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THE  
ENTOMOLOGICAL  
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VOL. I.



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M DCCC XXXIII.

“ The noblest employment of the mind of man is the study of the works of his CREATOR.

“ To him whom the science of nature delighteth, every object bringeth a proof of his GOD .  
and every thing that proveth this giveth cause for adoration.

“ His mind is lifted up to HEAVEN every moment; his life is one continual act of devotion.

\* \* \* \* \*

“ Thou who seest the whole as admirable in parts, canst thou better employ thine eye than in tracing out thy CREATOR's greatness in them; thy mind, than in examining their wonders?

\* \* \* \* \*

“ Wherein is knowledge but in the study of nature?

\* \* \* \* \*

“ All other sciences are vain; all other knowledge is boast; lo! it is not necessary or beneficial to man, nor doth it make him more good or more honest.

“ Piety to thy GOD, and benevolence to thy fellow-creatures, are they not thy great duties? What shall teach thee the one or what shall inform thee of the other, like unto the study of His works?”

*Economy of Human Life.*

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# EXPLANATION OF THE PLATES.

## PLATE I.—See ART. XXXV. 30 and 32.

- Fig. 1. *Nematus dimidiatus*. (larva).  
 2 & 3. *Allantus Scrophulariæ*. (larva).  
 4. *Lyda sylvatica*. (larva).  
 5. *Cræsus septentrionalis*. (larva).

## PLATE II.—See ART. XXV.

*Ephemera marginata*. (larva).

- Fig. 1. *a.* The great dorsal vessel.  
*b.* The point at which the great dorsal vessel curves inward and is lost to the view.  
*c.* The lateral vessels which convey a portion of the blood from the anterior to the posterior end of the body.  
*d.* Some of the points at which a part of their contents is discharged into the great abdominal cavity.  
*e.* The point at which they terminate, discharging their contents into the great dorsal vessel.
- Fig. 2. A portion of the great dorsal vessel.  
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*b.* The valves at the commencement of the expansion of the artery, when the blood is seen converging towards them from all points, and flowing through them into the upper portion of the artery.  
*c.* The exterior portion of the artery, connecting the parts above and below the valves.
- Fig. 3. A portion of the vessel in a state of collapse, with all the valves closed.  
*a.* The points of the lower valves closely compressed within the upper ones.  
*c.* The exterior portion of the artery, as seen in Fig. 2, *c.*
- Fig. 4. A portion of the vessel in its greatest state of expansion.  
*a.* The lateral openings closed, while the main current of the blood is passing up the vessel.  
*c.* The exterior portion of the artery as seen at *c.* Figs. 2 and 3.
- Fig. 5. A single compartment of the great dorsal vessel in its greatest state of collapse.
- Fig. 6. The same portion of the vessel in its greatest state of expansion.

## PLATE III.—See ART. XLVI.

- Fig. 1. *Sphinx Ligustri*. (larva).  
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 3. *Tipula oleracea*. (larva).  
 4. *Trichiosoma lucorum*. (larva).  
 5. *Ichneumon instigator*. (larva).  
 6. *Anthia 6-maculata*. (larva). Copied from Guérin.  
 7. *Trogosita Mauritanica*. (larva).  
 8. *Blatta* —————? (larva).  
 9. *Cicada Fraxini*. (pupa).  
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- Fig. 1. *Tabanus bovinus*. (imago).  
 2. *Sirex nigricornis*. (imago).  
 3. *Hydrous piceus*. (imago).  
 4. *Acridium bipunctatum*. (imago).  
 5. *Pentatoma dissimilis*. (imago).  
 6. *Ægeria Apiformis*. (imago).

(In this Plate the shaded portion is the mesothorax).

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<p>A. B. Caput, head or 1st segment.                      C. D. Prothorax . . . 2d ditto.                      E. F. Mesothorax . . . 3d ditto.                      G. H. Metathorax . . . 4th ditto.                      I. J. Propodeon . . . 5th ditto.                      K. L. Podeon . . . 6th ditto.                      M. N. Metapodeon . . . 7th ditto.                      O. P. Octoon . . . 8th ditto.                      Q. R. Ennaton . . . 9th ditto.</p>		<p>S. T. Decaton . . . 10th ditto.                      U. V. Protelum . . . 11th ditto.                      W. X. Paratelum . . . 12th ditto.                      Y. Z. Telum . . . 13th ditto.                      a. Propes . . . Fore-leg.                      c. Proala . . . Fore-wing.                      i. Mesopes . . . Middle-leg.                      o. Metala . . . Hind-wing.                      u. Metapes . . . Hind-leg.</p>
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*List of Subscribers for Five Copies of this Volume, to whom we  
return our most sincere thanks.*

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THE  
ENTOMOLOGICAL MAGAZINE.

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SEPTEMBER, 1832.

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INTRODUCTORY ADDRESS.

IN the present advanced state of the science of Entomology, it may be regarded as a little singular that no distinct periodical publication, exclusively devoted to its general interests, has hitherto appeared in this country.

It is true that the Zoological Journal, and the Magazine of Natural History, have partially supplied this deficiency; but the few papers which could be admitted on any one branch of Zoology into the former, combined with the irregularity of its appearance; and the very general character of the latter, which excludes strictly scientific articles; are reasons amply sufficient to justify the present attempt to establish a Magazine, which shall be wholly devoted to Entomology.

The projectors consider themselves as possessing a strong claim on the support of all the lovers of Entomology, having undertaken the work without the slightest expectation of pecuniary advantage to themselves, but with a disinterested desire to promote the progress of a science to which they confess themselves zealously attached. They contemplate no profit, and all their anxiety is, that it may receive sufficient support to guarantee them from actual loss.



The scientific Entomologist has frequently had occasion to regret the want of an appropriate medium through which his researches might gain public attention. Hence we find interesting Entomological papers scattered in magazines of a purely literary or philosophical character,\* or lost in the unreadable and cumbrous tomes of learned societies, where they are rarely consulted, and are often entirely overlooked. We might cite instances of this kind; for example—the admirable monograph of Mr. Kirby on the Genus *Apion*, and that of Mr. Spence on *Choleva*, in the *Linnean Transactions*. No one thinks of expending two guineas in the purchase of these volumes for the sake of a single paper, however excellent, and access to them is thus confined to a few. From this cause, we are satisfied that many valuable contributions to Entomology have been suffered to remain within the portfolios of their authors; few individuals choosing to incur the risk of a separate publication, with the knowledge that the sale of such works is extremely limited. We are also disposed to think that the want of an appropriate vehicle for imparting information has tended, in many instances, to repress that spirit of inquiry which is so highly desirable in the pursuit of science. These difficulties will now be removed;—the pages of this magazine will be open to record the labours of British Entomologists, which have been as yet imperfectly known.

The facilities for spreading information which Foreign Entomologists have long enjoyed, have given them a decided superiority and advantage in cultivating the science. We are convinced that our own countrymen will not be slow to avail

\* An instance in point has just come under our notice. In the *London and Edinburgh Philosophical Magazine and Journal of Science* for the month of August, there is a paper by J. O. Westwood, Esq., giving characters of two families, including sixteen genera of Hymenopterous insects, which, from being published in such a channel, are never likely to be seen by Entomologists.

themselves of the channel now afforded them, and that their industry and ability need only to be known to be fully appreciated: for we know there are manuscripts in existence, the result of years of laborious investigation, which would contribute to extend the science, and do honour to the unwearied, patient, and talented efforts of their possessors.

The plan of the projectors is to produce a magazine which shall contain Illustrations of the Habits and Metamorphoses of Insects,—Descriptive Characters of New Genera and Species,—Records of the Capture of Rarities,—Reviews (with extracts) of all new Entomological works,—and information of every kind connected with the science of Entomology. The present number will, it is hoped, as a precursor, be no unworthy pledge for the future; and will exhibit, in the variety of its subjects, our disposition not only to provide papers of scientific importance, but also those of a more popular character.

The cordial and unsolicited promises of support which this undertaking has received from the principal Entomologists of the United Kingdom, demand our sincere thanks; while they convince us still more of the necessity which exists for its appearance. In the prosecution of our design, we shall be happy to receive contributions from any authentic sources, either in Latin, French, or English, as it is not our intention to confine ourselves to British Entomology, but to embrace the whole circle of the science.

In addressing ourselves more particularly to Foreign Entomologists, we trust they will be disposed to aid our efforts, by forwarding their works, that we may be able to notice them immediately on their appearance. It will give us pleasure to introduce them to the numerous Entomologists of our islands, who, at present, have no adequate means of becoming acquainted with them.

Our anxiety will be to render the ENTOMOLOGICAL MAGAZINE a vehicle by which the labours of British and Foreign Entomologists may be speedily communicated, and thus, in some degree, prevent the recurrence of that confusion in the nomenclature of the science, which naturally results from authors, at a distance, being unacquainted with each other's proceedings.

The second number of the work will appear on the 1st of January, 1833, and will be subsequently published quarterly, on the 1st of March, July, and October. Should it appear necessary for the elucidation of generic distinctions, plates will be occasionally given, provided the sale of the work at all justify the expense.

None can regret more than ourselves that the spirit of party should pervade the walks of science. It is a reproach to philosophy and natural history, that their most distinguished advocates are not at peace among themselves; and that, in their researches after truth, they are too apt to allow selfish feelings to predominate, forgetting that the cultivation and extension of all knowledge is best accelerated by the exercise of candour and generosity. We therefore avow our determination to avoid, in this work, all illiberal or personal allusions, in referring to authors whose labours entitle them to our respect. With empirics and pretenders to science we can have no feeling in common;—justice to our readers will, in such cases, claim from us an unshrinking discharge of duty.

We now appeal to all who are desirous of encouraging this work, to remember that its permanent utility and success must be the result of individual effort. We look with confidence to those who possess information; and we trust that every Entomologist will feel gratified not only in giving us his personal support, but also his warmest recommendations.

ART. I.—*Abstract of M. Straus-Durckheim's "Considerations Générales sur l'Anatomie Comparée des Animaux Articules."* By EDWARD DOUBLEDAY.

"Lusimus, Octavi gracili modulante Thalia  
Atque ut araneoli tenuem formavinus orsum  
Posterior graviore sono tibi musa loquetur  
Nostra."

IN attempting to give a brief abstract of this admirable work, I cannot but feel how incompetent I am to do justice to such a subject. The task would not be an easy one for him who had drank deep at the fountain-head of science: for me, who, Hylas-like, have wasted my time with the lilies and poppies on the margin, it is almost an impossibility.

However, in these book-making days, when a knowledge of his subject is the last thing an author thinks of, as we have of late seen, more than once, in the publications of a certain *learned* professor, it may not be thought very great presumption in me to attempt a few pages, on a subject to which I have paid some little attention.

Before I proceed further, it may be well for me to explain the plan which I shall pursue. In the first place, I shall translate a very considerable portion of the Introduction, in the author's own words, as nearly as possible: of the rest I shall give as succinct an abstract as I can, without rendering it obscure. In all cases in which it is not otherwise specified, it may be considered, that the opinions expressed are those of M. Straus-Durckheim: wherever I venture an opinion of my own, it will always be duly marked, unless the context sufficiently shows to whom it belongs.

The remainder of the volume I shall pass over more lightly, only touching on the most important parts, and omitting those which are more generally known, or are less interesting in a scientific point of view. I am sorry to be compelled, as I often shall be, to omit much valuable matter; but to extract all worth extracting, would be the same thing as translating *verbatim* the whole work.

There is one remark in the Preface to which I cannot but refer, it being one we ought always to bear in mind when

engaged on the important subject of classification: it is this—those genera which form the connecting links of the principal divisions, offer, mostly, a very simple organization, which scarcely teaches us anything of the structure of the families which compose those divisions.

In the Introduction, the author endeavours to explain the laws which regulate the different changes of structure in passing from one group to another.

The most general law which we recognize in the organization of animals is, that all the systems of organs\* (“*appareils*”) are subjected to a constant variation of form, and even of function, in passing from one family to another.

In these changes, the organs mostly follow a gradation, by which they arrive at a more perfect or imperfect state, according to the plan which the Supreme Intelligence has ordained in the creation of beings. Upon this depends the classification of animals, at least the classification according to the System of Nature.

But however clear this law may be, in vain has been any attempt to detect the principles on which it reposes; and the many different systems of classification which have been proposed, show how great a diversity of opinion prevails on this subject. But is not the principal cause of these varying opinions, this—that most naturalists have founded their systems on the supposed preeminence of some *one* particular organ, or set of organs; whilst no system can be in accordance with nature, which does not rest on a consideration of the *whole*, and on the greater or less degree in which each one influences the other parts of the body?

Observation shows us that this general law is modified: 1. According to the functions which the organs have to perform: 2. According to the circumstances in which they are placed, with regard to one another: and, 3. According as the organs are, more or less, under the influence of external causes.

Consequently, this general law is divided into several particular laws (*lois particulières*). To the examination of such of

\* I do not know how far I am correct in using this expression to convey the same idea as the word “*appareils*,” but I have been compelled to employ it, not knowing any word in our language which conveys the precise meaning of the French term.



these as are common to all the organs, M. Straus-Durckheim next proceeds, leaving the others to be examined in those parts of the work in which each system is treated of separately.

FIRST LAW.—The organs, at one extremity of the scale, exercise always a very evident function; whilst, at the other extremity, they are constantly rudimentary and without function, and at last disappear.

We may here distinguish two cases. In the first, the organs present themselves at the head of the scale, developed to the highest degree of which they are susceptible, and decrease insensibly, until they arrive at the other extremity of the scale. Thus, for example, the posterior wings of insects are introduced suddenly into their organization at the highest point of perfection in the Coleoptera, where they alone serve for flight. In the Orthoptera and Hemiptera, they already begin to divide their function with the elytra; and go on diminishing gradually, until they exist merely as rudiments in the Diptera, where they are represented by the Halteres: finally, they entirely disappear in the Aphaniptera.

In the second case, the organs do not appear at the head of the scale in their most perfect state of development, and only acquire it by degrees. Such is the case with the elytra, or first pair of wings, which follow a course exactly contrary to the inferior wings. They only appear, at first, as organs slightly accessory to flight. In this state they remain nearly throughout the whole of the Coleoptera. In the Orthoptera and Hemiptera, they begin already to take a very active part in flight, but still preserve their primitive use. In the Neuroptera, particularly the Libellulina, they attain the development of the anterior wings, from which they differ but very slightly. From this point, they continue to surpass them, until, in the Diptera, they become the sole organs of flight, and, of course, have attained their highest degree of perfection. Arrived at this culminating point, they suddenly diminish in Hippobosca, and entirely disappear in Pulex.

Although, in this last case, the organs present their most perfect degree towards the middle of the scale, and decrease towards each extremity; yet, they never are found at the head of the scale in that state of perfect nullity which can properly be called rudimentary, but serve, more or less directly, for the function to which they are destined.

SECOND LAW. — In those organs which form series on the same animal, the gradation is commonly double: that is to say, on the one hand it is relative to the succession of genera and families; on the other, it is relative to the rank which each pair occupies on the body of the animal.

This is exemplified in the feet; the rudiments of which appear in *Lombricus* without any articulation, as mere cirrhi, and buried in the skin. These soon become external; and in *Nereis* and *Aphrodita* are furnished with a number of muscles, are evidently articulated, and become organs of reptation already very perfect. Lastly, in the *Myriapoda*, the integuments are become solid, the feet present well-defined articulations, but the pieces of which they are composed are all nearly similar; and it is only when we arrive at *Dorsigera*, that we find the feet assume the form so conspicuous in insects.

Arrived at the *Myriapoda*, the feet decrease in order of rank. The posterior diminish (*s'atrophient*) in passing to *Lepisma*, where the greater number are only rudimentary; the three pair belonging to the three segments of the trunk retain their usual form, and maintain it to the end of the Class *Insecta*.

Already, in *Scolopendra*, the last pair of legs, though much stronger than the others, no longer serve for locomotion; and in *Lepisma* they are changed into the long filaments at the extremity of the abdomen, which are again found in some *Orthoptera* and *Neuroptera*.

In the *Crustacea*, the feet likewise undergo a change of this nature; but as they also experience a change of function, they will be spoken of as examples of the next law.

THIRD LAW.—The organs often change function to replace others which disappear.

It is very rare that nature introduces a new organ, if another, become useless, can fulfil the same conditions. This admirable economy is remarkable, even in the forms which are preserved as long as possible; and the parts of the first system (*appareil*) which no longer are of service to the new function only, disappear gradually, by becoming more and more rudimentary. These parts, which are then as it were superadded to the organs, serve very advantageously to recognize the primitive use of these last.

Of this, the feet again serve for an example: in *Aphrodita* they are all locomotors; whilst in *Scolopendra* the first pairs

begin to tend towards the head, following a degradation in order of rank, to transform themselves into masticatory organs.

On the other hand, the posterior feet, which are maintained as locomotive organs amongst the Myriapoda, instead of disappearing amongst the Crustacea, as in the Insecta, are transformed successively into organs of respiration, commencing with the last pairs: and, advancing more and more towards the anterior pairs, we find that, in the Stomapoda, there exist but three pairs of legs capable of walking, whilst the others are changed on the one hand into the organs of the mouth; on the other, into organs of respiration. Amongst the Branchiopoda which terminate the Crustacea, all the feet, with the exception of a single pair, become branchiferous, and the only one which has not undergone this transformation is of no service in walking, but only in swimming. Lastly, in the Cirrhopoda, no pair of feet serves for progression, but simply for prehension, and it is probable they fulfil also the functions of branchiæ.

The feet in *Gammarus* present us with a remarkable instance of this change of function. The anterior are transformed into jaws; the following become chelate legs (*pieds machoires*), and serve for prehension. Of the middle pairs, the anterior remain ambulatory, the posterior serve for swimming, whilst the hinder pairs are transformed into branchiæ.

FOURTH LAW.—When the function demands a greater complication in the composition of the organ which has to perform it, this last acquires it successively, by parts, which are added at first under the form of rudiments.

These rudiments are further developed in other species, or in other pairs of the same organs, so that these have often undergone a very considerable change of form, before it becomes probable that they have changed function: this is particularly remarkable in the feet of Crustacea, which, from ambulatory organs, become branchiferous.

FIFTH LAW.—The same functions may be exercised by very different systems of organs (*appareils*).

In all circumstances where Nature could not preserve an organ, or system of organs; whether that it could not accord itself with the rest of the organization of the animal, or that, after the degradation it had undergone, it had disappeared, whilst it was necessary that its functions should be preserved;

we see, then, a new set of organs employed for this function, although it often fulfils another. Thus it is, that in *Limulus*, where the whole head, and consequently the organs of the mouth, have disappeared, mastication is performed by the feet, which, at the same time, serve as organs of progressive motion.

**SIXTH LAW.**—When one organ governs one, or many others, these follow the march of the dominant organ; and when at length this disappears, those which were subordinate to it retake suddenly their primitive form.

It is principally by this law, that we can recognize whether an organ, which is wanting in a species, has disappeared by the effect of its degradation, or is wanting by a merely specific imperfection (*simple avortement spécifique*). In this last case, all that was exclusively subordinate to that organ remains in exactly the same state as if it still existed; and more especially if the subordinate organs have already undergone a considerable transformation by the effects of the law of variation to which they were submitted, whilst the dominant organ was acting upon them, and that they would be obliged to undergo too great a change to return to their primitive form.

This law is shown most remarkably in the influence of the wings on the thorax. In proportion as the two pairs of wings change in form and size, the two segments of the thorax which support them follow the same progression, and become more and more united to one another; but no sooner do the wings disappear in the *Aphaniptera*, than the two segments of the thorax regain their primitive form, are separated from one another, and again present the same appearance as in *Lepisma*.

The wings being first introduced amongst the *Coleoptera*, and the thorax of these as yet differing but little from that of the *Thysanura*, it can easily return to the form it possessed previously to its undergoing any modification. It follows thence, that, in those species which are deprived of wings, the thorax returns more or less to its primitive form. This is particularly remarkable in the females of many species of *Lampyris*, which possess neither wings nor elytra: and this return is moreover occasioned in the *Coleoptera*, without wings, by another cause, which acts, in this case, on that part of the body; it is the diminution of the solidity of the integuments in those parts which are covered by the elytra.

In the other orders of insects, the two segments which bear the wings having already experienced a very considerable change of form, it would require a more powerful cause to bring them back to their primitive form: for this reason, the return does not take place in *Cimex celularius*, the *Formicæ*, &c., amongst which the imperfection is only specific. In the *Aphaniptera*, on the contrary, which we may consider as wingless *Diptera*, the transformation of the thorax takes place in consequence of a complete absence of the wings, brought about by the degradation which these organs have experienced in passing through the whole of the Class *Insecta*.

SEVENTH LAW.—The form of many organs of the vertebrata is generally in accordance with certain exterior agents, to which they are connected by their function: in the *Annulosa*, this dependence is less rigorous, and sometimes even insensible.

Thus, in the former, the form of the teeth depends on the species of aliment on which the animal feeds; whilst, in the latter, the organs of the mouth do not so rigorously follow the same law, being often under the influence of a second function, which modifies them, and causes them to appear anomalous. For example; we find in insects, carnivorous and herbivorous species, which offer a very great resemblance in the masticatory organs. In the *Coleoptera*, those which are the most carnivorous, such as the *Carabi*, the mandibles are commonly elongate, and armed with very strong teeth, which serve them as well to seize as to tear in pieces their prey; whilst their maxillæ and labium are small and feeble.

These characters are again found equally in *Lucanus*, which lives only on the sap of trees; but in these, the mandibles serve more particularly for defence. Other insects offer, in this respect, anomalies quite as remarkable.

The aquatic habits of many insects often influence but slightly the conformation, either of the whole body, or the feet only. Insects never being entirely aquatic in the perfect state, but only amphibious, it is not surprising that the feet of those which commonly reside in water differ often but slightly from those of the terrestrial species; the form which they commonly have, not being incompatible with the element in which the insects reside. But the *Crustacea*, which are almost all aquatic, offer very often, in their feet, forms which are nowise in

accordance with the medium in which they reside. For example—the greater part of the Decapoda Macrourea are in no respect adapted for swimming; and amongst the Isopoda, the Ligia, which are marine, and the Onisci, which are terrestrial, present no sensible difference of structure. The Hydrachnæ, also, offer no character which indicates their aquatic habits.—(*To be continued.*)

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ART. II.—*Monographia Chalcidum.* By FRANCIS WALKER, Esq. F. L. S.

IN the variety of their forms, the brilliancy of their colours, and probably the number of their species, the Chalcides excel every other family of insects. Very few have been described, except the species of Encyrtus, by Dalman, to whom, and Spinola, we owe the little information we possess. They may be divided into two primary groups, to which the names Pentameri and Tetrameri are applicable, from their five or four-jointed tarsi. The tetramerous tarsi have been noticed by Mr. Curtis in describing the genus Eulophus: the species of this division are usually smaller than the Pentameri; their bodies are softer; their colour less generally metallic; they run faster, but do not leap so far.

*Section I.*—CHALCIDES PENTAMERI.

Tarsis quinque-articulatis.

*Family I.*—EURYTOMIDÆ.

*Type.*—Eurytoma. Illiger.

Caput transversum: oculi laterales: ocelli in triangulum dispositi: *maris* antennæ 11-articulatæ, setaceæ, filiformes aut clavatæ: *femine* antennæ 12-articulatæ, clavatæ: mandibulæ apice angustiores, tridentatæ: maxillæ elongatæ: mentum elongatum, quadrangulum: labium basi angustum, anticè sinuatum: palpi maxillares articulis 3 aut 4: palpi labiales biarticulati: thorax gibbus aut cylindricus: prothoracis<sup>a</sup> scutellum magnum, subquadratum: mesothoracis scutellum benè determinatum suturis duabus lateralibus, scutum convexum ovatum, paraptera triangula: metathoracis præscutum angustum, scutellum magnum

<sup>a</sup> In describing the parts of the thorax, I have adopted Mr. MacLeay's nomenclature.



canaliculatum: abdomen cylindricum aut gibboso-compressum, petiolatum, segmentis 7: aculeus subexsertus: coxæ magnæ: femora subclavata: tibiæ apice spinis duabus armatæ: tarsi 5-articulati, articulo primo longiore, sequentibus longitudine decrescentibus: ungues arcuatæ.

In external appearance, this family seems to have many affinities with Smiera, Chalcis, and Haltichella, to which, with Dirhinus, *Dalman*, and Chirocera, *Latreille*, I propose restricting the term Chalcididæ. They and the Eurytomidæ differ from the rest of the Chalcides in their large quadrate proscutellum or collar, which is noticed by Dalman as the distinguishing character of Eurytoma. The trophi, however, of these two families are very different, and the Eurytomidæ may be easily known by their smaller coxæ, more slender thighs, and less arcuate tibiæ. Dalman remarks of Spalangia, which he places next to Eurytoma, that it resembles it in habit; but that the form of the head is totally different. Cerocephala, *Westwood*, may possibly be an intermediate genus, between which and Spalangia, the only apparent external difference consists in the horned head of the former: perhaps the stigmal branch of the anterior wing varies slightly. Another genus, as yet undescribed, one species of which is common on box-trees, in the spring, is closely allied to Eurytoma longula in habit, though its biarticulate palpi bring it near to Spalangia. The colour of all the Eurytomidæ I have seen is black, sometimes variegated with yellow or red, without any metallic hue, in which they resemble the Chalcididæ. They are usually found in marshy places, or in the vicinity of ditches. The species of Decatoma, however, are found in woods beneath oak-trees, &c. I have been informed by Mr. Davis, that he has obtained an individual of the latter genus from an oak-gall. This fact shews it to be similar to the Torymidæ in economy, one genus of which, Megastigmus, it also resembles in structure.

*Characteres Generum.*

Abdomen.	{	cylindricum: <i>Corpus</i>	{	elongatum, gracile: fem. antennæ apice rotundatæ . . . 1. ISOSOMA.
				breve, crassum: fem. antennæ apice acuminatæ . . . 2. SYSTOLE.
		compressum. <i>Antennæ</i> .	{	<i>mas</i> , setacæ verticillato pilosæ: fem. clavatæ . . . 3. EURYTOMA.
				<i>mas</i> , et fem. clavatæ . . . 4. DECATOMA.

GENUS I. ISOSOMA,<sup>b</sup> Walker.

Caput medium: palpi maxillares 4-articulati: *maris* antennæ 11-articulatæ, pilosæ, filiformes: *feminæ* antennæ 12-articulatæ, pilosæ, submoniliformes, clavatæ: thorax convexus: abdomen cylindricum.

\* *Abdomen ovatum, cylindricum, non compressum.*

† *Corpus omnino nigrum.*

Sp. 1. *Isos. atrum.* Fem. *Nigrum, alis subfuscis.*

Caput, thorax, et petiolus obscuri, punctati: abdomen nitidum, glabrum: oviductus apice fulvus: antennæ basi fuscae: tibiæ nigro, tarsi pallidè, fusci: genua tibiæ et apices flavi: alæ subfuscae. (Alarum longitudo, 2 lin.)

Dull black, pilose: eyes and ocelli black: abdomen smooth, shining, very finely punctured, pilose toward the apex: petiole dull black: punctured apex of the ovipositor yellow: antennæ rather thick, in length equal to one-third of the body, club short, base of the first joint fuscous: legs black: tibiæ dark fuscous, pubescent: tarsi pale fuscous: knees and extremities of the tibiæ yellow: wings slightly fuscous, nervures darker.

July; grassy banks; Southgate.

†† *Prothoracis latera anticè maculata.*

Sp. 2. *Isos. longulum.* Mas et fem. *Nigrum, prothorace anticè maculis duabus pallidè rufis, alis subfuscis.*

*Eurytoma longula.* Dalman.

Caput obscurum: thorax punctatus, maculis anticè duabus lateralibus pallidè rufis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: oviductus apice flavus: antennæ basi fuscae: tibiæ nigro, tarsi pallidè, fusci: genua tibiæ et apices flavi: alæ subfuscae. (Alarum longitudo, 2—3 lin.)

