seems a well-connected series of egotists, indigenous, exotic, living and extinct, who are most complacent touching the subject of their own attainments. This complacency (I may as well plead guilty to its possession) received a rude check in my own instance when, two years ago, joining the rush of Coleopterists to that oasis in the desert of British Coleopterology, Dawson’s ‘Geodephaga,’ I perceived that here and there, among the species which their reverend sponsor has so ably differentiated, there existed a character which, in common with my beetling brothers, I had entirely overlooked. This character is a most conspicuous depression at the base of the elytra, a sort of wide, shallow pit, reaching almost from shoulder to shoulder, and often extending down the suture to full one-third of its length without any compensating elevation of surrounding regions. At the bottom of this depression is the scutellum; and the depression, thus embracing the scutellar region, I have ventured to call the ‘scutellar depression.’ Such, then, being the scutellar depression, the question I would next ask is this,—What is its teaching? At first I plumed myself on having discovered a new species; but when I found that sixteen well-marked species had each a scutellar-depressed counterpart I relinquished this idea, as entailing too extensive an exercise of our cherished prerogative of name-giving: I thought it would be riding the pairs-of-species hobby a little too hard. Next I conjectured it might be sexual, and hoped to find it a ready mode of distinguishing the lady Carabs from the gentlemen; but the examination of more individuals threw this conjecture overboard. For my third guess I tried the wing difference, knowing that there were in some species winged and wingless individuals; but this failed: the depressed and elevated were equally provided with wings. I submitted them *seriatim* to the process of gently raising the elytra, and peeping beneath them; but no secrets were concealed there, and, as may be assumed, none were revealed. One ‘refuge for the destitute’ still remained—immaturity; but even this would not do: the depressed individuals were alternately hard and soft; and this last guess neither elevated their spirits nor mine. The phenomenon, in fact, was purely exceptional, and its occurrence governed by no law that I could enunciate. The following list will show, in a tabular form, the result of the examination of fifteen species, thus afflicted, in the cabinets of Dr. Power, Mr. Douglas, and the Entomological Club. I have only to add that I sincerely hope that Mr. Westwood may give us an explanation, at once logical, luminous and conclusive, like that he has appended to my paper on heterocampous pairs of Lepidoptera. To

have elicited those brilliant observations is, indeed, a high reward for my having jotted down a few passing thoughts. We cannot but admire, in Mr. Westwood, that more than Roman virtue which is ever ready thus to immolate his dearest friends on the altar of Science,—to drown them, as it were, in a flood of light.

Names.	Number of individuals examined.	Number of males depressed.	Number of females depressed.
<i>Elaphrus multipunctatus</i>	thirty-two		six
<i>Chlænienus nigricornis</i>	twenty-three	two	
<i>Badister unipustulatus</i>	ten		four
<i>Anchomenus pallipes</i>	thirty-six	three	three
„ <i>oblongus</i>	thirty-eight	two	two
„ <i>marginatus</i>	thirty	one	
„ <i>viduus</i>	eighty	fourteen	thirteen
„ <i>fuliginosus</i>	forty-two	twelve	ten
„ <i>Thoreyi</i>	fifty-three	four	four
<i>Pterostichus erythropus</i>	fifty-two		one
„ <i>minor</i>	thirty-six		three
„ <i>nigrita</i>	sixty-one	four	
„ <i>anthracinus</i>	thirty	two	two
<i>Stenolophus vespertinus</i>	twenty-one	two	one
<i>Bembidium doris</i>	sixty	two	one

Mr. Westwood had considered the depression of the scutellar region alluded to was in some way connected with the presence or absence of wings, but on examination had found wings in both depressed and non-depressed specimens. He regretted that Mr. Newman had not investigated the subject in that point of view.

Mr. Wollaston thought the depression in question to be a malformation, arising from accidental causes, probably the result of some injury received during the earlier stages of the insect, as in all the species exhibited it was the exception and not the rule.

Mr. Lubbock called attention to one of the binocular microscopes which he placed on the table, and explained the advantages this construction is considered to possess over ordinary instruments.

Mr. Wollaston could bear testimony to the excellence of the object-glasses. He considered that, as so many persons have eyes of different focus, the eye-pieces of the binocular microscope should be so constructed as to meet this difficulty.

#### *Grooves in the Eyes of certain Coleoptera.*

Mr. Wollaston called attention to the existence of grooves in the eyes of certain Coleoptera, adducing as an illustration the genus *Trixagus* (or *Throscus* of British cabinets), in which four out of five species with which he was acquainted possessed this structure, more or less developed, and which he had not seen anywhere alluded to. He stated that the impression was usually of a somewhat curved form, and extended, from the edge nearest to the insertion of the antennæ, across the centre of the eye, but that it seldom reached the opposite margin, becoming gradually evanescent as it approached it; that in the common *T. dermestoides* it was continued but little

more than half-way across, in the elateroides of Heer it occupied at least two-thirds of the entire distance, whilst in the gracilis of his 'Insecta Maderensia' it very nearly touched the opposite part of the circumference. The antennæ of *Trixagus* being implanted very near to the inner margin of the eye, he believed that this *sulcus* had reference to the lodgment of those organs when the insect was in a state of partial activity, and had removed them from out of the grooves of its anteriorly produced prosternum,—an hypothesis which was rendered the more probable since the only species in which he had as yet remarked the impression to be totally absent was one from Madeira (which he had lately described under the name of *integer*), in which the antennæ are inserted further from the eye than in the normal members of the group, and in which, consequently, any such ocular receptacles would be superfluous.

Mr. Tapping communicated some notes by Mr. Fedarb, of Dover, on Acari found in a photographic portrait-case, alluded to by that gentleman at a former Meeting of the Society; and also a notice, by the same, of the ravages committed by a species of *Atropos* on the Barbadoes nut, accompanied by drawings of the insects.

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May 4, 1857.

W. W. SAUNDERS, Esq., President, in the chair.

#### *Donations.*

The following donations were announced, and thanks ordered to be given to the donors:—'Proceedings of the Royal Society,' Vol. viii. No. 25; presented by the Society. 'Journal of the Proceedings of the Linnean Society,' Vol. i. No. 4; by the Society. 'Revue et Magasin de Zoologie,' 1857, No. 3; by the Editor, M. F. Guérin-Méneville. 'The Zoologist' for May; by the Editor. 'Stettinor Entomologische Zeitung,' Vol. xviii. Nos. 1–3; by the Entomological Society of Stettin. 'A Manual of British Butterflies and Moths,' Vol. i. and No. 14; 'The Substitute' for 1856–7; 'Elements of Entomology,' No. 7; 'The Entomologist's Weekly Intelligencer,' No. 27; by H. T. Stainton, Esq. 'On the Distribution of certain Species of Fresh-water Fish, and on the Modes of Fecundating the Ova of the Salmonidæ; by John Hogg, Esq., M.A., F.R.S., F.L.S., &c.,' by the Author. 'The Literary Gazette' for April; by the Editor. 'The Athenæum' for April; by the Editor. 'Proceedings of the Berwickshire Naturalist's Club,' Vol. iii. No. 7; by the Club. 'List of the Specimens of Lepidopterous Insects in the Collection of the British Museum,' Part XI., Noctuidæ; by the Author, F. Walker, Esq., F.L.S., &c.

#### *Exhibitions.*

Mr. Stevens exhibited two pairs of *Endromis versicolor* recently taken in Tilgate Forest; also a pair of *Euchirus longimanus* from Ceram; and some fine species of *Pieris* sent by Mr. Wallace from the islands of Baley and Lomback, which were interesting from the variation of the species in these closely-adjointing islands.

Mr. Stevens also exhibited a specimen of *Hetærius sesquicornis* taken on the 2nd

instant, in a nest of *Formica fusca*, at Hampstead; and a specimen of *Lophopteryx Carmelita* bred from the egg.

Mr. Foxcroft sent for exhibition specimens of *Anchomenus Ericeti*, *Punz.*, and other Coleoptera and Lepidoptera taken at Rannoch.

Dr. Power exhibited a box of British Coleoptera containing a fine series of *Drypta emarginata*, *Sunius filiformis*, *Meloe brevicollis*, and other rare species; also three specimens of *Heterius sesquicornis*, taken from nests of *Formica fusca* at Hampstead.

Mr. Croker exhibited a box of Indian Locustidæ and Gryllidæ; also a fan used in Egypt to drive away the mosquitos.

The President observed that similar fans were used in the East Indies for this purpose.

Mr. Westwood exhibited a mutilated specimen of *Acherontia Atropos* which he had lately found in a bee hive. He observed that he had never heard of any instance having been recorded, in this country, of this moth proving destructive to bees; but his attention had been lately drawn to one of his hives, the stock of which did not commence working, and gradually got weaker and weaker, till at last scarcely 100 bees remained. On turning up the hive he discovered the remains of the specimen of *A. Atropos*, which he exhibited, attached to the comb. Whether the loss of the stock was to be attributed in any way to the moth was a matter of conjecture.

Mr. Westwood also exhibited a gigantic species of flea, for which he proposed the specific name of *imperator*. The specimen, which is about twenty times the size of the common *Pulex irritans*, was found dead in a bed at Gateshead.

Mr. Westwood also exhibited some cloth-like texture from South America, said to have been found inside a tree, and to be the production of some insect.

Major Vardon exhibited some insects brought from the interior of Africa by Dr. Livingstone, respecting which Mr. Westwood furnished the following details.

“The insects which Dr. Livingstone has placed in my hands are—

“1. The larva of a coleopterous insect, of which I am unable to determine the family, but think it may possibly be Cembrionideous. The head is flat, nearly circular, and furnished with strong triangular jaws; the six legs short and jointed; the body rather thickly clothed with short black hairs, and terminated by two large and very strong, horny, conical appendages, which shut together on their inner edge. The insect has the habit of burying its head in the sand, leaving exposed its strong forceps-like caudal appendage, which it moves about so as to attract the attention of passing insects, which, on approaching, are seized by it, and then conveyed to the mouth and devoured. It thus has a certain amount of analogy with the ant-lion, but is quite unlike that insect, both structurally and in the details of its habits.

“2. Two larvæ of another species of beetle, short, thick and fleshy, black in colour, with a yellow head; which seem to me to be referrible to the family Chrysomelidæ. When crushed, they are employed by the natives for the purposes of poisoning the tips of their arrows, which are dipped into the fluids of the body.

“3. A species of tick, about a quarter of an inch long, with a granulated and much-wrinkled body; which burrows into the feet of the natives between the toes, causing inflammation, which gradually ascends the legs, and other diseases. It is closely allied to the so-called poisonous bug of Persia, *Argas reflexus*. With the specimens were about forty young, with the cast skins of the eggs from which they had

been hatched, and which were probably deposited by the female after being placed in the box.

"4. A species of the curious heteropterous genus *Phyllomorpha*, or dead-leaf bug, closely allied to the *Cimex paradoxus* of Sparrmann, brought from the interior of South Africa. It may be thus characterized:—

"*PHYLLOMORPHA LIVINGSTONII*, *Westw.*

"Fusco albidoque varia, longe spinosa, capite et parte antica prothoracis linea tenui media et hujus margine postico recto albis, lobis prothoracis maximis aliformibus, apice oblique truncatis, angulo antico truncaturæ acutissimo, lobis segmentorum 4 et 5 abdominalium maximis subæqualibus apice bipartitis, divisione singula acuminata. *Ph. Capicola et paradoxa* duplo major.

"5. The minute flat pupæ of a species of *Psylla* found on the leaves of a species of *Bauhinia* which cover themselves with a secretion similar to that of the Australian *Wo-me-la*, which is also the produce of a species of *Psylla*, and which is scraped off the leaves by the natives, and eaten as a saccharine dainty, as is also the case with the secretion brought home by Dr. Livingstone by the natives of Central Africa.

"6. Dr. Livingstone has fully confirmed the statements of Major Vardon relative to the destructive powers of the tsetze (*Glossina morsitans*, *Westw.* in *Proc. Zool. Soc.*) in its attacks upon horses, which it very often kills; it appears, however, not to attack asses."

Mr. Wollaston exhibited various *Coleoptera* lately captured near Farnborough, in Kent, in a high chalky valley belonging to Sir John Lubbock, including a series of *Homœusa acuminata*, *Mærk.*, an insect which was hitherto unique as British, a single example having been obtained by himself a year ago, from out of an ant's nest, in the same locality.† He also exhibited specimens of *Claviger testaceus* and *Lomechusa emarginata*, likewise from the nests of *Formica fusca*; and an example of a species of *Scopæus*, apparently the first detected in this country. The other species to which he called attention were *Callistus lunatus*, *Tritoma bipustulatum*, *Byrrhus dorsalis*, and some scarce *Pselaphidæ*.

Mr. Smith exhibited the at present unique specimen of *Tropideres sepicola*, *Herbst*, taken in August last, by Mr. F. Plant, in Budden Wood, Leicestershire, and now presented by him to the British Museum.

Mr. Janson exhibited a specimen of *Myrmedonia cognata*, *Mærk.*, being the third indigenous example hitherto recorded, taken by Mr. E. Shepherd in a nest of *Formica fuliginosa*; a pair of *Atemeles emarginatus* which he had taken *in copulâ*, and observed that he had not been able to detect any external sexual distinction; and a pair of *Ampedus subcarinatus* captured a few days since.

Mr. Bond exhibited specimens of *Mixodia Hawkerana* bred from sea spurge, and the pupa-cases from which they emerged.

Mr. Hawker also exhibited specimens of the *Mixodia*, and the shoots of the sea spurge in which the insects had assumed the pupa state.

Mr. Robinson exhibited a drawing of the larva of *Polyommatus Artaxerxes* feeding on *Helianthemum vulgare*.

Mr. Janson made some observations on Mr. Smith's remarks on *Bledius hispidus*,

*Parfitt*, with reference to which subject Mr. Westwood denied that he had, as stated, informed Mr. Parfitt that this species was new to Science.

Mr. Newman communicated the following:—

*A Word on the Pseudogynous Lepidoptera.*

“The attention of entomologists has lately been directed to a phenomenon, which, under a severe scrutiny, seems to have arisen from the questionable position of an exception into the importance of a normal law. I allude to Agamogenesis. I have now to invite attention to what might be termed a compensating or balancing phenomenon, —a phenomenon which, instead of providing an unlooked-for multiplication of life, seems to dry up the source of life. This phenomenon is Pseudogynism, or the occurrence of false or unproductive females. It is very familiar to the breeders of domestic cattle, by whom such false females are called free martins. All attempts to overcome their sterility having of course been unsuccessful, they have been abandoned, and the beasts have been at once fattened for the butcher. I think entomologists have not hitherto recorded the existence of the same free martinism, or pseudogynism, among moths; it is nevertheless a fact that it exists to a very great extent, more than half the individuals of certain species proving sterile females. The first observation I made on this subject was in 1846, on an autumnal-disclosed specimen of *Orthosia instabilis*, the abdomen of which was opened, with a view of ascertaining the state of the eggs on the occasion of this unwonted first appearance on the stage of life. Eggs there were none; the abdomen was a hollow cylinder, without any trace whatever of an ovary, or indeed of any portion of the ordinary contents. The next observation was made on an example of *Sphinx Convolvuli* taken the same year. The captor slit open the abdomen longitudinally, from the anus to the insertion of the legs, intending to remove the contents prior to drying the insect for the cabinet. In this case also the abdomen was perfectly empty. My notes on this subject were laid by, but not forgotten, until 1851, when I received a notice from the South of France respecting *Deilephila Celerio*, which that year appeared in profusion in the months of September and October, the report stating that all the females were barren. This of course afforded more food for reflection, and in 1852 I sacrificed a number of *Sphinx Ligustri* and of our three species of *Smerinthus*, thinking to find and investigate a similar phenomenon. In this I was disappointed: all the specimens were summer-disclosed, and all had the ovaries distended with mature eggs. I was now inclined to assume that the previously observed facts were accidental or exceptional, and not to be recorded as the results of any universally operating law; but, last autumn, that is the autumn of 1856, the subject was again brought before me by the examination of recently disclosed females of *Acherontia Atropos*, which proved perfectly sterile. Now, as I knew there was a summer disclosure of this insect, giving rise, among the raw recruits of our science, as in the case of hibernating *Rhamni*, to a double-brooded hypothesis, I could not but be struck with a phenomenon that began to assume the weight and importance of a fixed law. It appeared, on comparing and arranging a series of observed facts, 1st, that certain Lepidoptera had two periods of disclosure, the æstival and the autumnal; that the summer batch, produced while the leaves were in full vigour and afforded abundant food for the larvæ, was fruitful; the autumnal brood, disclosed when the leaves were about to fall, was barren. The autumnal brood seems only to occur in cases where the number of the specimens has been much larger



than usual, and when the species, if multiplied by uniform and ordinary fecundity, would either more than exhaust the usual food-plant, and would therefore starve, or would seek other food, and thus defoliate our vegetation. The phenomenon, therefore, if reduceable to a law, is yet another proof of that 'wisdom of God in creation' which was the favourite theme of our greatest English naturalist, and the illustration of which is the cherished object of every right-minded teacher at the present day. Before offering these remarks to the Entomological Society I thought I would submit the facts to the scrutiny of a second entomologist; and for this purpose I selected the 'Lepidopterologiæ Princeps' at once, thus passing by, not only the *habitués* of what might be called our 'Circumlocution Office,' but also those really hard-working investigators of truth, our Wollastons, our Douglasses and our Powers. Mr. Doubleday's experience, I am happy to say, exactly coincides with my own. The following extract from his letter contains irresistible evidence of the prevalence of my facts:— 'The first pupa,' Mr. Doubleday writes, 'that I ever possessed of *Acherontia Atropos* produced a female moth, in July, and was full of eggs. In 1846 I had a number of larvæ of the same species; these became pupæ at the usual time, and eight or ten moths were produced at the end of September or beginning of October; ALL the females were barren, their abdomens being quite hollow. Most of the female *Convolvuli* that I took the same year [it was the great *Convolvuli* year] were barren, but I took one or two which laid eggs; not one of the eggs, however, hatched. I believe the females of some species are mostly barren when disclosed in the autumn; but where there are two distinct broods of a species, a vernal and autumnal brood, both are fertile. I believe that all species occasionally produce barren females.'

Mr. F. Smith read the following extract from a letter addressed to him by Mr. R. T. Grant, from Canada West (Orillia):—

*Letter from Mr. R. T. Grant, West Canada.*

"The first insects make their appearance about the middle of April, on the blossoms of the sallows, which are very plentiful here, and swarm with insects of all orders, even before the snow has disappeared. Fancy the ground covered with snow to a great depth, and the beautiful butterflies sporting in the hot sunshine. The first to appear is *Vanessa Antiopa*, which is extremely abundant here; *Andrenidæ* are also very plentiful; *Andrena Clarkella* is here, and *A. chrysoseles* and a very dark species, like *Clarkella* but handsomer. I have also found *Colletes*, *Sphecodes* and *Halictus*. You say in your Bee-Book that you know of no other genus among the solitary bees but *Sphecodes* and *Halictus* that remain torpid in the winter; but there is one here, a genus I am quite unacquainted with, very like *Halictus*; I have found two species, both of a beautiful golden green; the commonest of them is found upon every log or stump." (The bees here mentioned belong to my own genus *Angochlora*, of which I have enumerated thirteen species from North America, and seventeen from different parts of South America; they are closely allied to the genus *Halictus*, and are remarkable for having the eyes more or less reniform, some species distinctly so, like a wasp.) "I have also taken several *Nomadæ*, one *Cælixys*, and two species of *Stelis*, *Melecta* and *Anthophora*; a very large *Chelostoma*, and four species of *Bombi*; also one *Apathus*. Here are also great quantities of ants, of which I hope to send you a great number. I have met with one species of the genus *Tapinoma*. The greatest annoyance here is from flies, which in fact are the only things I dislike

in the country. When you go out in summer, you are immediately pounced upon by a swarm of mosquitoes, black flies, cattle and deer flies, all eager to suck your blood. The mosquitoes are truly awful. One day, putting off in a canoe to cross a lake, I was completely covered with them; and so dreadful were their stings that I was driven almost mad. Their bite is extremely sore, and itches to a degree no one can imagine; the swelling was so great upon myself that I could neither close my hands nor move my fingers for several days. The only way to obtain rest at night is to light heaps of rotten wood and Fungi round your house. The contrast of temperature here is very great,  $96^{\circ}$  in the shade in July, and  $32^{\circ}$  below zero in January. To-day the cold is intense. I am writing this before a red-hot stove, to prevent the ink from freezing."

Mr. Douglas read the following note on

*Trachys pygmæa.*

"In the 'Revue et Magasin de Zoologie' of M. Guerin-Méneville, No. 2, 1857, is a report of a memoir by M. Leprieur, read by M. Dumeril at a Meeting of the Academie des Sciences de Paris held on the 2nd of February, 1857, intituled 'Essai sur les Métamorphoses du *Trachys pygmæa*, insecte de la famille des Buprestides,' from which I beg to present the following extract, which will be the more interesting as it relates to an insect which is a native of Britain, but hitherto exceedingly rare in our collections.

"M. Leprieur, after recapitulating in his memoir several observations already made, by authors whom he quotes, upon the larvæ of some coleopterous insects which live in the interior of stems of plants, under the bark or in the woody tissue, mentions those in particular which are developed in plants of the order Malvaceæ. The author relates that having remarked upon tufts of the mallow several leaves bearing vesicular spots, coarsely rounded in their circumference, of a yellow tint, contrasting with the green colour of the leaves, he sought to know the cause of them; and he supposed that they had been the abode of some insect. The following year he was fortunate enough to prove the presence in these little cavities of a Buprestis, which, in the space of two or three weeks, went through all the phases of its development. This was to him an extraordinary and unknown fact, and he studied it in all its details. They are very singular, but are too circumstantial to be reproduced here.

"The author of the memoir describes and figures the larva of this *Trachys*, which has a very peculiar form, as well as the pupa, which is transformed without being enveloped in a cocoon. He compared this larva with those of other Buprestidæ already known, in order to indicate by figures the peculiarities which distinguish them. He examined the interior of the vesicle of the epidermis, where he found the remains of the former skin, those of the digested matter which had served for the growth of the larva, and proof that, among other parasitic larvæ, that of a *Cynips* for example [?], had made their food of it, and took its place.

"We think that the memoir of M. Leprieur confirms and develops much better the first observation of Réaumur upon the larvæ of the *Trachydes*, all of which have very probably the same manner of living; that his researches establish a positive fact upon a point too little known in the history of these insects, that the exactness of his researches merits the approbation of the Academy, which has received them with interest, and that the publication of them is very desirable."

Part IV. of Vol. iv., N. S., of the Society's 'Transactions,' published in April, was on the table.

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June 1, 1857.

W. W. SAUNDERS, Esq., President, in the chair.

*Donations.*

The following donations were announced, and thanks ordered to be given to the donors:—'The Natural History Review,' 1857, No. 2; presented by the Dublin University Zoological Association. 'The Zoologist' for June; by the Editor. 'Revue et Magasin de Zoologie,' 1857, No. 4, by the Editor, M. F. E. Guerin-Méneville. 'The Literary Gazette' for May; by the Editor. 'The Journal of the Society of Arts' for May; by the Society. Certain Insects taken in the interior of Africa by Dr. Livingstone; by that gentleman. 'Elements of Entomology,' Nos. 8 and 9; 'The Entomologist's Weekly Intelligencer,' Nos. 28 to 35 inclusive; by H. T. Stainton, Esq.

*Election of a Subscriber.*

Henry Gorham, Esq., of 9, Hornton Terrace, Kensington, was elected a Subscriber to the Society.

*Exhibitions.*

Mr. Bond exhibited a beautiful series of *Retinia Turionana* bred from larvæ found in the shoots of Scotch firs in Buckinghamshire; also living larvæ of *Coleophora palliella* and *C. currucipennella* from Richmond Park.

Mr. Stevens exhibited *Stenolophus elegans* and other Coleoptera lately taken at Sheerness.

The Rev. H. C. Stowell sent for exhibition a fine dark variety of *Melitæa Euphrosyne*.

Mr. Stainton exhibited the living larva of *Hypercallia Christiernana* received from Switzerland.

Mr. Janson exhibited various species of Coleoptera captured by himself in the neighbourhood of London during the last month, and made the following observations in reference to them:—

"1. *Rhyncolus truncorum*, *Germar, Gyll.* A novelty to our list, notwithstanding that its name for many years there held a place; but, as Mr. Walton has shown, the insect thus designated by the late Mr. Stephens pertains to the genus *Phloeophagus*, being the *P. æneopiceus* of Schönherr.