*Var.*—Ocellus anticus rufus.

Dull black, pilose, punctured: eyes and ocelli black, the anterior ocellus sometimes red: the sides of the proscutellum have each a pale red spot on their anterior margins: the abdomen is smooth, shining, very finely punctured, slightly

<sup>b</sup> *Isos, equalis; σωμα, corpus.*



pilose toward the apex: the tip of the ovipositor is yellow: the antennæ are black, the base of the first joint fuscous: the antennæ of the male are as long as three-fourths of the body, those of the female are much shorter: the thighs are smooth and shining above, beneath dull, punctured: the four posterior tibiæ are dark fuscous, the anterior are paler, yellow beneath: the knees and extremities of the tibiæ are yellow: the tarsi are fuscous, the anterior darker than the four posterior: the wings are slightly fuscous, the nervures darker.

This species is common at Southgate, amongst grass on the banks of ditches, in the months of March, April, and May.

Sp. 3. *Isos. fumipenne*. Fem. *Nigrum, præcedenti brevius et crassius, prothorace anticè maculis duabus pallidè flavis, alis fumosis.*

Caput obscurum: thorax punctatus, maculis anticè duabus lateralibus pallidè flavis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: oviductus apice flavus: antennæ basi fusca: tibiæ tarsique fusci: genua tibiæque apices flavi: alæ fumosæ. (Alarum longitudo, 3 lin.)

This species is shorter and broader than the preceding, which it much resembles: the wings are darker.

July; on grassy banks; Southgate.

Sp. 4. *Isos. crassicorne*. Fem. *Nigrum, præcedenti brevius, prothorace anticè maculis duabus flavis, antennis rufo-cinctis, alis subfuscis.*

Caput obscurum: thorax punctatus, maculis anticè duabus lateralibus flavis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: oviductus apice flavus: antennarum articulus primus apice, tertiusque basi, rufo-fusci: tibiæ nigro-fusca: genua tarsique rufi: alæ subfusca. (Alarum longitudo,  $1\frac{2}{3}$ —2 lin.)

The body of this species is rather shorter than that of *Isos. fumipenne*, which it much resembles in shape: the antennæ are thicker in proportion, and more clavate: the abdomen is smooth, shining, very finely punctured, slightly pilose toward the apex: excepting the red colour of the extremities of the first, and the whole of the ringshaped third and fourth joints, the antennæ are black: the wings are slightly fuscous, the nervures darker.

June; amongst grass in fields; Southgate.

Sp. 5. *Isos. simile*. Mas. *Nigrum, præcedentibus angustius, prothorace anticè maculis duabus obscure flavis, alis fuscis.*

Caput obscurum: thorax punctatus, maculis anticè duabus lateralibus obscure flavis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: antennæ basi flavæ: tibiæ nigro-fuscae, anticæ apice flavæ: tarsi fuscis: genua flava: alæ fuscæ. (Alarum longitudo,  $1\frac{3}{4}$  lin.)

It is nearly allied to *Isos. longulum*, but is much smaller, and appears later in the year: the body is more slender: the wings narrower and darker.

July; amongst grass in fields; Southgate.

Sp. 6. *Isos. angustipenne*. Mas. *Nigrum, prothorace anticè maculis duabus pallidè flavis, alis fuscis angustis.*

Caput obscurum: thorax punctatus, maculis anticè duabus lateralibus pallidè flavis: abdomen nitidum, glabrum: antennæ basi tarsique fuscis: genua flava: alæ fuscae. (Alarum longitudo,  $1\frac{1}{2}$  lin.)

The wings of this species are very narrow, their breadth not being more than one-fourth of their length; this character, and its fuscous wings, will distinguish it from most species of *Isosoma*.

May; amongst grass in moist situations; Southgate.

Sp. 7. *Isos. brevicorne*. Mas. *Nigrum, prothorace anticè maculis duabus albidis, antennis dimidio corporis vix longioribus, alis fuscis.*

Caput obscurum: thorax punctatus, maculis anticè duabus lateralibus albidis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: antennæ quam in præcedentibus breviores: tibiæ anticæ fuscae, subtus flavæ: tarsi flavi, articulis 4 et 5 fuscis: genua flava: alæ fuscae. (Alarum longitudo,  $1\frac{1}{2}$  lin.)

This species is more minutely punctured than any of the preceding: the sides of the proscutellum have each an obscure white spot on their anterior margins: the antennæ are very short, scarcely more than half the length of the body: the three basal joints of the tarsi are yellow, the fourth and fifth fuscous: it resembles *Isos. crassicorne*, of which, possibly, it may be the male, but it is much narrower, the antennæ are

scarcely longer, and the head is much smaller: in *Isos. longulum* the male and female have very much the same shape, and the former has the larger head.

July; amongst grass in fields; Southgate.

Sp. 8. *Isos. hyalipenne*. Fem. *Nigrum, prothorace anticè maculis duabus pallidè flavescens, antennis basi flavis, alis hyalinis.*

Caput obscurum: oculi rufo-fusci: thorax punctatus, maculis anticè duabus lateralibus pallidè flavis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: oviductus apice pallidus: antennæ articulo primo apice, tertioque basi, flavis: tibiæ anticæ fuscæ: femorum tibiarumque apices, genua tarsique flavi: alæ hyalinæ, nervis fulvis. (Alarum longitudo, 3 lin.)

The abdomen is slightly pilose toward the apex: the antennæ have the apex of the first, and the whole of the ring-shaped third and fourth joints, yellow: the anterior tibiæ are fuscous: the tips of the thighs and tibiæ are yellow: the four posterior tarsi have the basal joint yellow, the following yellow beneath, with a fuscous line above gradually darker toward the apex: the anterior tarsi are yellow, with the basal and apical joints fuscous: the wings are hyaline, the nervures fulvous: the subcostal nervures of the superior wings are fuscous toward the base.

July; amongst grass in fields; Southgate.

Sp. 9. *Isos. longicorne*. Mas. *Nigrum, prothorace anticè maculis duabus albidis, antennis corpori longitudine æquis, alis fuscis.*

Caput obscurum: thorax punctatus, maculis anticè duabus lateralibus albidis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: tibiæ anticæ fuscæ: femorum tibiarumque apices, genua tarsique flavi: alæ fuscæ. (Alarum longitudo, 1½ lin.)

The body is rather long and narrow: the anterior margin of the proscutellum has an obscure white spot on each side: the abdomen is slightly pilose toward the apex: the antennæ, in length, exceed those of any other species in this genus: the tips of the thighs and tibiæ are yellow: the anterior tibiæ are fuscous: the basal joints of the tarsi are yellow, the apical fuscous: the wings are fuscous.

July; amongst grass in fields; Southgate.

Sp. 10. *Isos. breve.* Mas. *Nigrum, prothorace anticè maculis duabus pallidè flavescens, alis subfuscis.*

Caput obscurum : oculi rufo-fusci : ocelli rufi : thorax punctatus, maculis anticè duabus lateralibus pallidè flavis : petiolus obscurus, punctatus : abdomen nitidum, glabrum : femora apice, tibiæ basi apiceque flavæ : tibiæ anticæ fuscae : tarsi flavi : alæ subfuscae. (Alarum longitudo,  $1\frac{1}{3}$ — $1\frac{1}{2}$  lin.)

The body, antennæ, and wings, are shorter in this species than in *Isos. longicorne*; the latter, too, are paler : the tips of the thighs and tibiæ, and the base of the latter, are yellow, as also are the tarsi, except the two terminal joints, which are fuscous, as likewise the anterior tibiæ : the wings are slightly fuscous.

July ; amongst grass in fields ; Southgate. September ; Isle of Wight.

Sp. 11. *Isos. minor.* Mas. *Nigrum, prothorace anticè maculis duabus albidis, alis subhyalinis.*

Caput obscurum : oculi rufo-fusci : ocelli rufi : thorax punctatus, maculis anticè duabus lateralibus albidis : petiolus obscurus, punctatus : abdomen nitidum, glabrum : tibiæ anticæ fuscae : genua flava : tarsi fusci, basi pallidiores : alæ subhyalinæ. (Alarum longitudo,  $1\frac{1}{4}$ — $1\frac{1}{3}$  lin.)

It is smaller than the preceding species, which it much resembles : the antennæ are shorter and more slender : the wings also are shorter and narrower : in some specimens, probably lately hatched, the eyes and ocelli are paler : the wings are nearly hyaline.

July ; amongst grass in fields ; Southgate. September ; Isle of Wight. End of May ; Southampton.

Sp. 12. *Isos. elongatum.* Mas. *Nigrum, præcedenti angustius, prothorace anticè maculis duabus albidis, alis subhyalinis.*

Caput obscurum : oculi ocellique rufi : thorax punctatus, maculis anticè duabus lateralibus albidis : petiolus obscurus, punctatus : abdomen nitidum, glabrum : femora tibiæque apice, tibiæ tarsi-que basi flavi : tibiæ anticæ tarsi-que fusci : alæ subhyalinæ. (Alarum longitudo,  $1\frac{1}{4}$ — $1\frac{1}{3}$  lin.)

It is longer and more slender than either of the two preceding species : from the latter it may also be distinguished

by its narrower wings: the antennæ are much shorter, the wings shorter and narrower than those of *Isos. longicorne*.

July; amongst grass in fields; Southgate.

Sp. 13. *Isos. petiolata*. Mas. *Nigrum, prothorace anticè maculis duabus albidis, petiolo elongato, alis subfuscis.*

Caput obscurum: oculi rufo-fusci: ocelli rufi: thorax punctatus, maculis anticè duabus lateralibus albidis: petiolus obscurus, punctatus, abdominis dimidio longior: abdomen nitidum, glabrum: tarsi fusci: tibiæ anticæ apice genuaque flavæ: alæ subfusca. (Alarum longitudo,  $1\frac{3}{4}$  lin.)

The petiole in this species is much longer than in any of the preceding, its length being more than half that of the abdomen: the body is nearly double the length of the antennæ: the wings are slightly fuscous, the nervures darker.

July; amongst grass in fields; Southgate.

Sp. 14. *Isos. cornutum*. Mas. *Nigrum, prothorace anticè maculis duabus pallidè flavescensibus, alis hyalinis.*

Caput obscurum: oculi rufo-fusci: ocelli rufi: thorax punctatus, maculis anticè duabus lateralibus pallidè flavis: petiolus obscurus, punctatus, abdominis dimidio longior: abdomen nitidum, glabrum: tibiæ apice, genua tarsisque flavi: coxæ tarsisque apice fusci: tibiæ anticæ fusca, subtus flavæ: alæ hyalinæ, nervis pallidè fuscis. (Alarum longitudo,  $1\frac{1}{2}$  lin.)

This species resembles the preceding in shape: it is smaller: the wings are hyaline, the nervures pale yellowish fuscous, and the stigmal branch forms a more acute angle with the superior margin of the wing.

September; Isle of Wight.

Sp. 15. *Isos. tenuicorne*. Mas. *Nigrum, prothorace anticè maculis duabus albidis, antennis gracilibus, alis subhyalinis.*

Caput obscurum: oculi ocellique rufi: thorax punctatus, maculis anticè duabus lateralibus albidis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: tibiæ anticæ nigro-fusca: genua flava: tarsi fusci: alæ subhyalinæ, nervis pallidè fuscis. (Alarum longitudo, 1 lin.)

It has much resemblance in form to *Isos. elongatum*: it is narrower in proportion, and smaller: the antennæ and wings are more slender.

May; grass in fields; Southgate.

Sp. 16. *Isos. pusillum*. Mas. *Nigrum, prothorace anticè maculis duabus albidis, alis subfuscis.*

Caput obscurum: oculi ocellique rufi: thorax punctatus, maculis anticè duabus lateralibus albidis: petiolus obscurus, punctatus: abdomen nitidum, glabrum; tibiæ nigro-fuscæ: tarsi fuscii: genua flava: alæ subfuscae. (Alarum longitudo,  $\frac{3}{4}$  lin.)

Like the preceding, but shorter, and the antennæ are thicker.

End of May; amongst grass in fields; Southampton.

Sp. 17. *Isos. breviventre*. Mas et fem. *Nigrum, prothorace anticè maculis duabus albidis, alis hyalinis.*

Caput obscurum: oculi ocellique rufi: thorax punctatus, maculis anticè duabus lateralibus albidis: petiolus obscurus, punctatus: abdomen nitidum, glabrum, breve: genua tarsi que flavi: alæ hyalinæ, nervis pallidè fuscis. (Alarum longitudo,  $\frac{3}{4}$  lin.)

It is shorter than *Isos. tenuicorne*, or *minor*: from the former it differs also by its thick antennæ, their greater length distinguishes it from *Isos. pusillum*.

End of May; amongst grass in fields; Southampton.

Sp. 18. *Isos. angustatum*. Fem. *Nigrum, prothorace anticè maculis duabus albidis, alis pallidè flavofuscis.*

Caput obscurum: oculi ocellique rufi: thorax punctatus, maculis anticè duabus lateralibus albidis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: femora et tibiæ apice flavæ: tarsi flavi, articulis 4 et 5, nigro-fuscis: alæ pallidè flavofuscæ, nervis concoloribus. (Alarum longitudo,  $1\frac{1}{4}$ — $1\frac{3}{8}$  lin.)

It is more linear than any of the preceding species, and the colour of the first, second, and third tarsal joints is brighter, the fourth and fifth joints are dark fuscous: the wings are very slightly tinged with yellow, the nervures are pale: it much resembles the female of the preceding species, but is larger, and has thicker antennæ.

June, July; amongst grass in fields; Southgate. September; Isle of Wight.

Sp. 19. *Isos. dissimile*. Mas. *Nigrum, prothorace anticè maculis duabus albidis, tibiis anticis fuscis, alis hyalinis.*

Caput obscurum: oculi ocellique rufi: thorax punctatus, maculis anticè duabus lateralibus albidis: petiolus obscurus, punctatus:

abdomen nitidum, glabrum : tibiæ anticæ tarsique fusci : genua pallidè rufa : alæ hyalinæ, nervis pallidè fuscis. (Alarum longitudo,  $1\frac{3}{4}$  lin.)

The wings in this species are more hyaline than in most of the preceding : in length, the antennæ are equal to three-fourths of the body, and exceed those of *Isos. minor, breve, or elongatum.*

End of May ; Southampton.

††† *Prothorax fulvus.*

Sp. 20. *Isos. fulvicolle.* Fem. *Nigrum, prothorace pedibusque fulvis, alis pallidè flavescentibus.*

Caput obscurum : oculi rufo-fusci : ocelli rufi : thorax punctatus, anticè rufus, maculis duabus lateralibus albidis : petiolus obscurus, punctatus : abdomen nitidum, glabrum : oviductus apice fulvus : antennarum articulus primus, secundus apice, tertiusque basi, fulvi : femora intermedia basi nigro-fusca : tarsi apice fusci : alæ hyalinæ, pallidè flavescentes, nervis concoloribus. (Alarum longitudo,  $1\frac{1}{2}$ — $1\frac{3}{4}$  lin.)

The prothorax of this species is fulvous, the posterior margin black, the anterior with a white spot on each side : the basal joint of the antennæ, the tip of the second joint, and the ring-shaped third and fourth joints, are fulvous : the intermediate thighs have a dark fuscous spot on each, near the base : the fifth joint of the anterior, the fourth and fifth joints of the four posterior tarsi, are fuscous.

May ; amongst grass beneath trees ; Southgate. September ; Culver Cliffs, Isle of Wight.

\*\* *Abdomen apice acuminatum, subcompressum.*

Sp. 21. *Isos. depressum.* Fem. *Nigrum, prothorace anticè maculis duabus albidis, alis subfuscis.*

Caput obscurum : oculi ocellique rufi : thorax punctatus, albido utrinque anticè maculatus : petiolus obscurus, punctatus : abdomen nitidum, glabrum : antennarum articulus secundus apice, tertiusque basi, fusci : pedes flavi, femoribus basi nigris, tibiis 4 posticis medio tarsisque apice fuscis : alæ subfuscae. (Alarum longitudo, 2— $2\frac{1}{4}$  lin.)

*Var.*—Femora tibiæque 4 posticæ nigræ : tibiæ anticæ medio fuscae.

The semihyaline spots on the proscutellum are much larger



in this species than in any of the preceding: the wings are long and rather broad.

July; amongst grass in fields; Southgate.

Sp. 22. *Isos. lineare*. Fem. *Nigrum, prothorace anticè maculis duabus albidis, tarsis flavis, alis hyalinis.*

Caput obscurum: thorax punctatus, albido utrinque anticè maculatus: petiolus obscurus, punctatus: abdomen nitidum, glabrum: antennarum scapus fuscus: femora antica apicem versus, genua tarsisque flavi: tibiæ anticæ fuscae: alæ hyalinæ, nervis flavis. (Alarum longitudo,  $1\frac{1}{2}$  lin.)

This species has more slender antennæ than *Isos. angustum*, which it resembles in shape, but the body is longer and narrower: the abdomen is slightly compressed: the white spot on each side of the proscutellum is rather large: it is more linear than *Isos. depressum*, and has much shorter wings.

July; amongst grass in fields; Southgate.

Sp. 23. *Isos. attenuatum*. Fem. *Nigrum, prothorace anticè maculis duabus albidis, tarsis anticis fuscis, alis hyalinis.*

Caput obscurum: thorax punctatus, albido utrinque anticè maculatus: petiolus obscurus, punctatus: abdomen nitidum, glabrum: antennarum scapus fuscus, basi flavus: pedes flavi, femoribus tibiisque 4 posticis nigris: femora basi, tibiæ apice, tarsisque antici, fusci: alæ hyalinæ, nervis pallidè flavis. (Alarum longitudo,  $1\frac{1}{2}$  lin.)

It is very similar to the preceding species, but the body is longer and narrower: the white spots on the proscutellum are larger: the abdomen is more compressed: the antennæ are shorter, and more clavate: and the wings are much narrower.

July; amongst grass in fields; Southgate.

## GENUS II. SYSTOLE<sup>c</sup>, *Walker.*

*Fem.* Caput magnum: antennæ 12-articulatæ, breves, submoniliformes, clavatæ apice acuminatæ: thorax convexus: abdomen breve, cylindricum.

Sp. 1. *Syst. albipennis*. Fem. *nigra, alis albis.*

Oculi ocellique rufi: antennæ apice nigro-fuscae: caput, thorax, et petiolus obscuri, punctati: abdomen nitidum, glabrum: tibiæ

<sup>c</sup> συστολη, *contractio.*



anticae, genua, tarsique fuscis, subtus flavi: alae albae, nervis pallidè fuscis. (Alarum longitudo, 1 lin.)

September; Isle of Wight.

### GENUS III. EURYTOMA, Illiger.

Caput magnum: palpi maxillares 4-articulati: *maris* antennae 11-articulatae, setaceae, verticillato-pilosae, articulo primo elongato, secundo brevior, tertio et quarto brevissimis, quinto et sequentibus remotis, latitudine decrescentibus: *feminae* antennae 12-articulatae, pilosae, submoniliformes, clavatae: thorax gibbosus: abdomen compressum.

Sp. 1. Eur. verticillata. Mas et fem. *Nigra, pilosa, alis subhyalinis.*

Diplolepis verticillata. *Fab.*

Caput obscurum: oculi ocellique nigro-fuscis: thorax punctatus, gibbosus: petiolus obscurus, punctatus: abdomen nitidum, glabrum: antennae maris fusco-pilosae: tarsi fuscis: genua flava: alae latae, subhyalinae, nervis fuscis. (Alarum longitudo,  $2\frac{1}{2}$ —3 lin.)

June; amongst grass in meadows; Southgate. July; south of France.

Sp. 2. Eur. longipennis. Mas. *Nigra, pilosa, praecedenti angustior, alis longioribus subhyalinis.*

Caput obscurum: oculi ocellique rufo-fuscis: thorax et petiolus obscuri, punctati: abdomen nitidum, glabrum: genua flava: tibiae anticae tarsique fuscis, subtus flavi. (Alarum longitudo,  $2\frac{2}{3}$  lin.)

The smaller head, the much narrower, and less gibbous thorax, the longer antennae and wings, the latter also narrower, distinguish this species from the preceding.

July; amongst grass in meadows; Southgate.

Sp. 3. Eur. Abrotani *Panzer.* Mas et fem. *Nigra, alis hyalinis.*

Caput obscurum: oculi ocellique rufo-fuscis: thorax et petiolus obscuri, punctati: abdomen nitidum, glabrum: tibiae anticae fuscae, subtus flavae: tarsi antichi genuaque flavi: tarsi 4 postici pallidè straminei, supra pallidè fuscis: feminae tarsi omnino flavi. (Alarum longitudo,  $1\frac{3}{4}$ — $2\frac{1}{3}$  lin.)

*Var.*—Femora basi, tibiaeque anticae, flavae.

In shape, this species very much resembles *Eur. verticillata*, but it is more slender, and the antennæ are rather longer in proportion.

June; amongst rushes in meadows; Southgate. September; Isle of Wight.

Sp. 4. *Eur. apicalis*. Mas et fem. *Nigra, præcedenti angustior, alis hyalinis.*

Caput obscurum: antennæ graciles: oculi ocellique rufo-fusci: thorax et petiolus obscuri, punctati: abdomen nitidum, glabrum: tibiæ anticæ fuscæ, subtus flavæ: genua tarsique flavi. (Alarum longitudo,  $1\frac{1}{2}$ — $2\frac{1}{4}$  lin.)

*Var.*—Femora basi tibiæque anticæ flavæ.

In this species the head is smaller, the body longer and narrower than in the preceding.

July; amongst grass, in meadows; Southgate. September; Isle of Wight.

Sp. 5. *Eur. curta*. Mas et fem. *Nigra, Eur. abrotani similima, brevior, alis latioribus.*

Caput obscurum: oculi ocellique rufo-fusci: thorax et petiolus obscuri, punctati: abdomen nitidum, glabrum: tibiæ anticæ fuscæ, subtus flavæ: genua tarsique flavi: alæ hyalinæ. (Alarum longitudo,  $1\frac{3}{4}$ —2 lin.)

The anterior tarsi are fuscous above: the four posterior tarsi are entirely yellow, or have a pale fuscous longitudinal line above, darker toward the apex.

July; in meadows; Southgate. September; Isle of Wight. July; in the Forest of Fontainebleau.

Sp. 6. *Eur. collaris*. Fem. *Nigra, tarsis flavis, præcedenti simillima, statura graciliore antennisque longioribus differt, necnon, alis subfuscis elongatis angustis.*

Caput obscurum: oculi ocellique rufo-fusci: thorax et petiolus obscuri, punctati: abdomen nitidum, glabrum: tibiæ anticæ fuscæ, subtus flavæ: genua tarsique flavi. (Alarum longitudo,  $2\frac{1}{2}$  lin.)

This species has a longer and narrower body than most of the preceding: a considerable resemblance exists between it and *Eur. longipennis*, but the wings of the former are much narrower, the alary nervures and the tarsi paler.

July; amongst grass, in fields; Southgate.

Sp. 7. Eur. nitida. Mas. *Nigra, Eur. apicali affinis, alis hyalinis angustioribus.*

Caput obscurum: oculi nigro-fusci: ocelli rufi: thorax et petiolus obscuri, punctati: abdomen nitidum, glabrum: genua tarsique flavi. (Alarum longitudo,  $1\frac{1}{2}$  lin.)

It is nearly related to Eur. apicalis, but has much longer and more slender antennæ: the wings also are narrower.

July; amongst grass in fields; Southgate.

Sp. 8. Eur. gracilis. Mas et fem. *Nigra, præcedenti longior, alis hyalinis.*

Caput obscurum: oculi ocellique rufi: thorax et petiolus obscuri, punctati: abdomen nitidum, glabrum: pedes flavi: *maris* femora tibiæque 4 posticæ fusco-cingulatæ, *feminæ* nigro-fuscæ: tibiæ anticæ *feminæ* supra fuscæ. (Alarum longitudo,  $1\frac{1}{2}$ — $1\frac{3}{8}$  lin.)

It is longer and more slender, and has narrower wings than Eur. apicalis: the female may be distinguished from Eur. collaris by its more linear form, more clavate antennæ, shorter and narrower wings, &c.

July; amongst grass, in fields; Southgate. End of May; Southampton.

Sp. 9. Eur. annulipes. Mas. *Nigra, tibiis fusco cingulatis, alis subfuscis.*

Caput obscurum: oculi ocellique rufo-fusci: thorax et petiolus obscuri, punctati: abdomen nitidum, glabrum: pedes flavi: femora basi nigra: tibiæ nigro-fusco cingulatæ. (Alarum longitudo,  $1$ — $1\frac{3}{8}$  lin.)

*Var.*—Tibiæ anticæ fuscæ.

Like Eur. gracilis; but the antennæ are shorter, the wings broader, and the alary nervures paler.

September; Isle of Wight. July; Forest of Fontainebleau.

Sp. 10. Eur. minuta. Mas. *Nigra, alis hyalinis albis.*

Caput obscurum: oculi ocellique rufo-fusci: genua tarsique flavi: tibiæ anticæ fuscæ. (Alarum longitudo,  $\frac{2}{3}$  lin.)

I discovered this very minute species in the Forest of Fontainebleau, during the month of July.

Sp. 11. Eur. rufipes. Mas et fem. *Nigra, pedibus rufis, alis hyalinis.*

Caput obscurum: oculi ocellique rufo-fusci: thorax et petiolus obscuri, punctati: abdomen nitidum, glabrum: pedes pallidè

rufi: *maris* femora postica nigro-fusco cingulata, antica basi fusca. (Alarum longitudo, 2 lin.)

Body broad, gibbous: head large: wings rather short. July; on windows; Southgate.

#### GENUS IV. DECATOMA, *Spinola*.

Caput medium: palpi maxillares 3-articulati: *maris* antennæ 11-articulatæ, pilosæ, subclavatæ: *feminæ* antennæ 12-articulatæ, pilosæ, clavatæ: thorax gibboso-cylindricus: abdomen compressum.

\* *Stigma sublunaris*.

Sp. 1. Dec. Cooperi. *Curtis*. Mas et fem. *Nigra, pubescens, flavo variegata*.—British Entomology, Plate 345.

Caput punctatum, anticè flavum: oculi ocellique rufi: thorax punctatus, obscurus, anticè flavo marginatus: abdomen nitidum, glabrum: antennæ basi apiceque flavæ: pedes flavi: tibiæ posticæ-femoraque 4 posticæ nigro maculatæ: alæ hyalinæ: stigma sublunaris, fusca, costam versus nigra. (Alarum longitudo,  $2\frac{3}{4}$  lin.)

Found on the hazel-tree, in September, by A. Cooper, Esq.

Sp. 2. Dec. biguttata. Mas et fem. *Nigra, abdomine bimaculato, flavo variegata*.

Chalcis biguttata. *Swed*.

*Maris* oculi ocellique rufi: prothorax utrinque flavo maculatus: abdomen basi fuscum: antennæ fuscæ, scapo obscuriore: femora basi, genua tarsique flavi: tibiæ anticæ fuscæ, subtus flavæ: alæ hyalinæ: stigma sublunaris, fusca, costam versus nigra: *feminæ* caput flavo variegatum: prothorax flavus, maculis 3 nigris: mesothoracis lineæ duæ, obliquæ: alæ basi, abdomen basi, maculæque duæ laterales sublunatæ, flavæ: antennarum articulus 2 apice clavaque flavi: pedes flavi: femora tibiæque nigro vel fusco maculatæ. (Alarum longitudo,  $1\frac{3}{4}$ —2 lin.)

A yellow line extends along the suture, between the scutum and the parapsides of the mesothorax: there is a yellow line also between the mesoscutellum and the metathorax.

June; amongst grass beneath oak trees; Southgate.

Sp. 3. Dec. obscura. Fem. *Nigra, flavo variegata, femora tibiæque anticæ fusco maculatæ*.