"Of the two species of *Rhyncolus* extant in British collections and enumerated by Mr. Walton, the present insect is most nearly allied to *R. cylindrirostris*, *Oliv.* (*lignarius*, *Marsh., Steph.*), from which it may be at once distinguished by its more robust habit, its singularly depressed eyes, whose position may be styled infero-lateral, no

trace of them being discernible on regarding the insect from above, and by its slender tarsi.

"2. *Phloeophagus spadix*, *Herbst, Schönh., Walton.*

"3. *Leptinus testaceus*, *Müller, Hardy.*

"4. *Xantholinus glaber*, *Nordman, Erichson*, of which the only indigenous example previously known is in the cabinet of the late Mr. Kirby, in whose manuscript catalogue it is denominated *Gyrophypnus rotundicollis*; the insect, however, representing *Xantholinus rotundicollis* of Stephens in his collection is a small variety of *X. punctulatus*, *Fab., Eric.*

"5. *Stenus contractus*, *Eric.* (*fornicatus* of Kirby's but not of Stephens' collection; *basalis*, *Curtis.*)

"6. *Homœusa acuminata*, *Mäerke, Kraatz, Wollaston.*

"7. *Tomicus (Bostrichus) bispinus*, *Ratzeburg, Bold, nec Guyon.*

"8. *Homalota confusa*, *Mäerke, Kraatz, Waterhouse.* One of three specimens taken, a few days since, in a nest of *Formica fuliginosa*, by my kind and assiduous friend and colleague Mr. Edwin Shepherd."

Mr. Janson likewise exhibited a box of Coleoptera just received from Rannoch, where they had been recently taken by Mr. Foxcroft. The species most noteworthy were *Ampedus tristis*, *Rhyncholus ater*, both sexes of *Dictyopterus Aurora*, *Elaphrus uliginosus*, *Anchomenus Ericeti*, and *Calathus micropterus*.

Mr. Smith brought for distribution amongst the members some series of named specimens of British ants, and exhibited some cocoons said to have been found in the *débris* of a hornet's nest, and from one of which his correspondent assured him a male hornet had emerged; on examination, however, it was discovered that the remaining cocoons contained *Bombi*.

Mr. Wilkinson observed that he had tested a portion of the cloth-like substance exhibited at the last Meeting, which was said to be the production of some insect; the result of his experiments, however, proved it to be of undoubted vegetable origin.

Mr. Westwood called attention to the continuation of Sepp's 'Nederlandsche Insecten,' the publication of which had been resumed in Holland: he was happy to say that entomologists appeared to be going energetically to work in that country, the recently published parts of the 'Transactions of the Netherlands Entomological Society' containing several excellent memoirs.

Mr. Westwood read the following note:—

"With reference to a note by Mr. Newman, published in the 'Zoologist,' p. 5629, on the subject of the introduction of *Acentria nivea* into the order Lepidoptera, I beg leave to refer those who may be interested in the question to the first volume of the 'Transactions' of this Society, p. 118, where, twenty-three years ago, I proved the truth of this relationship; also to my 'Introduction to the Modern Classification of Insects,' pp. 324 and 413; to my 'British Moths and their Transformations,' vol. ii., and to Kolenati's 'Monograph of the Trichoptera,' p. 6. Why the propriety of the removal of *Narycia elegans* of Stephens, with its pectinated antennæ, well-spurred legs and want of thoracic tippets, to the order Lepidoptera, as affirmed by Dr. Hagen, should as a matter of course involve *Acentria* in the like fate, does not appear to me quite evident. As Mr. Newman, moreover, considers my arguments insufficient

for removing *Acentria* to the Lepidoptera, I call upon him to state upon what other grounds he has arrived at his conclusion. It is generally supposed that Mr. Newman has paid especial attention to the study of the Linnean Neuroptera, and entomologists will doubtless be very anxious to know what structural peculiarities he may have discovered sufficient to outweigh those which I have adduced in my various notices upon the *Acentria*."

Mr. F. Smith read the following notes:—

*On the Habits of Trypoxylon.*

"A few years ago the habits of the species of the genus *Trypoxylon* was a subject of some controversy; St. Fargeau, indeed, described it as being parasitic; the Linnean account, however, is the correct one, and was confirmed, as far back as 1840, by Mr. Kennedy and Mr. Westwood. Any one, however, who is in the habit of watching these insects, running as they do upon posts, rails or sand-banks, and constantly entering the burrows of other insects, might be induced to adopt the opinion of St. Fargeau; and if, in addition to the above habit of the species, he examined the structure of the females, and found them destitute of cilia and spines on the legs, his opinion would no doubt be considerably strengthened as to their parasitism. The observations of numerous hymenopterists have long settled the question, and they are well known to store up spiders as a nutriment for their young. One point in the economy of this genus remains to be established; and I may ask the question, Has any one ever observed a species of *Trypoxylon* constructing its own burrow? without any chance of its being answered in the affirmative. I am of opinion that there are some species of fossorial Hymenoptera, and also of Apidæ, which never construct a burrow for themselves, always availing themselves of some ready-formed receptacle suitable to their purposes: *Trypoxylon* is one of these, and, amongst the bees, probably *Anthidium* is another.

"I have an opportunity of exhibiting this evening a most remarkable illustration corroborative of my opinion as regards *Trypoxylon*. The Rev. Hamlet Clark obligingly undertook to capture a few Hymenoptera on his late visit to Brazil. In addition to several new species of Formicidæ, he also brought a number of nests of a species of *Polistes*, also new to me.

"On carefully examining the nests, I observed, in one of them, that several of the cells were closed with red earth or clay. On opening some of these cells, I found them stored with spiders, and in one of them a specimen of *Trypoxylon fugax* of Fabricius. The cells had been tenanted by a young brood of the *Polistes* before the *Trypoxylon* took possession of them. This is certainly a very striking illustration of what I believe to be the habit of this genus of insects.

"The nests and the *Polistes* were obtained by Mr. Clark at Petropolis, where, he informs me, it is common."

*On the Habit of Chelostoma florissomnis.*

"I have received a letter from Mr. George Kearley, Blomfield Street, Finsbury, in which he describes a singular habit of the males of *Chelostoma florissomnis*. Mr. Kearley says:—

"I send you half-a-dozen bees which I took last evening. They were resting in a most singular manner on a dead branch of hawthorn that had been thrust into a

hedge to stop a gap; the bees were attached to the points of the thorns by their mandibles, with their bodies stuck out straight and stiff in a line with the thorns, but quite clear of them. Almost every thorn on one part of the bush was grasped by a bee. They were attached so firmly, and were so loth to move, that it required a good shake to dislodge them; and when disturbed they immediately set about attaching themselves afresh. I broke off a twig and carried it to my residence, a quarter of a mile distant, swinging it about, but not one of them relaxed its grasp. On going early to the spot next morning I found the bush still thickly peopled with them, still attached by the mandibles alone, the legs being folded under the body, the body itself standing out stiff from the points of the thorns.'

"This habit in the males of *Chelostoma* being new to me, I have thought it worth recording in our 'Proceedings.' The bees were no doubt, as Mr. Kearley suggests, settling themselves for the night. I have frequently found them huddled together by half-dozens in the closed petals of flowers, but never in the manner above described.

Mr. Westwood read a paper on species of *Callirhipus*, &c., chiefly taken in Ceylon, by Herr Neitner.

Mr. Moore read descriptions of undescribed species of *Euplœa* in the collection of the East India Company.

The President expressed his intention to invite the members to a day's excursion at Reigate during the present month.

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July 6, 1857.

W. WILSON SAUNDERS, Esq., President, in the chair.

The following donations were announced, and thanks ordered to be given to the donors:— '*Nouveaux Mémoires de la Société Impériale des Naturalistes de Moscou* dédiés à sa Majesté l'Empereur Alexandre II.' Tome x. Formant le Tome xvi. de la collection; '*Bulletin de la Société Impériale des Naturalistes de Moscou*,' année 1855, Nos. 2—4; année 1856, No. 1.; presented by the Society. '*Exotic Butterflies*,' Part XXIII.; by W. W. Saunders, Esq. '*Journal of the Proceedings of the Linnean Society*,' Vol. ii. No. 5; by the Society. '*The Zoologist*' for July; by the Editor. '*The Athenæum*' for May and June; by the Editor. '*The Literary Gazette*' for June; by the Editor. '*The Journal of the Society of Arts*' for June; by the Society. '*Revue et Magasin de Zoologie*,' 1857, No. 5; by the Editor, M. F. E. Guérin-Ménéville. '*Elements of Entomology*,' No. 10; '*The Entomologist's Weekly Intelligencer*,' Nos. 36 to 40 inclusive; by H. T. Stainton, Esq. '*Fabricia Entomologica*,' Supplement to the 1st Livraison, and Livr. II. (the Plate illustrating the paper, by M. M. Saunders and Jekel, on new genera and species of *Curculionidæ*, presented some time since); by M. Henri Jekel. '*Zur Flora Westphalens Von Dr. Karsch*;' by Francis Walker, Esq.

*Election of a Member.*

Alfred F. Sealy, Esq., of 70, Trumpington Street, Cambridge, was balloted for and elected a Member of the Society.

*Exhibitions.*

Mr. S. Stevens exhibited *Molurus Bartolemi*, *Ceratorrhina Derbyana*, *Tefflus Delagorgii*, and other Coleoptera collected, by Mr. R. W. Plant, to the north of Natal, towards Delagorge Bay, a locality previously unexplored by him; also a living specimen of *Trichius variabilis*, which he had lately bred after remaining three years in the larva state, subsisting on the living wood of the oak.

Mr. Douglas exhibited specimens of *Stenolophus elegans* taken near Southend, and observed that Dr. Power and himself had, on one of the recent hot days, obtained upwards of sixty specimens of this hitherto rare species by searching in the wet mud; he also exhibited *Trinodes hirtus* lately bred from a rotten tree in Richmond Park.

Mr. Janson exhibited several species of Coleoptera taken near the metropolis during the past month, and made the following remarks respecting them:—

“1. *Læmophlæus Clematidis*, Eric., found near Gravesend, Kent, in dead stems of the traveller's joy (*Clematis Vitalba*). This species is now for the first time introduced into the British list. Mr. Wollaston, however, informs me that he some years since detected an individual among sundry insects purchased by him at the sale of the late Mr. Spry's collection, but, as that gentleman had incorporated many continental specimens with his British insects, he considered it inexpedient to announce the indigenoussness of the species upon the bare evidence of the individual in question. It is probable that this insect should be sought for in the month of May, or perhaps even earlier, as three out of the five specimens now exhibited were dead, dry, and considerably mutilated when found. The species was first taken by Mr. J. S. Baly, and subsequently by myself.

“2. *Lathrobium rufipenne*, Gyll., Eric. Apparently of rare occurrence in Britain. Mr. Stephens's descriptions (Illustr. Mand. v. 268, 6; Manual, 405, 3229) refer indubitably to this species, being copied, the diagnosis verbatim, from Gyllenhal, but in his cabinet a male individual of the common *L. elongatum* has served to represent it. Mr. Waterhouse captured a single example, in the immediate vicinity of London, in the summer of 1854, and I found two among various *Brachelytra* kindly presented to me by Mr. S. Barton, of Bristol, by whom they were taken near that town. The specimens now before the Meeting I found at the roots of rushes, amongst moss, at the side of a marsh near Gravesend.

“3. *Plinthus caliginosus*, F. Taken beneath a heap of decaying potato-haulm on a hedge-bank at Darent, Kent. This insect is probably more widely distributed over the southern portion of our island than we had hitherto supposed. The present is not the first instance of its occurrence in the vicinity of London: Mr. S. Stevens has secured a specimen near Wickham, Surrey.

“4. *Pseudopsis sulcatus*, Newm. A single individual, taken by Mr. Francis Walker in the Isle of Wight, about the year 1833, and from which Mr. Newman drew up his generic and specific characters (Ent. Mag. ii. 313), was, I believe, the sole English representative of this curious species until the autumn of last year, when Mr. Waterhouse captured a specimen flying at dusk near a manure heap. In the interim, however, Mr. Haliday met with it, in Ireland, by brushing herbage in the vicinity of hay-stacks, and to that gentleman's liberality our principal collections have been long indebted for specimens. The three individuals now exhibited I found near Dorking, Surrey, in a boletus on the decaying stump of a felled tree.

“5. *Cryphalus binodulus*, Ratzeb., Janson (Ent. Annual for 1857, p. 83, Plate, fig. 9). Of this I have succeeded in capturing about a dozen specimens from the same tree which yielded it me last year, and which, I fear, are all I shall be able to secure, as the tree is under condemnation, and will probably be consigned to the hearth ere the close of the next winter.

“6. *Scolytus rugulosus* (Koch), Ratzeb. die Forst. Insecten, i. 187 (1837). Reared in considerable numbers from the dead branches of a pear tree, gathered by Mr. Groves in his garden at Lewisham, and not hitherto recorded as British. The question has been more than once discussed in this room whether the Scolyti attack healthy and vigorous trees, or whether they select as a nidus such trees only as are already diseased,—whether, in fact, they are the primary or merely an accessory cause of the devastation which has been attributed solely to them. Each view has found warm and able advocates, but I believe the question still remains open, nor can I aspire to close it, but I think, as far as the species now under consideration is concerned, we may fairly conclude that, under ordinary circumstances, its pabulum consists of dead wood, since Mr. Groves informs me that it is on the upper dead branches alone that the insect is to be found, no trace of it being discernible on any other part of the tree; and, in fact, the branches which he has placed in my hands, and from which the specimens now exhibited were reared, present every appearance of having been destitute of vitality for several years. The present species, however, departs considerably in habit from that of its congeners which I have had an opportunity of studying (destructor, *Oliv.*, intricatus, *Ratzeb.*, and multistriatus, *Marsh.*, *Ratzeb.*), whose larvæ subsist chiefly on the inner bark, occasionally only attacking the sap-wood in their progress, and, when full-fed, assuming the pupa state at the end of the burrow, or in a very shallow cell excavated in the sap-wood; whilst, on the other hand, the larvæ of the insect now before us appear to derive their chief sustenance from the solid wood, into which they penetrate deeply, the outer surface presenting only faint traces of erosion.

“The genus *Scolytus*, first instituted by Geoffroy, but to which our continental brethren persist in applying the more recent generic appellation of *Eccoptogaster*, proposed by Herbst, at present contains upwards of a dozen described European representatives, all of which subsist upon trees indigenous to or generally cultivated in this country. Of these five only are at present known to me as natives, viz.,—1. *S. Ratzeburgii*, *michi*, Ent. Annual for 1856, p. 87 (destructor, *Eric.*, *Ratzeb.*, nec *Oliv.*), frequenting the birch, and probably confined to the northern portions of our island; 2. *S. destructor*, *Oliv.*, abundantly distributed throughout the southern and central portions of England, and which attacks the elm, confining itself, however, to the trunk and large limbs; 3. *S. multistriatus*, *Marsh.*, *Ratzeb.*, also peculiar to the elm, where it is occasionally found in company with the preceding, but more generally alone and in the small branches; 4. *S. intricatus*, *Ratzeb.*, a denizen of the oak, and, according to my experience, attacking the branches only; 5. *S. rugulosus*, *Ratzeb.*, the species now before you, and which, as we have seen, inhabits the smaller branches of the pear tree; on the Continent, Ratzeburg informs us, it occurs in plum and apple trees. Ratzeburg (*l. c.*) has thus divided the genus:—

- § 1. Abdomen beneath, in at least one of the sexes, with tubercles or teeth.
- § 2. Abdomen beneath without tubercles or teeth.

Of the ascertained British species, *Ratzeburgii*, *destructor* and *multistriatus* pertain



to the first section, *intricatus* and *rugulosus* to the second. *S. rugulosus* may be at once distinguished from its near ally (*intricatus*) by its smaller size, deeper, coarser and rugulose sculpture, and by the punctures on the interstices of the elytra, arranged in regular rows, being of equal depth and size with those of the true or normal striæ; in *rugulosus*, moreover, the apex of the elytra is usually more or less broadly red. I would further remark that the beautiful series of specimens, which I owe to the kind forethought of Mr. Groves, has enabled me to determine a solitary individual in Mr. Wollaston's collection, taken by that gentleman, several years since, at St. Neot's, and which has long caused me much perplexity, but which I have now no doubt is referrible to the *S. rugulosus*. In conclusion, I would earnestly recommend this genus to the careful attention of my brother entomologists, as offering an ample field not only for the discovery of new species and the augmentation of their collections, but for elucidating a question of vast importance to the community at large, and to which I have already adverted."

Mr. Westwood said that he had examined the *Scolytus* exhibited by Mr. Janson, and he thought it was described by Köllar in his work on insects injurious to gardeners and foresters, and of which the Misses Loudon had published an English translation, under the name of *S. hæmorrhous*.

Mr. Janson replied that he was well acquainted with the work alluded to by Mr. Westwood. He certainly had not referred to it with respect to the new British *Scolytus*, for his impression was that it was a popular treatise, and he believed that no strictly scientific descriptions were to be found in it; he would, however, look into the matter. If Köllar had really recognizably described the insect under the name of *hæmorrhous*, and such description was anterior in publication to Ratzeburg's description of *rugulosus*, there was but *one* course to pursue.

Mr. Janson also exhibited the following Coleoptera, which he had just received from Mr. Foxcroft:—

*Dictyopterus Aurora*, male and female, which Mr. Foxcroft, in his letter, dated Kinloch Rannoch, July 3, states feeds in black fir, of which the woodwork of the houses entirely consists, and where he had met with this insect, as well as in decayed stumps of that tree in the forest.

*Elaphrus lapponicus*, of which Mr. Foxcroft writes that he had recently captured two or three examples near some springs, at an altitude of about 3000 feet, and which he had not previously succeeded in finding.

Mr. Groves brought for distribution a quantity of living specimens of the *Scolytus* exhibited by Mr. Janson; he also exhibited portions of dead branches of the pear tree infested by these insects.

Mr. Westwood observed that at the last meeting Mr. Smith had exhibited the nest of a Brazilian species of *Polistes*, some of the cells of which were tenanted by *Trypoxylon fugax*. He had now an equally interesting fact to record, having lately had a portion of a comb of the hive-bee brought to him in which some of the cells were filled with larvæ of *Lepidoptera* stored up by solitary wasps, *Odynerus Antilope*, which had evidently taken possession of the cells for their own breeding purposes.

Mr. Westwood exhibited some leaves of a species of *Bauhinia*, collected by Dr. Livingstone and placed in his hands by Dr. Hooker, on which were some singular

insects, which at first appeared to be a Coccus, but proved on examination a species of Psylla.

Mr. Reading exhibited a living pair of *Carabus intricatus* from the neighbourhood of Plymouth.

Mr. Robinson exhibited some Coleoptera found near Gravesend, including *Cryptocephalus Coryli*, *C. nitens*, *C. Lincola*, *Chrysomela Banksii*, &c.

Mr. Pascoe called attention to Mr. Thomson's 'Archives Entomologiques,' the last published parts of which work he had brought with him from Paris, and, after remarking on its small cost and the beauty and accuracy of the Plates, said he regretted to hear from the author that there were only six subscribers in this country; he also gave a short account of the recent congress of naturalists at Montpellier, at which he observed he was the only Englishman present.

Mr. Douglas proposed a vote of thanks to the President for his hospitable reception of the members and their friends on the occasion of the Society's field-day excursion to Reigate on the 26th ult., which was very cordially agreed to.

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August 3, 1857.

H. T. STAINTON, Esq., V.P., in the chair.

#### *Donations.*

The following donations were announced, and thanks ordered to be given to the donors:— 'Proceedings of the Royal Society,' Vol. viii. No. 26; presented by the Society. 'Revue et Magasin de Zoologie,' No. 6; by the Editor, M. F. E. Guerin-Méneville. 'The Zoologist' for August; by the Editor. 'The Journal of the Society of Arts' for July; by the Society. 'The Literary Gazette' for July; by the Editor. 'The Athenæum' for July; by the Editor. 'The Entomologist's Weekly Intelligencer,' Nos. 41 to 44 inclusive; 'Elements of Entomology,' No. 11; by H. T. Stainton, Esq. 'Stettiner Entomologische Zeitung,' Nos. 4 to 9; by the Entomological Society of Stettin.

#### *Exhibitions.*

Mr. Waterhouse exhibited some insects received from Mr. Foxcroft, amongst which was a fine species of *Xylophaga* with its pupa case, and an apterous *Ichneumon* which Mr. Foxcroft considered was a parasite on *Anehomenus Ericeti*.

Mr. Waring exhibited fine specimens of *Trochilium Chrysidiforme*, *Pionea margaritalis*, *P. palealis* and *Melia bipunctana*, taken near Deal; also *Hemithea smaragdaria*, taken by Mr. Bouchard at Southend.

Mr. Stevens exhibited fine specimens of *Trochilium Chrysidiforme*, taken near Folkestone.

Mr. Westwood exhibited a species of *Pangonia*, sent from Ceylon by Mr. Thwaites, with the following remarks:—

"I send you a few specimens of the 'elephant fly,' a great plague to man and beast in some parts of the island, and not sparing the elephant. They bring blood,

whenever they get an opportunity of inserting their long sucker, even from the skin of bullocks."

Mr. Westwood also exhibited some singular rolls formed of the extremities of the leaves of the Spanish chestnut, of the size of a small thimble; each of these contained an egg, probably of some species of Rhynchites. He also exhibited some galls covered with a substance exactly resembling cotton wool, found by Mr. Groom on oaks near Bath; also a volume of drawings, chiefly of Lepidoptera and their transformations, made in India by Captain Mortimer Slater, and called attention not only to the artistic merit of the drawings, but to the accuracy of observation evinced by the MS. notes accompanying them, especially to those on a fine species of singing Cicada.

Mr. Pascoe observed that the collection of Coleoptera collected at Macassar and other parts of Celebes, lately received from Mr. Wallace, contained twenty-seven species of Longicorns, all of which were Indian forms, with the exception of a *Tmesister-nus*, a group confined to the southern islands of the Indian Ocean. Mr. Pascoe exhibited some of the species alluded to, and also an aberrant species of *Dorcadion* from Delagorge Bay.

Mr. Stainton exhibited three pieces of honey-comb found attached to branches of a tree, some of the cells containing a little honey. His correspondent had been at a loss to account for their, to him, novel position.

Mr. Westwood observed that it was not an uncommon occurrence for swarms of bees recently escaped to commence forming a comb in such situations, and afterwards abandon it.

Mr. Waterhouse read the following:—

*List of British Tachyporidæ.*

"In laying before the Society the following list I beg to state that my first object is to identify the species of Tachyporidæ in Mr. Stephens's works and collection with those of the two most important works on Staphylinidæ published by Erichson and Dr. Kraatz; and, secondly, to enumerate such British species as have come under my notice. It is to be understood that where Mr. Stephens is quoted thus '*Ste.*' the author's works only are referred to; when quoted '*Steph.*' both the works and collection are included, and when quoted '*Ste. coll.*' or '*Steph. coll.*' the collection only is alluded to. Some of the species enumerated in this list have been kindly examined by Dr. Kraatz; they are,—*Tachinus* (sp. 5) *scapularis* = '*T. palliolatus*'; *Tachyporus* (sp. 2) *formosus*; *T.* (sp. 8) *humerosus*; *T.* (sp. 11) *scitulus*.

<i>HYPOCYPTUS</i> ( <i>Schupp.</i> ), <i>Mannerh.</i> , <i>Eric.</i> , <i>Ste. Manual</i>	2 <i>pulicarius</i> , <i>Erichs.</i> , <i>Kz.</i>
<i>Cypha</i> ( <i>Kirby</i> ), <i>Steph.</i> , <i>Illustr.</i>	3 <i>discoideus</i> , <i>Erichs.</i> , <i>Kz.</i>
1 <i>longicornis</i> , <i>Payk.</i> , <i>Er.</i> , <i>Kz.</i> , <i>Ste.</i> <i>Man.</i>	biguttata ( <i>Cypha</i> ), <i>Matthews</i>
<i>rufipes</i> , <i>Steph. Illustr.</i>	4 <i>anisotomoides</i> , <i>Steph.</i>
<i>agaricinus</i> , <i>Steph.</i>	<i>læviusculus</i> , <i>Kz.</i> ?
<i>nigripes</i> , <i>Steph.</i>	5 <i>pygmæus</i> , <i>Kz.</i> ?
( <i>var. minor</i> ?)	<i>TRICHOPTHA</i> , <i>Mannerh.</i> , <i>Steph. Man.</i>
<i>parvula</i> , <i>Steph.</i>	1 <i>pilicornis</i> , <i>Mannerh.</i> , <i>Erichs.</i> , <i>Steph.</i>
<i>rufipes</i> , <i>Kz.</i> ?	<i>Kz.</i>
	<i>HABROCERUS</i> , <i>Erichs.</i> , <i>Steph.</i>
	1 <i>capillaricornis</i> , <i>Grav.</i> , <i>Erichs.</i> , <i>Kz.</i>

- nodicornis (*Kirby*), *Steph.*  
 LEUCOPARYPHUS, *Kz.*  
 Tachinus, pars, *Erichs. &c.*  
 1 silphoides, *Linn., Erichs., Steph., Kz.*
- TACHINUS, *Grav., Erichs., Steph.*  
 1 humeralis, *Grav., Erichs., Kz.*  
 cinctus (*Staphylinus*), *Marsh. ; Steph.*  
 latus, of *Steph. coll.* (not of *Marsh.*)  
 2 rufipes, *Fab., Er., Steph., Kz.*  
 apicalis, *Steph.*  
 fulvipes, *Steph.*  
 pullus, *Steph.*  
 3 flavipes, *Fab., Er., Kz.*  
 nigripes, *Ste. Illustr.* (not of *Man.*)  
 brunnipennis, *Steph.*  
 limbosus, *Steph.*  
 intermedius, var., *Steph. Man.*  
 intermedius, *Ste.*  
 lævigatus, *Marsh. Ent. B. 519, 62*  
 4 rutipennis, *Gyll.,\* Kz.*  
 5 scapularis, *Steph.*  
 palliolatus, *Kz.*  
 6 bipustulatus, *Grav., Gyll., Erichs., Kz.*  
 7 subterraneus, *Linn., Grav., Er., Steph., Kz.*  
 latus, *Marsh. Ent. B.*  
 ,, *Ste.* (not of the collection)  
 bipustulatus, *Steph.*  
 pallens, *Steph.* (immature)  
 8 marginellus, *Fab., Grav., Gyll., Er., Steph., Kz.*  
 lævigatus (marginatus, var., *Ste. Illustr.*), *Steph.*  
 laticollis, *Steph.*  
 9 collaris, *Grav., Gyll., Er., Steph., Kz.*  
 10 elongatus, *Gyll., Er., Steph., Kz.*  
 aterrimus, *Steph.*
- TACHYPORUS, *Grav., Erichs., Steph.*  
 1 obtusus, *Linn., Fab., Er., Steph., Kz.*  
 melanurus, *Marsh. Ent. B. 525, 80*  
 ,, *Steph. Illustr. = obtusus*  
 var. of the Manual  
 analis, *Steph.*  
 2 formosus, *Matthews, Ste., Kz.*  
 rufus, *Erichs.*  
 abdominalis, *Boisd. et Lacord.*  
 flavescens, *Ste. P*  
 subtetaceus, *Steph. P*  
 3 solutus, *Erichs., Kz.*  
 merdarius, *Steph.*  
 marginellus of *Steph. coll.*  
 ,, *Steph. Illustr. PP*  
 4 chrysomelinus, *Linn., Grav., Er., Steph., Kz.*  
 5 hypnorum, *Fab., Er., Steph., Kz.*  
 livens, *Ste.*  
 collaris, *Steph.*  
 marginatus, *Steph.*  
 nitidulus, *Marsh. Ent. B. 520, 64*  
 ,, *Steph.*  
 erythropterus, *Steph.*  
 apicalis, *Steph.*  
 6 pusillus, *Grav., Gyll., Er., Kz.*  
 lateralis (*Kirby*), *Ste.*  
 bipustulatus (*Conurus*), *Ste. coll.*  
 7 ruficollis, *Grav., Erichs., Kz.*  
 nitidicollis, *Steph.*  
 8 humerosus, *Grav., Er., Kz.*  
 ruficollis, *Steph.*  
 atriceps, *Steph.*  
 melanocephalus (*Conurus*), *Steph.*  
 9 tersus, *Erichs., Kz.*  
 10 transversalis, *Grav., Er., Kz.*  
 11 scitulus, *Erichs., Kz.*  
 dimidiatus, *Steph.*  
 macropterus, *Steph.*  
 12 brunneus, *Fab., Er., Steph., Kz.*  
 nitidulus, *Grav., Gyll.*  
 testaceus, *Steph.*  
 flavicornis, *Steph.*  
 nitidus, *Steph.*  
 angustatus, *Steph.*  
 minimus, *Steph.*

\* Recorded as British at the Entomological Society, by Mr. Janson, on the evening that this list was communicated, and subsequently inserted in the list.—*G. W.*

basalis, *Steph.*  
 gracilis, *Steph.*  
 libens, *Steph.*  
 thoracicus, *Steph.*  
 pyrrocera, *Ste.*  
 pusillus, *Steph.*  
 pyrropterus, *Ste. coll.*

LAMPRIUS, *Heer, Kz.*

Tachyporus, pars, *Ericks. &c.*

1 sagnatus, \* *Grav., Mannerh., Er., Kz.*

CONURUS, *Steph., Ericks., &c.*

Conosoma, *Kz.*

1 littoræus, *Linn., Er., Ste., Kz.*

angularis (*Tachinus*), *Steph.*

Sowerbii (*Kirby*), *Steph.* (*Tachinus*)

bipustulatus, var., *Ste. Man.*

collaris, *Ste.*

2 pubescens, *Grav., Er., Steph., Kz.*

conicus (*Staph.*), *Marsh. Ent. B.*

522, 69

Marshami, *Steph.*

3 immaculatus (*Kirby*), *Ste.*

pusillus (*Kirby*), *Steph.*

fuscus, *Ericks., Kz.*

4 lividus, *Ericks.*

flavipes, *Steph.*

nigripennis (*Tachyporus*), *Steph.*

obscuratus (*Kirby*), *Ste.*

obscuripennis (*Kirby*), *Steph.*

5 bipunctatus, *Ericks., Kz.*

BOLITOBIVS (*Leach*), *Steph., Er., Kz.*

Sect. I. (*Megacronus*, *Steph.*)

1 analis, *Payk., Grav., Marsh., Steph., Er., Kz.*

merdarius, *Steph.* (immature)

2 cingulatus, *Mannerh., Er., Kz.*

rufipennis, *Steph.*

castaneus, *Steph.* (immature)

3 inclinans, *Grav., Ericks., Kz.*

nitidus, *Steph.*

4 formosus, *Grav., Mannerh., Er., Kz.*

„ *Steph. Illustr. v. 167, pl.*

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Sect. II. (*Bolitobius*, *Steph.*)

5 atricapillus, *Fab., Grav., Er., Steph., Kz.*

lunulatus, *Fab., Steph.*

6 trinitatus, *Er., Kz.*

trimaculatus, *Steph.*

melanocephalus, *Steph.*

angularis, *Steph.*

7 exoletus, *Er., Kz.*

apicalis, *Steph.*

ochraceus, *Steph.*

marginalis, *Steph.*

8 pygmæus, *Fab., Er., Steph., Kz.*

bimaculatus, *Steph.*

thoracicus, *Steph.*

brunnipennis, *Steph.*

discoideus, *Steph.*

biguttatus, *Steph.*

BRYOPORUS, *Kz.*

Bolitobius, pars, *Ericks.*

1 cernuus, *Grav., Er., Kz. ?*

„ *Steph.*

MYCETOPORUS, *Mannerh., Er., Kz.*

Ischnosoma, *Steph.*

1 lucidus, *Er., Kz.*

2 punctus, *Grav., Gyll., Er., Kz.*

3 splendens, *Marsh., Er., Steph., Kz.*

nigricollis, *Steph.*

4 brunneus, *Marsh. Ent. B. 524, 74, Steph.*

ruficornis, *Kz.*

lepidus, var. *a.*, *Ericks.*

5 lepidus, *Grav., Er., Steph., Kz.*

punctato-striatus, *Steph.*

melanurus, *Steph.*

rufescens, *Steph.*

punctus, *Ste. coll.*

6 pronus, *Er., Kz.*

clavicornis (*Kirby*), *Ste.*

brevicornis, *Matthews*

7 splendidus, *Grav., Gyll., Er., Kz.*

elegans (*Megacronus*), *Matthews*

tenuis, *Ste.*

nitidulus (*Bolitobius*), *Steph.*

ruficollis (Bolitobius), *Steph.*  
 picipes ( „ ), *Steph.*

*Note.* — *Tachyporus diffinis*, *Steph.*,  
 and *Conurus immaculatus* of Stephens's  
 collection (not of his description), are  
 both = *Mylæna brevicornis* of Matthews  
 = *M. gracilis*, *Kz.*

Part V., Vol. iv., N. S., of the Society's 'Transactions,' recently published, was on the table.

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September 7, 1857.

J. O. WESTWOOD, Esq., V.P., in the chair.

*Donations.*

The following donations were announced, and thanks ordered to be given to the donors:—'Transactions of the Zoological Society of London,' Vol. iv. Part 4; 'Proceedings of the Zoological Society of London,' Nos. 314 to 333; presented by the Society. 'Catalogue of the Coleopterous Insects of Madeira, in the Collection of the British Museum;' by the Author, T. V. Wollaston, Esq., M.A., F.L.S. 'List of the Specimens of Lepidopterous Insects in the Collection of the British Museum: Part 12. Noctuidæ;' by the Author, Francis Walker, Esq., F.L.S., &c. 'The Natural History Review,' 1857, No. 3; by the Dublin University Zoological Association. 'The Zoologist' for September; by the Editor. 'The Athenæum' for August; by the Editor. 'The Literary Gazette' for August; by the Editor. 'The Journal of the Society of Arts' for August; by the Editor. 'Mémoires de l'Académie Royale des Sciences, des Lettres et des Beaux Arts de Belgique,' Tome xxx.; 'Mémoires Couronnés et Mémoires des Savants étrangers,' Tomes xxvi., xxvii. and xxviii.; 'Bulletins de l'Académie,' Tome xxii. 2e Partie Tome xxiii.; 'Annuaire de l'Académie,' 1856 and 1857; by the Académie Royale des Sciences des Lettres et des Beaux Arts de Belgique. 'Carabe d'Agassiz;' by the Author, M. Barthélemy. 'Description de douze Espèces de Longicornes des Vieux Calabar, à la côte Occidentale d'Afrique,' par M. A. Chevrolat; by the Author.

*Election of Members.*

R. Bakewell, Esq., of Finchley Road, St. John's Wood, and W. S. Atkinson, Esq., La Martinière, Calcutta, were balloted for and elected Members of the Society.

*Exhibitions.*

Mr. Foxcroft sent for exhibition some fine specimens of *Aplocera flavicinctaria*, taken at Rannoch.

Mr. Stevens exhibited a specimen of *Dynastes Mars*, lately sent him by Mr. Bates from the Upper Amazons, and observed that the only specimen hitherto known of this fine species was taken in the same country, a few years ago, by Mr. A. R. Wallace, and figured in the 'Annales de la Société Entomologique de France.'

Mr. Stevens also exhibited some insects lately received from Mr. Wallace, captured by him in Celebes, including *Papilio Deiphobus*, a fine species of *Papilio*

allied to *P. Peranthus*, and numerous fine Danaidæ and Nymphalidæ; amongst the Coleoptera he called attention to several new species of Cetoniadæ and Cicindelidæ.

Mr. Bond exhibited an apparently new species of *Depressaria* from the Isle of Wight, and a new species of *Coleophora* bred from the larvæ found on birch trees in the Regent's Park.

Mr. Waterhouse exhibited the following Coleoptera, which had not hitherto been recorded as British:—

1. *Cryptocephalus imperialis*, a single specimen from the collection of Dr. Power, by whom it was captured on Gogmagog Hills, Cambridgeshire, some years since; this individual had been first recognised by Mr. Edward Sheppard.

2. *Cryptocephalus variabilis*, of which he had found a solitary example in the cabinet of the late Mr. Stephens, mixed up with its near ally, *C. sexpunctatus*; he had likewise identified a specimen, also confounded with the same species, in the collection of the late Dr. Leach.

3. *Lema Erichsoni*, recently taken by Dr. Power in Ireland, but of which an individual existed in the Stephensian cabinet, where it had been set apart without a name.

Mr. Waterhouse pointed out the characters by which these species may be distinguished from such of their congeners as occurred in Britain, with which they might be confounded.

Mr. Janson exhibited a specimen of *Locusta migratoria*, which had been taken a few days since in the vicinity of Primrose Hill, and mentioned that another individual had been captured in Kentish Town.

Mr. Baly remarked that several instances of the recent occurrence of this insect in the latter locality had come under his notice.

Mr. Bond said he had seen specimens of this species recently taken at Willesden, and also in the New Forest.

Mr. Stevens stated that specimens had occurred at Brighton: he also announced that a specimen of *Deilephila Nerii* had been taken there a few days since.

#### *New Entomological Periodical at Vienna.*

Mr. Pascoe called the attention of the meeting to a new Continental entomological periodical published monthly at Vienna, styled 'Wiener Entomologische Monatschrift,' and submitted the first number containing "Dipterologische Notizen," by Dr. H. Loew; "Die Apionen der Wiener Gegend," by L. Müller; and "Ueber die Lycaeniden-Gattungen der europäischen Fauna," by Julius Lederer.

#### *Swarms of Locusts in China.*

Mr. Janson read, from the 'North China Herald' of June 13th, a notice of the appearance of enormous swarms of locusts in the district of Nanwei adjacent to Shanghai, and the means which the public officers had ordered to be adopted for the destruction of these all-devouring insects.

Mr. Westwood observed, that, although many of these injunctions might well

elicit a smile, yet some of them evinced an acquaintance with the natural history of the insect highly creditable to the Chinese authorities.

Mr. Spence communicated a letter from Mr. John Stedman on injuries caused to strawberry plants by a species of weevil supposed to be an *Otiorynchus*.

Mr. Adam White communicated some notes on the habits and economy of South American butterflies, received by him from Mr. H. W. Bates.

On the motion of Mr. Westwood, a special vote of thanks was given to Mr. Bates for this valuable and interesting communication.

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October 5, 1857.

W. W. SAUNDERS, Esq., President, in the chair.

The following donations were announced, and thanks ordered to be given to the donors:—‘*Journal of the Royal Agricultural Society of England*,’ Vol. xviii. Part I.; presented by the Society. ‘*Exotic Butterflies*,’ Part XXIV.; by W. W. Saunders, Esq. ‘*Proceedings of the Royal Society*,’ Vol. viii. No. 27; by the Society. ‘*Elements of Entomology*,’ Nos. 12 and 13; ‘*The Entomologist’s Weekly Intelligencer*,’ Vol. ii. and No. 53; by H. T. Stainton, Esq. ‘*The Athenæum*’ for September; by the Editor. ‘*The Literary Gazette*’ for September; by the Editor. ‘*The Journal of the Society of Arts*’ for September; by the Society. ‘*The Annual Address to the Berwickshire Naturalists’ Club*, on September 24th, 1857, by W. Dickson, Esq.’; by the Club.

#### *Election of a Subscriber.*

C. Dru Drury, Esq., of Grote’s Buildings, Blackheath, was allotted for and elected a Subscriber to the Society.

#### *Exhibitions.*

Mr. S. Stevens exhibited full-grown larvæ of *Deilephila Galii* found near Deal; also *Baris laticollis* and *Phlophagus æneopiceus*, which he had bred from *Brassica oleracea*, at the same locality.

Mr. Douglas exhibited, on behalf of Mr. Newman, a specimen of *Zuphium olens*, a species hitherto unrecorded as British, which he had captured whilst searching for water-beetles, on the 19th of September, in the remaining portion of the old Croydon Canal, at Forest Hill.

Mr. Stainton exhibited a specimen of *Acrolepia Betuletella* lately taken by Mr. Sang at Castle Eden Dean. He observed that the only specimen previously recorded is in Mr. Dale’s collection.

Mr. Turner sent for exhibition fine specimens of *Phlogophora empyrea* taken near Brighton.

Mr. Smith exhibited three species of ants new to the British Fauna. The name of one, *Formica brunnea*, had long appeared in the lists, but the specimens representing



that species in the Stephensian collection were examples of the *Formica umbrata* of Nylander: the specimen exhibited Mr. Smith stated to be the only true example of *F. brunnea* which he had seen captured in this country; it was taken at Deal. The second species, *Myrmica lippula* of Nylander, was discovered by Mr. Reading near Plymouth, in a nest of *Formica fusca*. The third species was *Myrmica nitidula* of Nylander, found by Mr. Waterhouse, in the nest of *Formica rufa*, in the New Forest, and also at Weybridge.

Mr. Smith also exhibited two specimens of the rare *Ponera contracta*; they were workers. Hitherto most, if not all, of the specimens taken had been males or females. These examples were taken by Dr. Power at Brighton.

Mr. Westwood exhibited specimens of a species of earwig, *Forficula maritima*, new to this country, which had been found in great numbers on the coast of Northumberland by Mr. Bold, and subsequently by Mr. Wailes; also a specimen of *Rhizophagus ferrugineus* found inside a ripe plum.

Mr. Westwood also exhibited a specimen of the venomous fly of Central Africa, known by the natives under the name of the *tsetze*, brought from Lake Tchad by Major Frank Vardon. Mr. W. had published a description of this insect (which belongs to the family *Muscidæ*, and is nearly allied to the common *Stomoxys irritans* of our apartments) in the 'Proceedings of the Zoological Society,' under the name of *Glossina morsitans*, after an examination of two other African species of the same genus which had been previously described by Mr. Walker in the British Museum 'Catalogue of Diptera.' Mr. Westwood referred to an article by Mr. Bracy Clark, published in the 'Zoologist' for 1857 (p. 5720), in which the writer states that "a considerable degree of uncertainty, and even misapprehension, appears to prevail about the fly that Dr. Livingstone so interestingly describes as annoying the cattle in Africa, and which he designates the *tsetze*, its African appellation. Although introduced as a new species, I beg to observe that it is a very old one under a new name,—the fly so feelingly described by Moses of old," which he considers to be identical with the *Æstrus Bovis* or ox bot-fly. Now, in the first place, the *Æstrus Bovis* is thus assumed to be a native of Central Africa; secondly, it is assumed that the animals destroyed by the *tsetze* are killed from wounds in the back made by the bots or larvæ; and, thirdly, it is assumed either that oxen alone are destroyed, or that the African individuals of the *Æstrus Bovis* attack other animals as well as oxen. Mr. Westwood, however, believed that there was not the slightest proof that *Æstrus Bovis* is an inhabitant of any part of Africa. He also read an extended series of extracts from the writings of Andersson ('Lake Ngami'), Vardon, Oswell, Livingstone and Gordon Cumming, proving that the death of the animals which have been the victims of the *tsetze* is the result of poison injected by the proboscis of the insect, the precise mode of action of the different organs of the mouth having even been observed, and the course of the disease with its symptoms carefully described; whilst, in the third place, it is unquestionable, from the remarks of these writers, that horses, sheep, and even dogs, as well as oxen, are destroyed by the *tsetze*, there being not the slightest proof on record of an *Æstrus* thus indiscriminately attacking more than one species of quadruped. Mr. Bracy Clark adds his belief that "this African *tsetze* is the real patronymic of the French *Estre*, made more pronounceable by introducing more vowels and fewer consonants, and then from it we get the Latin *Æstrus* and the Greek *Oistron*." Such a system of derivatives appeared, however, to Mr. Westwood to be rather inconsistent. It might perhaps, however, be true that all the names had a common origin, deriving

their sibilant character from a desire to express the sound made by the *Glossina* and *Cestrus* in their flight, just as the common names of certain birds are intended to represent their peculiar notes. Mr. Westwood expressed his regret at being obliged to differ from so old and worthy a writer as Mr. Bracy Clark, but, having in vain applied to the editor of the 'Zoologist' to publish a correction of the erroneous views which had been promulgated in that journal, he was reluctantly compelled, in the cause of truth, to come forward and support the statements which he had himself published in the 'Proceedings of the Zoological Society.'

The Rev. Hamlet Clark exhibited a series of *Chrysomelidæ*, being a portion of the collection recently made by him in the vicinity of Rio.

Mr. Bond exhibited a pair of remarkable varieties of *Apatura Iris*, both specimens being destitute of the usual white markings on the upper surface; also a pale male variety of *Argynnis Paphia*.

Mr. Shepherd exhibited a specimen of *Quedius dilatatus*, taken by Mr. Sealy in the New Forest, at sugar, which he had placed on a tree for the purpose of attracting *Noctuæ*; he also exhibited a living example of *Q. lateralis*.

The Secretary exhibited some seeds, apparently of a species of *Euphorbia*, containing larvæ, presumed to be lepidopterous, sent by W. G. Lettsom, Esq., H.B.M. Chargé d'Affaires, Mexico, with the following note:—

" British Legation, Mexico,  
" Sept. 2, 1857.

" Sir,

" As no scientific examination has, I believe, yet been made of the grub from the motion of which the 'moving seeds,' from the neighbourhood of Tassic, in this country, derive their celebrity, I send to you by the mail of this month a small box containing a good many of these seeds, quite fresh, being of this year's growth. These seeds are very lively, but that they should move about much it will be well to lay them in the sun, or put them in a warm place. They only require to be scattered on some smooth surface, when in a minute or two they will put themselves in motion. Should the Entomological Society deem the grub worthy of a detailed examination, I shall be extremely grateful if you would favour me with some account of their labours.

" I am, &c.,

" W. G. LETTSOM."

Mr. Janson exhibited six living and forty-six mounted specimens of *Drypta dentata*, *Rossi*, *Schaum* (*marginata*, *Fab.*, *Steph.*, *Dawson*), captured a few days since in the neighbourhood of Alverstoke, Hants, by Dr. J. A. Power; and also a fine series of the same insect secured by himself on the same occasion.

Mr. Waterhouse exhibited the following *Coleoptera*, from the collection of Dr. Power:—

*Thiasophila inquilina*. Two specimens, taken during the past summer, by their indefatigable and successful owner; one with *Formica rufa*, the other with *F. fuliginosa*.

*Chlanius Schrankii*. One specimen, recently secured in the Isle of Wight by Mr. F. Bates.

*Lyprus cylindrus*. One individual, captured by Dr. Power, about six weeks since, in the Isle of Sheppey.

*Trechus longicornis*. One example, found by Mr. Pinder on the Lancashire coast.

Mr. Janson exhibited, on the part of Mr. T. P. Dossetor, four females of a species of *Aphis* recently taken within a few days of each other, and apparently of one generation, and of which, since their capture, two had produced broods of living *Aphides*, and two had deposited eggs. He remarked that he had paid but little attention to the Hemiptera, especially to the homopterous division of that order; but he believed it was an axiom that all the individuals of the same generation perpetuated their kind in the same way, that is to say that they were either oviparous or viviparous.

The President observed that Mr. Francis Walker, who had studied these insects, and who was present, could probably throw some light on this seeming anomaly. Mr. Janson accordingly placed all the specimens and their progeny in that gentleman's hands.

The President stated that on the recent visit of Dr. Hagen to this country he had, whilst entomologizing at a pond near his residence, noticed *Notonecta glauca* rise and seize small insects on the surface of the water. This fact suggested the idea to the juvenile members of his family to attempt the capture of these insects by means of a fly attached to a thread; and so successful was this mode of fly-fishing that in a short time they secured above 100 examples.

Mr. Douglas read the following notes by W. G. Gibson, Esq., of Dumfries, on the capture of *Colias Edusa*, and other species which are usually rare in Scotland, during the past season:—

“Of *Colias Edusa* the first one was caught in a clover field in the parish of Kirkmahoe, four miles north of Dumfries; the next seven were taken in a turnip field near Glencapel Quay, eight miles south-east of Dumfries, near the mouth of the Nith; six were taken at Southerness, Kircudbrightshire, fifteen miles below Dumfries, on the banks of the Solway Firth. One was seen flying in the streets of the town ten days before the first one was taken. Only three females have been seen.

“Two specimens of *Thecla Quercus* were caught last week near here, by Mr. James Browne, Crichton Institution.

“*Vanessa Io* and *V. Atalanta* have been very common here this season. Of the former I bred upwards of 200 specimens.

“Two specimens of *Gryllus migratorius* have been taken in Dumfriesshire this month.”