Oculi ocellique rufi: caput anticè flavo variegatum: prothorax utrinque flavo maculatus: antennæ fuscae, apice subtusque pallidiores: femora basi, genua tarsique flavi: pedes antichi flavi, femoribus tibiisque fusco maculatis: alæ hyalinæ: stigma sublunaris, fusca, costam versus nigra. (Alarum longitudo,  $1\frac{2}{3}$  lin.)

The principal difference between this species and Dec. biguttata, is the prothorax with only two yellow lateral spots, and the entirely black abdomen of the former.

June; amongst grass beneath trees; Southgate. July; South of France.

Sp. 4. Dec. immaculata. Mas. *Nigra, capite thoraceque immaculatis.*

Oculi ocellique rufi: abdomen basi rufum: antennæ fuscae, apice pallidiores: femora basi, genua tarsique flavi: pedes antichi flavi, femoribus tibiisque fusco maculatis: alæ hyalinæ: stigma sublunaris, fusca, costam versus nigra. (Alarum longitudo,  $1\frac{2}{3}$  lin.)

July; amongst grass beneath trees; Southgate.

Sp. 5. Dec. plana. Fem. *Nigra, flavo variegata, mesothorace immaculato, abdomine bimaculato.*

Oculi ocellique rufi: caput et prothorax flavo variegati: abdomen maculis duabus lateralibus rotundatis parvis flavis: antennæ fuscae, apice pallidiores: pedes flavi: femora tibiæque 4 posticæ nigro, anticæ fusco maculatæ: alæ hyalinæ: stigma sublunaris, fusca, costam versus nigra. (Alarum longitudo,  $1\frac{2}{3}$  lin.)

This species is nearly allied to Dec. biguttata: it is smaller, more slender, and less variegated with yellow: the mesothorax is entirely black.

July; amongst grass beneath trees; Southgate.

Sp. 6. Dec. mellea. Fem. *Flava, nigro variegata.*

Oculi ocellique rufi: caput posticè, post-scutellum anticè, mesothoracis linea transversa, metathorax, abdominis maculæ 3 connectæ dorsales petiolusque nigri; antennarum articulus 2 supra fuscus: alæ hyalinæ: stigma sublunaris, fusca, costam versus nigra. (Alarum longitudo,  $1\frac{2}{3}$ — $1\frac{3}{4}$  lin.)

Var.—Antennæ fuscae: tibiæ 4 posticæ fusco maculatæ.

May; amongst grass beneath trees; Southgate. September; Isle of Wight.

\*\* *Stigma subtrigona*.

Sp. 7. Dec. variegata. Mas et fem. *Nigra, flavo variegata*.

*Maris* oculi flavo cincti ocellique rufi: proscutellum flavo quadrimaculatum; abdomen basi rufum: antennæ fuscae, apice pallidiores: pedes flavi: femora nigro, tibiæ fusco maculatæ: alæ hyalinæ: stigma subtrigona, fusca, costam versus nigra: *femine* caput flavum, nigro variegatum: prothorax flavus, nigro trimaculatus: mesothoracis scutum scutellumque flava, lateraliter maculata: abdomen maculis duabus lateralibus sublunatis flavis: antennarum articuli 1 et 2 nigro-fusci, apice subtusque flavi. (Alarum longitudo, 1—1 $\frac{3}{4}$  lin.)

*Var. β.*—*Fem.* mesoscutum flavo obliquè bilineatum.

*Var. γ.*—*Fem.* mesoscutellum nigrum, immaculatum.

The proscutellum of the male has four yellow spots, the two interior ones much the largest: that of the female is yellow, with a black spot on each side, and a larger one in the centre: the mesoscutellum has a yellow margin, interrupted toward the base.

July; amongst grass beneath trees; Southgate.

Sp. 8. Dec. minuta. Mas. *Nigra, flavo variegata, abdomine nigro-fusco, antennis basi flavis*.

Caput flavum, posticè nigrum: proscutellum bilineatum, lateribusque flavis: abdomen nigro-fuscum, basi pallidum: petiolus niger: antennæ fuscae, basi apiceque flavæ: pedes flavi: femora tibiæque fusco maculatæ: alæ hyalinæ: stigma subtrigona, nigra aut nigro-fusca. (Alarum longitudo, 1 lin.)

May; amongst grass beneath trees; Southgate.

Sp. 9. Dec. unicolor. Mas. *Nigra, immaculata, aut flavo bimaculata*.

Oculi ocellique rufi: abdomen basi obscurè rufum: antennæ nigro-fuscae, apice subtusque pallidiores: scapus niger: genua tarsique flavi: tibiæ anticæ fuscae: alæ hyalinæ: stigma subtrigona, nigra. (Alarum longitudo, 1 $\frac{1}{4}$  lin.)

*Var.*—Proscutellum utrinque flavo maculatum.

June; amongst grass beneath trees; Southgate.

Sp. 10. Dec. tenuicornis. Mas. *Nigra, flavo bimaculata, antennis flavis*.

Proscutellum utrinque flavo obscurè maculatum: abdomen basi rufum: antennæ flavæ, basi fuscae: pedes flavi: femora tibiæque

fusco maculatæ : alæ hyalinæ : stigma subtrigona, nigra. (Alarum longitudo,  $\frac{3}{4}$  lin.)

This species may be distinguished from the three preceding, by its narrower wings, and more slender antennæ.

June ; amongst grass beneath trees ; Southgate.—(*To be continued.*)

ART. III. *British Periodical Works on Entomology.*

1. *British Entomology.* By JOHN CURTIS, F.L.S.
2. *Illustrations of British Entomology.* By I. F. STEPHENS, F.L.S.
3. *Samouelle's Entomological Cabinet.*

MR. CURTIS commenced his beautiful work on the first of January, 1824, and has, with the most rigid punctuality, continued it in monthly numbers from that time to the present. We cannot be expected minutely to criticise such a mass of matter as must be contained in so extensive and laboured a production, yet we trust a few general observations will not be unacceptable to our readers.

Each number contains four highly-finished and accurately-coloured figures of insects, with dissections of the parts from which the generic characters are taken, at the foot of the page. Each of these figures is intended to illustrate a genus; and in order to be able to give plates of the most rare and beautiful species of each genus, and to record fresh discoveries as they occur, Mr. Curtis has not followed the usual plan of adopting any system of arrangement; a plan by which an author is frequently bound to publish sections of his subject, which have never obtained sufficient attention to bring them into any thing approaching a state of perfection. There are, perhaps, disadvantages attending this plan while in progress; but ultimately the work must, by this mode of publication, be rendered much more complete than it possibly could have been, had the genera been figured in regular succession. The plates, generally, represent one Coleopterous, one Hymenopterous, one Lepidopterous, and one Dipterous or Hemipterous insect; and we may safely say, we have never seen representations more elegant, or more true to nature. The dissections we have, in many instances, examined and compared with the



originals; and we are enabled to bear our testimony to their accuracy; and are convinced that engravings of this kind, tend more to fix the characters of genera on the mind than the most laboured descriptions.

Mr. Curtis frequently, in his plates of Lepidoptera, gives a figure of the larva, together with the plant on which it feeds: and, unwilling as we are to find fault, we feel we shall not be doing our duty to the public without expressing our disapprobation of a practice which Mr. Curtis has latterly too frequently adopted; we mean, that of copying the larvæ from the figures of Continental authors, instead of from real British specimens. Mr. Curtis must be thoroughly aware, that the same species varies so much in different climates, as to size, colour, and form, that it would be quite incorrect to figure an exotic specimen as British, even of an insect decidedly ascertained to be a native: secondly, every one is aware of the great propensity in our Continental neighbours to exaggerate their drawings, both as to size and colour: and, thirdly, Hubner's acknowledged carelessness about names, must frequently be a cause of error; and this error thus becomes perpetuated. We feel confident Mr. Curtis's excellent sense will convince him of the validity of these objections, especially when we assure him that many of his subscribers would prefer having no figure of the larva at all, to one copied from a foreign author. The gaudy caterpillars already figured, give to this part of the work a semi-foreign appearance, which deteriorates its value in the eyes of the British Entomologist: we speak not unadvisedly; we make ourselves the organ of the sentiments of others.

In future numbers of this magazine, we purpose examining minutely every number of Mr. Curtis's, and all other periodicals which may intervene between the appearance of our own numbers; but it is obvious we cannot suitably infringe on our allotted space for that purpose now, as it is necessary to give a general idea of each work before commencing the more laborious detail. We conclude, by heartily recommending the work before us to the attention and patronage of *every* British Entomologist; and we already have the happiness of knowing that, on the Continent of Europe, it is held in the highest esteem.

MR. STEPHENS'S highly valuable work, entitled "*Illustrations of British Entomology*," was commenced 1st January, 1829, and



has been continued, in monthly numbers, to the present time. In its appearance, however, we are sorry to say, there has been much irregularity, both as to time of publishing and quantity of matter; an irregularity which, having been severely commented on elsewhere, we only notice, for the sake of expressing our sincere desire that it may never occur again; as, in that case, the painful task of reprehension must fall on us, in the regular discharge of our duty to the public. Having mentioned the subject, we must express our regret that the article in question should have been written in the spirit in which it was; for, although we firmly believe the writer was unbiassed by any other motive than a wish to serve the public, yet it is clear that so pointed an attack must be productive, in many breasts, of an unkind feeling, which it should be the object of every scientific man to allay rather than excite. When we consider the very poor encouragement from the public that scientific works generally meet with in this country, it behoves us to make every possible allowance for one who has devoted the whole of his leisure time, and has doubtless sacrificed a considerable annual expenditure, to a work which affords no reasonable anticipation of even ultimate remuneration to its author. We wish, and have long wished, that a kindly and brotherly spirit were more cherished among us than has been the case of late; for we feel certain that mutual co-operation would tend materially to the advancement of the science. Let us all endeavour to forgive the past; and let us resolve not to be the first to offend in future.

To return to the work before us: the attempt to describe all the British species of insects, is in itself so bold a one, that every possible encouragement should be given to an author who would venture to undertake it. Mr. Stephens has already described above three thousand Mandibulata, and upwards of one thousand Haustellata; of a large number of which he has given plates. The specific descriptions are frequently not of that clear decided kind which we could wish; and, we think, bear the marks of too great haste in composition. We conceive it is scarcely a correct mode to make specific distinction depend in one instance on colour, and in the next on form; yet we find this mode of description frequently adopted: thus the leading words of the specific descriptions in the page open before us are: Sp. 4. *Elongatus*; 5. *Obscurè piceo-fuscus*;

6. *Levissimè punctulatus*; 7. *Picco-niger*; 8. *Leviter pubescens*. All these characters might suit one insect, excepting that, in 5 and 7, a little tautology occurs. We are perfectly aware that Mr. Stephens is not the only author who is to be charged with this carelessness; and we would wish, in giving our advice to him, to extend it to all, that *the leading character should be descriptive of difference*, excepting when that character runs through several species: in such instances, it may be repeated before each: and the second character must then be looked to as the distinguishing one.

This work, like Mr. Curtis's, we consider absolutely essential to the study of British entomology; and we strongly recommend those who are not yet on the list of Mr. Stephens's subscribers to enroll their names; and thus contribute their mite towards the support of a work calculated to be so eminently useful.

In concluding our notice of this highly valuable work, we must extend to British entomologists a caution;—BEWARE OF PIRACIES! The scissors-and-paste system of book-making seems now to have reached its acmé. A cheap pirated edition of Mr. Stephens's Illustrations of Haustellata has just appeared. It is got up by a quack so totally ignorant of the subject on which he *professes* to write, as to have faithfully retained every error, even those which have been merely typographical, and subsequently corrected by Mr. Stephens himself. Entomologists ought to unite in setting their faces against such an infamous proceeding: had they done so in a prior instance, this caution had not been needed. We are aware of the rage for cheap books; but we beg our readers to recollect the reason assigned by the broom-seller for being able to dispose of his brooms at such a low price,—he stole them ready-made.

MR. SAMOUELLE's pretty little work was commenced on the 1st of January, 1832, and, like the preceding ones, appears in monthly numbers, each containing six figures of British insects. It seems well calculated to please and instruct children in the history of insects; but we would caution Mr. Samouelle, if he expects his "Cabinet" to circulate among grown-up entomologists, to pay a little more attention to the letter-press as well as the pictorial part. Of such insects as *Carabus*,

*Trox*, &c., we could not have even guessed the genera: and in the description, we have "punctured with elevated lines," and similar inconsistencies continually. Names are also frequently incorrect: *Callidium bajulum* was a typographical error in Mr. Stephens's Catalogue, since corrected in his Illustrations. A *Nomada*, figured some time back, Mr. Samouelle will see by referring to the *Monographia Apum*, is incorrectly named. In the same number we observe the author adopts the old mistake of Fabricius about *Ægeria Asiliformis*, though so recently satisfactorily cleared up by Mr. Newman.

In every case in which an author endeavours to combine popularity and extensive sale, with science, an unusual degree of accuracy is required; as, in these instances, the blunders are calculated to do so much more harm from their wider dissemination. We hope Mr. Samouelle will profit by our admonition, and give us no reason to make similar complaints in our January number. We wish him success; but we should recommend him to take the necessary means to ensure it.

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ART. IV.—*Some Observations on Blight.* By RUSTICUS.

Sir,—It strikes me, that if you make the Entomological Magazine merely a medium for monographs, and that description of writing, your readers will weary of your unceasing technicalities, and lose their appetite before the quarterly meal you propose providing for them is consumed. There are many, who, like myself, are well enough pleased with a little taste of the science, without wishing to dip too deeply into it; and I beg of you to consider whether an occasional paper, containing no *crack-jaw*, would not be an inducement to some of these to take up your Mag. With this view, I shall send you a few observations on blights of various kinds, giving you full permission to translate any phrases which are too plain for the comprehension of the *élite*, into your choicest *cat-Latin*; but recollect, Sir, such editorial translations must be confined to foot-notes with Ed. attached:—I would not, for all the world, have the sin of your barbarisms to answer for.

Blight is a term generally misunderstood; especially among those whom it more particularly concerns. The knowing

horticulturist will tell you, "There is blight in the air to-day:" and in a few days or weeks, he will see the web of the *lackey*, or the *yellow tail*, or the *ermine*, on his white-thorn hedges; or the caterpillars of the *death's-head hawk moth* on his potatoes; or those of butterflies on his cabbages; and then he will give you a toss of his wise head, and utter, with a gravity quite in keeping, "I knew there would be a *blight* this year; I saw it coming in the air." Perhaps, however, he may find a good many snails eating his wall-fruit; or may, perchance, tread on two or three great stag beetles while performing their evening perambulation along his gravelled walks; and then, he "knew it would be either a *blight* or a *sneg*; but it's more of a *sneg* this year." Further than this, the horticulturist has not progressed: webs and soft insects are *blights*; snails and hard insects are *snegs*. Warm south-east winds produce the first; cold north-east winds, the last; and yet the same man would laugh in your face if you were to say seriously, on a cold misty morning, "There will be a *rise* in the funds to-morrow, I can see it in the air." I maintain that there can hardly be a greater service performed to horti- and agri-culturists, than by pointing out to them the nature and habits of their insect enemies; and their laughing at us in the first instance will perhaps be repaid by their thanking us at last.

Let us consider, separately, some of the insects which bear the name of blight. We will, in the first instance, examine the apple-tree. Cider is an important article of manufacture, as well as consumption, in many of our counties; and, consequently, whatever tends to increase or diminish the supply, ought to be deemed by the grower worth his notice. The apple-tree has many assailants: the principal are the weevil,<sup>a</sup> (*weevillum pomi*?), the woolly louse or American blight, and the moth. I will describe the first of these, and its mode of proceeding.

By carefully examining the bark of an apple-tree in the winter, you will occasionally find a pretty little beetle in the cracks, which, directly on being touched, shams dead, and drops on the ground, where you will not, without great difficulty, discover it, on account of the great similarity of its colour; you must, therefore, hunt till you find another. This

<sup>a</sup> *Anthonomus pomorum*.—ED.

time, as soon as you see him, place one hand below him, then touch him lightly with a little bit of stick, and he will drop into your open hand; his own scheme for self-preservation will beat him. Now roll him into a quill, or pill-box, and take him home. Place him on a sheet of writing paper; you will soon see his shape—the head is furnished with a trunk, from which, on each side, springs a feeler, bent at right-angles forward, so that the trunk altogether looks to be three-pronged, like a trident. The thorax and wing cases are brown, beautifully mottled; and an oblique line on each, pointing towards the suture or meeting of the wing-cases, is much lighter coloured, and gives the little beetle an appearance of having a letter V obscurely chalked on its back. Its size altogether is rather less than a hempseed.

With the first sunshiny day in March, these weevils leave their winter quarters, crawl up the trunk and along the twigs, perch themselves so as to receive the full benefit of the sun's rays, and plume themselves with their legs and feet all over, trident and all, just in the same manner that a cat washes her face with her paw: they then stretch out one leg at a time, cramped, no doubt, by the long confinement; they lift up their wing-cases, and unfold two large transparent wings, which, though twice as long as the wing-cases, were neatly folded up and hidden under them, and then, launching themselves into the air, they go roving about the orchards and gardens, their little hearts in an ecstasy of freedom, and love, and happiness. It is not long before each finds a suitable mate: no relations raise objections; and the nuptials are consummated. Now I will allow the gentleman weevil to go his way in quest of new loves and conquests; and in the mean time I will observe the conduct of the lady.

By the time the female is ready for the important task of depositing her eggs, the spring has considerably advanced, the apple-buds have burst, and the little bunches of blossom are readily to be distinguished. The weevil soon finds out these; and selecting a blossom every way to her mind, commences her operations. The beak, or trunk, before alluded to, is furnished at its extremity with short teeth, or mandibles: with these, she gnaws a very minute hole into the calyx of the future blossom, and continues gnawing until her trunk is plunged in up to her eyes; the trunk is then withdrawn, and

the hole examined with careful scrutiny by the introduction of one of her feelers<sup>b</sup>, or outer prongs of her trident. If it seem to require any alteration, the trunk goes to work again, and again the feelers; at last, being fully satisfied that the work is well accomplished, she turns about, and standing with the extremity of her abdomen over the hole, thrusts into it her long ovipositor, an instrument composed of a set of tubes retractible one within the other, and deposits a single egg (never more) in the very centre of the future flower. Another examination with her feelers now takes place; and when she is thoroughly satisfied that all is right, away she flies to perform the same operation again and again, never tiring while she has an egg to lay.

The bud continues to grow like the other buds; the little perforation becomes invisible. By and bye, the egg bursts, and out comes a little white maggot, with neither legs nor wings, which, directly it is hatched, begins to devour the young and tender stamens; next to these, the style is attacked, and eaten down to the fruit, the upper part of which is quickly consumed: the maggot is then full fed; it casts its skin, becomes a chrysalis, and lays perfectly still. Up to this time the blossom has continued healthy, no trace of the enemy being to be discovered without; but when the neighbouring blossoms are expanding their petals to the genial breath of spring, those of the mutilated bud remain closed, and retain the arched balloon-like appearance of a bud about to burst. For a few days they preserve their lovely pink colour; and then, by degrees, fade to dingy brown. In this state they remain, until the other apples are well knit; and then the damaged blossoms, by their decided contrast, appear very conspicuous. On opening these brown, or rather rust-coloured blossoms, about the 10th to the 15th of June, the chrysalis will be found to have changed to a perfect beetle, similar to its parent above described, which, had it been left to itself, would, in a few days, have eaten its way through the weather-beaten case of dried petals, and left its prison-house, flying about to take its pleasure, until the chilly winds of autumn should drive it to its winter habitation under the bark: and in the next spring, the whole round of operations, through which we have watched

<sup>b</sup> "Ears," Rennie.—ED.



its parent and itself, would be performed with the same unvarying unerring instinct.

The cloudy misty east wind, in which our farmers and gardeners see the *blight*, is the very weather of all least favourable to the propagation and increase of these weevils. The fine clear sunny days of March and April are the most favourable to them. The tomtits, sparrows, bullfinches, and other birds, which, at this time of year, more particularly frequent orchards and gardens, and which, also, at this time of year, are persecuted with relentless hostility by the farmer and gardener, live, during these months, solely on these weevils, and similar little insects; and, consequently, are the only check on their increase which we possess: so that, in the first investigation of blight, we see how a little prejudice, superstition, and ignorance, tend to increase the injury they dread.

I have much more of this kind in store, which shall be forwarded, if the sample be approved. If you admit all manner of *crack-jaw*, and register the invention of systems *ad libitum*, it would surely be unfair to deprive your readers of a little humble English, and plain statements of facts recorded by a faithful and attentive observer of nature.

I am, Sir, Yours, &c.

RUSTICUS.

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ART. V.—*On Two Species of the Genus Elaphrus, lately discovered in Scotland by Charles Lyell, Esq.* By JOHN CURTIS, Esq. F. L. S.

SIR,—I conceive that the discovery of a new object in nature, or, in other words, the attainment of knowledge, is one of the great incitements to men engaged in science. It is therefore just to give credit to those who are, by their zeal, daily adding to our stores of knowledge by the addition of new species. With this view, it is my intention occasionally to trouble you with the characters of genera, and the description of species; and I hope when more useful contributions do not occupy the pages of your Magazine, that you will do me the favour to insert them, that I may have the pleasure of giving as well as receiving information.

It has often happened that new species of insects have been discovered, belonging to genera so circumscribed, or so well

searched for, that they were the least expected to produce novelties.

The purport of my present communication is to make known to your readers two Carabidæ that may well be included amongst unexpected discoveries; they are Elaphri, presented to me by the learned author of the Principles of Geology, to whose munificence I am so greatly indebted for many of my most valuable acquisitions. They were accompanied with the following observations:—"The Elaphri were taken, during the first fortnight in June, 1831, on the north-west side of Catlaw, a mountain in Forfarshire, on a spot nearly 2,000 feet above the level of the sea, crawling on a soft green plot of bog-moss, on a sunshiny day. The *Carabus nitens* was found at the same time and place."

The Latin characters I shall give from Dejean, as they will distinguish them from all other species; and the English descriptions from my own specimens.

ELAPHRUS, *Fab. Curtis's Brit. Ent.* fol. 179.

Sp. 1. *Elaph. splendidus. Escli.* "*Viridi-æneus, punctatissimus, thorace capite latiore, fronte thoraceque foveolatis, elytris costis subelevatis æneis nitidis interruptis, maculisque cyaneo-viridibus ocellatis quadruplici serie, tibiis tarsisque nigro-cyaneis.*"—DEJEAN'S ICONOGRAPHIE, Tom. II. p. 139, pl. 86, f. 1.

Length 4 lines. Bright green, variegated with brilliant copper: antennæ brightest at the base: head and thorax coarsely punctured, uniting into lines on the crown of the former, the latter scarcely broader than the head, with a simple Y-shaped impression on the back: elytra elongate, ovate, with twenty green foveæ on each, blueish in the centre, and forming four longitudinal lines, connected by narrow shining spaces, scarcely raised, but two towards the apex highly polished.

Sp. 2. *Elaph. Lapponicus. Gyll.* "*Oblongus, cupreo-æneus, capite thoraceque punctatissimis, subfoveolatis, elytris parçè punctulatis, maculisque cœrulescentibus ocellatis obsolete impressis quadruplici serie.*"—DEJ. ICON. Tom. II. p. 131. pl. 86. f. 2.

Length  $4\frac{1}{2}$  lines. Copper colour: antennæ chalybeous, except at the base: head and thorax punctured as in *Elaph. splendidus*, but the latter is broader, with a small deep fovea on each side the back: the sides slightly green: elytra similar to the last, but rather broader behind: the foveæ very shallow, and dull lilac.



These may be considered among the most splendid discoveries that has been lately made; for the first species is exclusively known as an inhabitant of Kamstchatka, and the other of Lapland. Only one of each was taken; and as they are male and female, I think it possible they may be the same species, although they vary in size and colour.

It may be as well to remind entomologists that there is another species, *Elaph. littoralis*, Dej., which I have received from Austria, which so nearly resembles *Elaph. riparius*, that they may be easily confounded.

Mr. Lyell also mentions in his note, that *Callidium striatum*<sup>a</sup> has been taken, since my account of it was published, the end of May and beginning of June, flying in the garden; and others in or by a saw-pit, near the House of Kinnordy, in Forfarshire, Scotland.

July, 1832.

<sup>a</sup> Curt. Brit. Ent. Pl. 295.

ART. VI.—*Catalogue of a few Insects, found in Castle Eden Dean and its Vicinity, in the County of Durham, the beginning of July 1831 and 1832.* By GEORGE WAILES, Esq.

[TO THE EDITOR OF THE ENTOMOLOGICAL MAGAZINE.]

Newcastle, July, 30, 1832.

SIR,—I send you a catalogue of a few insects, collected in that wild and enchanting spot, Castle Eden Dean, with some observations on their habitats, &c. hastily thrown together, which, if you deem worthy of a place in the Entomological Magazine, is much at your service. I am, Sir, yours, &c.

G. WAILES.

Before giving the list of insects, mentioned below, it may prove useful to the entomologist to premise that Castle Eden Dean is the largest and most beautiful of a series of romantic dells, or deans, which consist, as it were, of immense clefts or chasms in that part of the secondary series of rocks, termed the magnesian limestone. These deans are, for the most part, narrow and confined, and so densely covered with wood as to render them too close for the active pursuit of the entomologist;

but as the chasms approach the sea-coast, where they all terminate, the banks lose their very precipitous appearance, and expand into vallies. Small brooks, locally termed *burns*, run through them; but from the porous nature of the limestone, the waters seldom reach the sea: and in Castle Eden Dean, where the stream is larger, and fed by two or three small rivulets, at the distance of perhaps a mile apart, the supply poured down by one disappears, and in one place very suddenly, ere it reaches that part of the main watercourse where the next empties itself. In winter, however, the melting of the snow, and heavy rains, apparently convert the dry bed into a torrent: and, judging from the width of the channel, a large body of water must rush down the valley. Castle Eden Dean is about four miles long, and averaging nearly a quarter of a mile in width, though in some places the rocks, often a hundred feet perpendicular, reduce its breadth to half that distance. Vegetation is most luxuriant: and its botanical treasures have long rendered it famous in the works on that part of natural history. Suffice it to say the rare *Cypripedium calceolus* is here, and almost here only to be met with. Towards the sea, the banks have a more barren appearance, and assume the peculiar marks of the tract of rocks to which the district belongs, producing a great variety of the grasses, and other plants delighting in an arid and poor soil. Here the juniper and privet are, by the force of the winds, thrown into those curious flat growths, which must have struck every one who has seen the trees and bushes growing on an exposed sea coast. The banks of the dean are generally moist, consequent on the density of the foliage, and numerous springs in the limestone; but here and there dry exposed grassy spots occur: and on the principal of these, nearly opposite the mansion of the proprietor, Rowland Burdon, Esq., the beautiful *Hipparchia Blandina* is to be found in abundance, being its only English habitat. I have been thus diffuse in describing the place, because I am persuaded that the connexion between entomology, geology, and botany, especially the two former, has not been sufficiently attended to; and, from my own short experience, I think a pretty good idea may be formed of the insects likely to be found in any district, if its geological features are taken into careful consideration. The following insects constitute only a part of those met with by my friend Mr. Currie

and myself; and as I give them more as an index than a full list, some will be found enumerated which are common in many parts of the kingdom besides Castle Eden.

Helobia Gyllenhalii	Lophopteryx camelina
Leistus spinibarbis	Dasychira fascelina
fulvibarbis	Nemophila Plantaginis
rufescens	Charæas graminis (Aug.)
Calathus mollis	Graphiphora augur
Abax striola	brunnea
Campta lutea	festiva
Telephorus cyaneus	C. nigrum
Orobitis cyaneus	plecta
Attelabus curculionides	Xylophasia sublustris
Rhagium inquisitor	Hadena plebeia
bifasciatum	Euplexia lucipara
Toxotus meridianus	Miana fasciuncula
Leptura melanura	Polia herbida
lævis	Ceropacha duplaris
ruficornis	Leucania comma
Pachyta 8-maculata	Plusia percontationis
Chrysomela litura	Phalæna margaritaria
geminata	Hipparchus cythisarius
Hyperici	Cleora lichenaria
lamina	Alcis repandaria
Cryptocephalus sericeus	conversaria
moræi	Abraxas ulmata
labiatus	Xerene albicillata
Lagria hirta	Aplocera plagiata
Acrida grisea, <i>Fab.</i>	Thera Juniperata
Æshna varia	Emmelesia ericetata
Cordulegaster annulatus	Blomeri, <i>Dale's MSS.</i>
Libellula vulgata	Hypercallia Christiannæ
depressa	Argyrositia, I. W. ella
Hipparchia Semele	Tipula crocata
Tithonus	nigra
Blandina (Aug.)	lutescens
Polyommatus Alsus	Dolichopeza sylvicola
Salmacis, <i>Steph. MSS.</i>	Atherix Ibis
Thymele tages	crassicornis
Ino Statices	Zodion cinereum
Anthrocera Filipendulæ	Conops flavipes (Aug.)
Hepialus Hectus	Loxocera Ichneumonea
velleda	Micropeza lateralis
Hepialus carnus	

With regard to *Hipparchia Blandina*, I may observe that every variety described by Mr. Stephens is found here; and it is somewhat singular that the males never have the broad

brown band on the posterior wings instead of the blueish ash one, whilst the females may be considered as divided into two great varieties (equally common), distinguishable not only by the colour of that fascia, but by the greater distinctness of the ocelli, which in the var.  $\eta$ , Stephens (that with the blueish ash fascia, which, I conceive, should have been the typical variety), are rather obscure, and approach, in appearance, those of the males.

*Polyommatus Salmacis*.—I entirely coincide with Mr. Stephens in considering this a distinct species. I must, however, state that Mr. S.'s description in his invaluable Illustrations (Haust. Vol. III. p. 235,) is not quite correct: for I have observed, out of at least 150 specimens, that the variety with the black spot forms two-thirds of the whole; and that neither sex possesses exclusively either the white or black spot, though the majority of the former variety are males.

This butterfly appears to be confined to the sea banks; and I have never seen it above half a mile from the coast, and only stragglers at that distance.

*Ino Stalices* is very abundant on the sea-banks: and nearly every specimen is the bright copper variety: whilst the blue-green variety is as exclusively confined to our inland habitats near Newcastle.

*Hepialus carnus*.—I cannot but suspect this to be only an extraordinary variety of *Hep. velleda*. Both occur at the same time, in the same places, and the markings seem to run into each other. This genus varies much in the colour and intensity of the markings; and I have taken specimens of *Hep. Humulus* with the anterior wings of a yellow tinge: and my friend Mr. Hewitson has shewn me similar specimens, captured in the Orkneys this season, which have very distinct markings on the anterior wings.

*Charæas graminis*.—I have generally met with a specimen or two of this moth on the wing, in the day-time, in the dean.

*Xylophasia sublustris*.—I took a specimen flying in the evening, in July, 1831; and Mr. Currie captured another this year. Both occurred at least three miles inland.

*Alcis conversaria*.—Mr. Currie was fortunate enough to meet with single specimens both years.

*Thera Juniperata*.—We took this very rare moth this season, in some plenty amongst the junipers. Mr. Stephens's

figure, which has evidently been drawn from a wasted example, conveys a poor idea of the beauty of fresh specimens.

*Emmelesia ericitata*.—The only specimen which has occurred hereabout, I met with in a damp part of the dean on our last visit.

*Emmelesia Blomeri*, Dale's MSS.—The first notice I had of this beautiful moth was from my friend Mr. Dale, who casually mentioned his having received a drawing of it from Captain Blomer, who bred it from the pupa in the spring of 1831. In July, I met with half-a-dozen specimens at Castle Eden, which, however, Captain Blomer did not appear to recognize, when I had the pleasure of seeing him last September; and Mr. Curtis, in November, shewed me a drawing, made from a specimen I sent Mr. Sparshall, and first intimated it was quite new. It will appear in one of his early numbers.<sup>a</sup> I succeeded in taking about twenty specimens this season, and suppose that the larva feeds either on the hazel, the Scotch elm, or the white thorn. The moth seems to delight in dark shady places, where the sun hardly penetrates. Can it be double brooded? Captain Blomer's was taken in the spring; mine, in beautiful condition, in July. The times of appearance of insects is comparatively little known; but the subject is well worthy of investigation.

*Hypercallia Christiernana*.—I took a single specimen of this little beautiful creature in 1831.

*Tipula nigra*.—Rare.

*Dolichopeza sylvicola*.—Last year, I met with this rare species near Newcastle, and also at Meldon Park; but all the specimens, about half-a-dozen, were males. This season I captured a good many, including some females. Its flight is slower than most of the Tipulidæ, and its beautiful white tarsi, as Mr. Curtis justly observes, betray it when the rest of the insect is scarcely visible. The banks of rivulets, in dark deep woods, are its favourite habitats.

<sup>a</sup> See Curtis's Brit. Ent. 416, for a figure of this beautiful insect, together with the rare *Cypridium calceolus*, mentioned above.—ED.

ART. VII.—*Sphinx Vespiformis. An Essay.* By EDWARD NEWMAN. 8vo. London: Westley and Davis.

So fully convinced are all true naturalists of the importance of discovering the true system of nature, that we doubt not but this little essay will be read with pleasure, even by those who may not be disposed to coincide in the peculiar views of the author.

Like Mr. MacLeay, Mr. Newman fully believes in the existence of circular groups, though he differs from him both as to the number of minor groups, of which they are composed, and as to the manner in which they are linked together. Without entering into a comparison of his views, and those of other systematists, we will proceed at once to give an outline of the arrangement he proposes, and which he considers as more in accordance with nature than any yet before the public. After showing the identity of the *Ægeria Asiliformis* of modern writers with *Sphinx Vespiformis* of Linné, he adds:—

“To ascertain the place among insects, or even animated beings, which this *Sphinx vespiformis* naturally occupies, I have attempted in the following pages. The *Systema Naturæ* has, for years, been the object of my most diligent search; but the idea which I have taken of the subject is scarcely a month old. An anxiety to hear the opinions of others has urged me to scribble these few pages with, I fear, far more haste than good speed, &c. I feel, however, a firm conviction that my theory is too near an approach to truth to suffer from any garb, however slovenly, in which I may have dressed it.”—Pref. p. 7.

After remarking on the probable existence of a natural system, and on the improbable nature of the supposition that the beautiful gradations, from one group to another, so conspicuous in every department of nature, should be merely the result of chance, our author proceeds:—

“Infinitely varied, however, as the course of such a peculiarity must be, the naturalist never finds those sudden departures from the regular flow of variation, which all systems, even the most approved, are constantly exhibiting; the reason of which is, *that in thus tracing approaches in his mind, he will continually discover an individual, completely surrounded by others, each of which partakes of its peculiarities, not only in a different degree, but in a different mode: and thus*



he will perceive the character, on which his attention has been fixed, ramifying in all directions. Now no system, hitherto suggested, will at all cope with this."—P. 10.

From this, after assuming the existence of circular groups, as proved, Mr. Newman proceeds to lay it down as a law of nature, that each group is composed of seven minor ones; of which the *central one* contains types of all the surrounding groups, and a seventh type peculiar to itself.

In support of a septenary division, he appeals to Scripture, (an appeal of which we cannot approve), to Cuvier, to Kirby, and lastly to Linné, remarking, moreover—

“Our own observation will speedily convince us, that most groups of animals, with which we are tolerably well acquainted, are divisible into seven. We shall never find the number greater; and, when less, we shall invariably perceive that the deficiency exists in groups, of which our knowledge is particularly limited; for the perfection of a septenary distribution of any particular group will depend entirely on our acquaintance with that group: thus the groups, at present known by the names of Mammalia, Aves, and Insecta, resolve themselves instantly into sevens.”—P. 15.

We much wish that Mr. Newman had favoured us with a sketch of the distribution of the two first-named groups, of both which there has as yet been no arrangement given which comes near to nature; and we still doubt whether the present theory will at all apply to them. However, with these we have nothing to do here; so we will return to the last groups, and proceed at once to the diagram of Insecta.

In this we find Neuroptera in the centre, connected with the six other classes, as Mr. Newman calls them, as follows; to Lepidoptera, by *Psyche in Neuroptera*, and *Tinea in Lepidoptera*; to Diptera by *Cloeon* on one hand, and *Chironomus* on the other; *Termes* leads to the Hymenoptera by *Formica*; the approach to Coleoptera is by *insecta incognita*; to Orthoptera by *Mantispa* and *Mantis*; to Hemiptera by *Psocus* and *Aphis*. That there may be insects which will form the connecting link between Coleoptera and Neuroptera we will not deny; but, as yet, there is certainly none well known. In some of the others he seems to have mistaken a distinct analogy for an affinity; but this arises from what we consider as the greatest error of the author, an utter disbelief

in the existence of such relationships. Now, we will ask, Are there not innumerable relations of analogy between the Hymenoptera and the Diptera, and even the Lepidoptera? Are not almost all the genera of the first typified in the second; and are there not exotic species of *Tenthredo* L., whose transparent wings, with well-defined coloured margins and banded abdomens, might cause even an entomologist to mistake them for *Sesiæ*, or *Egeriæ*, at a short distance? And again, Do not any Hemipterous insects strongly resemble the former Lepidopterous genus?

The author, moreover, rejects, and with great semblance of reason, the division of insects into *Haustellata* and *Mandibulata*. He even places so little value on the characters dependent on the form of the mouth, as to hint that *Pulex* is nearly allied to *Coleoptera*. In this we think him decidedly wrong, considering it much nearer to the *Diptera*. We will now proceed to the *Lepidoptera*, of which he gives a diagram, first quoting the following sentence:—

“Whoever will give himself the trouble to examine thoroughly a collection of British *Lepidoptera*, will find a very great majority of them evincing very evident symptoms of relation to one or other of the following species:—*Papilio Machaon*, *Sphinx Ligustri*, *Pyralis verticalis*, *Tinea pelionella*, *Noctua pronuba*, and *Geometra roboraria*; and should any form, widely different from either of these, occur, it may, if the larva be known, be placed in the centre of a ring, formed by the groups, which we will suppose surrounding their respective types.”—P. 33.

These six insects form the types of his six external groups; the central one he considers to have for its type *Attacus Atlas*.

Considering *Urania* allied to *Geometra*, by its setaceous antennæ, Mr. Newman supposes it met by *Ourapteryx* in that subclass, whilst *Castnia* and *Coronis* connect the *Papiliones* to *Sphinx*; both these he seems to think *Papiliones*. With respect to *Coronis*, he most probably is correct: but *Castnia*, setting with its wings deflexed, as we have ourselves observed, can scarcely be a butterfly; but far more resembles, even in the colouring in some species, *Catocala*. With regard to *Urania*, also, both its antennæ and palpi bear a near resemblance to those of *Erebus*, with which Fabricius placed some of the species, remarkable for their near resemblance in colour



to the Erebi. Moreover, one of the Arctiidæ, a native of China, has the same formed palpi as Erebus and Urania; and resembles the former in thick posterior legs. However, despite of all this, we will not say the author is wrong in assigning it the station he has.

From Sphinx he excludes the Egeriæ and Zygænæ, placing the first in the central group with Cossus, the latter in the next group with Pyralis; from which he passes by Ilithyia and Chilo to the Tineæ; thence, by Halias, to Cymatophora in the Noctuæ; and thence, by Catocala, to Metrocampus in the Geometræ. The central group is composed of *Bombyces*, connected with Papilio by Godart's Genus Barbicornis; *Lariæ*, by Orgyia, to Nyssia in Geometra; *Arctiæ*, by Apatela in this group, to Chareas in Noctua; *Lithosiæ*, by Lithosia, to Yponomeuta; *Notodontæ*, by Cilix, to Aglossa in Pyralis; lastly, in the centre, *Phalænæ*, including Attacus, Saturnia, &c.

For a further account of these groups, and also for a generic character of the Genus Memythrus, a genus which he has formed from Sphinx Vespiformis of Linné, we must refer our readers to the work itself, a perusal of which will amply repay them for the requisite time and attention. We will conclude by giving the following table of the "natural divisions to which Sphinx vespiformis is referable:"—

First Primary Group . . . .	Animalia.
First Kingdom . . . . .	Annulosa.
Central Sub-Kingdom . . . .	Insecta.
First Class . . . . .	Lepidoptera.
Central Sub-Class . . . . .	Phalænæ.
Second Natural Order . . . .	Cossi.
Second Family . . . . .	Ægeriidæ.
Second Genus . . . . .	Memythrus.
First Species . . . . .	Vespiformis.

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ART. VIII.—*French Periodical Works on Entomology.*

1. *Iconographie et Histoire Naturelle des Coleoptères d'Europe*, par M. LE COMTE DEJEAN et M. BOISDUVAL. Paris.
2. *Histoire Naturelle des Lepidoptères, ou Papillons de France*, par M. GODART, continuée par M. DUPONCHEL, Paris.
3. *Magasin de Zoologie*, par M. GUERIN. Paris.

THE titles above given, will convince our readers that our Parisian neighbours are by no means behind ourselves in the encouragement given to periodical works on Entomology. Here are three works, all of them vying with our ablest productions, and superior, in scientific accuracy, to much which we have submitted to us by our countrymen. The plates in these works (we speak of them in a mass, and make no invidious comparison), are ever somewhat exaggerated: there seems, to us, a perpetual desire to make each representation of an insect more conspicuous—more showy—than the insect itself. This has ever been an erroneous practice: we are happy to see it is fast falling into disuse. When we compare the able works, whose titles we have given above, with the figures enlarged, and often preposterously coloured, of early continental authors, we cannot but be sensible of a great improvement in this respect. It seems to us, that the pictorial branch of natural history should strive to give a more correct idea of nature than we can possibly do by words. It should never be an object of ambition with the draughtsman “to copy Nature, and improve her too.”

M. Dejean's *Iconographie* has, from the well-known talents of its authors, attained a rank in science which makes it a work of continual reference. The descriptions are generally clear and distinct; but we fancy we observe, in the plate before us, representing the genera *Anchomenus* and *Agonum*, rather too great a sameness of character. The legs, for instance, in either species, would, with but very little alteration in the shade of colour, do for all. Great attention should be paid to catch the peculiar character of each species, and fix that character in delineating it. The objection we refer to, we believe often

arises from the artists never having seen the insect while living.

The *Papillons de France*, of MM. Godart and Duponchel, has already grown to a somewhat formidable size, and, we regret to say, affords no reasonable prospect of ever arriving at a termination. M. Duponchel having proceeded as far as *Pyralis*, in a regular and systematic manner, now informs us that the work is to be extended, in supplementary numbers, to the *Lepidoptera* of Europe. This departure from the original plan of the work we most decidedly condemn: we think we are hardly going too far, in calling it a breach of faith. The subscribers of M. Duponchel must now either continue their numbers to an extent of which they can see no limit, and in which they feel but little interest, or discontinue the work altogether, and thus leave their copies imperfect. The latter course will be, and has been, adopted by so many, that we trust M. Duponchel will see the folly of departing from the original plan, and proceed, as before, with the insects to which his title alone refers—the *Lepidoptera* of France. With this exception, we think the work deserving support.

M. Guérin's *Magasin de Zoologie* is on the plan of Mr. Curtis's *British Entomology*; the genera being selected entirely at the option of the author, without any attempt at systematic arrangement. The plates and descriptions are beautiful and accurate; and we are pleased to see, in the number on our table, two contributions by our countryman, Mr. Westwood. This work we strongly recommend to the notice of entomologists. The plates and letter-press are got up with an attention that deserves encouragement; and there is a sterling worth about the publication combined with a modest appearance and unpretending style, which, we are persuaded, will render it an increasing favourite with the public.

However we may compete with our continental neighbours in this individual branch of the science, there are other and higher walks which they have made almost exclusively their own,—we mean the natural history, as regards habit and metamorphosis, and the anatomy of insects. On these subjects the works of Réaumur, Malpighi, Swammerdam, Lyonnet, Lewenhoeck, and many others, have no parallel at all on this side the channel: and, more recently, the splendid work of Straus-Durckheim, on anatomy, may be hailed as a monument

of human genius. We could not trust ourselves to undertake the task of reviewing this work in a single article; and have persuaded our talented friend Mr. Doubleday, to give, in a series of articles, a sketch of its contents. The first of these will be found in the present number, and will, we are confident, be received with pleasure by our readers, as no translation has yet appeared in England, except some garbled ones executed for an illiterate bookmaker, by some person evidently unacquainted with his subject.

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ART. IX.—*An Entomological Excursion.* By EDWARD DOUBLEDAY and EDWARD NEWMAN.

NOT only the success, but the pleasure of the entomologist, are so much under the influence of the weather, that it is next to impossible to give any thing like a correct diary of a three weeks' expedition of this kind without a constant allusion to this important subject: we shall therefore offer no apology for making these notes a journal of weather as well as of entomological captures: and if the frequent repetition of the word 'rain' become at last tiresome, our reader will be kind enough to recollect how much more tiresome it must have been to those who were constantly exposed to its effects.

To begin our narrative with due formality and precision, we started outside the Worcester Mail at twenty-five minutes past seven, P.M., on the 4th of June, 1832: we occupied the roof-seat, side by side: the wind was S.S.W., and a mild rain was falling, which continued until we reached Worcester, being about fourteen hours. After breakfasting at Worcester, we resumed our seat: the rain had ceased; and the sun gleamed at intervals weak and watery, on our progress. The country between Knightsford-bridge and Bromyard-down is at all times beautiful: but now, clad in the bright green of spring—for summer had not reached this country, the oak and the ash being scarcely in leaf—the richness and beauty of the scenery far exceeded the powers of an entomologist to describe. The respite from rain lasted about two hours: it then returned; and we sate silent, dripping, weary, mopish, sleepy and uncomfortable, until

we reached Leominster; and there terminated our journey for a while.

June 6th. The locality of Leominster is particularly suited to the increase of the insect tribes. It stands in a valley intersected by numerous streams, the banks of which are generally bordered by trees and underwood; and the valley itself is completely inclosed by hills, the summits of which are frequently wooded. On the morning after our arrival, we ventured out, notwithstanding the ragged and stormy appearance of the clouds, and were rewarded by the capture of several good insects; among them *Pachyta collaris* and *Atherix Ibis*, both in considerable abundance. The extremely confined habitat of the former insect is worthy of notice: we found it only on *Umbelliferae* in the hedgerows surrounding a hop-ground; and although we could not satisfactorily ascertain that its larva feeds in the decaying poles, there appeared but little reason to doubt it. We have since learnt from Mr. Griesbach, that he has found this insect on the white-thorn blossoms in the same neighbourhood. *Chelostoma florissomne* and *Eucera longicornis* were also abundant in the hop-grounds: the former nidificates in the poles; on which we also observed a great number of *Lyctus oblongus*: the females were thrusting their long retractile ovipositors into the wood. These various tribes must, of course, cause great injury and eventual decay to the poles: we observed many were perforated in all directions. Among the growers, the hop seems to be the only object of attention; otherwise, it would not be difficult, by a slight wash over with some nauseous fluid in the winter, to secure the poles from these destroyers. The hops were looking moderately well; but on the upper leaves the *Aphis* was to be seen, three to ten on each leaf. The constant showers during the day prevented our going further than a few fields from the town: and the length and wetness of the grass insured us wet legs and feet; even though the sky above was for a time tolerably fair.

7th. We again kept close to the town: took more *Atherix Ibis*. This beautiful fly we obtained by sweeping with a common water-net among the weeds on the banks of the rivers. The female is much the rarer sex, occurring but as one to six of the male: the eyes of the insect, when living, are remarkably beautiful and iridescent. In the same locality we also found *Orthoperus punctum*, *Leiodes multistrigata*, and another

*Leiodes*, apparently undescribed, besides an immense number of the Neuropterous subclasses, *Phryganea*, *Perla*, and *Ephemera*. The weather, however, still continued so wild and wet, that we were glad to get dry shoes and stockings, and crowd to the fires which we found our friends every where enjoying.

8th. At one this morning, we mounted the Bristol and Liverpool mail, which passes through Leominster; and arrived at Shrewsbury at five, having travelled forty-two miles in about four hours. After a hasty and bad cup of coffee, we proceeded by the Express towards Oswestry, passing near or through Westfelton. We, of course, requested the coachman to point out the habitation of Mr. Dovaston, the amusing contributor to Mr. Loudon's Magazine of Natural History; but were surprised and disappointed to find that he could not do so. It is pleasant to know the residence of a naturalist, so familiar to our thoughts as this clever writer has rendered himself. The day was cloudy, but without rain. After passing the little village of Chirk, the road takes a grand sweep to the left; and, for the first time, Wales bursts on the traveller in all its beauty. However unentomological, it is quite impossible to pass by, unnoticed, those stupendous aqueducts, Chirk and Pont-y-Cyssyltau, which, bestriding valleys, seem to be the work of giants. The ride hence to Llangollen is full of beauty: the Dee, clothed with banks of trees, winds along the valley over a bed of rock; and the mountains, rising precipitously on every side, confine the horizon to about half its usual limits. At Llangollen we had a second and capital breakfast. The scenery, for some miles, continues fine, but towards Corwen assumes a tamer appearance; and at last gets so flat and dreary, that the traveller who, like ourselves, has been up all night, may be excused if for an hour or two he go quietly to sleep. About five miles beyond Cernioge<sup>a</sup> he must wake up, and open wide his eyes, for it is impossible to make too much use of them:—rock and ravine, mountain and valley, verdure and barrenness, the dead and silent lake, the roaring rapid, the mad and leaping waterfall, follow each other in quick succession, or crowd altogether on the view, with a splendour that cannot be imagined.

We stopped at Capel-Curig about three; and after dinner

<sup>a</sup> Pronounced Canny-oggy.



ascended the mountain at the back of the inn. Under stones we found beautiful green varieties of *Notiophilus quadripunctatus*, *Omaseus orinomum*, *nigrita*, *rotundicollis* (Steph. MS.), *Patrobis rufipes*, and a few other *Carabidæ*. We also observed the beautiful little plant *Pinguicula vulgaris*, growing in great abundance on the wet and boggy parts of the mountain. Having reached the summit, we saw the whole mass of the Snowdon mountains in unclouded majesty before us. The air was slightly hazy; but not sufficiently so to interfere in the least with the magnificence of the outline. As we descended, we observed a belt of clouds passing between us and Snowdon, a thousand, or perhaps fifteen hundred feet below the highest peak. On our return to the inn we found a botanical friend<sup>b</sup> of ours, who, with a party of his relations, had arrived during our absence; and with whom we immediately fixed on ascending Snowdon the following morning. In the evening, we took several *Phryganææ* flying about the river; and among them the beautiful *Philopotomus scopulorum*, and a large *Perla* apparently *marginata*.

9th. The party who had arrived last evening kindly gave us seats in their carriage from Capel Curig to the pass of Llanberris. We three naturalists then commenced the ascent on foot, accompanied by a guide named David Jones, an incipient insect-collector of great promise. In the first quarter of an hour, we had taken *Carabus glabratus* and *arvensis*, *Steropus Æthiops*, *Helobia Marshallana* and *Gyllenhalii*, *Elater cupreus* and *pectinicornis* (the former is in great abundance, both sexes of each), *Telephorus Æthiops*, a *Byrrhus* apparently undescribed,<sup>c</sup> and several other insects we had neither of us before taken.

We now found, by the masses of clouds which rolled in grand and billowy succession down the mountain-side, that we might shortly expect rain: and scarcely had we arrived at this conclusion, when rain, hail, and snow, or a compound of the three, began to fall around us in torrents, and very speedily

<sup>b</sup> William Christy, Jun. Esq. of London.

<sup>c</sup> *Byrrhus* Alpinus, Newm. *ater*; *elytris lævissimè punctulatis*; *lineis undecim longitudinalibus elevatis*.

*B. pilulæ simillimus*, at paulo major; caput, thorax, elytra, abdomen pedesque nigri, pilis aliquot albidis.]

Habitat in montis *Snowdon* graminibus; Junii diebus frequens.

wetted us all to the skin. After deliberately proceeding through this kind of weather, with sundry falls, and divers bruises occasioned thereby, for about an hour and a half, we reached a little stone hovel, erected by the workers of a copper mine as a shelter for themselves and their tools. Here we stood awhile, cold and drenched with wet, and held a consultation or council of war—the usual consequence of a defeat. We were three quarters of the way up the mountain; it continued to rain and hail in torrents; there was no prospect of shelter elsewhere, whether we proceeded or returned; we had neglected to take with us any spirits, in spite of the advice of the waiter at the inn; and now we found out our error: for wet, cold, wearied with the long, laborious, and slippery ascent, and sore with repeated falls, we really seemed to need some renovating influence from within to counteract so many ills from without. To proceed or to return were equally uninviting. Whilst in this state of uncertainty, the rain suddenly ceased. We sallied forth at once, and were unanimous in our determination to proceed. The path was now steep and stony; the clouds, like huge curtains obeying the impulse of an invisible line, rolled up the mountain sides in the same majestic manner in which, a short time before, they had descended; and, through an aperture, we gained a glimpse of the country below—crag piled on crag, interspersed with lake and mountain-stream, bathed in sunshine, and altogether gloriously glittering with the recent rain. The view was grand but transitory: the clouds again rolled down the precipices—the fairy scene was gone—and we reached the summit of Snowdon, enveloped in so thick a cloud that we could scarcely distinguish each other when standing close together. On the flag-staff, and under stones, we found abundance of *Helobia Marshallana* and *Patrobis rufipes*. The ladies of our party, who had gone on to Llanberris to procure horses, now joined us, to our great gratification; and kindly supplied us with sandwiches and wine, which we found particularly acceptable. It is a little remarkable, that, in their ascent of the mountain from Llanberris, they had not had a single drop of rain.

In descending, the *Helobia* were running about in all directions among the stones; but we were too wet and cold to pay much attention to them, especially as our bottles were



previously pretty well stored with them. When we had reached some hundreds of yards below the summit, we found the heavy cloud which had enveloped it had completely disappeared, and all above us was clear blue sky. The country below us was also visible in places, through openings in the clouds. The green lake, so remarkable, as many of our readers may recollect, for its deformed fishes, presented a curious appearance:—a stratum of rain-clouds was passing over it, although far below the spot where we stood; and its whole surface was in a kind of simmer with the heavy rain, at a time when the sky above us was beautifully clear and cloudless. In the Coppermine-lake we exercised our water-net, and took three water-beetles, *Hydroporus Davisii*, *Colymbetes fontinalis* (a singular variety, without the usual ochreous spots on the elytra), and another *Colymbetes* resembling the very common *C. bipustulatus*, but differing in some respects; and, as we cannot find it described, we have given its characters below, and purpose assigning to it the name *Snowdonius*; the name *nigro-æneus*, which precisely describes its colour, being pre-occupied.<sup>d</sup> After leaving the lake, we found the *Carabi* and *Steropi* running about in great abundance, both in and after the rain, which now recommenced; they were evidently preying on worms, which were tempted by the moisture to make their appearance. Under stones we found *Elater riparius*, and a few, not uncommon, *Coleoptera*. In our descent, we also remarked a beautiful rainbow, which, though in the evening, and therefore a goodly arch, reached not to the sky in any part, but was wholly visible against the side of a mountain. On our return to Capel Curig, we were completely overcome with wet and fatigue, and were right glad to get rid of our wet clothes and go to bed.

10th. Breakfasted early, and walked through the Cwn Glassor Pass of Llanberris: on the road took *Oëstrus bovis*, *Carabus glabratus*, *Byrrhus sericeus*, *Elater cupreus*, &c. The morning was fine and warm; the air, clear. Snowdon was occasionally visible; but there were some clouds about, and always below,

<sup>d</sup> *Colymbetes Snowdonius*, Newm. *nigro-æneus*, *lævis*, *capite posticè punctis duobus ferrugineis*.

*C. bipustulato simillimus*, at minor convexior ac posticè angustior. *Maris elytris striis obsoletè elevatis*. *Totus nigro-æneus*, *antennis pedibusque piceis*.