Mr. Stevens read the following letter, received by him from Mr. A. R. Wallace:—

“Dobbo, Arru Islands, March 10, 1857.—Here I am, alive, well, and hard at work. I have been here just two months, and as I am going into the interior I leave this note to be sent by a vessel which returns to Macassar in April. The country is all forest, flat and lofty, very like the Amazonian forest. Insects, on the whole, are tolerably plentiful in specimens, but very scarce in species. There are, however, some fine things, and I am getting good series of several, including *Ornithoptera* sp., near *Priamus*, perhaps *O. Poseidon*, or close to it, a glorious thing but hard to get perfect; four or five other rare or new *Papilios*, but all scarce; *Cocytia d'Urvillei*? rather scarce, a lovely creature; also *Hestia d'Urvillei*. For six weeks I have almost daily

seen *Papilio Ulysses*? or a new closely-allied species, but never a chance of him; he flies high and strong, only swooping down now and then, and off again to the tree-tops: fancy my agony and disgust; I fear I shall never get him. There is a fine *Drusilla* or *Hyades* abundant, with numerous varieties; but the *Lycænidæ* and *Erycinidæ* are the gems; I only wish there were more of them; there are about half-a-dozen species equal to the very finest of the little Amazonians. The *Coleoptera* are far too few in species to please me: in two months' hard work I can only muster fifty *Longicornes*, a number I reached in ten days in Singapore; but *Lamellicornes* are the most extraordinarily scarce; I have only nine species, and four of them single specimens; there are, however, two fine *Lomaptera* among them, I hope new. All other groups are the same; *Geodephaga*, scarcely a dozen species, and nothing remarkable; not one *Cicindela*; only one *Tricondyla* (*T. aptera*?) and one *Theretes* (*T. labiata*), with not a single *Colliuris*; two or three fine *Buprestes*, however, and some remarkable *Curculionidæ*, with the beautiful *Tmesisternus mirabilis*, make a pretty good show.

"On my way here we stayed six days at Ké Island, and I got there some very fine beetles, two fine *Cetoniæ*, and a *Buprestis* the most beautiful I have seen. Of the few insects I got there the greater part were different from any I have seen here, though the distance is only sixty miles, the mountains of Ké being visible from Arru in fine weather. This makes me think I shall get different things at every island in this part of the Archipelago. Arru is zoologically a part of New Guinea. Of the birds here half are New Guinea species; in the small island where we live many of the birds of Arru never come, such as the two species of the birds of Paradise, the black cassowary, &c. I am going now to the mainland, or great Island of Arru, in search of these birds, but have had the usual difficulty about men and boats.

"I have learnt here all about New Guinea; parts are dangerous, parts not; and next year, if I live and have health, I am determined to go. I must go either to Banda or Ternate first, I have not yet decided which, and shall try and go to the large Island of Wargion, at the north-east of New Guinea, where are found the *Epimachus magnificus*, three rare species of the Paradise birds, and the glorious *Ornithoptera d'Urvilliana*? The weather here is very changeable; storm, wind and sunshine alternately. I think nine-tenths of the things I am getting will be new to the English collections; with which comfort for our entomological friends,

"I remain yours sincerely,

"ALFRED R. WALLACE."

"*Postscript*.—Dobbo, May 15.—I have returned from my visit to the interior, and the brig is not gone yet; so I add a postscript. Rejoice with me, for I have found what I sought; one grand hope in my visit to Arru is realized: I have got the birds of Paradise (that announcement deserves a line of itself); one is the common species of commerce, the *Paradisæa apoda*; all the native specimens I have seen are miserable, and cannot possibly be properly mounted; mine are magnificent. I have discovered their true attitude when displaying their plumes, which I believe is quite new information; they are then so beautiful and grand that, when mounted to represent it, they will make glorious specimens for show-cases, and I am sure will be in demand by stuffers. I shall describe them in a paper for the 'Annals.' The other species is the king bird (*Paradisæa regia*, Linn.), the smallest of the paradisians, but a perfect gem for beauty; of this I doubt if any really fine specimens are known, for I think Lesson only got them from the natives; I have a few specimens absolutely perfect. I have,

besides, a number of rare and curious birds,—the great black cockatoo, racquet-tailed kingfisher, magnificent pigeons, &c.,—and a fair addition to my insects and shells. On the whole I am so much pleased with Arru that my plans are somewhat altered: on returning to Macassar I shall probably not stay more than two or three months, but get as soon as I can to Ternate, and then to the north coast of New Guinea, where all the remaining species of Paradise birds are found? I believe I am the only Englishman who has ever shot and skinned (and ate) birds of Paradise, and the first European who has done so alive, and at his own risk and expense; and I deserve to reap the reward, if any reward is ever to be reaped by the exploring collector. I think there is good work for three years in N.E. Celebes, Gilolo Ceram, north coast of New Guinea, and intermediate islands, of all of which Ternate is near the centre, and it is certainly one of the least-explored districts in the world, and one which contains some of the finest birds and insects in the world. On the whole I have had much better health here than at Macassar, but I am now, and have been a whole month, confined to the house, owing to inflammation and sores on the legs, produced by hosts of insect bites. Confinement has brought on an attack of fever, which I am now getting over. My insect collecting has suffered dreadfully by this loss of time.—A. W.”

Mr. Moore read a monograph of the genus *Adolias*, in which fifty-two species were described, of which number thirty were new to Science.

The President observed that the number of new and rare species exhibited during the evening proved the unabated ardour of the entomologists of this country.

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November 2, 1857.

W. W. SAUNDERS, Esq., President, in the chair.

*Donations.*

The following donations were announced, and thanks ordered to be given to the donors:—‘The Natural History Review,’ 1857, No. 4; presented by the Dublin University Zoological Association. ‘The Literary Gazette’ for October; by the Editor. ‘The Journal of the Society of Arts’ for October; by the Society. ‘The Natural History of the Tineina,’ Vol. ii., containing *Lithocolletes*, Part I.; ‘Elements of Entomology,’ No. 14; by H. T. Stainton, Esq.

*Election of a Subscriber.*

H. W. Brown, Esq., 1, Westbourne Street, Hyde Park Gardens, was elected a Subscriber to the Society.

*Exhibitions.*

Dr. Gray exhibited some living examples of the case-bearing larvæ of an *Oiketiscus*, found on a species of *Ficus* at Sydney, and brought to this country by J. W.

Chapmant Esq.; also some singular galls, found on a species of oak at Ischl, in Austria, the trees growing at an elevation of from 2000 to 3000 feet above the level of the sea. These galls were considered by Mr. Westwood to be the production of some dipterous insect.

Dr. Gray also exhibited some specimens of a new species of gall lately found in Kent, and made the following communication respecting them:—

“On a wild rose (*Rosa canina*) in a hedge near West Wickham, in Kent, Miss Stanely, with whom I was walking, observed a kind of gall which I cannot find noticed in any of the works to which I have access. Many more specimens were afterwards collected, and my friend made a series of drawings of their different forms, which were exhibited to the Society. In its perfect state the gall is a globe, from one-fourth to three-eighths of an inch in diameter; the upper surface is rather flattened, and surrounded with some elongated, tapering, acute spines, generally rather shorter than the diameter of the body of the gall. In the youngest state the spines are much longer and stouter in comparison with the size of the body of the gall. The number of spines varies considerably; the normal number appears to be six, but galls are often found with only two, three, four or five, and more rarely with seven or eight; in general the spines are simply awl-shaped, but they are sometimes divided at the top into two or even three small points. The galls are generally attached to the under surface of the leaflets; sometimes two or three are clustered on one leaflet; they are also sometimes found on the foot-stalk of the leaf or of the leaflet. On putting some of the galls into a box with a glass cover, the larvæ developed themselves, and no less than three species of the genus *Eurytoma* were emitted, which Mr. Walker has kindly determined to be *E. æthiops*, *E. plumata* and *E. gracilis*. It is doubtful if these are not the parasites of the former, rather than the former of the galls.”

Mr. Wollaston exhibited some specimens of *Chrysomela cerealis* from Snowdon, and called attention to the under wings of this species, which are of a beautiful pink colour. He observed that the under wings in Coleoptera had hitherto been much neglected, but often afforded good characters in the discrimination of species.

Mr. Stevens exhibited some Coleoptera and Lepidoptera sent from Moreton Bay, by Mr. Diggles, amongst which were the sexes of *Eurycus Cressida*, *Cezara Ardeniæ*, *Cacostomus squamosus*, *Figulos Lilliputanos*, and some beautiful species of *Bombycidæ*. Mr. Stevens also exhibited some Coleoptera sent from Delagorge Bay by Mr. R. W. Plant, including *Cacosceles Œdipus*, *Dicronorrhina Derbyana*, &c.

The Rev. H. Clark exhibited a species of *Hydroporus* apparently new to this country, and a new species of *Agabus*, for which he proposed the specific name of *sexuarius*.

Mr. Smith exhibited a nest of *Pelopæus*, from Virginia, tenanted by two distinct species, viz., *P. cyaneus*, *Linn.*, and *P. flavipes*, *Fab.*

Mr. Yatman observed that he had noticed in New Jersey that different species of this genus inhabited the same holes.

Mr. Westwood read some extracts from a letter received by him from Mr. Brodie, on fossil insects lately found in the tertiary formations in the neighbourhood of Stevenage.

Mr. F. Walker read the following

*Notes on Aphis Quercus.*

"Having lately taken a few specimens of the *Aphis Quercus* of Linneus, I beg leave to offer to the Entomological Society a few notes on that species. It was first discovered by Mr. Ingall, in 1847, on an oak at Dulwich; Mr. Smee found it soon afterwards at High Beach, in Epping Forest; and about a month ago, when I happened to meet him, he told me that he had just observed it on an oak at St. George's Hill, Weybridge. He kindly directed me to the spot, and after some search I found the oak tree by a foot-path in the wood, and in the neighbourhood there were two other oak trees also infested by the *Aphis*. The presence of the latter is detected by the numbers of the black ant which come to feed on the honey, and whose multitudes much add to the trouble of extracting the *Aphis*, for its body is so soft, and its rostrum is buried so deeply in the bark, that it must be cut out of the tree carefully, in order to avoid crushing it. I then wrote to Mr. Ingall, and asked him some questions respecting the structure of the rostrum, and he with much kindness lent me all the specimens which he had preserved in Canada balsam, fifty-five in number, and his MS. notes, from which I have extracted nearly all the following observations.

"THE MALE.

"This is apterous, like the males of many other species of *Aphis*, and appears about the beginning of October, and continues till November. It is less than one-fourth of the size of the female, and about twice the size of the egg (which is large), and has no appearance of any mouth either in the young or in the adult state. In other species of *Aphis* the mouth has a like structure in both sexes.

"THE WINGED FEMALE.

"This lives early in the year, and seems to be scarce. It does not possess the long rostrum which distinguishes the following form, and is very different from it in appearance.

"THE WINGLESS FEMALE

has a rostrum which is more than twice the length of the body, and in the young insect is more than four times the length of the body. It seems to be quite distinct from the true mouth, which possesses three extremely slender setæ (the middle one double); these are received into the groove of the rostrum or tube, and rather exceed it in length. The rostrum is fitted into a 'sac at the base of the lower lip, which sac probably extends nearly the length of the body;' it can be folded? and is often contracted to half its usual length, and more rarely to one-fourth of its usual length, and may be seen retracted within the body to the base of the fore legs, or to the base of the hind legs, or even to the tip of the abdomen. The joints, also, of the rostrum can be withdrawn one within another, like the parts of a telescope, and the whole apparatus is peculiarly adapted for the extraction of the sap of the oak between the rugged clefts of the bark. The eggs are deposited in October and November.

"I will endeavour to make further observations on this species during next year, and hope that in the meanwhile some person will kindly undertake to dissect it, in order to ascertain fully the structure of the rostrum, and how it is received into the body."

December 7, 1857.

Dr. GRAY, V.P., in the chair.

*Donations.*

The following donations were announced, and thanks ordered to be given to the donors:—‘Smithsonian Contributions to Knowledge,’ Vol. ix.; ‘Annual Report of the Board of Regents of the Smithsonian Institution;’ presented by the Smithsonian Institution. ‘Proceedings of the Boston Society of Natural History,’ Vol. v. pp. 321 to 416; Vol. vi. pp. 1 to 160; by the Boston Society of Natural History. ‘Proceedings of the Academy of Natural Sciences of Philadelphia,’ Vol. viii. Nos. 3 to 6; by the Academy. ‘Ohio Agricultural Report,’ 1850 to 1855; by the Ohio State Agricultural Society. ‘Proceedings of the Zoological Society,’ Nos. 334 to 338; by the Society. ‘Proceedings of the Literary and Philosophical Society of Liverpool,’ No. 11; by the Society. ‘Journal of the Proceedings of the Linnean Society,’ Vol. ii. No. 6; by the Society. ‘The Athenæum’ for October and November; by the Editor. ‘The Literary Gazette’ for November; by the Editor. ‘The Journal of the Society of Arts;’ by the Society. ‘Die Linsengallen der Oesterreichischen Eichen, Ein Versuch zur vergleichenden Beschreibung der Gallengebilde,’ von Georg Frauenfeld; ‘Beitrag zur Fauna Dalmatiens,’ von Georg Frauenfeld; ‘Ueber Raymondia, Fr., Strebila, Wd., und Brachytarsina, Mcq.,’ von Georg Frauenfeld; ‘Beiträge zur Naturgeschichte der Trypeten nebst Beschreibung einiger neuer Arten,’ von Georg Frauenfeld; by the Author. ‘Verhandlungen des Zoologisch-Botanischen Vereins in Wien,’ Band VI.; ‘Separatabdruck Naturwissenschaftlicher Abhandlungen aus den Schriften des Zoologisch-Botanischen Vereins in Wien;’ by the Society. ‘Stettiner Entomologische Zeitung,’ XVIII. Jahrgang, Nos. 10 to 12; by the Entomological Society of Stettin. ‘Elements of Entomology,’ No. 15; ‘The Entomologist’s Weekly Intelligencer,’ Nos. 58 to 62; by H. T. Stainton, Esq.

*Election of Subscribers.*

C. P. Gloyne, Esq., 5, Terrace, Kensington; G. W. Canham, Esq., 28, Osborne Terrace, Clapham Road; and C. E. Challis, Esq., 2, Old Cambridge Terrace, South Lambeth, were balloted for and elected Subscribers to the Society.

*Exhibitions.*

Mr. Stevens exhibited a specimen of *Dynastes Actæon* from Peru, and another which he believed might prove a distinct species, also from South America, but the exact locality was unknown.

Mr. Holdsworth exhibited a piece of the wood of a Scotch fir perforated by the larvæ of *Sirex duplex*, *Shuck*. The insects had done considerable injury to a plantation of those trees, and he inquired of the Members present whether any means could be adopted for destroying them. It was observed that the structure of the ovipositor in the female of this species proved beyond doubt that the eggs are deposited under the bark, and as the larvæ eat into the solid wood of the trees there appeared no way of checking their ravages but by cutting down the infected trees, and destroying the perfect insects.



Captain Cox exhibited a series of drawings illustrating the transformations of British Lepidoptera, beautifully drawn from Nature by Mrs. Cox; amongst them were the larvæ of eight species of the genus *Eupithecia*.

Mr. Waterhouse exhibited a series of specimens of the British species of the genera *Rhizophagus* and *Monotoma*; the species of the former genus determined from Erichson, and of the latter from Aubé's 'Monograph,' as follows:—

#### RHIZOPHAGUS.

- |                 |                    |
|-----------------|--------------------|
| 1. nitidulus    | 5. ferrugineus     |
| 2. dispar       | 6. perforatus      |
| 3. bipustulatus | 7. parallelocollis |
| 4. depressus    | 8. cribratus       |

to which may be added the *R. cæruleus*, *Walll.*

#### MONOTOMA.

- |                  |                    |
|------------------|--------------------|
| 1. conicicollis  | 5. quadricollis    |
| 2. angusticollis | 6. quadrifoveolata |
| 3. picipes       | 7. longicollis     |
| 4. spinicollis   |                    |

Mr. Newman exhibited a remarkable dark variety of *Argynnis Euphrosyne*, and a specimen of *Heilipus brachypterus* infested by Fungi, and made the following communications respecting them:—

#### *Remarkable Variety of Argynnis Euphrosyne.*

“Mr. Weaver has placed in my hands a specimen of *Argynnis Euphrosyne* so remarkable that I think the Members of this Society will take some interest in examining it. The specimen is rather above the average size, and the spatulate terminal portion of the antennæ is of nearly double the usual length; the apex itself is very much flattened and twisted backwards. The upper surface is nearly black, the usual tawny spaces being almost obliterated by the suffusion and union of the black markings; this is more particularly the case with the hind wings, in which the only remaining traces of tawny are confined to the anal angle, and six obscure spots just within the outer margin. On the under side the colours of the fore wings are more suffused than usual, but otherwise not remarkable; but the distribution of colour in the hind wings is totally changed; the prevailing colour towards the base is greenish yellow; the marginal silver spots are changed into large silver markings of an elongate-conical form, and the middle one of the seven unites with the large silver spot in the centre of the wing.”

#### *Fungus on a Rhyncophorous Beetle.*

“Mr. Ingall has placed in my hands a specimen of *Heilipus brachypterus* which is in the finest condition, and looks as though it had been pinned while living, yet has several specimens of a black thread-like fungus, probably a *Sphæria*, growing from various parts of its body; three of these, about an inch in length, issue from the interstice between the prothorax and elytra; a fourth issues beneath the head, from the interstice between the head and prothorax; and there are many shorter ones in

a diversity of situations, but none appear to have pierced the more solid parts of the exo-skeleton."

Mr. Smith exhibited some specimens of a small species of *Trigona*, from Moulmein, with a portion of the nest of this species, and read the following communication :—

"In April, 1857, Sir Archibald Bogle, Commissioner of the Tenasserim Provinces, forwarded to the Agricultural and Horticultural Society of India a specimen of a substance called 'Pwai-nyet,' procurable at about one anna ( $1\frac{1}{2}d.$ ) per pound in those Provinces. Sir Archibald states that this material has only to be moistened with earth-oil till of the consistence of paint, and then spread with the fingers on a bit of cloth on the cracks of the roof of a house, to make it quite waterproof and to stop all leakage whatever; and it dries in an hour or two. Sir Archibald adds that, having found it most valuable, he thinks it very desirable to bring it to the notice of the Society.

"Sir Archibald having left India for Europe shortly after the receipt of the above specimen, the Society preferred a request to another member resident in the Tenasserim Provinces, the Rev. C. S. Parish, for further information as to the nature of the material in question, whether vegetable or mineral, and for any additional particulars he could afford. In reply Mr. Parish has been kind enough to supply the following interesting information, in a letter dated from Moulmein, May 20:—

"The substance about which you seek information is, as Sir A. Bogle stated, commonly procurable in the Moulmein Bazaar. It is not a vegetable substance, but is the result of the labours of a small bee (probably, however, it is the mixture of various gums and resins gathered by the bee). Fortunately, since receiving your letter I have met with a small colony of the Dammer bee at work in a hole of an old teak post. I have the pleasure to send you by this mail a small piece of the substance, for identification, taken out on the point of a knife; also two specimens of the industrious little creature itself, enclosed in a glass cell. I am not an entomologist, but shall be glad to know the name of the species. If any of your entomological friends think the species of interest, I will try to catch them some more, as I believe it has no sting. I have not, indeed, submitted them to the microscope, but, though numbers settled on me and flew round me, as I disturbed them in their work, I felt no evil consequence. The bee makes her nest of this substance, which is at first soft and plastic to the fingers and extremely glutinous, but afterwards, on exposure to the air, becomes dry, hard and brittle. The nest, I believe, is made indifferently in a hollow tree, in a hole in the ground, or, as in the present instance, in that of an old post. When bought it is commonly in a large irregularly shaped lump, rudely honey-combed, mixed with much extraneous matter. It is soluble in oil; any oil, I fancy,—at least I find that olive-oil answers the purpose of detaching it from the fingers as well as wood-oil.

"It is a well-known and commonly used substance here; but, though frequently noticed, mistakes as to its true nature have often been made, chiefly owing to the fact that the name of 'Dammer' is given to it in the Bazaar by the natives of India, who sell it, in common with many other resins and gums, which in appearance and quality it resembles. It is not 'Dammer,' though, if you ask for Dammer in the Bazaar, it is as likely that you will have this substance offered as any other. The Burmese know it only as 'Pwai-nyet.' They use it for caulking generally, mixing it with wood-oil over a fire; and it answers its purpose admirably in the case of wood-work, but whether of Pucka or Chunum work also, I cannot say."

Mr. Smith observed that the bees exhibited were a species described by him in the last part of the 'Proceedings of the Linnean Society,' by the name of *Trigona læviceps*; and that Mr. Parish was quite right in supposing it had no sting, as, like all the genus, it was destitute thereof. He added that he was informed by the Rev. H. Clark that a species of this genus was excessively abundant in Brazil, forming its nests in banks.

The Secretary read some notes on Australian Lepidoptera and their larvæ, communicated by Mr. Diggles; and a paper by Mr. A. R. Wallace on the habits and transformations of a species of Ornithoptera allied to *O. Priamus*, found in the Aru Islands, near New Guinea.

Mr. Stainton read a paper intitled "On the Aberrant Species hitherto placed in the genus *Elachista*."

Mr. Smith read a Supplementary Essay on the British Formicidæ.

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January 4, 1858.

W. WILSON SAUNDERS, Esq., President, in the chair.

#### *Donations.*

The following donations were announced, and thanks ordered to be given to the donors:—'Nota sul genere *Opsebius* fra i Ditteri Enopidei,' presented by the Author, Achille Costa. 'The Canadian Journal of Industry, Science and Art,' N. S., Nos. 11 and 12; by the Canadian Institute. 'Descriptions of eight new Species of Entomostraca found at Weymouth;' by the Author, John Lubbock, F.G.S. 'The Zoologist' for January; by the Editor. 'Memorias de la Real Academia de Ciencias de Madrid,' Vol. iv.; by the Academy. 'The Athenæum' for December; by the Editor. 'The Literary Gazette' for December; by the Editor. 'The Journal of the Society of Arts' for December; by the Society. 'The Insect Hunters;' by the Author, Edward Newman, F.L.S. 'The Entomologist's Annual' for 1858; by H. T. Stainton, Esq.

#### *Exhibitions.*

Mr. Janson exhibited a root of *Monizia edulis*, *Lowe*, from Dezertas Island, near Madeira, where it is commonly known as the "wild carrot." Although brought to this country in May, 1857, since which time it had been kept in a dry room, it still exhibited traces of vitality, and was infested with a species of *Coccus*.

Mr. Waterhouse exhibited to the Meeting his extensive series of the British species of *Atomaria*.

Mr. Douglas exhibited a portion of one of the staves of a flour-barrel, perforated by the larva of *Rhizopertha pusilla* of Fabricius. All the softer portion of the wood (American oak) was completely eaten away, and considerable leakage and loss of the flour had taken place in consequence.

Mr. Stevens exhibited some Lepidoptera, lately received from Mr. Bates, taken in

the neighbourhood of Ega and on the river Janari, Upper Amazons. The collection contained *Papilio Columbus*, *P. Bolivar*, *P. Patros* and *P. Pausanias*, some splendid *Catagrammæ* and *Erycinidæ*, and a number of fine *Geometridæ*. The most interesting portion of the collection, however, was a series of minute *Lepidoptera*, which had arrived in the most perfect state of preservation, and included many most beautiful and remarkable species, especially amongst the *Pyralidæ* and *Æcophoridæ*. The collection also contained several species of *Pterophoridæ* closely resembling the European representatives of that family.

Captain Cox announced his intention to call the especial attention of the Society, at the next Meeting, to the fearful ravages committed by the *Scolyti* on the elm trees in the vicinity of the metropolis.

Mr. Stainton read a "Synopsis of the Genus *Elachista*."

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Anniversary Meeting, January 25, 1858.

W. WILSON SAUNDERS, Esq., President, in the Chair.

F. Smith, J. T. Syme, J. O. Westwood, and J. S. Wilkinson, Esqrs., were elected Members of the Council, in the room of J. Lubbock, H. T. Stainton, G. R. Waterhouse, and T. V. Wollaston, Esqrs.; and the following were elected to fill the respective offices for the year: Dr. J. E. Gray, President; S. Stevens, Esq., Treasurer; E. Shepherd and E. W. Janson, Esqrs., Secretaries.

The Report of the Council to the Society, which stated that the typical specimens had been withdrawn from the collection of exotic insects, and recommended a speedy sale of the remainder, was read and received.

Mr. Stainton, one of the Auditors, read an abstract of the Treasurer's accounts, showing a balance of £75 9s. 6d. in favour of the Society, above all liabilities.

The President delivered an Address on the affairs of the Society and the general progress of the Science, for which, and his able services to the Society during his term of office, the Meeting passed a cordial vote of thanks, with a request that he would allow his address to be printed.

The President, in returning thanks, expressed his willingness to print the Address at his own expense.

A vote of thanks was then passed to the Treasurer and Secretaries, for their services to the Society.

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## THE PRESIDENT'S ADDRESS.

GENTLEMEN,

In again meeting you on the occasion of another Anniversary it gives me pleasure to report that the Entomological Society is in a very flourishing condition. Our ranks are increasing in number; our meetings have been very well attended; valuable papers have been read at our meetings and printed in our 'Transactions;' and our excellent Treasurer shows that he has been very careful of the funds entrusted to his charge, by having a clear surplus in his hands, after paying all debts, of about £75.

The following statement, which has been kindly furnished by our Secretary, Mr. Shepherd, will show that during the past year four names have been added to our list of members, and eight to that of our subscribers; that we have lost by resignation two members and three subscribers, and by death one member; so that the increase of our number amounts to twelve, and the decrease to six, leaving the Society stronger by six members or subscribers than it was at the commencement of the year.

## ELECTED DURING 1857.

Atkinson, W. . . .	Member.
Bakewell, R. . . .	Do.
Croker, T. F. D. . . .	Do.
Sealy, A. F. . . .	Do.
Biggs, C. J. . . .	Subscriber.
Brown, H. W. . . .	Do.
Canham, G. W. . . .	Do.
Challis, C. E. . . .	Do.
Drury, C. . . .	Do.
Gorham, H. . . .	Do.
Gloyne, C. P. . . .	Do.
Lewis, G. . . .	Do.

## RESIGNED DURING 1857.

Bates, F. . . .	Subscriber.
Jobson, J. . . .	Do.
Langcake, I. . . .	Do.
Curtis, J. . . .	Member.
Edwards, G. . . .	Do.
	<i>Dead.</i>
Spinola, Marquis . . .	Do.

The member whose death we have to lament is that of the Marquis Max. Spinola, an enlightened and veteran entomologist, well known and much appreciated for his valuable contributions on many branches of entomological study, but especially for his knowledge of European Hymenoptera. His writings will be found chiefly dispersed in the pages of the 'Annales Ent. Soc. France,' the 'Revue Zoologique,' the 'Annales Mus.,' and Silberman's 'Revue Entomologique.' His 'Insectorum Leguriæ,' in two vols. 4to, was published as a separate work, and appeared in the years 1806 to 1808.

The Treasurer's account has been read to you this evening, wherein is fully detailed the income and expenditure of the Society during the year now brought to a close. Comparing it with last year's statement the receipts appear to be less by about £8, but on the other hand the payments have been also less, there being on this head a decrease of £20, so that there is a clear gain here to the Society of £12. Carrying on the comparison, our liabilities will be found now £24 less than at this time last year, but again our assets are somewhat smaller, so that, striking a balance, the Treasurer finds now a surplus of £75 9s. 6d., instead of £44 4s. 9d. when he last made his annual statement. One item in the account cannot however be passed over without comment, namely, the sum brought this year to account for the sale of 'Transactions.' You will find this sum put down at £36 9s. 3d., when last year £63 16s. 5d. was paid to the Treasurer, arising from the same source, and there has been therefore a falling off this year in the sale of the 'Transactions' of £27 7s. 2d., or about three-sevenths of the amount. The publication of three parts of the 'Transactions,' instead of four, will partly account for the deficiency; but still there would be, making the most liberal allowance for this fourth part, a considerable sum wanting, and to account for this I can only suppose the parts published have not been attractive to the usual purchasers. When the 'Transactions' contain interesting and attractive Plates they invariably sell the best; and it is worthy of remark that some of the parts of the 'Transactions' are now nearly sold out, and that these are extensively and beautifully illustrated.

I have already alluded to our meetings having been well attended, and there seems to be every reason to believe that this is owing to the variety and extent of the objects which have been brought for exhibition, and which, during the last year, have been more than

usually interesting and instructive. This result is very satisfactory, and most urgently do I call on our members for increased exertions in this respect, for, besides the interest exhibitions give to our evening meetings, much entomological information is spread among the members, and many facts brought to light of real importance to the branch of Natural History for which we are associated. I am very anxious to see more done by British entomologists in the study of the history of insects,—more attention paid to their transformations, habits and economy,—so that the skill of the entomologist may when required turn to good practical account. If our members would therefore, as often as practicable, bring for exhibition at our meetings anything tending to this point, many important facts only known to a few would get currently circulated in the entomological world, and much valuable information would be permanently placed on record. To effect this, I would strongly recommend to as many who have time and opportunity to indulge in that very pleasant and rational way of passing time called field-work, and see what insects are about in their haunts on the hill-sides and sunny banks in woods and open fields, in ditches and ponds, and indeed everywhere, either above or below ground; make a call upon them at home, and become fully acquainted with them,—they will amply repay you for the trouble. The last remarkably fine season has been particularly adapted for this branch of entomological research, and many of our members have made good use of the favourable combination of circumstances presented to them.

Our library has been enriched by a variety of works, and continuations of foreign and home periodicals, chiefly presentations. As I attach much value to a good collection of books for the use of our members, I think that, as we have now a little spare money, some of it might with advantage be laid out in the purchase of standard entomological works which may be wanting to the library. An expression of opinion on the part of the members would show the Council the wishes of the Society on this subject, and steps might be taken to secure good works should an opportunity of purchasing them occur.

The 'Transactions' and 'Proceedings' have not appeared quite regularly. Of the former three parts have been printed and circulated: a delay has occurred in the fourth part, owing to the difficulty of getting the papers corrected for the press, but it will appear with

the first part for the ensuing year, in the shape of a double number. The printing of the 'Proceedings' had been stopped for a time, the Editor of the 'Zoologist,' in which work our proceedings appear, not having been willing to come into the views of our Secretaries on the subject: this difficulty, I am happy to say, has been quite overcome, and in a very short time the whole of the unprinted matter will be before the Society; it is already in the course of printing.

The 'Transactions' contain the following papers:—

The concluding portion of Mr. Pascoe's first paper "On new Longicorn Beetles," and his second contribution on the same subject, in which will be found the descriptions of many remarkable and very interesting forms belonging to this large and important family.

A paper by Mr. Newman, "On a few apparently undescribed Insects from Moreton Bay," describing two species of Coleoptera, *Elater Jansoni* and *Stenodorus quietus*; three Lepidoptera, *Deilephila Dalii*, *Macroglossa Nox* and *Castulo Doubledayii*; and two Diptera, *Pangonia Walkeri* and *Dasypogon Grantii*.

"Observations on Genera," by Mr. Stainton, in which the author gives his ideas on the nature and extent of the characters necessary to form a genus. This is a subject on which there is a great variety of opinion, and the author's views are entitled to consideration.

"Observations on the Difficulties attending the discrimination of the Species of Stylops," by Mr. Smith. Here the author shows the necessity of describing and figuring the species of Stylops while alive, and not when dried up and the parts greatly altered, and points out the confusion which has arisen from not attending to this important particular.

"Characters of undescribed Diptera," by Mr. Walker. A paper giving the descriptions of numerous new species forming a portion of the collection of your President.

The commencement of a paper by Mr. Westwood, "On the Oriental Species of Butterfly allied to *Morpho*."

A short note by your President, to accompany three Plates of the transformations of some Lepidopterous Insects of Natal, by Mr. Plant, and Mr. Walker's description of *Lebeda cuneilinea*, one of the Lepidoptera figured, and which is new to Science.

A paper by Mr. Westwood, "On the Wing-Veins of Insects," in which the author maintains the propriety of naming the thickened portions of the wings of insects, sometimes called ribs, rays, nervures, &c., veins, the author being of opinion that these thickened parts are essentially veins



“A Revision of the British Atomariæ,” by Mr. T. V. Wollaston, executed with the known precision and care of that talented entomologist. The number of species amounts to twenty-three. One new species, *Atomaria Hislopi*, is described.

“On the recent progress of Micro-Lepidopterology on the Continent,” by Mr. Stainton, in which the author well points out what our Continental friends have been doing among these now favourite families of the Lepidoptera.

Mr. J. S. Baly gives descriptions of two new species of *Pseudomela*.

The present state of the National Collection of Insects, and the progress made in its arrangement, cannot but be interesting to entomologists; and I have therefore much pleasure in laying before you the following report, kindly furnished to me by my friend Dr. Gray, and for which I beg to tender him my best thanks. The collection of insects under his care is, I have every reason to believe, the most extensive which has yet been formed, and of the greatest importance to working entomologists in this country, giving them an opportunity of examining a vast variety of insect forms, and placing them in a very advantageous position as compared with entomologists on the Continent. Under the able management of Dr. Gray the collection is rapidly augmenting, and the contents are being arranged and put in good working order by a gentleman of known ability, and whose labours are well shown in a series of Catalogues, which are a most valuable contribution to the science of Entomology.

“In reply to your kind note I have the pleasure to inform you that we have added and arranged, in their places in the Collection, 22,705 specimens of Insects and Crustacea, during the year ending the 31st of December, 1857. These are all specimens selected from large collections as those most useful for completing our collection, or of typical importance.

“We have lately added to the Department, and arranged apart for more easy study, a very large Collection of European Coleoptera, all received from Continental entomologists of good reputation, so as to enable our English Coleopterists to determine, by actual comparison, the names by which their specimens are known to their Continental brethren.

“Mr. Wollaston has added to his collection of Madeira Coleoptera

already in the Museum all the species which have been since discovered in these islands by himself or other entomologists, and there has been added to this collection the specimens of all the other orders of insects which Mr. Wollaston found in these islands, forming one of the most complete local Insect-Faunas, next to our British Collection, now known.

“A large general collection of Coccinellidæ, all named, many of them being type specimens described by M. Mulsant.

“The British Collection of Lepidoptera has been greatly extended, by the addition of many new species and fresh specimens: it has been rearranged according to the edition of Mr. Stephens' Catalogue revised by Messrs. Stainton and Shepherd.

“It has also received, among other donations, many valuable specimens of Hemiptera, and other insects collected in Brazil, by the Rev. Hamlet Clark.

“M. Jekel brings in succession the species of the different genera of Curculionidæ, purchased by Mr. John Bowring, and deposited by him, for the use of entomologists, in the British Museum, until his return from China.

“Dr. Hagen, of Königsberg, visited the Museum at my invitation, for the purpose of describing the new species and revising the nomenclature of the described species of Trichoptera and Neuroptera in the British Museum, and especially for the purpose of preparing a Catalogue of the British species for Mr. Stainton's 'Annual.'

“We continue to produce a succession of Entomological Catalogues, which must make our Collection contain the largest number of types of any in Europe. I may mention the following:—

- “1. Mr. Wollaston's 'Catalogue of Coleoptera of Madeira,' containing a description of the species discovered since the publication of his large work on the subject.
- “2. Mr. Walker has published three parts of his 'Catalogue of Noctuidæ,' containing the description of many new species not mentioned in the later Continental works on the subject.
- “3. Mr. Smith has published another part of his excellent 'Catalogue of Hymenopterous Insects,' containing the family Vespidæ; and he has a 'Catalogue of the Species of Formicidæ' quite ready for the press.

“I wish I could have added to this list the illustrated ‘*Monograph of Phasnidæ*,’ by Mr. Westwood, the plates of which have been ready and all the manuscript of which has been in type for some months, and is only waiting for the correction of a few pages; and the ‘*Catalogue of British Coleoptera*,’ which has been so anxiously looked for, but I fear we can no longer hope for its appearance from the gentleman who undertook the work, which is the more to be regretted as I believe he has the material for the work, either in his cabinet or MSS. The want of this catalogue may be considered as a stigma on the industry and talents of our entomologists.”

Various works and papers relating to Entomology have appeared in this country since I last addressed you, evincing a considerable amount of activity among those naturalists who make insects their study.

The following enumeration will show the chief of the publications alluded to:—

In the ‘*Journal of the Proceedings of the Linnean Society*’ there is the conclusion of Mr. Walker’s “*List of the Homopterous Insects collected in Borneo by Mr. Wallace*,” and Mr. Smith’s “*Catalogue of the Hymenoptera*,” collected also in Borneo, by the same able collector.

In the ‘*Annals of Natural History*’ for 1857 there are the following papers:—

“*Synopsis of the British Edriophthalmous Crustacea*,” by Mr. C. Spence Bate.

“*A List of Coleoptera received from Old Calabar*,” with a plate and outline figures, by Mr. Andrew Murray.

“*Descriptions of New Ceylon Coleoptera*,” by Mr. John Neitner; taken from the ‘*Journal of the Asiatic Society of Bengal*.’

“*Descriptions of eight New Species of Entomostraca found at Weymouth*,” by Mr. J. Lubbock.

In the ‘*Natural History Review*’ for 1857 the following entomological papers occur:—

“*Entomological Notes*,” by Mr. Haliday.

“*On the occurrence of *Portunus marmoreus* at Birterbee Bay, Connemara*,” by Dr. C. Farran.

“On the *Xanthe rivulosa* and other Decapodous Crustacea occurring at Valentia Island,” by Dr. J. R. Kinahan.

“On a New Crangon (*C. Allmanni*), and Notices of other Non-descript Crustacea,” by Dr. J. R. Kinahan.

“Carcinological Notes, being a List of the Crustacea Podophthalmia of Galway Marine Districts,” by Dr. J. R. Kinahan.

“On a peculiar form of the Ovaries observed in a Hymenopterous Insect constituting a New Genus and Species of the Family Diapriidæ,” with a plate, by Mr. Haliday.

“On the remaining blanks in the Natural History of Native Diptera,” by Mr. Haliday.

“An additional Note on the Metamorphosis of some Species of Diptera hitherto undescribed or known imperfectly,” with figures, by Mr. Haliday.

“An Addendum to the Supplemental Dublin List of Crustacea,” by Dr. J. R. Kinahan.

“On a New Amphipod (*Iphimedia Eblæna*),” with a plate, by Mr. Spence Bate.

“Notes of a Visit to Michelstown Caves, and of the Discovery of *Lepura Stellicedia*,” by Mr. E. Percival Wright.

“Notes on the European Blind Fauna,” by Mr. Haliday.

“On the Embryo State of *Palinurus vulgaris*,” by Mr. R. Q. Couch.

“Analysis of Terrestrial Isopods, with Descriptions of New Genera and Species,” by Dr. J. R. Kinahan.

In the last volume of the ‘Proceedings of the Zoological Society’ (1856) will be found the following papers:—

“On a New Species of Lepidopterous Insect,” by Mr. G. R. Gray. The insect described is a female belonging to the genus *Ornithoptera*, and is named *O. Victoriae*. There is a plate attached (No. 39), giving an excellent representation of this fine insect.

“Descriptions of some Coleopterous Insects in the Collection of the British Museum, hitherto apparently unnoticed,” by Mr. Adam White. This paper contains descriptions of several very interesting Longicornes and Lamellicornes, with figures, among which will be found that of *Psalidococtus scaber* of White, a very remarkable and noble insect, from Tana, in the New Hebrides. The Lamellicornes belong to the family *Cetoniadæ*.

“Some Remarks on Crustacea of the Genus *Lithodes*, with a brief Description of a Species hitherto unrecorded,” by Mr. Adam White.

*Lithodes (Petalocerus) Bellianus* is here described and well figured, at page 42.

“Description of *Mygale Emilia*, a Spider from Panama, hitherto apparently unrecorded.” This is a large and very fine species of *Mygale*, remarkable for its colour. It is figured at Plate 43.

‘The Zoologist’ continues to afford a variety of information, as usual, on the habits and localities of British Insects especially, and besides there are special papers on the following subjects:—

“On the Classification of the *Deltoides* and *Pyralites* of M. Guenée, with Remarks,” by Mr. C. R. Bree.

“On Pupa Digging,” by the Rev. J. Greene, M.A.

“Entomological Botany,” by Mr. H. T. Stainton; in continuation of former papers on the same subject.

“A Systematic List of Coleoptera found in the vicinity of Alverstoke, South Hants,” by Messrs. A. Adams and W. B. Baikie; continuation.

“Sketch of a short Arachnological Excursion,” by Mr. R. H. Meade.

“A List of the British Species of *Aleocharidæ*,” by Mr. G. R. Waterhouse.

“List of the Podophthalmous Crustacea occurring in Dublin Bay and the adjacent Waters,” by Dr. J. R. Kinahan.

“Determination of the Species of *Phryganidæ* described by Mr. Stephens in his ‘Illustrations of British Entomology,’” by Dr. Hagen.

I have had the pleasure of examining a copy of a ‘Catalogue of the Lepidopterous Insects in the Museum of the Hon. East India Company,’ by Dr. Horsfield and Mr. F. Moore. Vol. I., containing 278 pages, an excellent Index, and 18 Plates.

This first volume, although printed, is not yet made public. It is a very important addition to our knowledge of the insects of India, and highly creditable to the Editors. The general superintendence of the work is by that veteran in science and able naturalist Dr. Horsfield, and the descriptive part by Mr. Moore, whose knowledge of the Lepidoptera is very extensive, and whose care and skill, as exhibited in the work now under consideration, will not fail to be favourably appreciated by entomologists: 595 species of diurnal Lepidoptera and 50 Sphingides are enumerated in the work, many of which are new to Science. The plates are very valuable, giving details of the transformations of several species: the first twelve plates are devoted to

this desirable purpose, and should be carefully studied by Lepidopterists. The enlightened liberality of the Hon. Court of Directors of the East India Company, in bearing the cost of a work so highly creditable to Science, must not be passed without comment, and should be held up as a bright example of support given to the advancement of Natural Science.

To Mr. Stainton, whose energies are unabated for the advancement of Entomology, especially as regards a knowledge of the insects of Great Britain, we are indebted for another volume of the 'Entomologist's Annual,' containing much information, and papers by Dr. Hagen, on the British Planipennes; by Mr. Smith, on Aculeate Hymenoptera; by Mr. Dawson, on British Geodephaga; by Mr. Janson, on New Species of British Coleoptera; by the Editor, on New British Lepidoptera; by Mr. Westwood, on the Caterpillars of the Saw-flies; and by Professor Frey, on the Tinea of the higher Alps. The volume is accompanied by a well-drawn and coloured plate, on which are figured nine insects new to this country, and will be found of much use to all students of British Entomology.

From the same indefatigable hand we have a regular continuance of the weekly paper, the 'Intelligencer,' in which will be found a mine of information on the captures and habitats of our insects, with other particulars of much value.

The editing of a periodical of this description must be a work of much labour; and as a love of the Science can be the only inducement to keep up the energies of the Editor, entomologists must feel indebted to him for the great trouble he is taking in trying to infuse a love of their favourite Science into the public mind. It is evident, from the number of subscribers to the 'Intelligencer,' that entomologists abound among the public to a far greater extent than might be anticipated.

A second volume of the 'Natural History of the Tineina' is another of Mr. Stainton's very meritorious labours, adding greatly to the knowledge of the economy and transformations of a genus of minute Lepidoptera: 24 species of Lithocolletis are carefully described, in all their stages of existence, and admirably represented on eight coloured plates.

Mr. Dallas has brought his 'Introduction to Entomology' to a

conclusion. It forms a neat handy volume, and will be found very valuable to students in Entomology.

In the 'Insect Hunters,' a poem by Mr. Newman, in the style of Longfellow's 'Hiawatha,' the author has brought together, in a very pleasing way, a great deal of really good entomological matter bearing upon the habits and economy and classification of insects. I can strongly recommend it to young persons who wish to obtain sound entomological information; and the kindly tone in which the work is written is deserving of much commendation. I will not pass an opinion on the desirability of putting Entomology or any other Natural History study into verse, as the experiment is novel: time will show its value; but possibly to young people the character of the verse may impress the facts brought forward more strongly on the mind than if merely stated in the common way.

I am not prepared to give you a sketch of the Continental publications on the subject of Entomology which appeared last year, but the following may be mentioned, irrespective of the usual periodicals:—

'Die Noctuiden Europa's,' by Jules Lederer. This work, published at Vienna, gives, in German, descriptions of the genera of the European Noctuidæ, including those of Asiatic Russia, Syria and Labrador, and is accompanied with four outline plates of dissections. Under each genus the various species included therein are enumerated. The work will be found useful to Lepidopterists conversant with the German language.

'Käferbuch,' by Dr. C. O. Calwer; published at Stuttgart, with 1 plain and 48 coloured plates. This is a natural history of European beetles, in German, with generic descriptions, and the species arranged systematically after each genus. Some few species are described; but the majority are merely enumerated, with the countries where they are found. The 48 coloured plates are very well executed, and contain a large number of figures each. This work, which is sold at a very low price, will be found of great use to any one studying the European beetles.

The 'Histoire Physique, Politique and Naturelle de l'Isle de Cuba,' is a thick octavo volume, with Atlas of Plates devoted to the "Animaux Articulées," by M. Guérin-Méneville. The author has here got together a great amount of information on all branches of the Entomology of Cuba, including the Crustacea and Spiders, and the work will be found indispensable to all studying the insects of the

West India Islands. The Atlas contains 20 plates of admirably executed figures, with dissections, and are everything that could be wished for illustrating the letter-press.

'Fauna Austriaca, die Käfer.' Descriptions of the Beetles of Austria, according to the analytical method. By Ludwig Redtenbacher. In German: 764 pp. to the Curculionidæ, genus *Anthonomus*; 6 parts.

'Neuroptera Austriaca.' Vienna: 1857. An 8vo pamphlet, of 80 pages; by F. Brauer and Franz Low; gives descriptions of the Neuropterous Insects of Austria, in German. There are 5 outline plates of details of genera and species attached to the work.

'Insecta Caffrariæ,' Part II., by C. H. Boheman, is a continuation of an excellent work on the Insects of South Africa. It contains the Lamellicorn beetles.

'Monographie des Cicindelides,' by M. James Thomson (Paris, 4to), is a work of much promise: one number is published. The work is got up with much care, and the plates are beautifully engraved and coloured, the figures giving excellent representations of the insects. The high price of the work will, I am afraid, place it out of the reach of a number of our working entomologists.

'Archives Entomologiques,' by M. J. Thomson (Paris, 8vo), is a work intended to illustrate new and rare insects, and has already reached five parts. The Longicornes are the insects chiefly described and figured as yet. The plates are carefully drawn and well coloured, and the work appears likely to be of much use to entomologists.

The 'Annales des Sciences Naturelles,' fourth series, vols. v. and vi., contain an excellent paper on the Ants of France and Algiers, by Dr. Wm. Nylander; a paper by M. Schiödt, on the *Staphylinus vivipares* which are found accompanying the Termites; a paper by Ch. Lespes, on the Organization and Habits of the *Termites lucifuga*; a paper by M. Fabre, on the Instinct and Metamorphoses of the Sphegidæ; a reproduction of M. C. Th. E. De Siebold's researches on the Parthenogenesis of the Lepidoptera and Bees.

Erichson's 'Naturgeschichte der Insecten Deutschlands' has four additional parts published during the year, in which will be found a continuation of the Carabidæ, by H. Schaum; the Buprestidæ, by H. v. Kiesenwetter; and the conclusion of the Staphylini, by Dr. G. Kraatz.

Entomology, viewed in the light of an interesting, useful and delightful branch of Natural History, is no doubt advancing in the



estimation of the British public; and I see with pleasure Societies forming in the country, particularly at the English Universities, having Entomology as their object. The Entomological Society of London must have at heart the well-being and progress of such kindred Societies, and I am desirous that it should enter into communication with them, and show its willingness to aid and assist them as far as practicable.

Entomology is yet a vast nearly unworked field of research. The natural history of any insect has not yet been fully written. The labourers are very few. Let us, therefore, encourage new hands taking to the work, and new Societies formed for the advance of Entomology, and hold out the right hand of good fellowship to all who have Entomology at heart. They will doubtless do good service to the cause; Science will benefit by their exertions, and we shall arrive at knowledge by their labours.

In relinquishing the Chair of the Entomological Society, for the second time, I cannot refrain from again tendering to the Officers and Members of the Society generally my best thanks for the kindness and attention I have received at their hands during the last two years. You have made the task of presiding over you an easy one, nay one of pleasure, and you have kindly overlooked my shortcomings, giving me, I believe, credit for the intention of upholding the high character of the Society, and the desire of promoting the best interests of our Science. Gentlemen, I wish you heartily farewell.



*Report of the Library and Cabinet Committee.*

We have to report that the Collections and Library remain in a good state of preservation.

With respect to the Exotic Collections, which the Society have determined to dispose of, we beg to report that, having obtained every assistance in the task of recognising the typical specimens, in order to ensure their preservation, they have been withdrawn from the Collection; and, the greater portion of the Exotic Insects having been divided out into suitable lots, we now recommend that they be offered to public competition with as little delay as practicable.

WM. WILSON SAUNDERS,  
J. W. DOUGLAS,  
FRANCIS P. PASCOE,  
FREDK. SMITH,  
E. SHEPHERD.