*Variat interdum*, (*exemplariis crudis*) *elytris piceis*.

*Habitat in montis Snowdon aquis; Junii diebus frequens*.

its summit. The Pass of Llanberris is superb. On the right rises Glyder, tumultuously, ruggedly, and abruptly, more than a thousand feet. On the left, the Snowdon mountains, with all their peaks, are piled together in indescribable grandeur and confusion. Some of their naked and black peaks, inaccessible to man, are the abode of the buzzard, the sea-mew, and raven, which may ever be seen wheeling in circles over and around them; and the shrill cry of the hawks, the harsh screams of the mew, or the hoarse croak of the ill-boding raven, are almost the only sounds which these wilds ever know, except, occasionally, the cheerful cry of the Welsh girl to her cows as she brings them home to milk, or the echo of their lowing. The mountain-streams in this region were particularly beautiful. You may, from below, trace their winding leaping course for hundreds of feet down the side of a precipice, white as driven snow, and looking in the distance no wider than a piece of tape. Having nearly reached the village of Llanberris, we turned to the right and ascended Glyder, the mountain under which we had passed. At first, the ascent was but moderately steep, and, being covered with a fine soft turf, afforded us a good and secure footing. Here we took the most splendid varieties of *Carabus arvensis*, brassy, coppery, blue, purple, green, and jet black; we found also several *Silphæ*, besides *Steropi*, *Omasei*, and other *Carabidæ*, running in the sunshine. After an ascent of several hundred feet, the character of the mountain completely varies: it presents nothing but a surface of loose sharp stones, and becomes so nearly perpendicular that the only mode of progression is on all fours, and severe work we found it. A pleasant sight we should have afforded to some of our brother entomologists of Cockney-land, whose researches are confined to Copenhagen brick-fields, or the wilds of Battersea cabbage-gardens. Our view from the summit, over Anglesea, and the sea beyond, was very fine; but the peep over the precipice, into the Pass of Llanberris, was really awful: human beings in the road could no longer be recognised as such without a glass, but appeared like black specks. Our principal motive in seeking this spot had been to find *Chryso-mela cerealis*, which our botanical friend informed us had been taken under stones, and on the *Juniiperus nanus*, which grows here in profusion; we were, however, unsuccessful: but in directing our course from hence towards Capel Curig,

we espied a single specimen sunning itself on a stone in an indented gully or hollow, which appeared to have formerly been the channel of a river or brook, and over the bottom of which similar stones are scattered throughout its length, which appeared to be at least half a mile. By a good deal of perseverance we succeeded in taking nine others, all in similar situations. Should this meet the eyes of an entomologist who proposes making a similar excursion, he must remember the locality is in a right line between the point of Glyder which overlooks the Pass of Llanberris (to which point the guide will be sure to take him), and the inn at Capel Curig, about five hundred or seven hundred yards from the point, and on a nearly flat part of the mountain.

In descending Glyder, we took abundance of *Colymbetes fontinalis*, in the clear streams of the mountain. These little beetles were difficult to secure, eluding our hands by an instant retreat under the stones; and the situation was one in which it was impossible to use a water-net. In these streams we also observed some large soft white larvæ, apparently those of a *Tipula*. This day was fine until the evening; when it began to rain.

11th. It rained the whole of this day: nevertheless we proceeded, clad in cloaks, to the waterfall of Rhaidery-Gwennol, about three miles from Capel Curig; and, on our way, took some *Phryganeæ*, among them specimens of a very curious genus, perhaps *Chimarra* of Dr. Leach: the upper wings have a raised oblique line on them, giving the insect a very unusual appearance. We shall not venture on a description here, as the whole subclass is at present undescribed. Should it prove an unknown species, we venture to propose the specific name of *Cambrica*. In the afternoon, we went to a meeting of the sect, called Jumpers,<sup>e</sup> and we certainly cannot express our

<sup>e</sup> The clergyman begins preaching pretty deliberately at first; but, as he warms with his subject, his enunciation becomes excessively rapid. The congregation at first groan; then, in different parts of the meeting, both men and women begin to preach, lifting up their hands and arms, and brandishing them about with a tremulous motion; then they jump or jerk themselves up and down as they stand, uttering strange sounds, until at last the noise and agitation of the assembly become really frightful. Before the service ended, at least twelve persons, besides the parson, were preaching at the top of their voices, and with a rapidity I have never heard equalled. The groaning, mixed with occasional screams, and the tremulous quaking motion, continued throughout. We observed many present were laughing outright at this exhibition.—E. N.

approbation of this singular mode of worship, but were much pleased with the pretty appearance of the Welsh girls, in their dashing beaver hats, and snow-white caps and handkerchiefs.

12th. Rained all day. We returned to Shrewsbury; and thence to Leominster. While dining at Corwen, we heard a most remarkable thunder-clap; the lightning and thunder appeared to be simultaneous; the thunder was as loud as the report of a cannon, and was followed by little or no reverberation.

13th. Showery: collected round Leominster: took more *Pachyta collaris* and *Atherix Ibis* in the same localities, also *Tenthredo vidua* and *punctum*, *Sapyga sexpunctata*, &c. With the water-net, in the River Lug, we took *Colymbetes maculatus*, *Hydroporus depressus*, *Haliphus elevatus*, *Hydræna pusilla*, *Hydrobius bipunctatus* and *globulus*, *Helophorus viridicollis*, and several other water-beetles; on the blossom of the chamomile, in a wheat-field, *Phalacrus æneus*, and by sweeping, *Leachiellus* and *corticalis*. In the evening, we mothed, for a short time, in Eton Wood, and took very fine specimens of *Abraxas ulmata* and *Emmelesia alchemillata*.

14th. Showery day: Dinmore-hill. On this finely-wooded hill we took several good insects; *Throscus dermestoides* and *Lamprias chlorocephala*, beaten out of the broom; *Cephus satyrus*, out of the oak; *Pachyta octomaculata*, apparently asleep on the blossoms of the *Viburnum opulus*, in great abundance; *Rhagium bifasciatum* and *vulgare* on the same flower; *Clytus arietis* was remarkably abundant; *Empis pennipes*, *Dioctria œlandica*, and several *Tenthredines* and *Ichneumones*.

15th. Briarly Wood. Steady rain; which however did not deter us until we found the roads impassable for mire. We took *Tillus ambulans* on a whitethorn hedge; *Oxyporus rufus*, in some *Fungi*; *Mordella abdominalis*, on *Umbelliferæ*; and, in a wheat-field, *Agonum plicicolle*, and a great number of *Agonum parumpunctatum*, the variety which Marsham has called *Carabus cœrulescens*: we observed, these are generally smaller and run slower than *parumpunctatum*; the apex of the elytra, we perceived, was, in some lights, slightly ochreous.—Why is not *A. cœrulescens* a species?

16th. Olden Barn.<sup>f</sup> We were fortunate in a really fine

<sup>f</sup> The property of the writer's father.

day. On this beautiful farm, and on our way to it, we captured a number of insects; and among them several species of *Carabus*, *Leistus*, *Harpalus*, and *Amara*, a new species; *Anchomenus*, *Badister*, *Bembidum*, *Omasseus anthracinus*, and several others; *Synuchus vivalis*; *Odontonyx rotundicollis*; *Elater pectinicornis*, *cupreus*, *tessellatus*, *nigrinus*, *testaceus*, *sputator*, *rufipes*, *holosericeus*, *murinus*, *ruficaudis*, *marginatus*, *limbatus*, &c.; several *Malthinus* and *Anaspis*; abundance of *Tetrops præusta*, *Bombylius ctenopterus*, *Tabanus micans*.

18th. We paid another visit to Dinmore Hill, and were more fortunate in the weather than on the former occasion. We took a great number of *Pachyta octomaculata* in the same locality as before; *Lamprias chlorocephala*; *Ægeria culiciformis*, both sexes. On returning through the meadows we took some good Diptera; *Bombylius major* and *minor*, in the standing grass; *Criorhina asilica*, and *Berberina* on *Umbelliferae*; a single specimen of *Gomphus vulgatissimus*, a great number of *Telephorus flavilabris*: we also killed a very large female adder, rather a rarity in this county.

19th. Rained all day, or nearly so. We ventured out for about an hour, and took *Sphæriestes ater*; *Xyletinus striatus*, on a gate-post; *Sinodendron cylindricum*, in a decayed willow; *Coccinella globosa*, on a blade of grass; and, in the evening, *Abraxas ulmata*, and a fine specimen of *Chaonia dodonea*, in Eton Wood.

20th. It rained in torrents all last night: but notwithstanding this, and the black and threatening appearance of the clouds, we ventured once more to Olden Barn. In addition to the former captures, we obtained *Osmylus maculatus* (fine specimens) and *Polyommatus Acis*; of the latter rare butterfly, five specimens only, four of which were females: we found them in a rich meadow, on a hill-side. We took *Chrysotoxum arcuatum*, *Epipone spinipes*, and several other *Diptera* and *Hymenoptera*: we swept *Magdalis ater* out of the grass; *Tethea duplaris* off the alder, &c. &c. We saw it raining continually, during the day, on all sides of us, but were fortunate enough to escape.

21st. We repeated our visit to Briarly, and had a finer day. Our principal takes were, *Cephus satyrus*, *Sapyga sexpunctatu*, *Ino statices*, *Euclidia Glyphica* and *Mi*, *Tachina viridis*,

*Porphyrops fenestratus*; the last was sporting over the pathways, the moisture of which it seemed completely to enjoy. They were in great numbers, and resembled little animated pieces of silver dancing about gracefully in the air. In the afternoon we took *Pogonocherus nebulosus* on a blade of grass, and the larva of *Catocala promissa* on the stem of an oak.

22nd. Thoroughly wet day. During a short interval of rain, walked to the river Pinsley: found it overflowing its banks, and observed some *Coleoptera* crawling up the blades of grass out of the way of the water; took several *Liophlæus nubilus*, and one fine specimen of *Cistela Ceramboides*.

23rd. Wet morning: started for Worcester.

24th. Dry blowing day.

25th. This day we had scarcely an hour's rain. We started early in the morning; and, after breakfasting at Malvern, ascended the hills. After the Snowdonians, these little turfy lumps, which one might run up, without taking breath, appeared insignificant. The view from the top, over Herefordshire and Worcestershire, is very rich. We found but few entomological rarities:—*Elater æneus*, *Notiophilus quadripunctatus*, *Cychnus rostratus*, &c., and an immense quantity of the larvæ of *Cucullia verbasci* on the *Verbascum nigrum*.

26th. We left Worcester per mail; and 27th, arrived in London.

N.

ART. X.—*Alphabet of Insects, for the Use of Beginners.*

By JAMES RENNIE, M. A. *Professor of Zoology, King's College.* William Orr. London. 1832.

A LITTLE work, briefly, accurately, and familiarly explaining the first rules or principles of Entomology, has become quite a desideratum to the science. The number of students has of late years rapidly increased, while the diffusion of information has by no means kept pace with the desire to obtain it. An Entomological Primer, or Grammar, was loudly called for; and it was a matter of importance that it should be published at so easy a price, that no objection could possibly arise on that score, even from those to whom the outlay of a few shillings was a matter of consideration. The name of Mr. Rennie, as Professor of Zoology at King's College, and as a



public lecturer on this particular branch, seemed of itself a recommendation, especially to numbers of young persons, who had been delighted with the wonders they had heard of, for the first time, from the Professor's own lips. Every circumstance, therefore, combining to induce the public to patronize the Alphabet of Insects immediately on its appearance, it becomes the duty of an impartial critic to point out how far it is really worthy of that patronage: in doing this, we shall excuse ourselves from making any comments on the censures bestowed by the author on Cuvier, Latreille, Kirby, MacLeay, Swainson, and other eminent naturalists, and endeavour to ascertain whether his own knowledge of the subject will warrant him in speaking of these great men so disparagingly.

We find, at p. 18, the *antennæ* of an insect called its *ears*, without any previous explanation of the Professor's reasons for making this grand alteration in the supposed use of an organ; an alteration which strikes an entomological reader as forcibly as though he found in a figure, representing the human frame, the hands called eyes, or the eyes hands. Naturally anxious for the explanation of so strange a supposition, we searched through the book, and found the following paragraphs bearing on the subject:—

“ The sense of *touch* has been, by many, supposed to reside in the organs I have ventured to call the ears, which have thence been termed feelers: but the evidence on which this rests is slight and unsatisfactory; for the bending of the ears forward, and moving them in walking, seem to be for the purpose of listening.” Pp. 79, 80.

“ For the brief reasons assigned under ‘Touch,’ and for others deduced from dissection and experiment, I have ventured to call the *ears* two horn-like organs, always situated near the eyes, to which various incongruous functions have been assigned. As I have little doubt these organs will one day be proved to be ears, I think it will direct attention more decidedly to them by at once terming them ears, than by leaving them open to all sorts of crude fancies, so easy to form, but so detrimental to correct inquiry.” Pp. 80, 81.

We request our reader to give his attention to this. *The bending of the antennæ forward, and moving them in walking*, is sufficient reason, the Professor thinks, for their being considered ears! The reasons *deduced from dissection and*

*experiment*, when adduced, shall receive our attention ; until then, our own positive knowledge, and the corroborating testimony of *all* great naturalists, will *induce* us to believe, as before, that insects use antennæ as feelers, and not as ears. The idea that it will *direct attention more decidedly to them, by at once terming them ears*, is erroneous. If you assign an improbable, we may say, impossible use to any member, it merely excites ridicule, not attention. We could readily prove that the antennæ are feelers, if it were an object of importance ; but the occasion before us does not call for argument.

We proceed :—

“ Each bone of other animals, moreover, is well known by a distinct name : but the pieces of the skin in insects have only been recently examined ; and the few names already given to the pieces are not well determined, and still in much confusion.” P. 20.

We know not whether the Professor be really ignorant of the profound, accurate, and invaluable labours of entomologists on the “ pieces of the skin” (what an expression!), or whether he fancies he has detected some error in them : we strongly suspect the former. This, however, we do know, that the subject is one which has been thoroughly and most satisfactorily elaborated.

“ The human skin is formed of three layers, the scarf skin, the mucous net-work, and the inner skin. In insects only two layers are usually obvious, the inner somewhat resembling the mucous network of the human skin, and, like that, being the membrane of colour.” P. 21.

We have the learned work before us, from which these observations are taken : it is a most valuable and accurate remark, but is not applied to *insects*. It refers to *Annelida*, a totally different class of animals ; and it happens, most unfortunately, to be the exact opposite of what holds good in insects, as our Professor would have perceived further on in the same work. The colouring matter is the uppermost coat of all in *insects*, and is spread very thinly over the surface ; so much so, that it may often be scraped off with a knife, or even washed off with spirits of wine.

“ A considerable number of insects are clothed with hair or down, inserted, as in other animals, into the skin. It seems useful in keep-



ing bees warm; in preventing the water from soaking into water-beetles: and may also possess electrical uses which we cannot trace." P. 21.

Insects are cold-blooded animals: no cold injures them: water beetles are without hair or down. The electrical uses of the hair we leave, until the Professor has invented a theory on this point.

"Most of the names" (of the parts of the thorax) "are confused, inappropriate, and bad. I shall endeavour to be as plain and simple as I can." P. 25.

The Professor, in his laudable endeavour to be simple, uses such expressions as "fore-back-plate," "hind-breast-plate," "six pair of flanks," "haunches," &c. in the thorax; terms which, were they to come into use, would render the science a mass of unintelligible contradiction.

*Note.*—In Latin, Epistoma. In Latin, Epimera." P. 27.

We need hardly say, these are not Latin at all. The Professor derides scientific names whenever he happens to know them. All the synonyms thus given are equally inaccurate.

"In beetles, and some other insects, the abdomen is joined to the corslet," (the Professor's name for thorax,) "without any joint to permit motion." P. 35.

This blunder we have before seen in print: the Professor, therefore, may plead plagiarism as his excuse. Need we say, that in beetles it is not the case. "Other insects" we leave, until we are informed what insects.

We frequently find the Professor sadly out in the application of descriptive terms: he says, the ears (antennæ) are, "as to their direction, stiff or flexible," p. 38; "as to their form, downy, bristly, or hairy," p. 39.

After hinting at the theories of Lamarck and Savigny, of one race improving or degenerating into another, and adding that "English naturalists are far behind in logic and generalizing," the Professor proceeds:—

"I have stated this in order to prevent misconception, which, from the imperfection of terms, is but too apt to mislead a genuine field-observer, and is certain to mystify and bewilder a compiler or a cabinet naturalist." P. 43.

We know not what "is stated to prevent misconception:" we leave our readers to discover. We acknowledge "misconception is apt to mislead a genuine field-observer; and is certain" (the "Alphabet of Insects" is an excellent example) "to mystify and bewilder a compiler."

"These jointed members" (the palpi) "are called feelers, though the term is objectionable, because their use is not well ascertained." P. 44.

This is admirable, after the antennæ have been called by the Professor "*ears*," because they are bent forward and moved in walking. The Professor considers *their* use well ascertained.

"I think the feelers" (palpi) "on the under jaw, &c. may be more plausibly considered the organs of touch." P. 80.

This is very like a contradiction to the last quotation we gave; but we find the Professor not very particular on these subjects: perhaps he will explain it.

"In earwigs, there is a forked member on the last ring, the blades of which are moveable, and which *are*" (the Professor is not at all nice about grammar,) "said to be used for folding up (rather, I should think, for unfolding) the wings, which are, for the most part, concealed under the short wing cases." P. 57.

The forceps not only is not, but cannot, be used for any such purpose. This idea, to a naturalist, is perfectly ludicrous.

"It" (the winglets or alulæ,) "is sometimes double; that is, two to each wing, like a bivalve shell. It" (we understand the Professor has a *Conspectus of Grammar* in a state of great forwardness) "does not, as has been supposed, produce the buzzing of flies." P. 55.

That these alulæ do produce the loud buzzing noise made by flies, recent experiments have proved almost beyond a doubt. The fact has for years been considered as settled; and we know not what right the Professor has thus to contradict an established fact, without even condescending to attempt a reason for so doing.

"Consequently, there is not, and cannot be, any real or direct circulation of blood in insects; though a claim to the discovery of such a circulation has been lately made, upon very slight grounds, by Professor Carus, of Dresden." P. 67.

This is an interesting subject. The circulation of blood in insects has been, until lately (notwithstanding the remarks of Professor Carus), considered very doubtful. The brilliant discovery has, however, been at length made by an English naturalist, J. Bowerbank, Esq.; and it is found to be as beautifully perfect, and the pulsations as regular, as in the human system. Mr. Bowerbank has delighted us by a sight of this extraordinary phenomenon; and we trust shortly to see a statement of it in detail laid before the public. The Professor was rather hasty in the conclusion, that there “cannot be a circulation of blood in insects.” We did not expect the Professor would be aware of the fact; but he need not have decided on its impossibility. It has a long time been known, by naturalists, that circulation must exist, to prevent the putrefying consequences of stagnation; but its existence has hitherto, we acknowledge, wanted proof.

“Insects have the two sexes as distinct as the larger animals; and, in many respects, are similar to birds, as far as pairing is concerned.” P. 82.

We have been practical collectors of insects for thirty years, and have not met with these instances of pairing, or any instances of similarity to birds. The fact, which we are not now disposed to dilate on, is the reverse of the statement.

At p. 90, and sequel, we find the Professor changes the usual terms, *Larva*, *Pupa*, and *Imago*, to “*Infancy of Insects*,” “*Adolescence of Insects*,” and “*Adult stage of Insects*,” because he will never adopt Latin or Greek words, when Saxon ones can be obtained, and because he considers that “of all vulgarities, pedantic vulgarity is the most offensive.” (!) p. xii.

“Butterflies seldom live longer than a few days.” P. 97.

Rhamni lives twelve months; Io, Atalanta, Cardui, Polychloros, &c., nine months; the other British butterflies, two to three months.

Professor Rennie concludes his Alphabet by abusing system-makers and systems without mercy. He rejects the system of Fabricius as complex, that of Linnæus as indistinct, and modern systems as hypothetical; and then gives us his own views of the subject. He describes the bee-parasite, Stylops,

as having "four unequal wings, the first and second pair hooked together." p. 102. Stylops has but two wings: they are not hooked together.

"Wingless insects. 1. Those with the hind legs formed for leaping; bed-fleas, bird-fleas, dog-fleas. *Note*.—In Latin, *Thysanura* (Leach).

"2. Those with tail bristles, formed for leaping. In Latin, *Anoplura*, (Leach)." P. 104.

The *Thysanura* of Dr. Leach, and subsequent writers, have not their hind legs formed for leaping. The order does not include bed-fleas, bird-fleas, or dog-fleas. The *Anoplura* of Leach, and others, have no bristles formed for leaping; nor has any previous author so asserted. The words *Anoplura* and *Thysanura* are Greek, not Latin.

Here we bid the Alphabet "farewell." Had it been written by an unknown hand, we had passed it by as unworthy of notice. As it is, the popularity of the author entitles him to a review; and we have, to the best of our abilities, given him a fair one. On the Continent, we fear this work will be considered a specimen of British research in this science, because emanating from a Professor of Zoology. By this article, our neighbours will see the value in which the Professor's fellow-countrymen estimate his labours.

To British Entomologists we feel we ought to apologize for having so long detained them over so worthless a publication: but we can assure them the task is any thing but a grateful one, and has been undertaken solely from a sense of imperative duty.

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ART. XI.—*Monographia Ægeriarum Angliæ*. By EDWARD NEWMAN.

[Obs. This article was intended as a supplementary chapter to "Sphinx *Vespiformis*;" but a difficulty in unravelling some of the synonyms prevented its appearance with that work, and a hasty and very imperfect conclusion was published in its place: supposing this chapter added, the previous one would have terminated at p. 51, with the words "pointed out."]

THE divisions and subdivisions in Natural History are, and ever must be, in some degree, subject to the caprice of the nomenclaturist. It is his duty to examine carefully what has previously been done,—to reject what is worthless,—to retain

what is valuable,—to invent, where there exist previously no intelligible combinations. A writer, who fears to innovate where he finds innovation necessary, fails in his duty to the public, as much as he, who, for the temporary fame it may bestow, proposes genera and species, which, before the discriminating eye of science, fall instantly to the ground.

The adoption of natural orders, or rather the formation of natural orders, out of the genera or sub-genera of Linnæus, was, when I ventured to propose it but a few weeks since, considered visionary and problematical: now, I am happy to find, that feeling is fast dying away, and the necessity for some such division is rapidly becoming obvious to all.

The division of natural orders into natural families, never exceeding seven in number, is the next step: and here let me remark, that occasional deficiency in the number seven is no objection; while the detection of a greater number of families, in a supposed natural order, will at once prove that that order is not established on sound characters. The natural order *Cossi*, of which the larva and pupa have been already described,<sup>a</sup> contains but four families, at present known as inhabitants of this country. A fifth is European, and two others, I have good reason to believe, exist in Extra-European climates; but I feel unwilling to hazard any opinion about these at present. I shall not, therefore, even suggest names for them; knowing that what is done prematurely has, most commonly, to be done twice.

*Characteres Familiarum.*

FAMILIA I. Adhuc ignota.

II. Palpi prominentes, triarticulati: antlia thorace longior: antennæ plerumque thorace longiores, post medium crassiores: abdomen plerumque barbatum: alæ hyalinæ . . . ÆGERIIDÆ, Steph.

III. Palpi minus prominentes, triarticulati: antlia nulla: antennæ thorace breviores, a basi ad apicem gradatim attenuatæ: abdomen barbatum: alæ opacæ . . . . . STYGIIDÆ, Newm.

IV. Palpi nulli: antlia nulla: antennæ brevissimæ, setacæ: abdomen haud barbatum: alæ anticæ opacæ, posticæ semi-hyalinæ . . . . . HEPIALIDÆ, Steph.

V. Adhuc ignota.

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<sup>a</sup> Sphinx Vespiformis, p. 41.

- VI. Palpi indistincti, fere nulli : antlia nulla : antennæ breves, setacæ, a basi ad medium bipectinatæ : abdomen haud barbatum : alæ semi-hyalinæ . . . . . ZBUZERIDÆ, *Newm.*
- VII. Palpi distincti, triarticulati : antlia nulla : antennæ mediocres, sub-pectinatæ : abdomen haud barbatum. . . . . COSSIDÆ. *Newm.*

These families correspond with the five genera described by M. Latreille in the *Regne Animal*, under the names *Sésies*, *Stygies*, *Hepiales*, *Zeuzères*, and *Cossus*; all of them are good, well-defined, and distinct groups; and, in the opinion of that eminent Entomologist, are of equal value. I am the more desirous of impressing this on my reader, because the confining of families to a single species does, I acknowledge, imply, to a cursory observer, the existence of a somewhat too eager desire to subdivide.<sup>b</sup>

It will be observed, that, in these families, I adhere very nearly to what has already been done by that excellent entomologist, Mr. Stephens, whose arrangement of insects by far excels any other that has yet been carried into detail. In separating the genera *Cossus* and *Zeuzera* from *Hepialus*, I am only doing what is absolutely necessary; for the families *Hepialidæ* and *Ægeriidæ* are so complete and compact, when limited in their contents to the genera *Hepialus* and *Ægeria* of Fabricius, that the introduction of any other genus would not only entirely destroy their uniformity, but would completely nullify any characters designed for these beautifully isolated groups, by making them too comprehensive.

Mr. Stephens's family, *Ægeriidæ*, seems to me, in every respect, a natural family; and I may add, that this, and the neighbouring families, *Sesiidæ*, *Zygænidæ*, *Hesperiidæ*, &c. are excellent examples of this kind of group. In saying this, I do not pretend to know to what foreign genera Mr. Stephens would extend these families; I speak of them only as regards their British contents.

## FAMILIA II. ÆGERIIDÆ, *Stephens.*

GENUS SPHINX, *Linnaeus.* ÆGERIA, *Fabricius.*

Trochilium, *Scopoli.* Sesia, *Laspeyres.*

OVUM—subglobosum glabrum.

<sup>b</sup> It may be observed there are many exotic species of each family.



LARVA—subpubescens, pallida capite obscuriore, subdepressa, anticè incrassata, posticè attenuata: pedibus sedecim, sex thoracis, corneis, glabris, acuminatis, validis: octo abdominalibus verruciformibus; duobus posticis porrectis inutilibus: habitu Prioni vel Cerambycis larvæ non dissimilis: admodum pigra, et ob exilitatem pedum intermediorum ferè meatu expers: victus è cortice, medulla lignoque arborum et fruticum, in quibus vias sibi excavat: domicilium suum non nisi metamorphosin aditura relinquit: metamorphosin aut in terra ad radices arborem et fruticum, in quibus vitam degerat, aut in ipsa vetere habitatione subit in folliculo serico cylindrico, terra vel scrobe aucto in quo per aliquot hebdomadis haud mutata quiescit.

PUPA—elongata, cylindrica, scabra; abdominis utrumque segmentum duabus ordinibus dentium minorum, peracutorum dorso armatum; in motibus vivida.

IMAGO—*palpis* triarticulatis basi incrassatis, apice acuminatis; *antiliam* corneam, involutam, filiformem, bifidam includentibus: *antennis* subcylindricis, ante apicem incrassatis, apice ipso acuminatis, fasciculoque setarum aliquot rigidarum præditis: *ocellis* duabus hemisphericis, pellucidis, minutissimis, ad superiorem oculorum marginem: abdomine elongato cylindrico, apice sæpius barba triloba instructo: pedibus longioribus, spinis armatis: alis anticis angustioribus, posticis brevioribus, omnibus plerumque hyalinis: vivacissima; miranda velocitate radiis solaribus volat, sedendo tamen florum nectar haurit, sub perpetua alarum abdominis pedumque motione: coitus diurnus in floribus sæpè diu durans.<sup>c</sup>

These characters are, I conceive, sufficiently clear; yet it may be as well to point out the real differences between this group and those to which they appear to approach. The family *Ægeriidae* bears a very close resemblance to the Hymenopterous subclass *Tenthredo*. It must be evident that in this case there can be no real relationship; a glance at the primary characters<sup>d</sup> of each will shew at once that they belong to distinct and distant classes: yet if we take apparently approaching genera or species from each group, and arrange them side by side, the similarity is so striking and so continual, that

<sup>c</sup> These characters, as well as those of species hereinafter given, are in part taken from Laspeyre's *Sesiæ Europææ*; but in no instance without a comparison of the characters there given with nature; and additions, omissions, or alterations have been made wherever they appeared desirable.