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*Abstract of the Treasurer's Accounts for 1857.*

## RECEIPTS.

	£	s.	d.
By Balance on hand, January 1, 1857 .....	85	14	9½
„ Arrears of Subscriptions .. .. .	9	9	0
„ Subscriptions for 1857 .. .. .	115	10	0
„ Admission Fees .. .. .	12	12	0
„ Tea Subscriptions .. .. .	10	10	6
„ Sale of 'Transactions' at Rooms, &c. .... £19 0 6			
„ „ „ at Longmans' .. .. . 17 8 9			
			36 9 3
„ Cash of Mr. Saunders, for Coloured Plates of Mr. Plant's Natal Moths .. .. .	11	6	0
„ Cash of Mr. Spence, Subscription for Cases to Educational Museum, Kensington .. .. .	5	5	0
			£286 16 6½

## PAYMENTS.

	£	s.	d.
To paid arrears for 1856:—Mr. Standish, for Colouring ... £2 1 0			
Messrs. Roworth, for Printing 15 16 0			
Mr. Clyde, for Bookbinding... 4 7 0			
Mr. Dunn, for Oil..... 4 3 0			
Rent to Christmas, 1857 ..... 20 0 0			
Mr. Day, for Plates .. .. . 5 0 0			
			51 7 0
„ Rent to Midsummer last, two Quarters .. .. .	20	0	0
„ Insurance to Lady-day, 1857 .. .. .	2	10	0
„ Curator for attendance .. .. .	18	4	0
„ „ Sundry small payments .. .. .	0	13	8
„ Tea, thirteen Meetings .. .. .	13	13	0
„ Attendance, Coals, Cleaning, &c. .. .. .	4	8	7
„ Postage, Parcels, Stationery, &c. .. .. .	3	8	6
„ Printing 'Transactions,' three parts .. .. .	33	7	4
„ „ 'Proceedings,' &c. .. .. .	4	3	0
„ „ Plates .. .. .	5	0	0
„ Colouring ditto .. .. .	23	15	8
„ Engraving ditto .. .. .	6	8	0
„ Collector's Commission!.....	0	10	0
„ Christmas Boxes .. .. .	0	12	6
„ Box for Educational Museum .. .. .	1	1	0
Balance in hand .. .. .	97	14	3½
			£286 16 6½

*Liabilities and Assets of the Society.*

<i>Liabilities.</i>			<i>Assets.</i>		
	£	s. d.		£	s. d.
Mr. Newman, for Proceedings, &c. ....	4	5 0	Arrears of Subscriptions, good .....	10	10 0
„ Day, for Plates.....	2	10 0	Ditto, doubtful £18 18 0		
„ Bright, for cleaning Lamps .....	0	13 0	Add balance in hand .....	97	14 3½
„ Dunn, for Oil .....	4	13 0		£108	4 3½
„ Yates, for Plates .....	0	13 9	Less Accounts due at Xmas.	32	14 9
Rent to Christmas .....	20	0 0			
	<hr/>		True Balance in favour of the Society .....	£75	9 6½
	£32	14 9		<hr/>	

Balance in favour of Society, Christmas, 1856 ..... £44 4s. 9½d.

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*The figures refer to the pages of the Transactions, and the Numerals to the pages of the Journal of Proceedings.*

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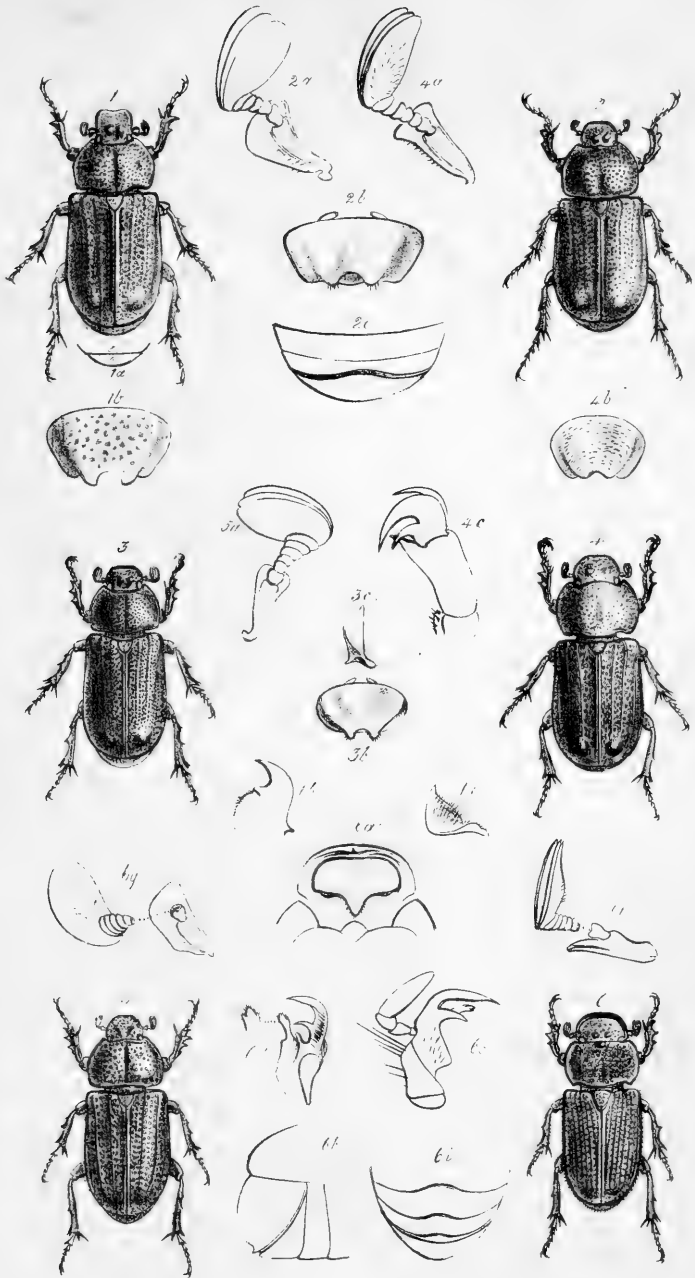
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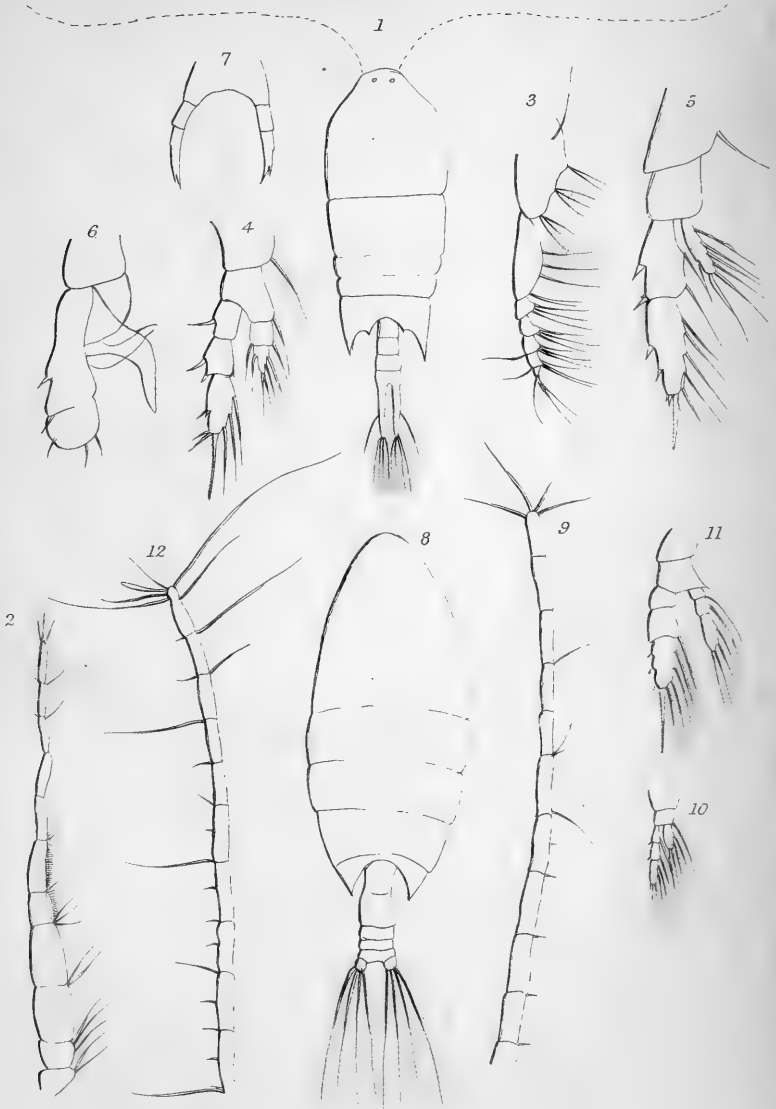
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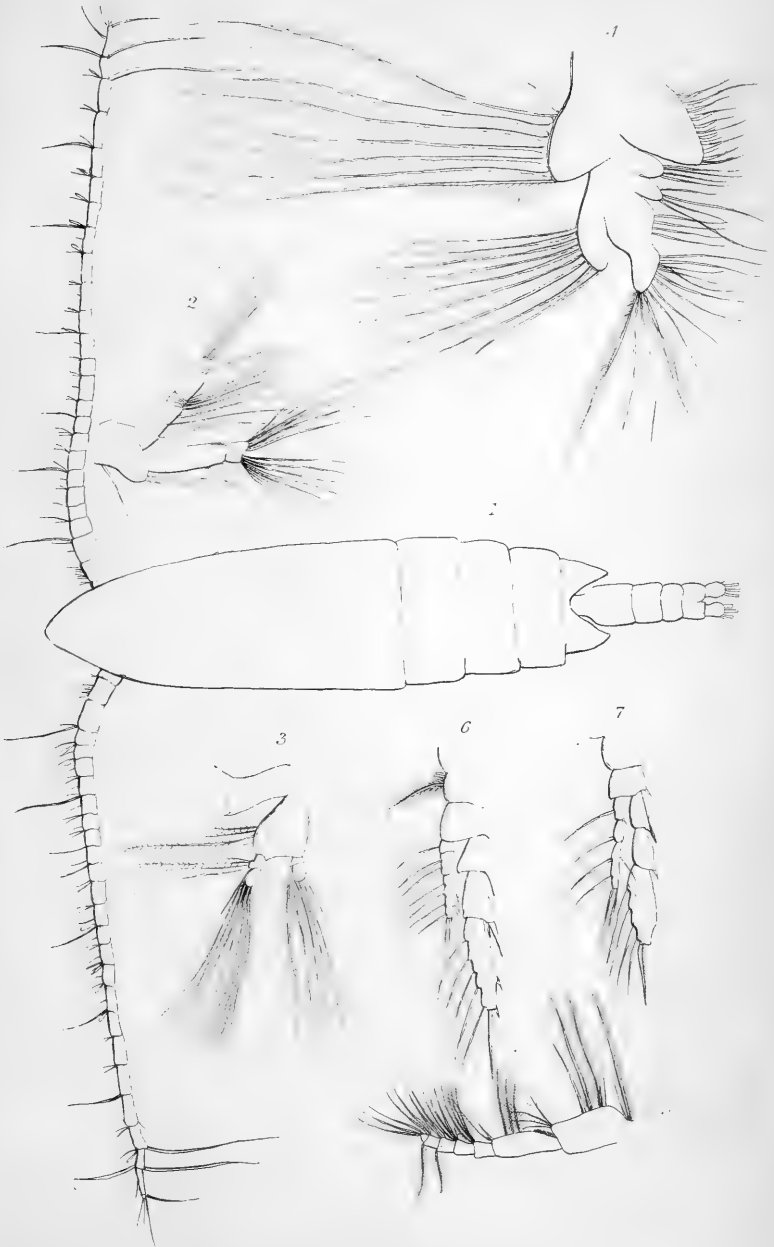




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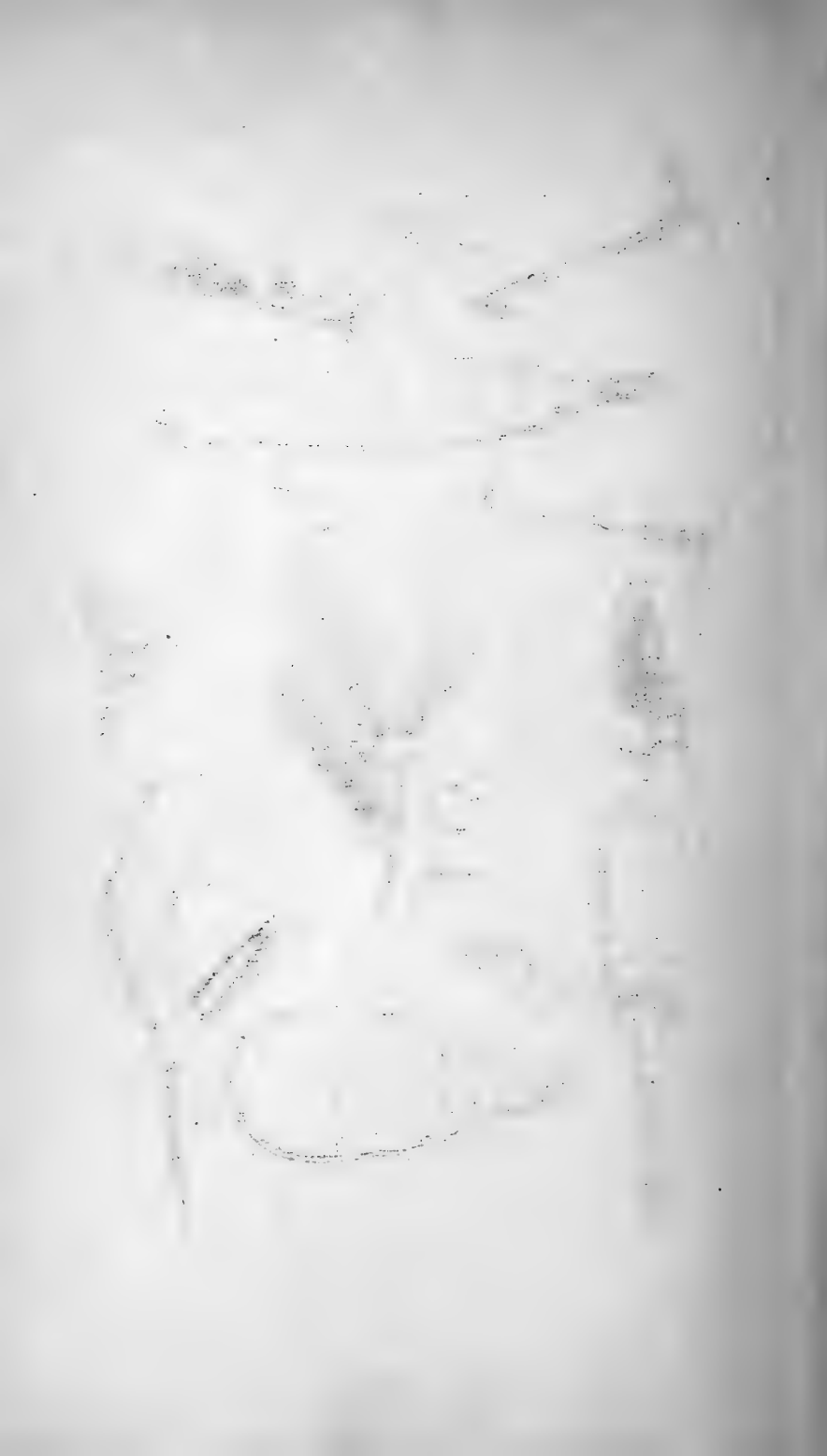


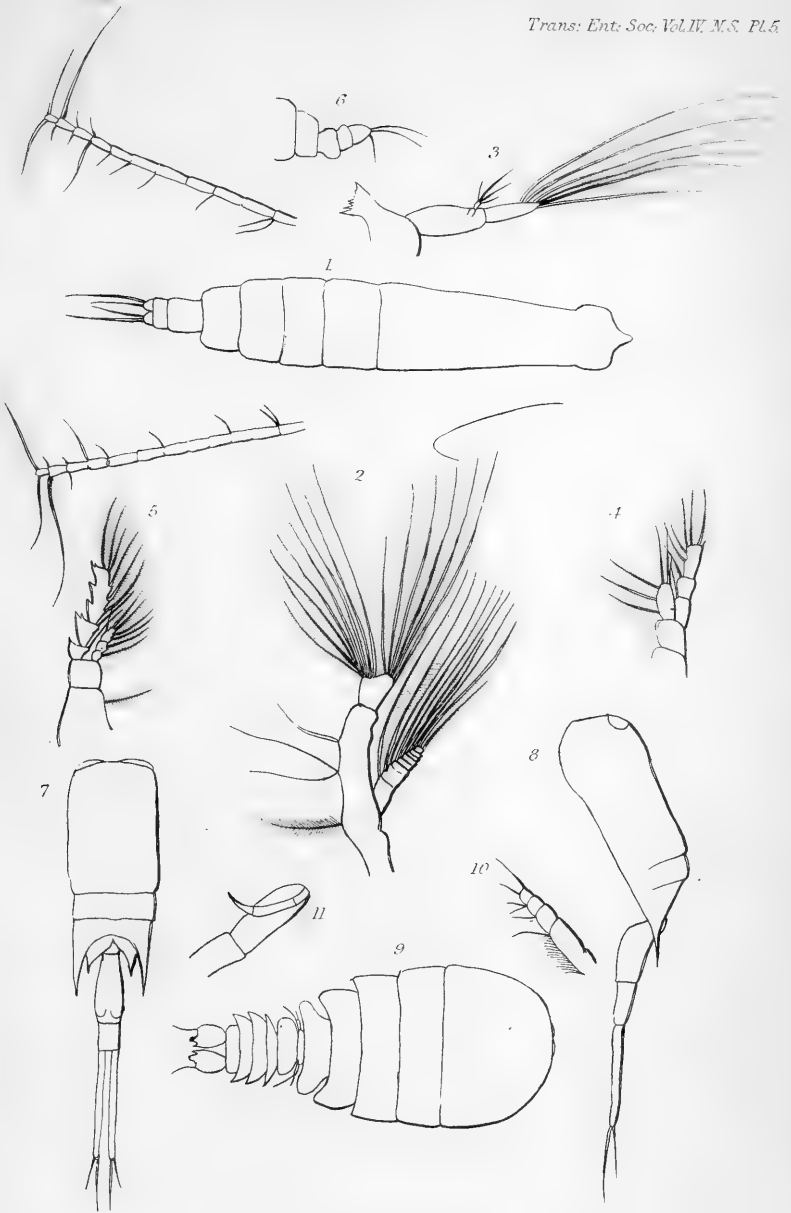






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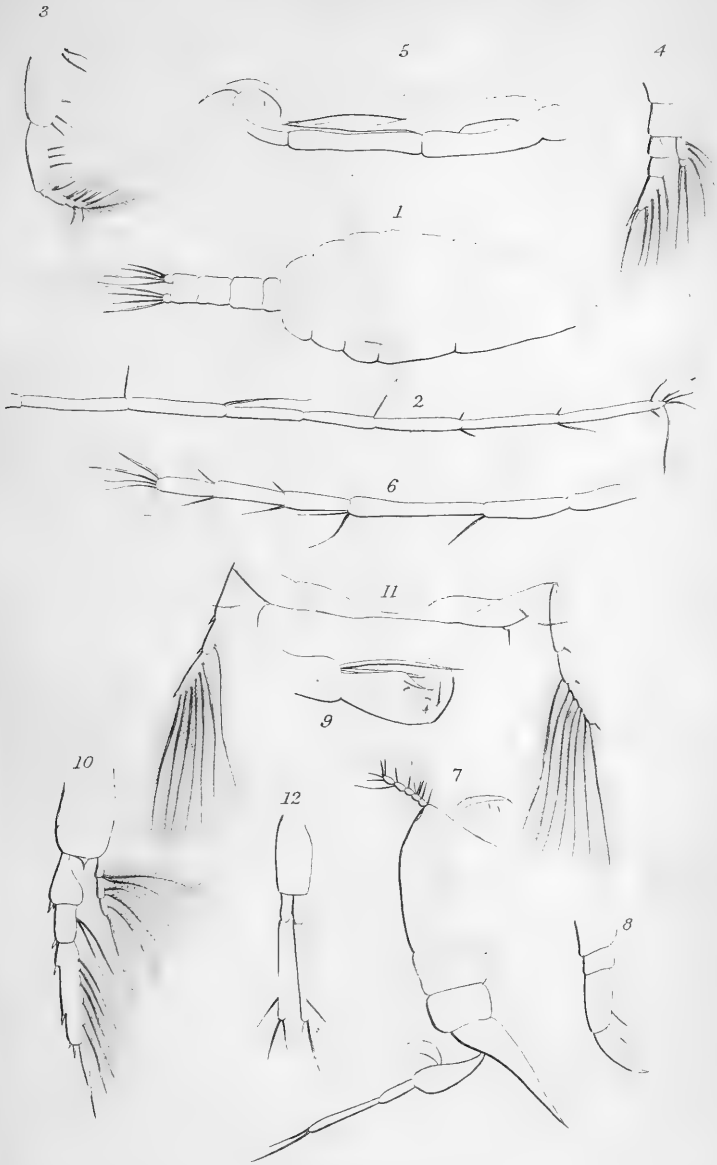




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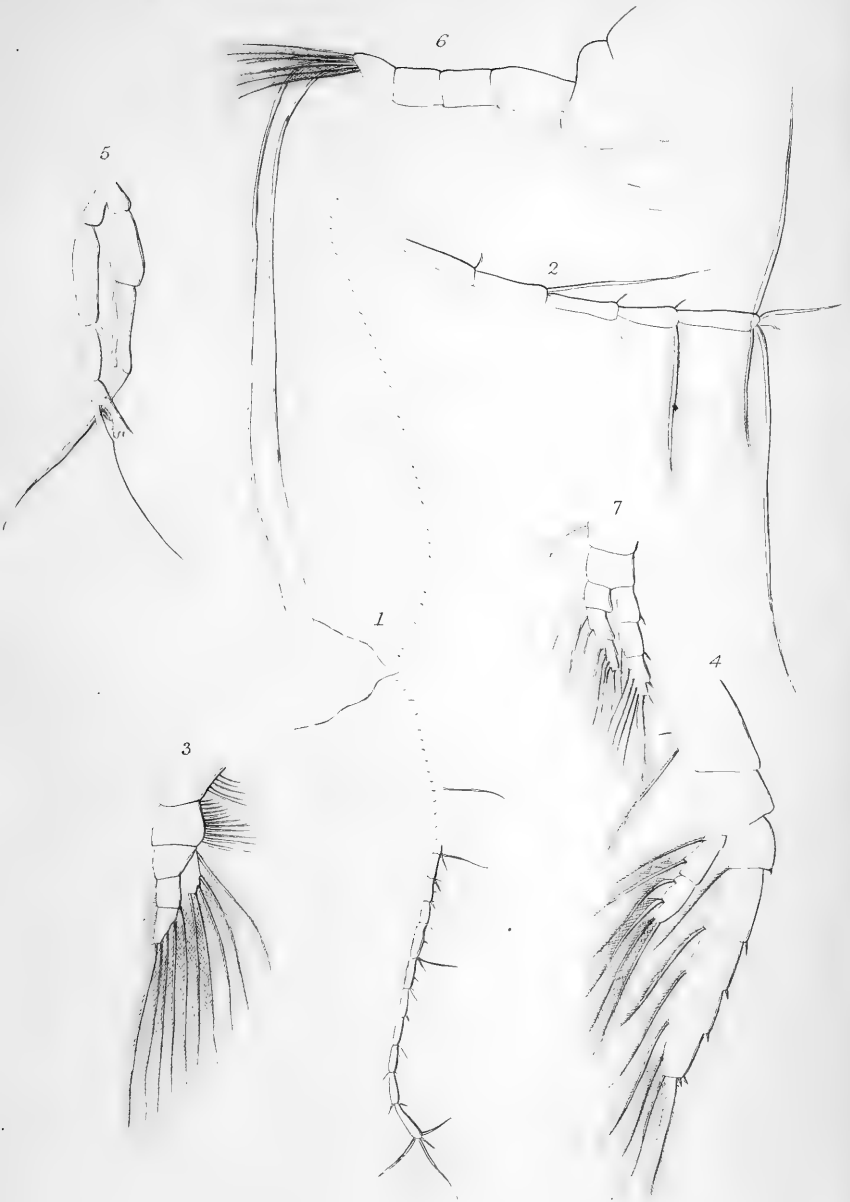