<sup>d</sup> *Sphinx Vespiformis*, p. 23. Character of imago.



something more than accident must have induced it. A design, a trace of system, is undeniable; every peculiarity of form and colour, possessed by one group, is assumed in so extraordinary a manner by the other. In this country, the tracing of these similarities from indigenous specimens is attended with some difficulty, owing to the paucity of our species; yet the similarity between *Ægeria Apiformis* and *Cimbex* or *Sirex*, and between *Conopia Myopæformis* and *Tenthredo neglectus*, &c. is too obvious to escape the notice of the most cursory and superficial observer. This similarity is one to which the term "analogy" might, with some reason, be applied. Analogy is a term, as I have before stated,<sup>e</sup> generally misplaced, and scarcely ever understood. To be clearly intelligible it ought to mean, *a superficial similarity, which fails before the test of distinguishing primary characters*;—in fact, precisely such a similarity as exists between an *Ægeria* and a *Tenthredo*; whilst affinity,—a word equally misapplied,—might be defined *a positive similarity in intrinsic characters*, whether these characters be derived from either larva, pupa, or imago separately, or combine a description of all the three. Analogy extends no farther than to colour, size and general form,—in fact, to those most trivial of all distinctions by which we separate varieties, or perhaps sometimes species. Affinity, on the contrary, is to be ascertained only by a reference to those higher characters by which genera, families, orders, sub-classes, or classes are to be distinguished. Thus the same specific character might answer equally well for a *Tenthredo* or an *Ægeria*;<sup>f</sup> but no generic, or higher characters could possibly be applied with equal, or with any propriety to a genus of *Ægeriidae*, or a genus of *Tenthredinidae*. Therefore the similarity between *Ægeria* and *Tenthredo* is an excellent instance of analogy, as it ought to be understood;—the relationship between the families is evidently none.

Of a very different character is the relation between the *Ægeriidae* and the *Sesiidae*, which, it will be observed by a reference to the diagram,<sup>g</sup> are placed in close contact; yet

<sup>e</sup> *Sphinx Vespiformis*, p. 47. See also pp. 26, 27.

<sup>f</sup> For example, *Ægeria* aut *Tenthredo*, Sp. rubro-cingulata. *Antennæ nigrae ante apicem albæ: thorax niger, linea laterali albida: abdomen nigrum, cingulo rubro: femora nigra: tibiæ nigrae, macula extus alba: tarsi nigri: alis hyalinis, venis nigris.*

<sup>g</sup> *Sphinx Vespiformis*, facing p. 31.

even here the differences are so decidedly marked, that, as I have already stated,<sup>h</sup> I think even this approach, obvious as it is, ought to be considered a relation of analogy rather than of affinity. The perfect insects, it is true, in both families, fly in the hottest sunshine,—live on the nectar of flowers, over which they hover, spreading their equally fan-like tails, and humming with their equally transparent wings; yet the *Sesiæ*, like swallows, are ever on the wing: with porrected trunk they rifle the nectary of a flower without even attempting to settle. The *Ægeriæ*, on the contrary, must always settle before they can even unroll their trunk. The *Sesiæ* prefer Didynamious,—the *Ægeriæ*, Syngenesious, or Umbelliferous flowers; but, from habit, (to revert, as we ought, to metamorphosis,) we find the *Sesiæ* are produced from conspicuous highly-coloured larva, which have invariably their penultimate segment enlarged, and bearing a hard recurved horn; which have six corneous and pointed, and ten fleshy and strongly prehensile feet; which feed on leaves in the autumn, and, burying themselves in the earth, change, without a web, into perfectly smooth and motionless pupæ; and remain in that state through the winter, and until the following summer. The *Ægeriæ* are produced from almost colourless maggots, which have the penultimate segment diminished, and without any horn; which have six corneous and pointed, and ten wart-like and almost useless feet; which feed in the interior of the trunks of trees, throughout the winter and spring, and then, spinning a cocoon among their food, change into remarkably rough and vivacious pupæ, which, in ten or twelve days, produce perfect insects. Here, then, is an approach, too decided to escape the notice of even a tyro, and sufficiently close to have been acknowledged by all entomological writers, as one of affinity, yet totally unsupported by any intrinsic characters, whether of larva, pupa, or even of imago;<sup>i</sup> for, on a minute investigation, we shall find that here, too, all trace of similarity is lost.

Excepting in the prior states of larva and pupa, there is but little connexion to be found between the *Ægeriidæ* and the

<sup>h</sup> *Sphinx Vespiformis*, p. 42.

<sup>i</sup> It should be remarked that the *Sesiidæ* have the biarticulate palpi of a *Sphinx*,—the *Ægeriidæ*, the triarticulate palpi of a *Phalæna*. The neurations of the wings, also, evince a decided distinction.

other families which I have arranged in the same natural order. I am inclined to believe that many genera, formerly intervening, have become extinct, or are yet undiscovered: the most marked *hiatus* is between the *Ægeriidae* and the *Zeuzeridae*, the central *Cossidae* being evidently, though not nearly, related to both of them; to the *Ægeriidae*, by similarities in the palpi and antennæ; to the *Zeuzeridae*, by similarities in the antennæ, legs, and wing nervures, and by the total want of mouth.

Another family having been formerly coupled with the one now under consideration, by one of the most talented entomologists that this or any other country has ever produced, I must not pass it by quite unnoticed. I allude to the genus *Zygæna* of Fabricius, included, by Dr. Leach, with *Ægeria*, under the name *Zygænidæ*; and Mr. Samouelle, compiling from Dr. Leach's papers, in his Compendium, assigns as a character to the family, "palpi long, separate, covered with long scales, or porrected hair."<sup>k</sup> These characters apply but very indifferently to *Zygæna*; and its whole habits and economy<sup>l</sup> are at variance with those of *Ægeria*.

Such, then, are the characters, and such the relations, real and supposed, of the family *Ægeriidae*. After all, so weak are the bonds of alliance,—so far removed the only supposable approaches, that the family must be considered one of the most isolated that natural history affords; and as such I will now consider it, and only treat of it in relation to itself.

Following out the Septenary System, we look for a type or centre, around which to arrange all the species we are at present acquainted with. This offers, in *Sphinx Apiformis*<sup>m</sup> of Linnæus; and consequently, a genus to contain that species must be central, and six other genera arranged round it, or vacancies left should a deficiency appear. I fear there are those who will disapprove of further generic division in this family: but I think I have from the first been tolerably regardless of the opinions of others, and it is now too late to swerve from my object in order to propitiate private favour; and I would wish those who are ever ready to cavil on this

<sup>k</sup> Entomologist's Useful Compendium, p. 244.

<sup>l</sup> *Sphinx Vespiformis*, pp. 35, 36.

<sup>m</sup> When the Septenary System is thus reduced to units, as I may say, I find the largest species is invariably the type or centre.

point, to examine before condemning. It is my own opinion that a genus should be established for every species whose primary characters differ from those of its congeners: in the present instance it will be found, by a reference to exotic specimens, that none of the proposed genera are confined to single species; and, in three instances, the number of species amounts to seven. Five of the genera were established by M. Hubner in 1816.<sup>n</sup> The addition to the number, on my part, only amounts to two; and these two, I trust, will stand the test of that scrutiny with which, I doubt not, they will be favoured.

*Characteres Generum.*

- GENUS VII. Palpi breves: antlia brevis, quasi imperfecta: antennæ thorace breviores, *maris* pectinatæ: abdomen crassum, haud barbatum . . . . . ÆGERIA, *Fab.*
- V. Palpi elongati, articulo ultimo nudo, subtus emarginato: antennæ thorace paulo longiores, *maris* ciliatæ: abdomen barbatum, *maris* barba compressa, *feminae* dilatata . . . . . PYROPTERON, *Newm.*
- VI. Palpi elongati, articulis omnibus squamatis: antennæ thorace vix longiores, *maris* ciliatæ: abdomen medio crassius, vix barbatum . . . . . BEMBECIA, *Hubn.*
- I. Palpi elongati, articulo ultimo lævissimè squamato: antennæ thoracis longitudo, *maris* subpectinatis: abdomen *maris* gracile, *feminae* crassum et brevius, valdè barbatum, barba dilatata . . . . . SYNANTHEDON, *Hubn.*
- II. Palpi elongati: antennæ thorace longiores: abdomen *utriusque sexûs* gracile, valdè barbatum: barba triloba dilatata TROCHILIUM, *Scop.*
- III. Palpi elongati: antennæ thorace longiores, *maris* ciliatæ: abdomen *maris* medio compressum, gracilissimum, *feminae* gracile, *utriusque sexûs* valdè barbatum: barba triloba dilatata . . . CONOPIA, *Hubn.*
- IV. Palpi elongati subtus quasi angulati: antennæ thorace paulo breviores, *maris* bipectinatæ: abdomen crassum, vix barbatum . . . . . PARANTHRENE, *Hubn.*

<sup>n</sup> Proposed in the *Verzeichniss bekannter Schmetterlingen*, 1816, where the other genera which I have adopted will be found. I am indebted to J. F. Stephens, Esq. for all the information I possess on the subject of these genera

GENUS VII. ÆGERIA, *Fabricius*.

Palpi breves: antlia brevis, quasi imperfecta: antennæ thorace breviores, *maris* pectinatæ: abdomen crassum, haud barbatum.

The typical genus, as might be expected, partakes more of the characters of the typical family, than do any of its cognate genera. The formation of the antennæ is little more than a modification of that of the antennæ of *Cossus*: the beardless and heavy abdomen, the imperfect mouth, the minute palpi, and the general sluggish character, also evince the near relation of this family to the typical group. The restoration of the original name to this genus is unavoidable. The name *Trochilium*<sup>o</sup> was first applied by Scopoli to the whole of this family, and intended for those species to which I have applied it, and not particularly to the species *Apiformis* and *Bembeciformis*. The Fabrician genus *Ægeria*, also comprised the whole Family. Hubner was the first who separated these two species under the name, *Sphacia*, which name I should, as a matter of course, have adopted, had not I considered it imperative to give the Fabrician name to the typical genus, *i. e.* to the species which Fabricius himself considered typical: moreover, the family having already received the name *Ægeriidae*, it is important that its central and typical genus should retain the derivative of that name.

Sp. 1. *Æg. Apiformis. Palpi flavi: caput flavum: thorax fusco-ater, anticè maculis duabus flavis: abdomen flavum cingulis fusco-atris.*

*Apiformis. Linn. Syst. Nat. p. 804. Sp. 29.*

Id. *Bork. Fab. De Geer. Esper. Lasp. Haw. &c.*

Id. *Steph. Ill. (Haust.) Vol. I. p. 137. Sp. 1.*

Id. *Curtis, B. E. 372\*\*.*

of Hubner, and could not have given them here, had it not been for that gentleman's kind assistance. I should, perhaps, however mention, that I do not know on what characters Hubner's Genera are founded; my own were divided and arranged as at present, before I was aware that that great Lepidopterist had previously gone over the same ground.

<sup>o</sup> *Trochilium* was applied to this group from their fancied resemblance to humming-birds, and is not appropriate to *Apiformis* and *Bembeciformis*, nor intended to refer to them: these were included to save sub-division. *Vid. Scopoli's Entomologia Carniolica.*

Caput flavum: palpi flavi: antennæ fusco-nigræ, subtus ad basin ferrugineæ, interdum flavescentes: thorax fusco-niger, anticè maculis duabus quadratis, posticè duabus minoribus obscurioribus flavis: abdomen flavum, segmentis primo quartoque fuscis, reliquis tantum margine fuscis, quinto ultimisque duobus in dorso fuscescentibus: femora intus fusca, extus flava: tibiæ fulvæ, incrassatæ: genua fusca: tarsi fulvi: alæ anticæ hyalinæ, supra testaceo subtilissimè irroratæ, basi puncto flavo, venis marginibus lunulaque ferrugineo-fuscis, cilia fusca.

Habitat in Angliā, haud infrequens: larva albicans linea dorsali obscura: sub corticem Populi nigræ et tremulæ victitat: imago diebus 23 ad 28 Junii insedens truncis.

Sp. 2. Bembeciformis. *Palpi fulvi, caput atrum, thorax fuscus, collari flavo, abdomen flavum, cingulis duabus fuscis.*

Bembeciformis. *Hub.* T. XX. f. 98.

Id. *Ochs.* II. 126.

Id. *Curtis, B. E.* 372\*.

Crabroniformis. *Lewin. Haw.*

Id. *Steph. Ill. (Haust.)* Vol. I. p. 138. Sp. 2.

Caput atrum: palpi fulvi: antennæ nigræ, subtus ad basin ferrugineæ: thorax fusco-ater, collari punctisque duabus flavis: abdomen flavum, cingulis duabus fusco-ferrugineis: femora fusca: tibiæ fulvæ incrassatæ: tarsi fulvi: alæ hyalinæ, flavescentes, venis marginibus strigaque transversa ferrugineis.

Habitat in Angliā rarissimè: larva albicans puncto fusco in plurimis segmentis versus pedes: sub corticem Salicis capræ victitat: pupa fusca: imago Julio insedens in truncis.

The specific name, *Crabroniformis*, given to this insect by Lewin, appears to have been prior to the one I have adopted; but that name having been previously assigned to a species of the genus *Paranthrene*, it cannot be retained for the present insect.

#### GENUS V. PYROPTERON, *Newman.*

Palpi elongati, articulo ultimo nudo, subtus emarginato: antennæ thorace paulo longiores, *maris* ciliatæ: abdomen barbatum, *maris* barba compressa, *femine* dilatata.

This appears to me to be a most decided genus, the remarkable structure of the apical joint of the palpi being so very



different from that of any other species with which I am acquainted; yet M. Hubner has not thought proper to separate it from his genus *Bembecia*, which combined this species with those in the two following genera.

Sp. 1. Pyrop. Chrysidiforme. *Palpi baseos nigri, apice ochracei nudi: abdomen nigrum cingulis duabus albidis: alæ squamosæ crocæ, macula lineari hyalina.*

Chrysidiformis. *De Villars, Ent. Lin. T. II. p. 103. n. 28.*  
Tab. 4. Fig. 18.

Id. *Bork. Esper. Hub. Haw. Ochs.*

Id. *Stephens, Ill. (Haust.) Vol. I. p. 141. Sp. 4.*

Palpi baseos hirsuti nigri, apice nudi pallidè fulvi: antennæ fusco-nigræ, subtus dilutiores basi albæ: thorax niger, pectus nigrum immaculatum: abdomen nigrum, cingulis duabus albidis: barba nigra, media parte lutea: femora nigra: tibiæ crocæ: tarsi flavescens: alæ anticæ suprâ squamosæ crocæ, linea longitudinali medio hyalina, marginibus et macula nigris.

Habitat in Mauritania et Italia frequens: in Gallia australi rarissimè.

I have described this insect, more because I wished to give an example of the genus, than from any conviction of its being a native of this island. It appears to have obtained a place in a cabinet as British; but it seems scarcely probable that an African insect, although naturalized on the warm shores of the Mediterranean, should have found its way into our colder climate. It was a common and very culpable practice of collectors formerly, to fill the spaces left in their cabinets for rare British insects, with some foreign species nearly allied to the British ones that were wanting; a circumstance which subtracts greatly from the value of all old specimens, the history of which has not been authentically recorded at the time of capture. This species is closely allied in habit to the foregoing; it is a heavy dull insect: Laspeyres describes it as "*pigrum et sensu ferè experts.*" It also very nearly approaches the genus which follows; and to the genus *Paranthrene* several characters pronounce its relationship.

#### GENUS VI. BEMBEZIA, *Hubner.*

Palpi elongati, articulis omnibus squamatis: antennæ thorace vix longiores, *maris* ciliatæ: abdomen medio crassius, vix barbatum.



This is another genus, which I have ventured to separate from the *Bembecia* of Hubner, retaining, however, his name, as the only British species referable to it is the one to which that author has assigned the leading or typical situation. Its beardless abdomen is an excellent character, and demonstrates its natural situation to be between the typical *Ægeriæ* and those *Phalænæ*, which are entirely without this peculiarity.

Sp. 1. Bemb. Ichneumoniformis. *Palpi flavi, abdomen fuscum cingulis sex flavis, alis apicibus maculaque media fulvis.*

Ichneumoniformis. *Fab. Ent. Syst. T. III. P. I. p. 385. n. 22.*

Id. *Fuess. Bork. &c.*

Id. *Curtis, B. E. 53.*

Id. *Steph. Ill. (Haust.) Vol. I. p. 140. Sp. 3.*

Vespiformis . . . *Esper. Haw. &c.*

Palpi lutei, apice fusciscentes : antennæ *maris* fuscae, medio paulo pallidiores, *feminæ* medio flavescentes, subtus ferrugineæ : thorax fusco-niger, collari, linea longitudinali et litura transversa juxta abdomen flavis : pectus fuscum immaculatum : abdomen fuscum, *maris* sex, *feminæ* septem cingulis flavis : barba valdè, indistincta ; fusca, medio pilis aliquot flavis : femora fusca : tibiæ fulvæ, macula versus apicem nigra : tarsi suprâ flavi, subtus pallidè fuscis : alæ anticæ suprâ venis et marginibus fuscis, puncto ad basin, apiceque flavis : lunula transversa extus, margoque inferior crocei.

Habitat in Anglia rarissimè : larva adhuc ignota.

This insect varies very much in size, and in the colour of the antennæ. Mr. Bently has several specimens, which at first sight appear somewhat different ; but, on examination, possess all the distinguishing characters of this species.

#### GENUS I. SYNANTHEDON, *Hubner.*

Palpi elongati, articulo ultimo lævissimè squamato : antennæ thoracis longitudo, *maris* subpectinatis : abdomen *maris* gracile, *feminæ* crassum et brevius valdè barbatum, barba dilatata.

Sp. 1. Synan. Cæstriforme. *Palpi flavi extus nigra linea, abdomen nigrum, maris quatuor cingulis flavis, barba nigra, feminæ tribus cingulis flavis, barba flava.*

- Œstriformis. *Naturforscher*. VII. p. 109. n. 3.  
 Id. *Esper. Europ. Schmett.* T. II. Tab. XXIII.<sup>p</sup>  
           Sup. V. Fig. 3. p. 181.  
 Id. *Bork. Hub. Pap. d'Europ. Haw.*  
 Cynipiformis. *Esper. Bork. Haw. Ochs.* (*Sexus alter.*)  
 Id. *Steph. Ill. (Haust.)* Vol. I. p. 141. Sp. 5.  
 Vespiformis. *Vieweg. Tab. Verz. Fuess. Laspeyres.*  
 Asiliformis. *Naturg. Bork.*  
 Chrysorrhæa. *Don.* IV. Pl. 116. (S.)  
 Tipuliformis. *Berken.* Vol. I. p. 132. Sp. 9.

Palpi flavi, extus nigra linea: antennæ nigræ, articulo primo subtus flavo: thorax niger, linea laterali longitudinali flava: pectus macula laterali flava: abdomen nigrum, *maris* quatuor cingulis flavis barba nigra, *femine* tribus cingulis flavis barba flava, femora nigra: antica extus flava; tibiæ flavæ, annulo nigro: tarsi flavi: alæ anticæ, suprâ ad basin puncto flavo, venis marginibus fasciaque transversa intus nigris, apice fasciaque transversa extus croceis.

Habitat in Anglia infrequens: larva albicans capite fusco, sub corticem *Quercus roboris* et *Betulæ albæ* viçtitat: imago in Junii diebus flores frequentens.

## GENUS II. TROCHILUM, *Scopoli.*

Palpi elongati: antennæ thorace longiores: abdomen *utriusque sexûs* gracile, valdè barbatum, barba triloba dilatata.

Sp. 1. Troch. Tipuliforme. *Palpi supra nigri, subtus flavi abdomen nigrum, maris quatuor femine tribus cingulis flavis, alis apice latè sed pallidè inauratis.*

- Tipuliformis. *Linn. Syst. Nat.* II. p. 804. n. 32.  
 Id. *V. Tab. Verz. Bork. De Geer. Fuess. Esper.*  
           *Hub. Haw. Lasp. Ochs. &c.*  
 Id. *Steph. Ill. (Haust.)* Vol. I. p. 142.

Palpi supra nigri, subtus flavi: antennæ nigræ: thorax niger, linea laterali longitudinali flava: pectus macula laterali flava: abdomen

<sup>p</sup> The references to Esper and Hubner are frequently taken from Laspeyres' *Sesiæ Europæ*; but, through the kindness of J. Curtis, Esq., I have, on a former occasion, been able to compare these references with the works of those authors, and have been satisfied of their accuracy. The references to Linnæus, Fabricius, Borkhausen, Laspeyres, Ochsenheimer, Hawarth, Berkenhout, Kirby and Spence, Samouelle, Stephens, Curtis, &c., are from the works of those authors.

nigrum, *maris* cingulis quatuor angustissimis flavis, *femine* tribus: femora nigra: tibiæ nigræ, cingulo apicibusque flavis: tarsi suprâ nigricantes macula flava, subtus flavescentes: alæ anticæ supra venis marginibus fasciaque transversa latiori nigris, apice latè sed pallidè inauratæ, venis nigris.

Habitat in Anglia frequens: larva albida, capite pedibusque fuscescentibus, in medulla Ribis rubri victitat, et interitum efficit: imago in flores involat.

Sp. 2. Troch. Muscæforme. *Palpi albicantes linea extus apicibusque nigris, abdomen nigrum, quinque aut sex cingulis flavescensibus.*

Muscæformis. *Vieweg. Tab. Verz.* I. p. 18. n. 9.

Id. *Esper. Europ. Schmet.* T. II. Tab. XXXII. Cont. VII. f. 5.

Philanthiformis. *Lasp. Ses. Europ.* XXI. p. 31. Fig. 25, 26, 27, et 28.

Id. *Ochs.*

Palpi albicantes, linea extus et apicibus nigris: antennæ fuscæ, apice nigricantes, medio pallidiores: thorax linea laterali longitudinali lutea: abdomen nigrum, cingulis quinque aut sex flavescensibus: barba nigra, lateribus flavescensibus: femora nigra, luteo varia? tibiæ nigræ, medio et apicibus flavescensibus: tarsi lutescentes: alæ anticæ supra venis marginibus fasciaque transversa nigris, fascia transversa extus puncto flavo.

Habitat in Anglia rarissimè: in Europa frequens diebus Maii et Junii in floribus, præcipuè Thymi Syrpilli.

The only British specimen of this insect that I have seen or heard of was taken in Devonshire, and is now in the cabinet of J. F. Stephens, Esq. who kindly permitted me to take the above description. The specimen is rather wasted, but I have not the least doubt of its being the *Muscæformis* of Esper. Its size is about that of the preceding species.

Sp. 3. Troch. Allantiforme. *Palpi supra nigri subtus flavi, antennæ nigræ, abdomen nigrum cingulo flavo.*

Allantiformis. *Newman's MSS.*

Palpi supra nigri, subtus flavi: antennæ nigræ: thorax niger: abdomen nigrum, cingulo flavo: barba medio flava, lateribus

nigris : femora nigra : tibiæ nigræ : tarsi fulvi, apicibus nigricantibus : alæ anticæ venis marginibus fasciaque transversa nigris, ciliis omnibus fuscis.

Habitat in Anglia rarissimè.

The only British specimen of this insect that I have ever seen or heard of, was taken at Greenhithe, by Mr. Chant, and is now in that gentleman's cabinet: from this specimen, the above description was taken by Mr. Chant's kind permission. I am unable to find, in any work, a figure or description that will agree with it. The *Scoliaformis* of Borkhausen, described and figured in his *Naturg. Europ. Schmet.*,<sup>9</sup> and also by Laspeyres, in his *Sesia Europeæ*,<sup>†</sup> more nearly approaches it than any species with which I am acquainted; but there are still such decided differences, that I cannot venture to assign it that name. *Scoliaformis* has the upper half of the antennæ of a pure white: in our insect they are black throughout. The thorax of *Scoliaformis* has a yellow line on each side: this is wanting in the insect before us. Again, *Scoliaformis* has two yellow belts instead of one, and the beard of its abdomen is externally yellow instead of black. Now as only females of *Scoliaformis* have yet been taken, and as Mr. Chant's insect is a male, it is possible that they may be the sexes of the same species; but the differences are too great to conclude that they are so, without some more sufficient evidence.

Sp. 4. Troch. Sphegiforme. *Antennæ antè apicem albicantes, abdomen nigrum cingulo albido.*

Sphegiformis. *W. V.* 305. 10.

Id. *Fab. T. III.* 383. n. 15.

Sphegiformis. *Bork. Hub. Esper. Laspey. Haw.*

Id. *Steph. Ill. (Haust.) Vol. I.* 140. Tab. XI. Fig. 1.

Palpi supra nigri, subtus flavi, apice nigricantes : antennæ cœruleo-nigræ, supernè antè apicem albicantes : thorax cœruleo-niger,

<sup>9</sup> *Sphinx Scoliaformis. Alis fenestratis, anticis in medio macula magna rotunda nigro-cyanea : abdomine fulvo barbato : antennis a medio usque ad apicem albis.* Borkhausen. *Nat. Eur. Schmet.*, T. II. p. 173. n. 13. b. Vid. Tab. Fig. 2 et 3, fem.

<sup>†</sup> *Sesia Scoliaformis. Sesia alis hyalinis, anticarum marginibus maculaque nigris : abdomine barbato nigro, cingulo flavo, barba crocea : antennis apice albis.* Laspeyres. *Sesia Europeæ*, N. VI. p. 13. Vid. Tab. Fig. 1 et 2. fem.

linea laterali longitudinali flava: pectus cœruleo nigrum macula magna laterali flava: abdomen cœruleo-nigrum, cingulo albido: femora nigra, antica extus ad basin flava: tibiæ nigræ, spinis luteis, posticæ internè flavescentes: tarsi flavescentes nigro irrorati: alæ anticæ hyalinæ, supra apice, venis marginibus fasciaque transversa latiore nigris; cilia fusco-cinerea.

Habitat in Anglia rarissimè: imago reperitur Junii diebus involans in flores, vel sedens in Betulæ albæ truncis, cujus ligno larva vic-titat.

Mr. Stephens figures this species with two white belts. Laspeyres describes it as having but one; and the British specimens I have seen certainly have no more. Priority, as well as grammar, in this instance, demand the restoration of the original name.

### GENUS III. CONOPIA, *Hubner*.

Palpi elongati: antennæ thorace longiores, *maris* ciliatæ: abdomen *maris* medio compressum gracilissimum, *femine* gracile, *utriusque sexûs* valdè barbatum, barba triloba dilatata.

This Genus differs from the foregoing, in having a single red belt on the abdomen, and in having the abdomens of the males very slender in the middle; the palpi, also, are rather more incrassated at the base, and have a slightly angulated appearance, somewhat as in *Paranthrene*.

Sp. 1. Con. Myopæformis. *Palpi maris supra nigri, subtus albi, femine toti nigri, abdomine cingulo coccineo.*

Myopæformis. *Bork. Naturg. Europ. Schmet.* T. II. p. 169.

Culiciformis. *Hub. Esper. Haw. Ochs.*

Mutillæformis. *Lasp. Ses. Europ.* Fig. 15, 16, et 17.

Id. *Steph. Ill. (Haust.)* Vol. I. p. 142. Sp. 7.