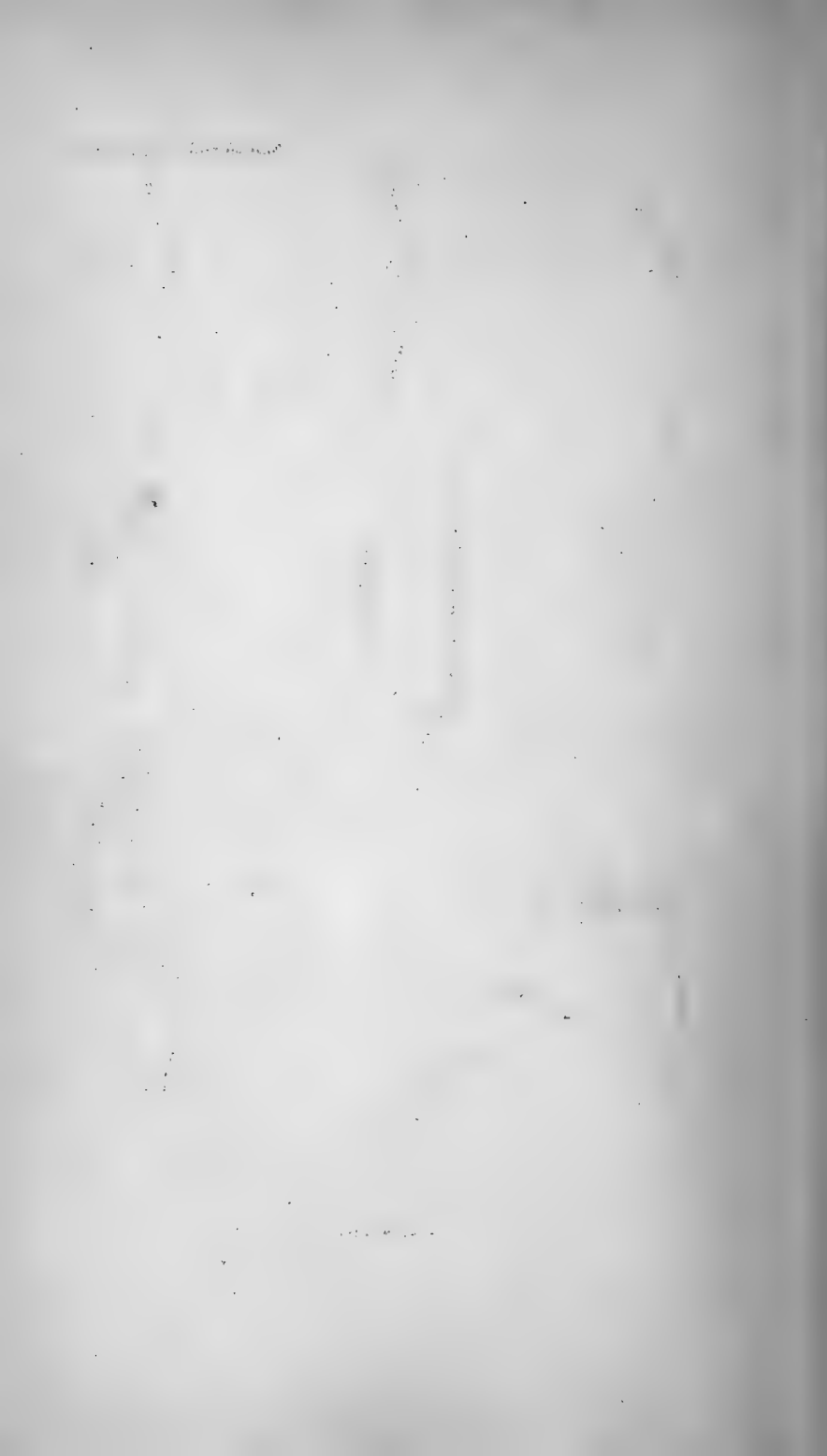


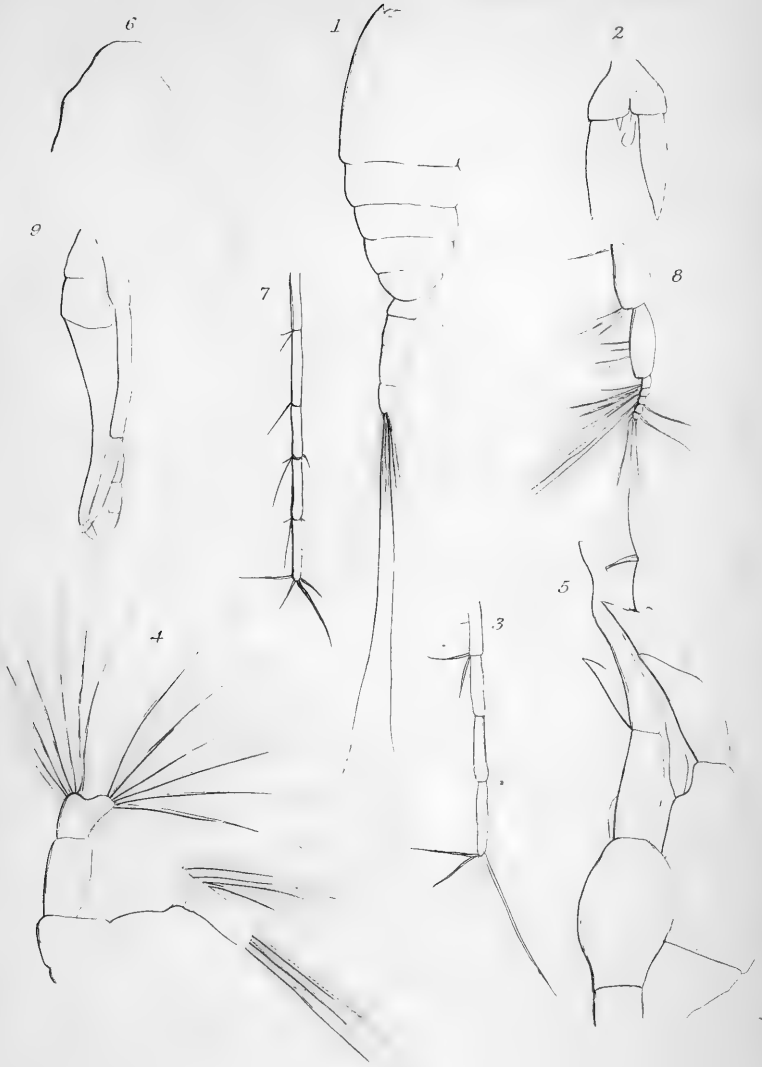
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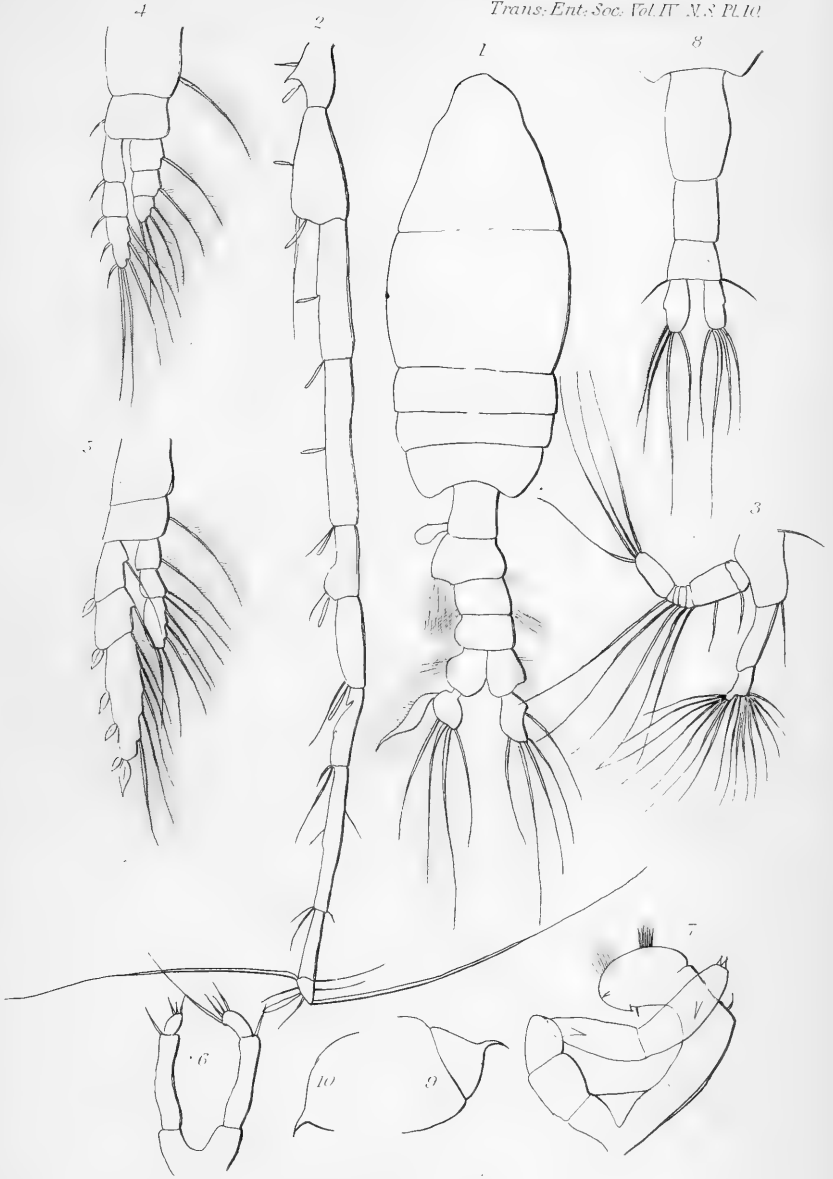


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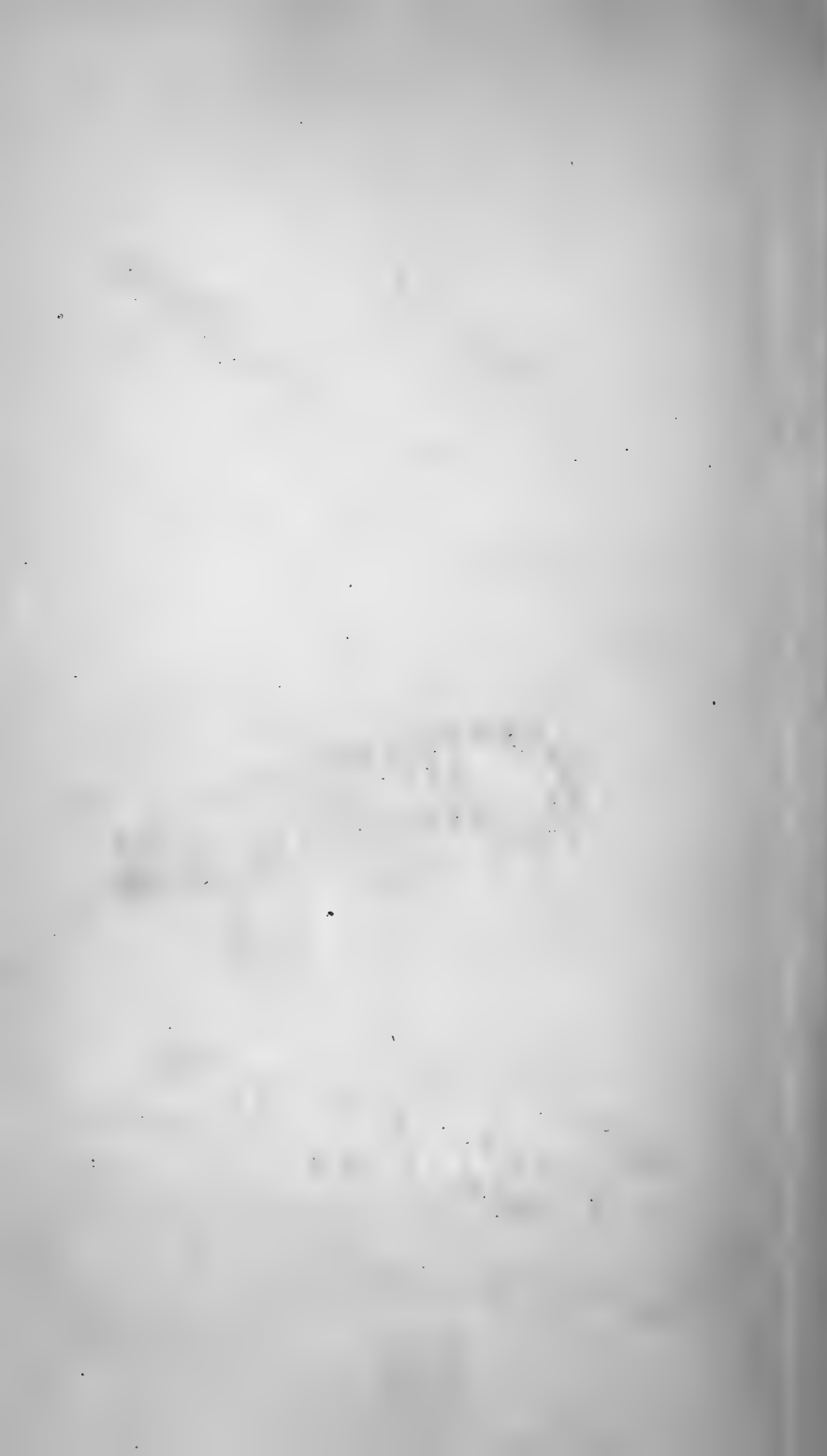


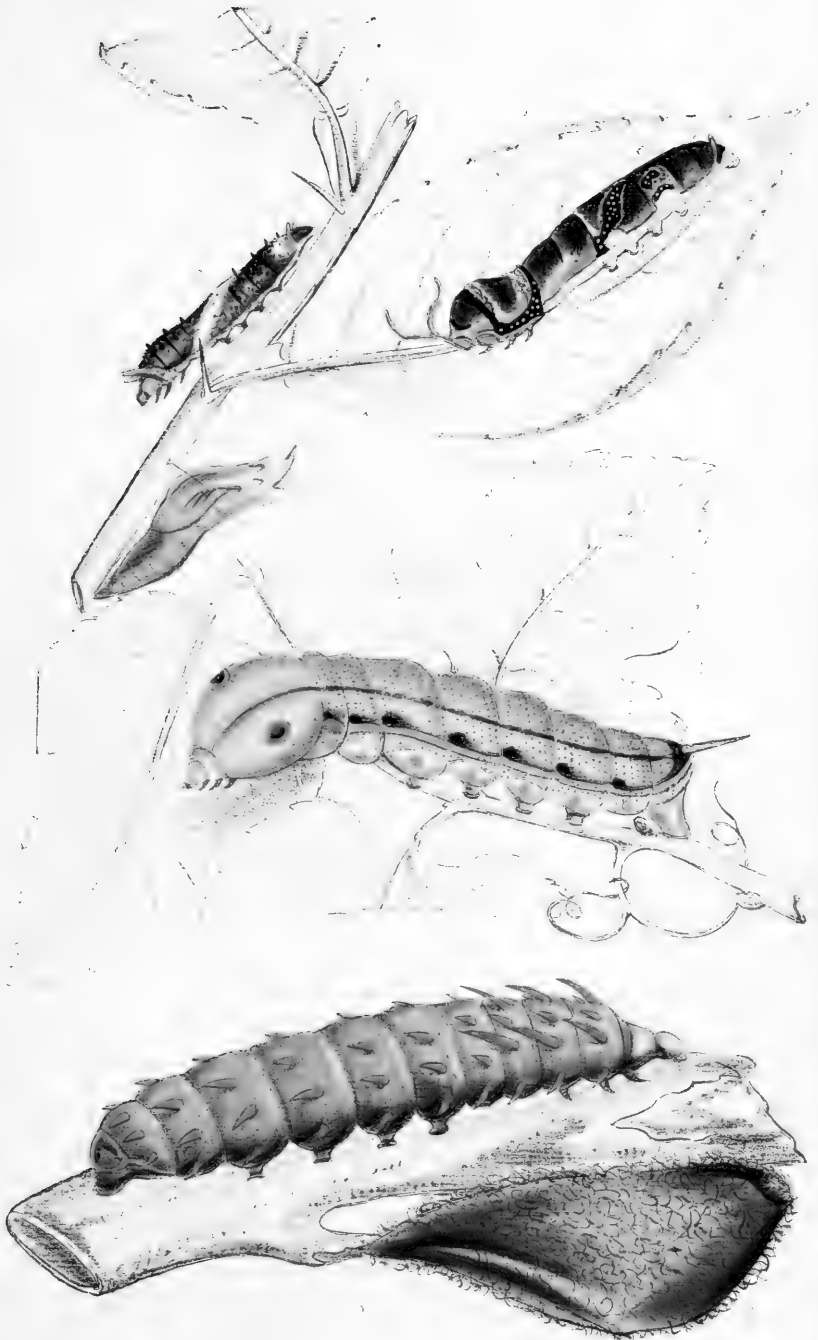
J. Lubbock, del<sup>t</sup> et sculp<sup>t</sup>





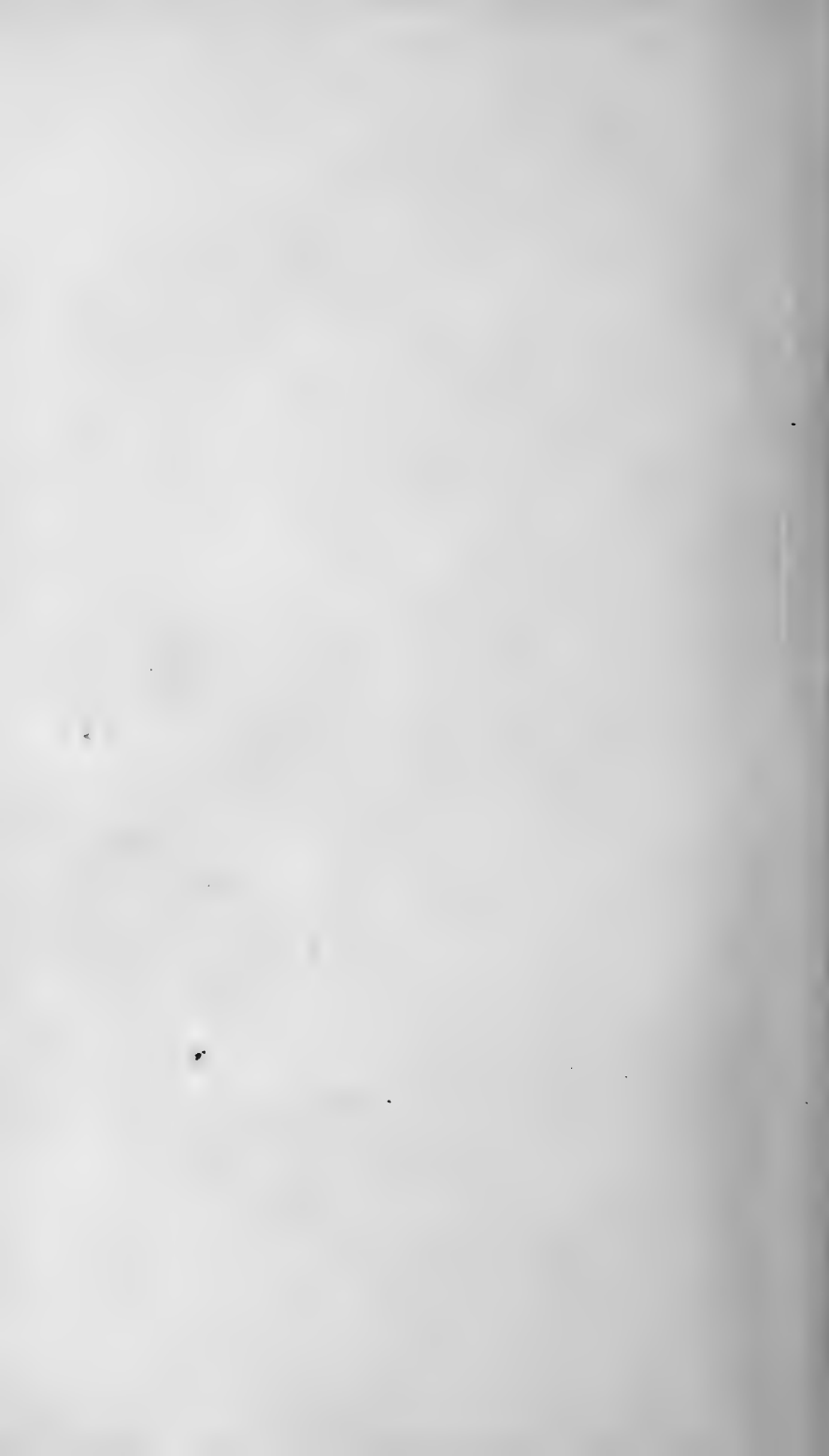
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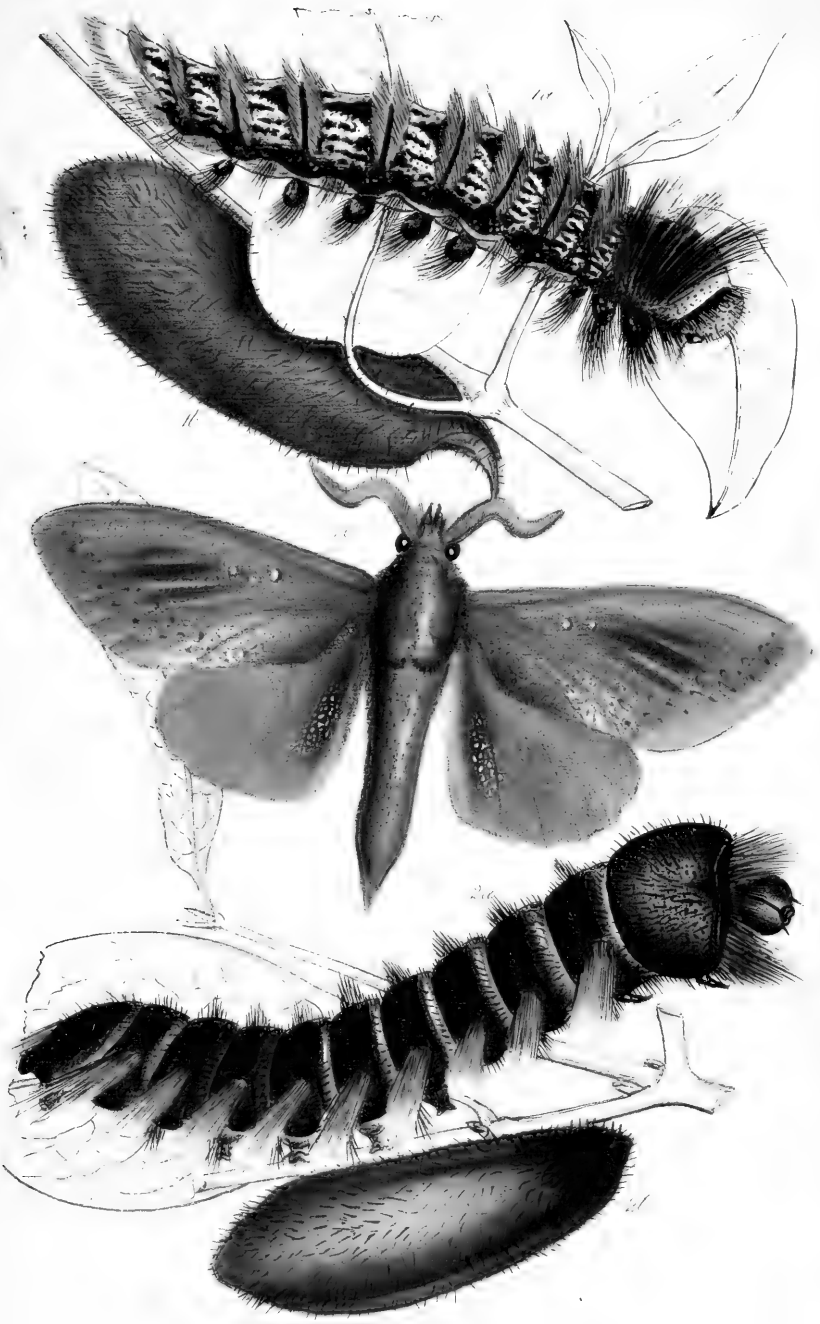