Stomoxyformis. *Steph. Ill. (Haust.)* Vol. I. p. 143. Sp. 9.  
(*femine var.*)

Palpi *maris* supra nigri, subtus albi, *femine* toti nigri: antennæ nigræ: thorax cœruleo-niger: pectus macula magna laterali in-aurata: abdomen cœruleo-nigrum, cingulo coccineo: femora nigra, antica extus lineola alba: tibiæ nigræ: tarsi pallidiores: alæ anticæ supra venis marginibus fasciaque transversa nigris.

Habitat in Anglia frequens, involans in floribus, et sedens in foliis Rubi idæi, cujus medulla probabiliter larva vic-titat.

Mr. Stephens appears to have confounded the female of this species with the *Stomoxiformis* of Hubner; from which, however, it may be at once distinguished by the want of two bright red longitudinal lines on the thorax. I have carefully examined the specimen described and figured by Mr. Stephens, and also those in the cabinets of Mr. Davis and Mr. Chant,<sup>s</sup> and compared them with others of my own taking, and I feel convinced that they are all referable to the present species. *Feminam Stomoxiformis, Ste., mare Myopæformis, Bork., copula conjunctam ter cepi.*

Sp. 2. Con. Formicæformis. *Palpi supra nigri subtus fulvi, alæ anticæ apice latè rubris.*

Formicæformis. *Esper. Europ. Schmet. T. II. Tab. XXXII. Fig. 3 et 4.*

Id. *Bork. Lasp. Ochs.*

Culiciformis. *Scopoli.*

Tenthrediniformis. *Esper. et Bork. (altero loco.)*

Formiciformis. *Villars. Haw. Steph. Ill. (Haust.) Vol. I. p. 144. Sp. 10.*

Palpi supra nigri, subtus fulvi: antennæ nigræ: thorax niger: pectus nigrum immaculatum: abdomen nigrum, cingulo coccineo: femora nigra: tibiæ nigræ, cingulo albido: tarsi supra nigri, subtus fulvi, apice pallidiores: alæ anticæ supra venis marginibus fasciaque transversa nigris, costa et apex rubri.

Habitat in Anglia infrequens: larva subpubescens, albida, capite caudaque fuscescentibus, in ramulis Salicis albæ victitat: imago salicetis.

The alteration of this name, as to the termination of the derivative, appears to me to have been not only unnecessary, but improper; *Formica*, not *Formicus*, being the generic name whence the present trivial name is derived. I have restored the original name.

Sp. 3. Con. Culiciformis. *Palpi utriusque sexûs subtus fulvi, abdomen nigrum cingulo coccineo.*

Culiciformis. *Linn. Syst. Nat. II. p. 804. n. 30.*

Id. *Bork. De Geer. Esper. Lasp. Ochs. &c.*

Id. *Steph. Ill. (Haust.) Vol. I. p. 143. Tab. X. Fig. 3.*

<sup>s</sup> These specimens are referred to by Mr. Stephens as belonging to this species. *Illustrations of British Entomology, (Haust.) Vol. I. p. 144.*

Palpi supra nigri, subtus fulvi: antennæ cœruleo-nigræ: thorax cœruleo-niger: pectus macula magna laterali fulva: abdomen cœruleo-nigrum, cingulo coccineo: femora nigra: tibiæ nigræ: tarsi cinerescens aut fulvescens, apicibus nigricantibus: alæ anticæ suprâ versus basin fulvæ, venis marginibus fasciaque transversa nigris.

Habitat in Anglia: larva subpubescens, sordidè alba capite fuscescente, sub corticem Pruni domestici et Pyri mali victitat: imago in floribus præsertim Viburni opuli.

#### GENUS VI. PARANTHRENE, *Hubner*.

Palpi elongati, subtus quasi angulati: antennæ thorace paulo breviores, *maris* bipectinatae: abdomen crassum, vix barbatum.

This genus differs also in having the anterior wings covered with scales, and consequently opaque; whereas, in every other genus, they have an appearance of transparency: in the approaching genus, *Pyropteron*, that appearance is nearly lost. Say, in his *American Entomology*,<sup>t</sup> asserts that the opaque or hyaline wings are merely a sexual distinction,—an assertion in which facts certainly will not bear him out: and M. Laspeyres suggests that all the *Ægeriidae* have their wings more or less clothed on leaving the chrysalis,<sup>u</sup>—a suggestion by no means necessary, as the existence of perfectly hyaline wings is well established among the *Papiliones*, *Sphinges*, &c.

Sp. 1. Paran. Vespiformis. *Palpi nigri apice flavi, abdomen nigrum, maris cingulis quinque, feminae tribus flavis.*

Vespiformis. *Linn. Syst. Nat. II. p. 804. n. 31.*

Asiliformis. *Fab. Bork. V. T. V. Fuesslin. Hub. Esp. Pap. d'Europ. Haw. Lasp. Ochs. &c.*

Id. *Steph. Ill. (Haust.) Vol. I. p. 139. Sp. I.*

Œstriformis. *Kirby and Spence, Int. to Ent. Vol. I. Tab. 3. Fig. 2.*

Palpi basi nigri, apice flavi: antennæ nigræ, subtus testaceæ, basi flavæ: thorax niger, collari, litura laterali, punctoque ad alarum anticarum basin flavis: abdomen nigrum, *maris* cingulis quinque flavis alternis angustioribus: *feminae* cingulis tribus, æquidistantibus flavis: barba vix conspicua atra, pilis aliquot flavis:

<sup>t</sup> Vid. *Say's American Entomology*, Vol. I. plate 19.

<sup>u</sup> *Alæ specierum plurimarum, imo ut opinor omnium, dum pupam relinquunt, minime hyalinae, sed polline subtilissimo, facile detergendo, adpersæ sunt.* Laspeyres, *Sesie Europeæ*. p. 3, nota, [6.]



femora nigra, postica basi flava; tibiæ spinosæ, fulvæ extus, macula nigra: tarsi flavi apicibus nigris: alæ anticæ squamosæ, fuscæ, venis margineque superiori nigris, maculaque elongata in medio hyalina.

Habitat in Anglia rarissimè: larva sub corticem Betulæ albæ et Populi dilatatæ victitat: imago diebus Junii et Julii in floribus umbelliferis.

I have proved elsewhere,<sup>x</sup> I hope satisfactorily, that this is the insect described by Linnæus in the *Systema Naturæ*, under the name *SPHINX VESPIFORMIS*.<sup>y</sup>

POSITION OF THE GENERA.

I.

VI.

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ART. XII.—*Varieties.*

1. *Genus Amphimalla, Lat.*—SIR, Will you permit me to avail myself of your pages, to inquire of Mr. Curtis, why he suppresses the *Genus Amphimalla* of Latreille? It appears to me to be impossible to include in one genus, species the joints of whose antennæ do not agree even in number; when Mr. Curtis himself frequently makes the length of a joint of the antennæ a distinguishing character. I am, Sir, yours, &c. SCRUTATOR.

[SCRUTATOR will observe we only publish his postscript: his letter "On the State of the Collection of Insects in the

<sup>x</sup> Vid. Preface to *Sphinx Vespiiformis*, p. 6.

<sup>y</sup> All information on the subject of this family of insects, whether new matter, suggestion of improvement in description, detection of error, or of any other kind whatever, will be thankfully received, and may be addressed to me "to the care of the publishers of the *Entomological Magazine*." There is scarcely any group in natural history of which the characters have hitherto been so loosely thrown together, the relations so utterly unknown, or unattended to, and the synonyms so perplexingly confused, as the one now illustrated; and, although I have taken considerable pains to be correct, I cannot but anticipate that some errors have still crept in.

British Museum" is personal, and we should make ourselves responsible for any pseudonymous attack. Ed.]

2. *Colias Electra*, Lin. ; a *British Insect*.—SIR, By a comparison of the *Colias Edusa* of our cabinets with the Linnæan description of *Papilio Electra*, in the *Systema Naturæ*, p. 764, and also with the specimens in the Linnæan cabinet, you will find there is no doubt of their being the same insect ; and therefore the name *Electra* ought to be restored. Your's, truly,  
EDWARD NEWMAN.

3. *Capture of Aspidiphorus orbiculatus*. — Of this rare insect, I captured two specimens in moss, from the edge of our forest, on the road leading from this place to Chelmsford, on the 17th of November last. No well-authenticated instance of its capture having yet been made known, I beg you will allow me to record my good fortune in the first number of your Magazine. EDWARD DOUBLEDAY, Epping, July 27, 1832.

4. *Constable's Miscellany*. — No. LXXV. of Constable's Miscellany, is entitled "The Book of Butterflies. Vol. I. By Captain Thomas Brown, F. L. S. &c." When the *second* volume is published, we shall notice the whole work in the regular way : at present, we can merely call the attention of our readers to the appearance of the *first*.

5. *New British Forms of Parasitic Hymenoptera*.—Mr. Westwood has transmitted us the characters of sixteen genera of Hymenopterous Insects, comprising two families which he has called, *Chalcididæ* and *Proctotrupidæ*. The paper is published in the August number of the London and Edinburgh Philosophical Magazine, p. 127, to which we refer our readers. The characters appear to us to be clear and good ; and we have on this account the more to regret that Mr. Westwood has not given a finish to his undertaking, by a description of each species ; as we have so often seen that genera thus proposed fall to the ground, from the difficulty in ascertaining to which particular genus any undescribed species is referable. The pages of this Magazine will afford Mr. Westwood the means of making his labours in Entomology better known. As to ourselves, we have long been acquainted with Mr. W.'s zeal and

industry, and have regretted that the public has never received the benefit of them. The Philosophical Magazine is first-rate in its peculiar walk: we have often been delighted and instructed by its pages; but among merely entomological readers, its very existence is unknown.

6. *Observations on Lucanus Cervus*.—The village of Lee, in Kent, appears to be a favourite habitation of this gigantic species of beetle; but some seasons seem peculiarly favourable to the production of the insect. On the 14th of June, 1831, I found a single male; and every day between that period and the 5th of July, I found one or more specimens. The evenings of the 23d and 24th of June, were those on which they were most numerous: many of them were taken on the wing, but generally crawling upon palings, or on elm and lime trees. The females are later in the time of their appearance than the males; the first I took was on the 21st of June, and they were not at all numerous until the evening of the 23d: even then they were few,—not more, on the average, than one to three males. The females come out later in the evening, and are more sluggish in their motions than the other sex: it is also worthy of remark, that I never took, or even saw, a female on the wing.

On the 23d of June, early in the evening, I took two males and one female; I placed them under a tumbler, and shortly after, both the males began to pay some attention to the female. The larger of the two, however, attacked the other with some spirit, pursuing him round the glass, and occasionally pinching him severely with his mandibles, and actually, with his powerful jaws, lifting him fairly off the table. The *smaller male* appearing to resign his pretensions, I withdrew *him*, and *the others* remained *in copula* about twenty minutes: but the male did not quit his hold of the female for many hours; during which period another act of copulation took place. The same evening, I took a small pair *in copula*; they remained in that state some hours. Subsequently to this, I have seen several other pairs in a similar situation.

On the evening of the first of July, I took five males all on the wing about a small extent of paling, on which a female was subsequently discovered. I have little doubt that the males were attracted by the female, which was one of the

largest I had seen during this season—the whole of the males were also large.

The variety of size in this insect is very remarkable. I have captured males so small as not to exceed 1 inch 4 lines in length up to 2 inches 2 lines; and females, from 11½ lines to 1 inch 8 lines, including every possible intermediate size.

They appear to prefer warm and still evenings, after hot days: then they are on the wing between eight and nine in the evening. I have never detected them flying earlier or later: and on cold and windy evenings, they are very rarely met with.

The fact is thus fully established, that the *Lucanus inermis* of Marsham is truly the female of *Cervus*; and from the many varieties taken in the same locality, it is also pretty certain that the *Cervus, grandis, inermis*, and other presumed species are really but one, varying in size, from some cause arising from their condition in the larva state.

It may not be uninteresting to remark a fact as to the vitality of this insect. I picked up a mutilated male on the 3rd of July. The abdomen was gone. I separated the head from the thorax and elytra, and was astonished to find my finger violently pinched by the mandibles: it continued to hold me tightly, frequently pinching, the antennæ also quivering, for a full hour. The following morning it did the same; and was not wholly without motion twenty-four hours after it had been separated from the thorax:—how long the abdomen had been lost, is uncertain.

A. H. DAVIS.

*Nelson-square, Aug. 1, 1832.*

7. *Zeuzera Æsculi* found impaled on a Thorn.—SIR, I have in my possession a female of the wood-leopard moth (*Zeuzera Æsculi*) which was found last month transfixed on a thorn. It was quite alive; but, of course, unable to disengage itself, as the thorn completely pierced the thorax transversely and came out on the other side. It was perfect, with the exception of the loss of one of the wings; the plumage was in tolerably good preservation. It must, I suppose, have been placed there by a butcher-bird (*Lanius colurio*,) which is not uncommon in the neighbourhood of Hampstead. If this, however, were the case, it is singular that it

should not have been devoured, and that it should have been in a perfect state; as I believe the bird thus impales its prey that it may devour it at leisure. Perhaps some of your correspondents may be able to give some information on the subject. I have found a *Bombus* impaled in the same manner.

Should you consider the above worthy of a corner in your Magazine, I shall feel happy in having communicated even so trivial a fact from the great Book of Nature, which is always open to those who are willing to read in it, and the minute perusal of which must always be an inexhaustible source of amusement and instruction.

WM. LONGMAN.

Hampstead, 16th July, 1832.

8. *Stephens v. Rennie and Orr*, (Court of Chancery, Thursday, 19th July, 1832).—SIR EDWARD SUGDEN applied, *ex parte*, for an injunction to restrain the defendants from printing and publishing a work entitled, “A Conspectus of the Butterflies and Moths to be found in Great Britain.” In support of the injunction, he read the affidavit of the plaintiff, which stated that he, the plaintiff, had published, and was still proceeding with the publication of a work of a similar nature, entitled, “A Synopsis of the Indigenous Insects of Great Britain,” from which the defendants drew the principal part of their publication. That it was a piracy there could be no doubt, as the defendants confined their descriptive powers to those insects which had been already described in the volumes published by the plaintiff; and, when those failed them, they had nothing of their own to fall back upon, but were at a dead stand. A single glance at the two books would at once shew the propriety of this injunction being granted. In one part, where the plaintiff described an insect, by mistake, as with *oculi nudi*, the defendant described the same insect exactly in the same manner, copying the mistake, without any notice; but instead of using the Latin words they gave it in English. In another part, where a description of the insect, *Syenna*, had been, by a mistake of the press, given under the name of *Scoria*, the defendants still copied the mistake. The defendants, in some places, admitted that they took extracts from the plaintiff’s work; but that did not alter the case.

THE LORD CHANCELLOR.—What proportion does the pirated part bear to the rest of the work?

SIR EDWARD SUGDEN.—It is a piracy throughout, from beginning to end.

THE LORD CHANCELLOR, on looking at the book, said that the author strongly recommended the plaintiff's book.

SIR EDWARD SUGDEN.—He does, my Lord; no one understands the value of it better than he does.

THE LORD CHANCELLOR said, that he should doubt whether the two works were addressed to the same class of persons. The plaintiff's seemed to be intended more for scientific persons, who could afford to pay *1l. 11s. 6d.* for it; but the other was more for popular sale: and he much doubted whether it would interfere with the plaintiff's book. They might, however, take the injunction at present; but he was sure they would hear more about it.

[We think, in such a case as this, Entomologists should raise a subscription to enable Mr. Stephens to carry on his cause with vigour and effect. It is in this instance a private wrong; but who amongst us will hereafter venture on publishing the result of years' patient investigation and dear-bought experience, should the defendants succeed in removing the injunction?—ED.]

9. *Magazine of Natural History.*—This excellent work has lately been rich in entomological articles of great interest. The April number has a detail of captures by Mr. Dale, another by Mr. Davis, and a record of a most singular discovery of a hyperparasitical insect by Mr. Newman. In May, we have a notice of remarkable entomological forms by Mr. Westwood, some of which are strange in the extreme; the engraver of the figures has not conveyed the idea of *Mormolyce*; there is no separating line on the elytra as represented. The other cuts represent very tolerably the insects for which they are intended; the Greek derivations are ludicrously incorrect; some of these we see Mr. Westwood has since rectified. The Rev. W. T. Bree has three excellent articles in this number; in one of which, a review of "Insect Miscellanies," he points out in the most gentlemanly manner the deplorable ignorance of its author: we give a shrewd guess who that author may be, and though we fear he is beyond the reach of Mr. Bree's refined criticisms, we hail with delight the



appearance of a species of review, which can thus ably unveil a pretender to science, without descending to a coarse and personal attack. In June, we have miscellaneous records of captures, and a few disconnected articles by the indefatigable Mr. Bree. In July, "Notices of the Habits and Transformations of the Dragon-fly, by J. D.," is an amusing paper, and full of instruction to beginners. We refer our readers to the articles themselves, in which we are sure they will find abundance of instruction and amusement.

10. *Obrium cantharinum*.—Several pairs of this extremely rare insect have been recently taken at Broxbourne, Herts, by Mr. Bond, a diligent collector. Having met with one or two flying in an outhouse, he was induced to examine the building, when he discovered, from some holes in the rafters, that they were, in all probability, bred in the timber. On further examination, he found that the rafters were made either of the common poplar or the aspen, and, as is frequently the case in country buildings, had been used without stripping off the bark. On removing the bark, he procured several more of the perfect insect, and one larva. I have a piece of the bark which shows the path of the larva and the place of exit of the imago. The outhouse had been erected about eighteen months, and the timber had been purchased from the park of J. Bosanquet, Esq.

August 20, 1832.

A. H. DAVIS.

11. *Vespa vulgaris*.—The predacious habits of the common wasp are pretty well known; but one or two singular instances of this character which have come under my observation, may not be altogether uninteresting.

In 1830, during a short residence at Snaresbrook, in Essex, I was much annoyed by the swarms of wasps which entered the house from an extensive settlement in a bank not far distant. I had placed the produce of an evening's mothing on a setting-board over the mantel-piece. On the following day, I observed a wasp fly in at the open window, and make immediately for the setting-board, on which it instantly alighted. I rose to ascertain its object, when I found it separating, with its mandibles, the wings of a moth from the trunk. I captured the wasp; and, on further examination, I discovered that the whole of the bodies of the previous night's captures



had been removed, and that the moth to which the wasp had flown on its entrance was the only one remaining. The pins and braces had kept the wings in their position, so that the depredation had not been discovered. It was perfectly obvious to me that the same wasp had paid previous visits to the board from the direct course which it took on entering the room, and its at once alighting on its prey. I also witnessed, in many instances, its capture of the common fly. The wasp having seized the fly, generally on the window, almost immediately commenced by biting off the wings and legs on one side, and then the other,—all the time buzzing against the glass. I have held my hand beneath, and caught the limbs as they were successively detached from the body. Having accomplished the task, the wasp as speedily as possible escaped, and made away direct for the nest.

A few days since, I observed one of this species on the Golden-rod, in a garden at Blackheath, suspended from a leaf by the claw of one of the posterior tarsi. The other legs and the head appeared actively occupied; and on closer inspection I observed that the wasp was in possession of a fly, and engaged in the operation of severing the legs and wings, while its own weight was suspended by the claw. On approaching nearer, the marauder flew off with his victim.

I have since witnessed a similar occurrence on the same plant, but the fly taken (*Eristalis nemorum*) was much larger. The wasp instantly suspended itself, and in less than half a minute had bitten off not only the legs and wings, but also the head. I captured the wasp as it was taking flight with its prey.

A. H. DAVIS.

12. *Ixodes hexagonus*.—SIR, I have lately taken two specimens of *Ixodes hexagonus*; and as, from their peculiar habitat, I should imagine they are not generally known, I subjoin a description of them with a few observations.

I was examining a hedgehog, and was surprised to find, behind each ear, a large tubercle, as it then appeared to me; but, on examining more closely, I found they were the parasites I have mentioned above, firmly fixed by their rostrum, and the abdomen lifted up over the head, so that that was the only part of the animal I at first saw. They were so firmly fixed that I was unable to disengage them without cutting off

a piece of the hedgehog's flesh. Latreille says that they are either blind, or that their eyes are not apparent. I examined them minutely with a microscope, but was unable to discover their eyes: they must however possess these organs, or some delicate sense to compensate for their absence, since one of them, that I placed near a lamp, constantly turned away to avoid the light. They belong to the *Ricinæ*, Latreille's fifth family of Trachean *Arachnidæ*; their spiracles are two in number, one is placed on each side of the abdomen; they have eight six-jointed legs; the tarsi are didactyle; the thorax and abdomen are united, and are composed of only a single segment; the abdomen is by far the largest part of the body; in the front of it is an oval coriaceous plate,—the scutum; the palpi are two in number, large and oval, and are single-jointed; they must, I should imagine, live entirely by suction, in which they are probably assisted by the palpi; the rostrum is well adapted for maintaining a firm hold, as it is deeply serrated, the serræ pointing backwards. In this species, the head, legs, palpi, and the scutum are brown, and the abdomen a livid white.

Some of this genus lay a large number of eggs, which, according to M. Chabrier, pass through the rostrum. But here a question presents itself as to how they are originally placed on the animal. Are they attached to it from its birth; or how and when are they placed there, as their locomotive powers are so limited?

Yours, &c.

W. LONGMAN.

13. *Insects captured at Shellness and Neighbourhood.*—Near the end of last month I took at Pegwell Bay, Shellness, and in the surrounding neighbourhood, the following insects:

<i>Notoxus monoceros</i>	<i>Platyderus ruficollis</i>	<i>Megachile centuncularis</i>
<i>Allecula sulphurea</i>	<i>Synuchus vivalis</i>	Willoughbiella
<i>Cicindela maritima</i>	<i>Odontomyia viridula</i>	Allantus
<i>Broscus cephalotes</i>	furcata	Tenthredo
<i>Calathus piceus</i>	<i>Tabanus bovinus</i>	Cephus
rufangulus	<i>Eristalis sepulchralis</i>	Nematus, and several
mollis	intricarius	species of each.
	<i>Gymnosoma rotundata</i>	

*Broscus cephalotes.*—The habit of these insects is very curious; they are found only in the sand on the sea-shore, and live in dens about three inches deep and half an inch wide, which are made in a diagonal position in the sand, where it is mixed with decomposed stalks of *Elymus arenarius*. They appear to rove during the day occasionally, but, upon any

alarm, run swiftly to their dens,—projecting from the mouths of which their heads may be seen watching for prey. On holding another beetle to the hole, the one within would immediately seize hold of it with its jaws, and continue so tightly fixed as to suffer itself to be drawn out without quitting its hold. They appear to be very ferocious insects; and, from the number of elytra and other parts strewed about the sand, it may be supposed that they prey on each other.

*Cicindela maritima*.—I found this insect in great plenty on the bare sand, where it is overflowed in the spring and autumn by the high tide. It flies more heavily than the common *Cicin. campestris*, and not so far at a time. I remarked, also, that the abdomen hung down very much in flying. Growing among the *Elymus arenarius* I found a single plant of *Æno-thera biennis*, the leaves and whole plant had a red fleshy appearance. It was several miles from any house or garden, and growing, as it is reported to do, in Lancashire. Can this be a new habitat?

ROBERT FOSTER.

Bromley, August 1, 1832.

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ART. XIII.—*Colloquia Entomologica.*

Γνωθι σεαυτον.

SCENE—*The Parlour at the Bull Inn, Birch-wood-corner.*

ERRO and ENTOMOPHILUS, seated.

ENTOMOPHILUS. Well, old gentleman, do you seem the better for it?

ERRO. I am going to take a look—(*opens his box*)—What, what, what! all in a buzz—whirling like teetotums.

ENT. There, Rocky, there's the last bit for you. Make haste and bolt it: there, don't let Mrs. Jewell see you eating, or else she'll charge three dinners—there's a good dog!

ERRO. (*Still looking in his box, settling and shifting his insects*)—*Eristalis florens*; come, be still! There he is, off again, w-whirr-rr-ee!

ENT. What a wretch!—(*taking out his boxes and balancing his chair on the hind legs, his head resting against the wall*)—Virens, Fullo, Sycophanta. I wanted duplicates of these.

ERRO. Mihi, my eye, mihi! Moffy, do you think these fellows have any feeling? They seem excessively merry—ce!

ENT. Why, *yes*, or rather *no*—but which do you think? I have *Trichius nobilis* though, really. Aspice! ecce! I took it on the elder-flowers, just out here.

ERRO. So it is! What, what, what!—*Cistela ceramboides* too!

ENT. I am inclined to believe that insects are perfectly insensible; that is, when any one maintains a contrary opinion—keep your wings still;—but if you think they have no feeling, like a hard-hearted savage as you are, come,—I'll kill you, a little, old fellow, if you keep on kicking that *Geometra*—if you think they have—(*a pause*)—they are, as I was saying, really indigenous;—I'll furnish you with facts, and prove by arguments hitherto unadvanced—I'll be whipped if he has'nt kick'd its head off!

ERRO. That's very clear; you should have been a pleader.

ENT. What?

ERRO. If I were to set my wits to work, I think I could prove that insects have feeling.

ENT. I don't—try—(*shutting his box and thrusting his hands into his breeches-pockets*).

ERRO. First, by analogy, all our ideas tend to confirm the probability of the existence of sensation in every creature; because, in ourselves, and in all those of whose peculiarities we can readily satisfy ourselves, we detect its presence without the slightest difficulty; and, it is only when the objects become minute, of a different structure, and cease, in consequence, to be within the precise range of the experiments by which we had tested, as it were, the sensation of higher animals, that we can entertain a doubt on the subject. Apparently, then, from analogical reasoning, truth is on my side: I claim the advantage. I say insects feel, because I feel. If you doubt, disprove: no insect, I suppose, ever told you that it could not feel when you were piercing it?

ENT. No.

ERRO. Then the positive disproof is wanting. Now we'll suppose, still pursuing analogy, a similar operation performed on the human body: a man shall be laying quietly asleep; then comes a monster, some anthropologist with an anthropological pin, fifty feet long and two feet round—the parallel's a just one—and, with immense energy, forces the horrid weapon into him just on the right side of the vertebral column: ribs, lungs, liver, &c. give way, and are forced out of their places,

perhaps carried on the javelin's point twenty feet under ground—it's no exaggeration—don't smile;—what would be the man's feeling? I ask, what would be your feeling, Moffy, eh? What would you do?

ENT. Die!

ERRO. Yes, perhaps so. Yes, you certainly would. Then how awful must be the pain to a creature whose intense vitality supported it even in such a horrible situation. Life it certainly retains; but what a life, futile, indistinct, false, feverish—none of your smiles—writhing convulsively on a similar instrument; yet from some cause, at present unknown to us, capable of withstanding death—that is, immediate death: but death must follow at no great distance of time, embittered by pain and hunger, and in its most awful forms; sometimes sinking exhausted, after hours or days spent in struggling for liberty; sometimes, from numbness and inertness, the disruption of its vital parts being followed by a total loss of sensation.

ENT. Roey!

ERRO. Yes, excess of pain having worn out the nerves: sometimes from loss of blood; which you must often have remarked on the paper where the wretched sufferer has turned round and round in agony, but mostly from——

ENT.—steam—But really, Roey, excuse me; you make but a poor hand at defending a cause against your conscience. *You* would never do for the law: why, you have said nothing, literally nothing—smoke, mist, which rising before the sunlight of truth requires not even my weak breath to disperse; if, under circumstances which, you have very unnecessarily laboured to prove, would kill a man, an insect not only lives, but, struggling for liberty, whirls at the pin-head like a teetotum, and you are aware, although you have not advanced it, will eat and drink as heartily as usual; and, when liberated, will immediately pursue its customary occupations of sport, love, or industry! Why, how, in the name of fortune, do you make out any analogy?

ERRO. Don't stop, Moffy.

ENT. There is, then, some decided difference somewhere in organization: where is it? What is sensation, or rather where does it originate?

ERRO. In the brain.