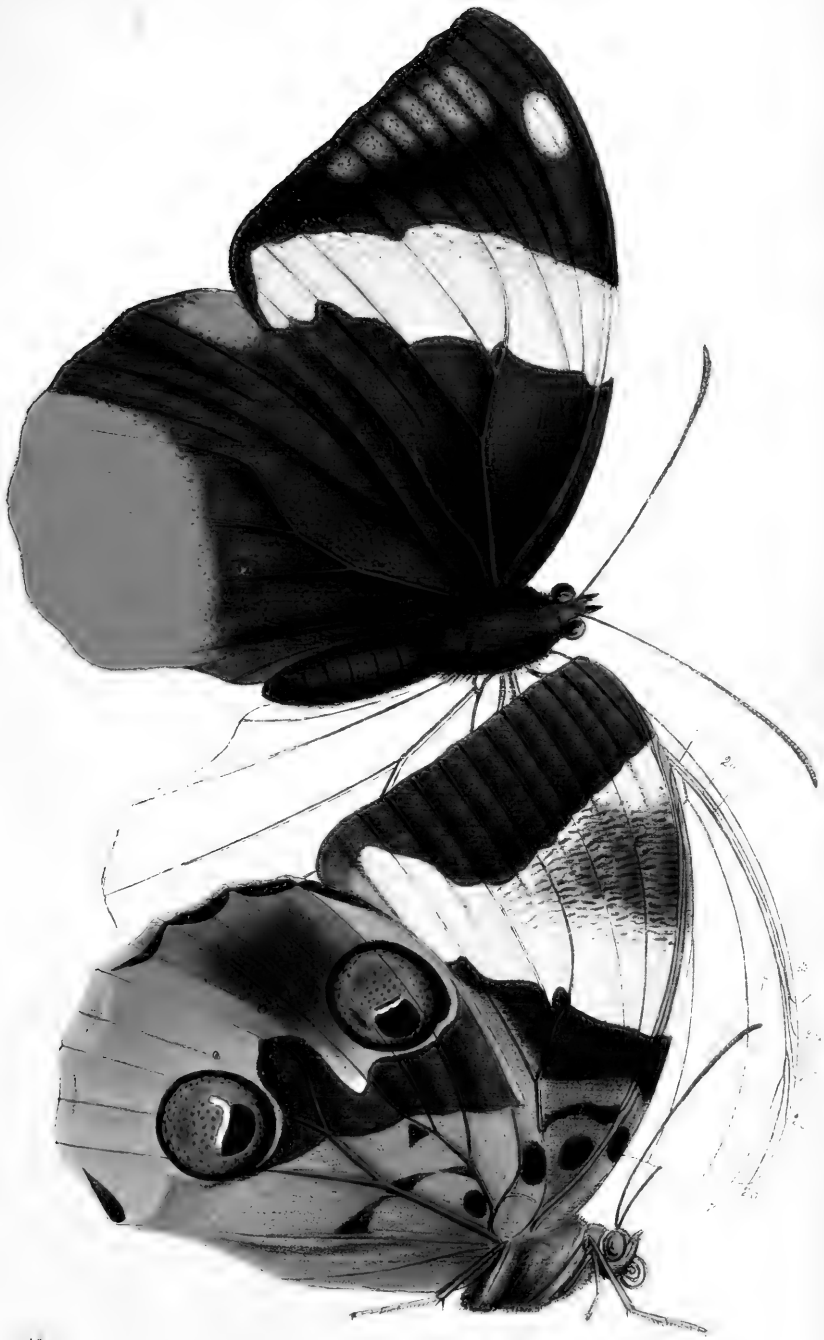


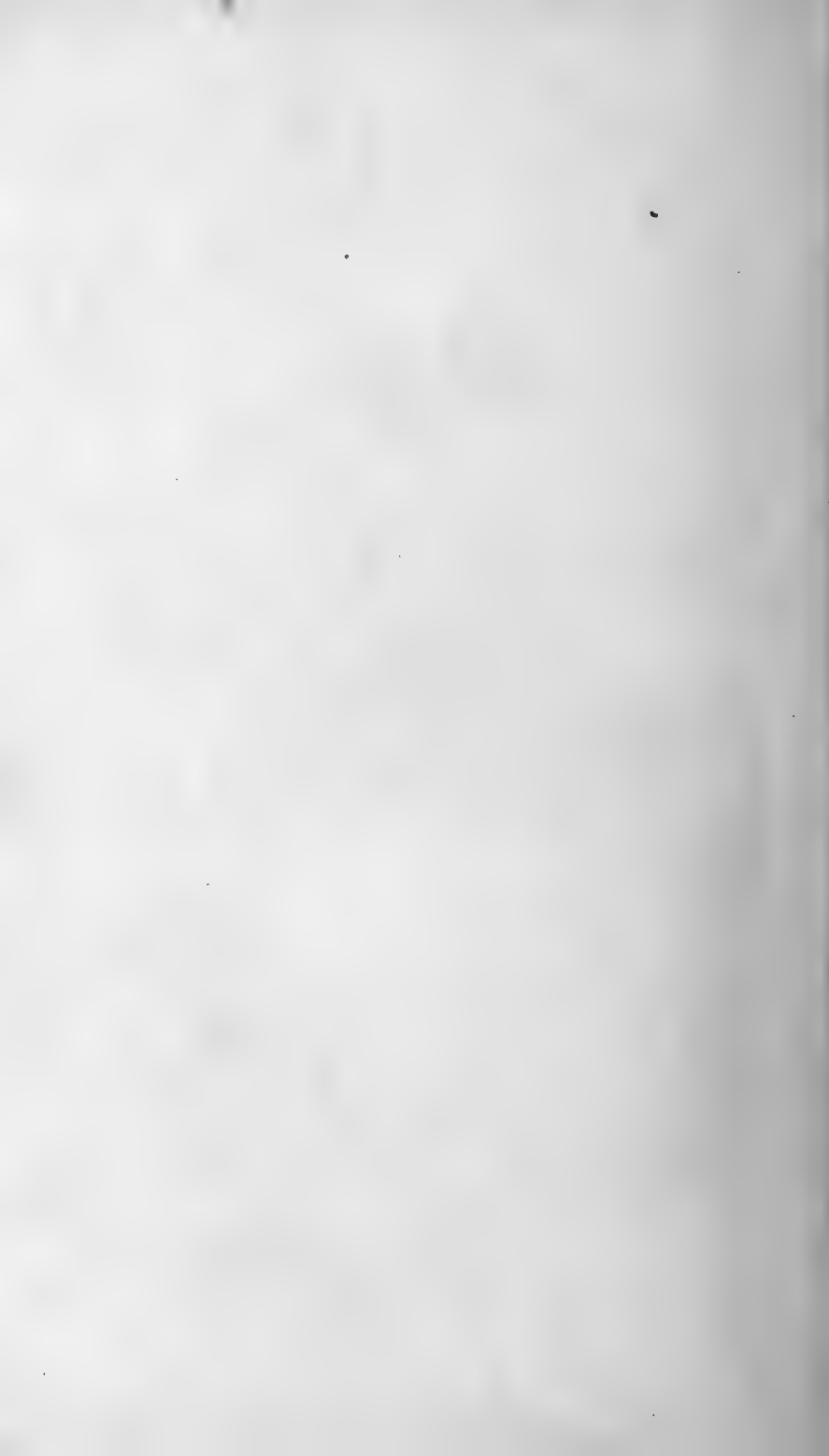








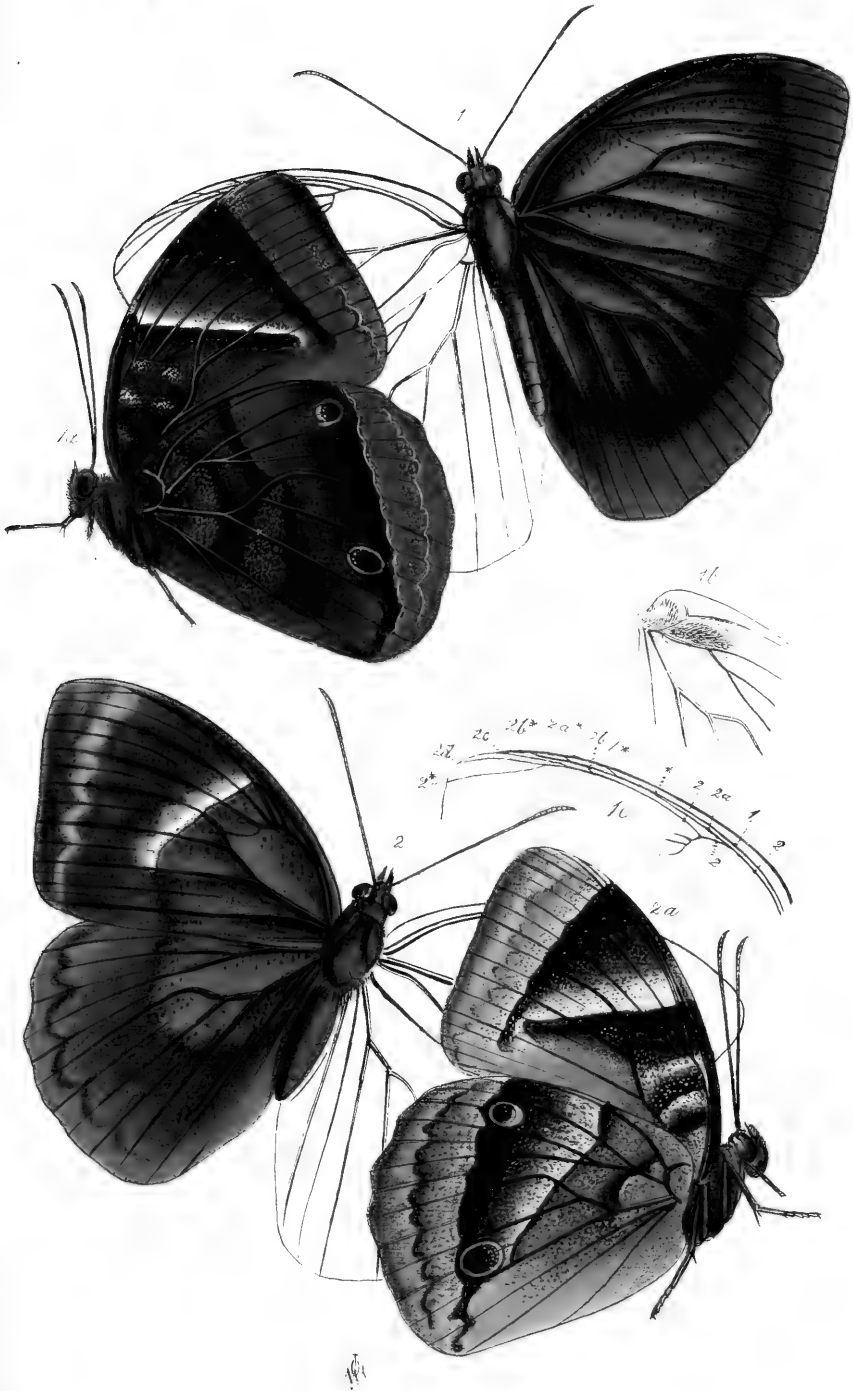








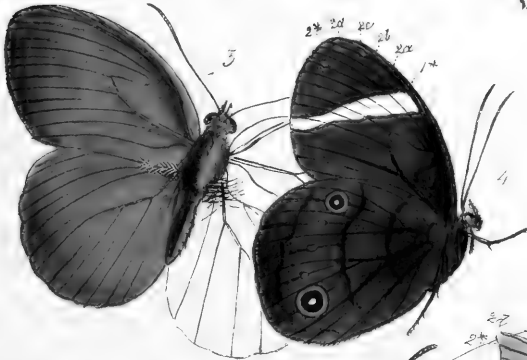




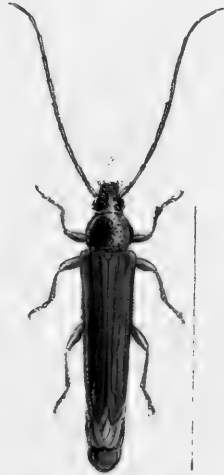
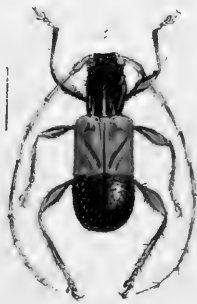
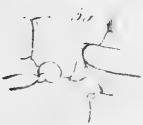






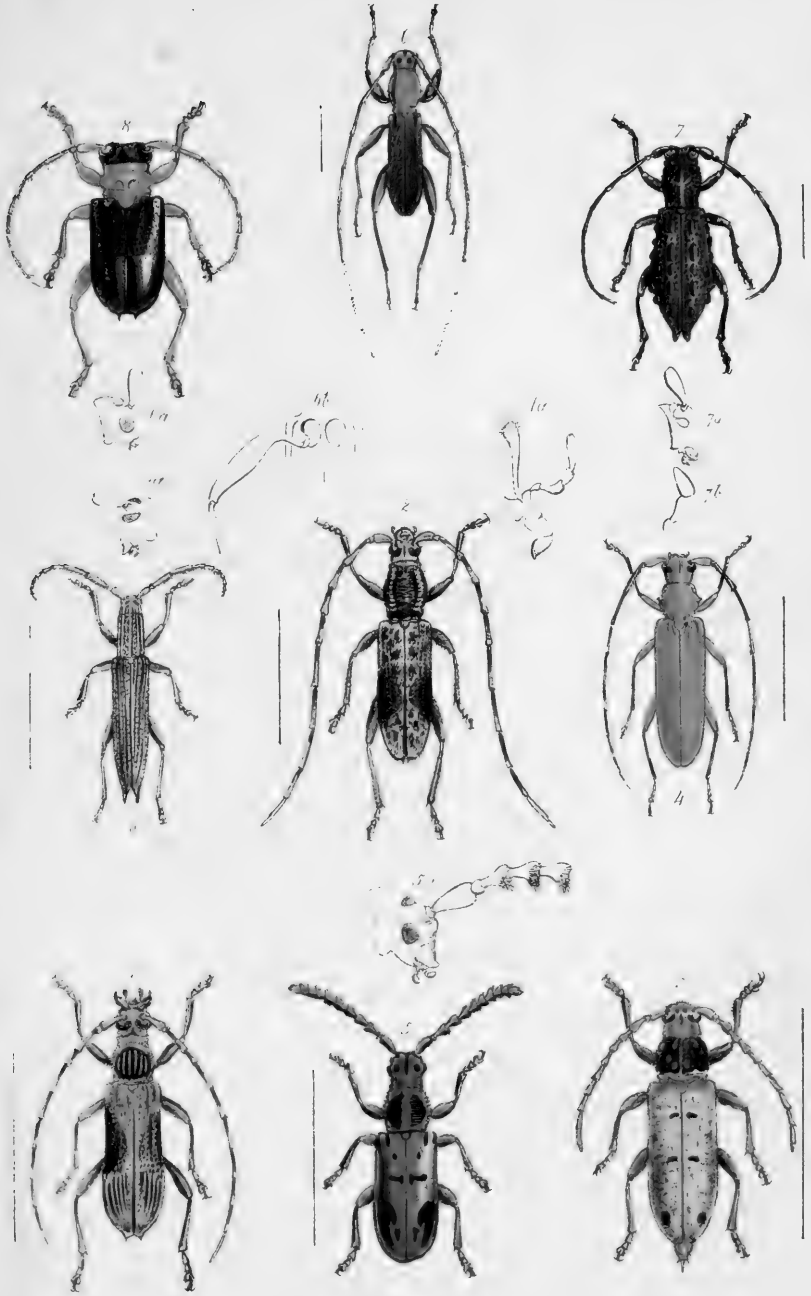




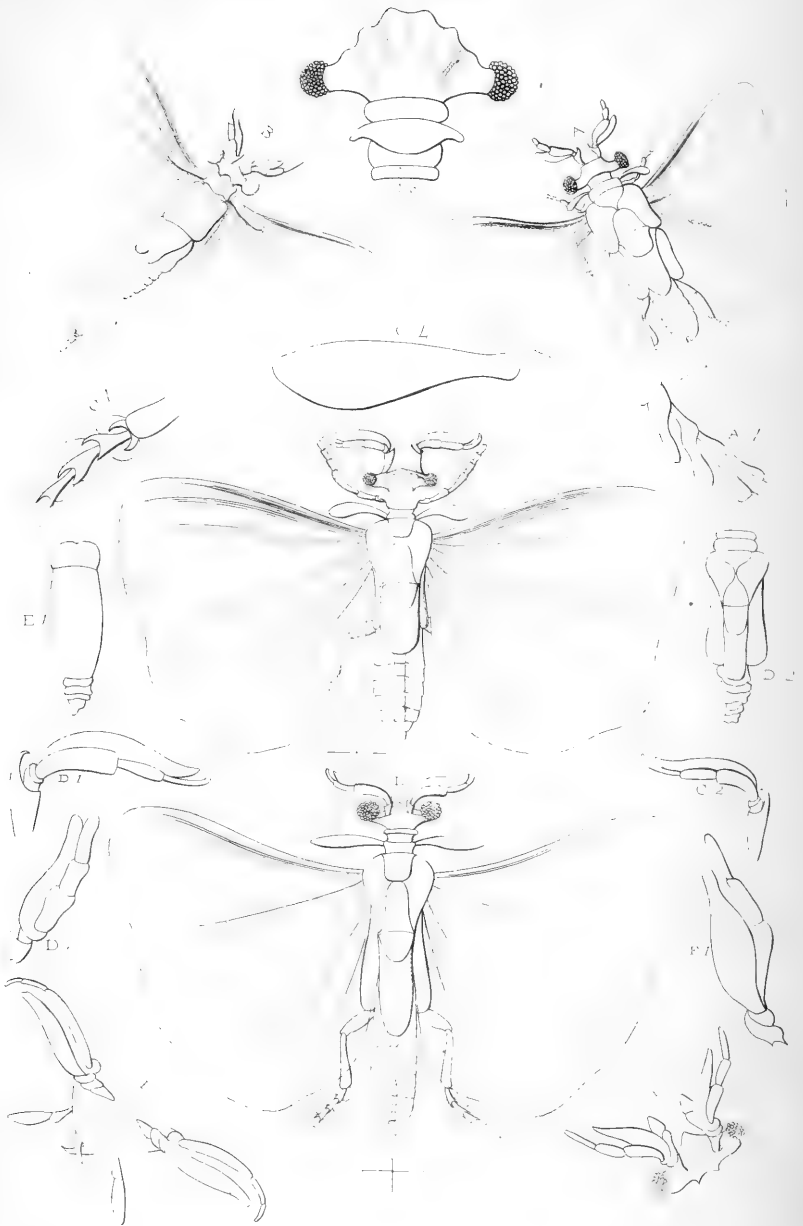




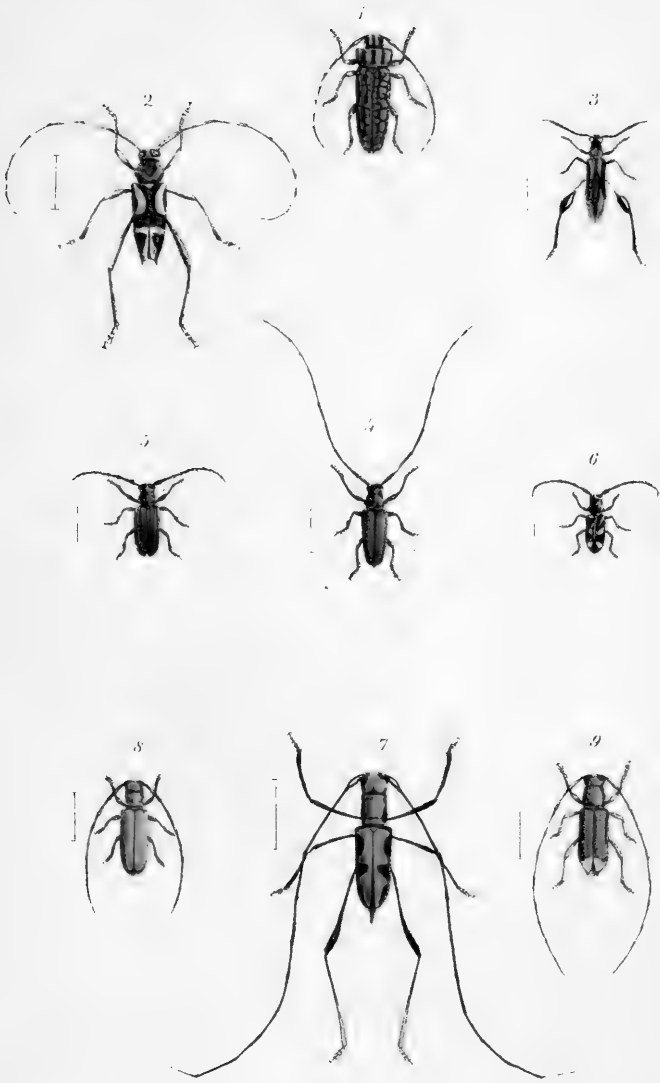




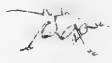








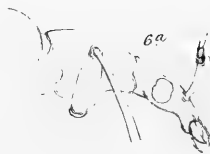
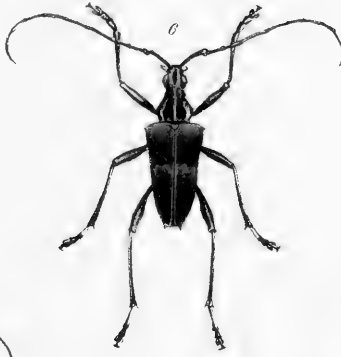
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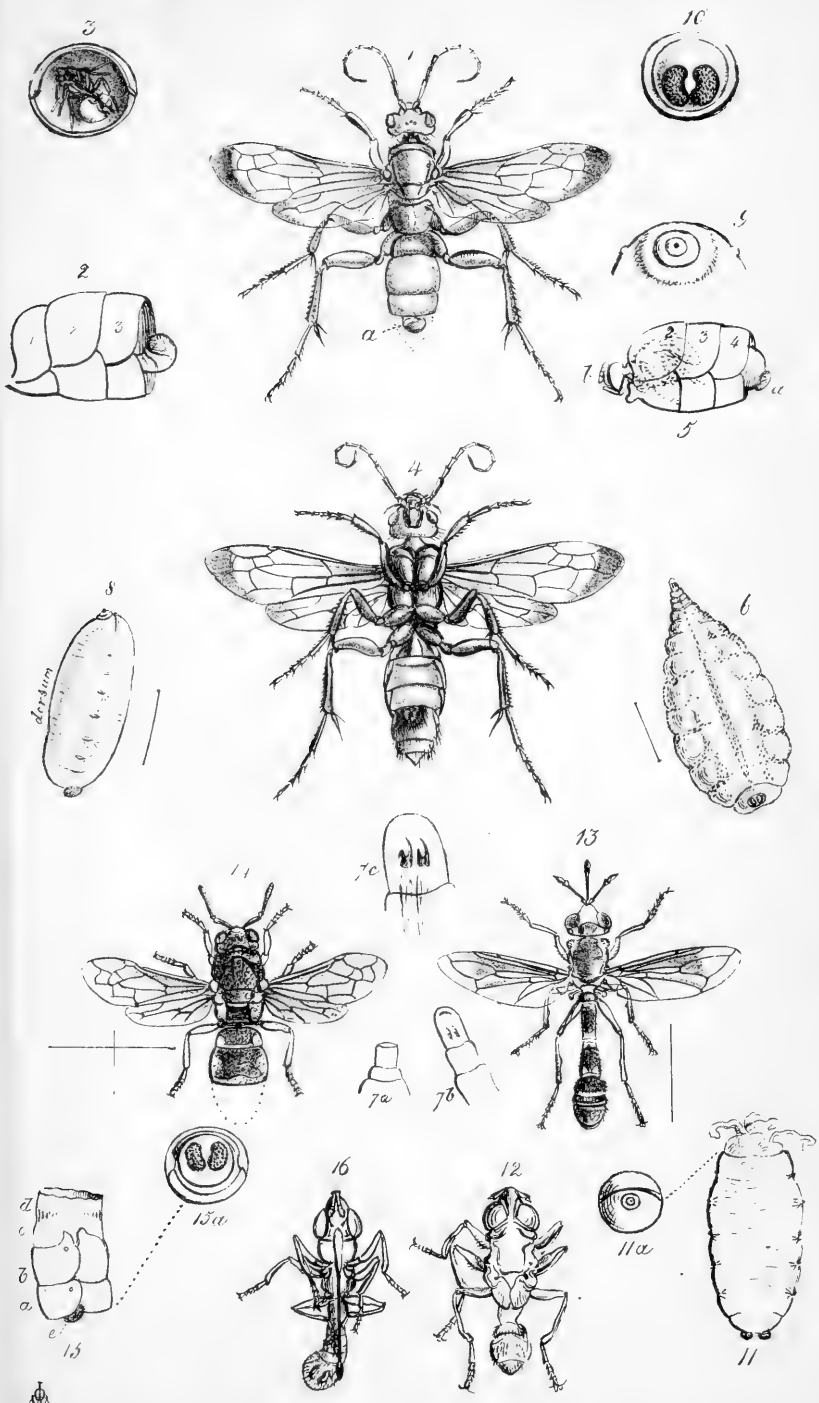


- 1 *Doryphora trivittata* Baly Para
- 2 *Leptinotarsa signatipennis* Baly Mexico
- 3 *Doryphora batesi* Baly, Ega
- 4 " *invalis* Baly Venezuela
- 5 *Elytrophora vittata* Baly Brazil
- 6 *Doryphora sheppardi* Baly Guatemala
- 7 " *catenulata* var A C. in Upper Amazon
- 8 " *subglobosa* Baly Para
- 9 *Cryptotetha marmorata* Baly Brazil
- 9a " "
- 9b " "









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