ENT. In the brain—right. Now, in vertebrates, the brain

is a collected, a concentrated mass, enclosed within a bony skull, and situated at the anterior extremity of the vertebral column; in insects, on the contrary, it is in—

ERRO.—two nodules—

ENT. Pish! hush! excuse me, Roey, hear me speak—'tis no such thing, the brain is omnipresent; it is diffused, in ramifications, from the thorax to every extremity. Now, in vertebrates, from the brain emanate the nerves or organs of sensation. In insects, the brain and nerves, I firmly believe, are one and the same thing,—so—

ERRO. Reaum—

ENT. My dear fellow, allow me.—I am well aware that Reaumur thought differently; and that in this, all his copiers have followed him: and so they would had he represented one hind leg to contain the brain and another the nerves; but this is nothing to my purpose. I am not now going to propose, much less press, a new theory on that subject; yet mark me:—in vertebrates, an injury to the brain destroys feeling. Ask all the surgeons: they will readily convince you of this. Here, then, is proof positive that sensation emanates from, and is dependent on the brain. We will allow an insect, for argument's sake, all the acuteness of sensation the most tender-hearted would wish:—you, who were this moment going to quote Reaumur against me, must now abide by him: you will find your horrible weapon—

ERRO.—

*Monstrum horrendum, informe, ingens, cui lumen ademptum.*

ENT. Either listen, or translate your ideas into the vernacular.

ERRO. *Monstrum*, a stocking-needle; *horrendum*, rusted; *informe*, bent; *ingens*, as big as a Grecian javelin: *cui lumen ademptum*, broken off just below the eye.

ENT. I suppose that's wit! Ought I to laugh? But laughter increases wit, as watering a plant makes it grow. Well, you will find this horrible pin, or needle if you like it better, passes through the very sensorium,—the chief seat of the ganglions,—their union, their centre, their nucleus,—and thus gets foul of the main cerebral masses, and, carrying them away on its point through the insect, leaves them, perhaps, some considerable depth in the cork. Now this disruption,—this annihilation of brain,—must destroy the sensitive property of all nerves emanating from or centering in



that brain, precisely in the same manner as the destruction of the trunk of a tree must deprive its branches of vitality; and sensation, however acutely once possessed, must consequently inevitably cease.

ERRO. Well?

ENT. I have done.

ERRO. But I cannot let you off so easily. You suppose a fact, of the truth of which you acknowledge you entertain a doubt. You say, "allowing insects all the acuteness of sensation the most tender-hearted would wish," &c.

ENT. Are you serious? Deny insects feeling, what have I to disprove? You are less bright than usual, Roey: but I do deny that insects possess any sensation of pain like that with which we are acquainted; although, in doing this, I forsake an argument which I trust is incontrovertible. It is useless to dilate to you on the structure of an insect: you know far better than I; you have proved yourself the industrious bee, and have filled your storehouses with knowledge for the good of the hive. I, like the thoughtless butterfly, forsaking labour, gambol idly in the sunny air of science, and now and then stoop to sip its sweetest flowers for my own gratification. Observe for a moment the hard shell of "the shard-borne beetle," and reflect that the exterior of every insect is but a modification of this. The bones may be said completely to envelope the softer, and what would generally be considered the more sensitive parts. But there would be no necessity for sensitive internal parts, except as communicating with sensitive external parts; and we know that the Almighty has created nothing in vain. We therefore naturally expect to find sensation evinced, if evinced at all, on the exterior; and here we have only a hard resisting substance, uninjured by the severest usage,—our own hair and nails are tender in comparison,—our teeth are of somewhat similar texture. Now, Roey, as you dwell on analogies with such delight, allow me to offer one. Suppose a man enveloped entirely, eyes and all, in a coat like the enamel of one of his teeth,—you cannot imagine him very susceptible of pain; and a beetle is in precisely a similar case.\*

\* The tortoise is a strange connecting link between the *vertebrata* and *annulosa* in structure, and partakes of the peculiar tenacity of life and absence of sensation so observable in the latter.—ED.



ERRO. But a butterfly is not.

ENT. You are perfectly right; but yet you must often have observed at Darenth with what unconcern the bramble-delighting *Paphia* opens and shuts her wings in the sunshine, long after they have lost their original shape and colour, and are, in fact, little more than mutilated transparent tendons. This would never be the case, had she feeling in these wings: she must have long since died from such repeated mutilation.

ERRO. There is something in that; but may not the wing of a butterfly be analogous to hair or nails, as you suggested but now, in man, and therefore have no sensation?

ENT. I think not. The wings of insects have a membranous texture, which, like those of the bat, partake of the properties of other parts of their frame: but surely you will admit legs to an equal feeling with other parts, and the loss of these is equally common,—you must have remarked it among the gnats?

ERRO. I have been willing to listen, Moffy, to all this, because I like to hear you talk; but I agreed with you before you began, and therefore needed not to be convinced. One argument, however, you have not availed yourself of, which seems to me even more strong than any you have used: it is this,—a beneficent Providence would hardly have subjected such hosts of creatures to the constant loss of members, did such loss cost to them the same anguish which it does to the larger animals. An insect, perfect in all its members, and a human being deficient in any, are almost equally uncommon.

ENT. Roey, it seems to me that entomology, particularly in this country, has never been raised to that station among sciences which it deserves: I fear it has not advocates which do it sufficient justice. How some of the dons would sneeze at me if they heard this! It has yet to become a science. But we are not really so low as the world about us believe: they would set us down with the auricula, tulip, pigeon, rabbit, and bull-dog fanciers.

ERRO. I understand even your own relations condemn your insect-hunting as a lamentably weak pursuit,—a strange waste of time,—a sort of half-madness.

ENT. They will be proud to own me some day or other. I do not think I am for a long life; and a few years after death

mellows down harsh feeling as well as fond:—a man rises or falls to his proper level as soon as it is known he can no longer have private ends to serve.

ERRO. I hope so. Kirby and Spence did good in that line. What a work,—what a monument of industry and patient research, aided by sterling talent, guided by excellent judgment, and pervaded throughout by a kind-hearted, humble, meek, quiet, and most pious feeling!

ENT. Why do not you undertake something of the kind? A popular work, at about a fourth of the price, with all new matter, yet not to forsake truth for the sake of popularity.

ERRO. That piece of advice is scarcely necessary to me,—is it, Moff? yet your extending the caution so coolly is an excellent satire on the taste of the present generation. I think, however, there is room for such a work; but you must not look to me:—you can't make a satin purse out of a sow's ear. One subject connected with entomology seems hitherto entangled in mystery,—I wish you would take it up.

ENT. What is it?

ERRO. It wants a masterly hand. The line between reason and instinct has never yet been drawn, or even proposed, with any show of probability.

ENT. And yet nothing were easier. The concentrated brain meditates; the diffused brain acts.

ERRO. Excellent in sound, but I only know of one individual on earth who dare attempt to found an argument on such a dictum, or whose attempt would be attended with the most distant chance of success; and that individual, dear Moffy, is —

ENT. More fools, they. People in general, Ro, muddle their heads with all manner of unintelligible works on a straight-forward, plain, intelligible subject. Instead of presuming or venturing to be original on this question, they give you musty quotations of high-sounding passages,—which have been long refuted and therefore done with,—and parade them as their own; like the jackdaw, that stuck the peacock's feathers in his rump long after the peacock had dropt them as useless: and thus ornamented, these fools think to pass for philosophers, when, in reality, they are, by thinking men, despised for adopting antiquated stuff, more worthless, if possible, than even themselves could have devised, had they

employed for that purpose the little brain which Providence had been pleased to allot them.

ERRO. I have often been amused to hear the talk of those who pass current for philosophers: it seems a heterogeneous conglomeration of the opinion of others learned by rote. In my opinion, the original thinker is the only philosopher—the man of books a mere parrot.

ENT. Your number of philosophers would be very small, methinks, Roey: I never recollect meeting with one.

ERRO. The learned fool, like an animal, lives on the gross food of earth; the original mind, like the more delicate plant, thrives on the breath of heaven.

ENT. I understand you, I think: but a granary and a mine were a more apt, though a less beautiful, simile. The book-learned head is a granary well stored from without; while the riches of a truly great and powerful mind are like those of a mine—its own. I never hear a good idea expressed that is not old to me; if new, I find it worthless. And why is this? Because men refuse to think: it is too hard work. Believe me, a thinker is as rare as a phœnix.

ERRO. And has ever been so. Plato, Aristotle, Newton, have been thinkers; perhaps Locke.

ENT. And, certainly, the younger MacLeay, the entomologist. From this fear, or dislike, or, shall I say it, incapacity for thinking, arises our present ignorance? What if you and I were parrot-masters of all that exists in print at this moment; we should not add one iota to the general stock of knowledge: and yet there is no man, no *soûdisant* philosopher on earth, but would consider this the very climax of his wishes. Let us strike out a new road: let us strive, of our own resources, to enlighten what is obscure; to discover what is hidden. The desire to know, is the talisman whose touch solves mystery. The pursuit of truth ensures its capture.

ERRO. Instinct. Moff, you are wandering.

ENT. Ah! the statement I made, you seemed to think, required logic and argumentative powers to sustain: no such thing. Divest your mind of all the nonsense you may have met with in Essays on Instinct, and such trumpery, and look only at naked facts. Select a prominent example of each form; for instance, as a vertebrate with concentrated brain, the elephant; as an annulose with diffused brain, the ant. My dear friend,

have you never watched a lady's delicate fingers wander a voluntary prelude among the keys of a piano? and have you never thought the music more delightful than the most studied and elaborate harmony produced by the consummate and combined skill of composer and performer? So now let your mind wander a moment among the wards of your memory, in search of facts and anecdotes of the elephant and the ant: the result will be more convincing, more delightful far than the most abstruse and complex essay that man could compile. The elephant, you already find, premeditates; the ant is the creature of mere impulse.

ERRO. Allow me to suggest that insects alter their habits according to weather and other casualties.

ENT. I have heard that bees in the tropics cease to collect honey; that wasps, which build here underground, build there in trees. These fictions are copied from one to another, and will be to the last day, no doubt. They might as well say that men assume the tails of monkeys at the equator, and the horns of rein-deer at the poles. Naturalists, if consulted, would contradict such absurdities at once.

ERRO. Where is such precious trash to be found?

ENT. I don't know; I never read.

ERRO. Nor I, except Waterton's Wanderings. I can say that by heart, and am now learning to repeat it backwards. I have already learned the last journey perfectly.

ENT. How very interesting!

ERRO. You can't know a good thing too well. How gladly would I start on just such a pilgrimage as his to Essequibo. I never see the swallows gathering on the roof of the about-to-be-deserted house, or on the topmost twigs of the tree about to die, but I long to join these gay and giddy habitants of perpetual summer. My soul yearns for the primæval shades of Demerara, for the unclouded sun of Venezuela. How gladly would I leave my home, my country, my friends,—aye, even you, Moffy,—in this chilly inhospitable clime, and pursue my trackless way in company with Nature's self, through woods which none but the wild deer, or the wilder native, ever trod; where the king-vulture-mounted Mora rears its lightning-blasted and single branch into the sky,—a solitary but triumphant memorial of its quondam superiority over whole oceans of forestry.

ENT. We'll go together, Roey.

ERRO. What mines of natural history those delightful regions contain,—mines hitherto totally unexplored; for in entomology what has yet been done? O, I long to watch the bright fire-fly illuminate the night, and the emerald butterfly blaze from flower to flower in all the radiance of a noon-tide sun!

ENT. We'll go together, Roey, that's certain.

ERRO. I will find out for you the larva and pupa of *Urania* and *Castnia*, and all those arcana of our craft which at present envelope it in a mantle of mystery. I will send you, Mofsy, from time to time, histories that shall make even Aristotle raise him from some thousand years' slumber to listen to. I will bring home thousands of insects never before heard of,—

Quem qui scire velit Lybici velit æquoris idem  
Discere quam multæ Zephyro turbentur arenæ,  
Aut ubi navigiis violentior incidit Eurus  
Nosse quot Ionii veniant ad littora fluctus.

ENT. Speak the vernacular, Roey, pray. Your Greek and Hebrew is a sealed book to me, you know very well.

ERRO. My *modus operandi* would be this: I would take up my residence on some hill-top surrounded with woods, and would spend all my time in collecting, and in observing nature pure and undefiled by the contact of man. I would live in friendship with the bear, the wolf, and the vampire. My life should be spent in discovering the glorious works of an Almighty Creator, and in unfolding them for the benefit of my fellow-creatures.

ENT. Noble idea; let me go too.

ERRO. I should like a companion, but I fear it will not be

————— thine to stray,  
The friend and soother of my watery way;  
In the heart's solitude, more mute and drear,  
For all that howls and clamours on the ear,  
With one kind voice that desert to dispel,  
And turn to home a joyless cabin cell.

How often has fate, apparent chance, disappointed me even at the threshold of my hopes! How often, yielding to the wishes of others, I have myself conquered for a time the feeling—but every fall it returns with redoubled strength—*hæret lateri*

*lethalis arundo*. I cannot eradicate it; I cannot quietly jog along the every-day track which mortals have trodden for centuries.

———Tentenda via est qua me quoque possim  
Tollere humo; victorque virum volitare per ora.

And if I die of the yellow fever, or some she-jaguar takes me to feed her young ones; or, better still, some huge boa swallows me whole; why, it wont much signify, I shall leave behind no one that will care about me.

ENT. Not one?—think Roey. Have *we* never been sufficiently pleased with each other's company for each of us to take some interest in the fate of the other? I shall, at least.

ERRO. Yes, indeed have we; and recollection leaves a perfumed fragrance on my mind which will adhere to it long after this frail vessel of clay shall have lost its vigour:

You may break, you may ruin, the vase as you will,  
The scent of the roses will cling round it still.

ENT. Would you do any geology?

ERRO. No. Geology is a tempting but dangerous study; you begin with wondering, and proceed through doubting to disbelieving.

ENT. It always has appeared to me that those geologists who plead the cause of the Bible have done more harm than good by their sophistries, their weak attempts to prove a coincidence between what is written and what is seen; and that they open a wider field for doubt by proposing theories so easy of disproof. In these cases, I believe what I read in the Bible, and what I see with my eyes; and if the results do not always agree so well as I could wish, I seek not to pervert or twist a meaning on the one hand, or disguise a fact on the other, for the sake of proving a correspondence between the two; but humbly and devoutly trust that whenever Time may open to us the book of Nature, we shall find its pages are in perfect accordance with those of the Book of Truth.

ERRO. What, after all, can a geologist learn? He merely scratches the surface like an old hen; he knows nothing of the interior; and, like the same animal, he chuckles over his useless labours.

ENT. Shall you write a book?

ERRO. No, no; a mere manuscript, for you, and Venator,



and Ambulator, and a few more of the right stamp to have a peep at. It would be far too wild and strange a concern for the scientific world: they would turn up their noses at it, until they exhibited to you what little brains they possessed through the apertures.

ENT. Too true: one must not say a word about natural history with a smile on one's face. Your scientific man must always be as solemn as an owl, and as long-featured as ——.

ERRO. And, to add mental to personal beauties, as stupid as the first, and as obstinate as the last.

ENT. You and I hold a different opinion; yet, Roey, I often think that, as we pass along through life, we ought to erect here and there by the way-side some little mark, just to show others where we have been:—"There lived a man" is but a poor memento.

ERRO. And yet how many spend a long life without performing one act entitling them even to the name of man. But, my friend, you are sure of a name; you have erected, even now in your early years, a monument, "*perennior ære.*" Content, aye, happy should I be, could I but grave my name thereon, ever so humbly, that the two names might drift together down the tide of time to the ocean of eternity, with the same unity our kindred spirits enjoyed while here.

ENT. Roey, ar'n't we getting a little bit sentimental and stupid? Come, come, what a deal of time we've been fooling away here—eh! Rocky, my man,—hark, hark! yoicks! (*the beagle, seated on his tail, gives tongue*) there's a mellow note! You must stay and pay the reckoning, Rocky. Three—recollect—don't cheat. I shall stick a cigar in my face; won't you, Roey?

ERRO. Not altogether fooled away. This half-hour's talk, however trivial, will add yet another link to the golden chain of memory, which, like an enchanted girdle round my thoughts, serves to cheer many an hour, that without its aid would be utterly miserable.

ENT. Happy the man, Roey, the chain of whose memory has none but golden links. He, at least, need never talk of misery; his cares must be all ideal. Here goes. (*Leaps through the open window.*)

ERRO. Cleverly done, indeed. I must try.

(*Exit in same style.*)



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ART. XIV.—*On the Want of Analogy between the Sensations of Insects and our own.* By the REV. C. S. BIRD, M.A. F.L.S. late Fellow of Trinity College, Cambridge.

[Read in the Clarendon, Oxford, before the British Society for the Advancement of Science, June 20, 1832.]

IT may not, perhaps, be thought inconsistent with the objects of the British Society for the Advancement of Science, if a few observations be made, tending to remove, or at least weaken, a very popular objection to the study of Entomology. Were this neglected, but beautiful field of nature more widely cultivated—could the students of Entomology be brought to bear any comparison in number with those of Botany, it is impossible to say to what extent science in general might ultimately be benefited. Who can tell what discoveries are in store, and only waiting till the foot of some fortunate Entomologist shall explore some untrodden tract? Need we call to mind how deeply Medicine is already indebted to what is commonly called the Spanish Fly, *Cantharis Vesicatoria*? Who knows how the debt may yet be increased? Need we recur to the Philosophical Transactions, a century and a half ago, in order to draw encouragement from the example of Ray? If he could elicit from the common ant what many celebrated writers contend is an acid *sui generis*, the formic, who can predict what other properties, which now lurk beneath the lovely exterior of the innumerable insects around us, may yet enrich that most wonderful of modern sciences, chemistry?

The objection alluded to is this—that Entomology cannot be studied without making a collection of insects, and that such a collection cannot be made without involving much cruelty. The former of these assertions may be allowed, but the latter may fairly be questioned. It is of the greatest consequence to question it, because it is in the mouth of every one who has paid no attention to the subject, and because it rises most readily to the lips of those, the goodness of whose hearts, and the warmth and simplicity of whose feelings, render them the most desirable converts, being the very persons who would engage in this delightful pursuit with the greatest enthusiasm if once converted. In self-defence too, it is absolutely necessary that an Entomologist, who lays claim to as much benevolence as others, should shun the questionable shape in which the objection presents itself to his mind at least. For my own part, I will claim more for the Entomologist, and will assert that his acquaintance with insects will increase his benevolence towards them, and will make him the last person in the world who would grudge the trouble of putting a spider or an earwig out of the window rather than crush it to death, or pass by the commonest fly or beetle floating on a stream without reaching out a stick to save it.

The charge of cruelty wholly rests on an implied assumption that we are capable of judging by outward symptoms of the sensations of insects, and that they occupy such a place in the animal kingdom as to oblige us to suppose that their sensations are like our own under like circumstances. Both these positions I deny to be tenable. I shall endeavour to prove, by popular arguments, unconnected with any inquiries into the anatomy of insects,<sup>a</sup> that the outward symptoms, by which it is hastily judged that pain is felt, are referable, if to any sensation analogous to ours, only to the instinct of escaping from restraint unaccompanied by pain; and, moreover, that there is so broad a line to be drawn between the lower part of the animal creation and the higher as to make it extremely doubtful whether there is any analogy whatever in their sensation. As my attempt to draw this line is new, at least to myself, I shall begin with that.

Few persons, comparatively speaking, are aware how diffi-

<sup>a</sup> This subject has been ably argued in our last article, p. 94, *et seq.*—ED.

cult it is to draw the line which separates animals and vegetables, though every one supposes that he knows such a line, and admits into the pale of his sympathy all that lies on one side of it, whilst he entirely excludes all that lies on the other. Bishop Watson, in the fifth volume of that delightful work, which should be a model for popular writers on scientific subjects, his *Essays on Chemistry*, has shewn in a lively manner the extent of this difficulty. The late President of the Linnæan Society, Sir J. E. Smith, has also stated it in his *Introduction to Botany*. The presence or absence of a stomach, he observes, will not suffice to establish a distinction, for the polypus may be turned inside out, like a glove, and left in this state without any derangement of its functions. The power of locomotion is not an universal criterion, as many vegetables seem to possess it in a higher degree than the corals and corallines. In short, it has cost philosophers more trouble than is generally imagined, to give a definition of what is an animal. Sir J. Smith tells us that the only definition to which he had hitherto found no exception, is that of M. Mirbel, given in his *Treatise of Vegetable Anatomy*, that “plants alone have a power of deriving nourishment, though indeed not exclusively, from inorganic matter, mere earths, salts, or airs, substances certainly incapable of serving as food for any animals, the latter only feeding on what is or has been organized matter, either of a vegetable or animal nature. So that it should seem to be the office of vegetable life alone to transform dead matter into organized living bodies.”

Admitting then, that the line can be drawn which separates animals from vegetables, I contend that another line should be drawn, almost as broad, which separates animals from each other. This line will be found at the point where there ceases to exist in animals a unity of being. In man, we are all aware, there exists this unity. There is nothing that a man is more conscious of to himself than his own identity. He knows that he cannot be in two places at one time, that he has a continued, uninterrupted existence, and that whatever acts he performs cannot be ascribed to another. The soul is immaterial and indivisible, but the body is not. Accordingly, if the body be separated into two parts, and life remain at all, it remains only in one and not in the other. One only of them can constitute the man, otherwise he would lose his identity. This

peculiarity of constitution we suppose to belong to the higher orders of animals as well as to ourselves, and if a leg be cut off from one of such animals, we never think of concerning ourselves about the leg or pitying it, we only pity the animal that has lost it. The very reverse of this is the case with a plant: there we take slips or cuttings, and form so many new plants, and whatever we predicate of one of these, we may of another, and we feel no compunction in performing the operation, because we conceive that no analogy exists between us and them. It is not demonstrable that they do not feel like ourselves, but we are content when we see this extraordinary divisibility to suppose that they do not, till it is demonstrated that they do. Now in this respect, worms approach very near to plants. It is said, that, if cut properly, a worm may be multiplied into many new worms. When we look at a worm, we are apt to look at it as one creature, but we are in reality looking at an aggregate of several creatures, which for the present are united, but may, if we please, be disjoined. What a mighty distinction does this create between us and them! How can we reason from ourselves to them? And if not from ourselves, how reason at all? Now this want of unity of being which thus makes worms approximate more to vegetables than to ourselves, is found in an inferior degree in insects. As this is the principal point which I wish to establish, I may be permitted to detail the circumstances which first led me to observe it.

When I was young in Entomology I wished anxiously to find the quickest mode of killing an insect. Having captured a pretty beetle, *Malachius Æneus*, it struck me, that, cutting it in two at the junction of the thorax and abdomen, the part which gives rise to the name Insect, *Insectum*, *Εντομον*, I should kill it in a moment. I took a pair of scissars, and divided it; the parts fell on a piece of white paper which lay before me. Far from being dead in an instant, I was grieved and surprised to see the head, with the two fore-legs attached to it, begin to run about the paper. It occasionally stumbled, but rose again, and exhibited, if I may so speak, perfect self-possession. It made for the edge of the paper, but arriving there, and looking over, it seemed to think it too precipitous, and so coasted along in quest of an easier descent, which nevertheless it did not seem able to find. This coasting and

searching for a convenient place of descent, suited to its curtailed condition with respect to legs, of which it appeared perfectly aware, occupied the head incessantly. I regarded it with astonishment. "Here then," I said to myself, as I watched its motions, "here lies the vitality of an insect!—the body at any rate is dead." But in this I was quickly undeceived; for in about a minute after the body had fallen on the paper, I saw the hind legs brought upward, and employed deliberately in brushing and cleaning the wing-cases, exactly as a house-fly may be seen to clean its wings on a window-pane. The legs were then withdrawn, the cases raised up, and the true wings expanded from beneath, and all made ready for flight, which indeed I expected to see; but the body, seeming then to become aware that there was no guide, the head, its former companion, being in possession of the eyes, the design was abandoned, the wings folded up in their usual beautiful manner, and the attitude of rest again assumed. This whole process was repeated with perfect regularity at intervals of about a minute, if I rightly remember. A more perfect act of a sentient creature could not be exhibited. The head continued to run about, and the body to clear and spread its wings, the one for about twelve, and the other for sixteen hours; their energies gradually decaying, till they appeared to perish, or rather to sleep. And now, I ask, Which was the beetle?—Where was the original creature?—Had not the head and the body an equal right to be taken as its representative? Is not all analogy between insects and ourselves destroyed by such a phenomenon? If a soldier were deprived of his arm on the field of battle, we know how to talk about the soldier still; we can compassionate his sufferings; we can admire the heroism with which he bears them; but if the arm were to exhibit animation and independence—if it were to strike an approaching enemy, or do such deeds as could not by possibility be ascribed to mere muscular action, what should we think of it, and, above all, how should we speak of it? Would not all ordinary language be at fault? What sort of a creature would the arm be? Would it be a human creature? Should we not be almost irresistibly impelled to introduce a supernatural, invisible agent, rather than attribute to the arm itself the actions we witnessed? I trust I have said sufficient to prove my point, that the want of identity in insects, their divisibility

into parts having separate independent consciousness, establishes a line of demarcation between them and the higher orders of animals, almost as broad as that which already confessedly exists between them and vegetables. I hope to be forgiven for having entered into details so simple; yet the results of which are so striking. I do not imagine that the facts are new; it is only the importance which I attach to them, and the inference I have drawn from them, that can pretend to any thing like novelty.

I must now hasten to the other point, which I trust I shall be able shortly to establish; namely, that even if there were no such line of separation between insects and the higher animals as to confound our reasonings with respect to them, and if we still think ourselves at liberty to judge of their feelings by outward symptoms, we have no cause, if we be not led away by first appearances, to conclude that they suffer pain. If in any case an insect feel pain, nothing, we should imagine, could call forth the feeling more than the act of passing a pin through its thorax, a part which we know to be peculiarly sensitive. It is, in fact, this very act of violence, equivalent to spearing a wild boar or a salmon, which is most revolting to observers; and if their compassion can be shewn to be misplaced in this case, they will hardly, I believe, appeal to any other. Now I have repeatedly pierced a moth<sup>b</sup> through the thorax, when it was in a quiescent state, taking care only to do it with a steady hand, and no abrupt motion; and the moth has taken no notice of it whatever. I have even lifted it up by the pin which transfixed it, and have carried it from room to room in the same state of motionless quiescence, and have shewn it in this state to those whose incredulity it was my object to remove. If we be to judge by outward symptoms in this case, where was the pain? The fluttering is the symptom, the only symptom, by which people in general are convinced that an insect is suffering; but here there was no fluttering. And then to shew, that even when it flutters we are not hastily to infer pain, I have suddenly and abruptly touched a leg or some other part of its body, but not so as to wound it, and alarmed the moth, after which it has begun to flutter, and finding the restraint of the pin, has never ceased to

<sup>b</sup> Not one of those moths which, like some, if not all, of the *Lithosiæ*, counterfeit sleep or death when suddenly alarmed.



flutter more and more until I destroyed it. I conclude, therefore, that the violent struggles, which excite so much pity in us before we know their cause, are merely the effect of alarm, and display that strong instinct so necessary to insects for their preservation, by which they endeavour to avoid any thing strange, and to escape from restraint. If this conclusion be not thought inevitable, let me refer to Messrs. Kirby and Spence's Introduction to Entomology, for the mention of a fact, which though I cannot vouch for myself, I must believe on such good authority. These gentlemen tell us, that the head of a wasp has been known to eat honey after it had been severed from the body; and that the union of the sexes has taken place between bodies that have been deprived of their heads. If this be true, it settles the question at once. It demonstrates, that, under the worst possible circumstances, either no pain exists, or it is most easily superseded. On any hypothesis, therefore, the charge of cruelty in the destruction of insects seems to be refuted. Either there is no analogy whatever between them and us on account of the distinction I before mentioned with respect to their divisibility, or if we gratuitously suppose such analogy to exist, and are guided in our judgment solely by outward symptoms, we are compelled to confess, that insects can have no feeling of pain at all resembling our own.

It has been well observed, that, from the benevolence of the Deity, we might, *à priori*, have drawn the same conclusion. We find insects liable to such an infinite number of accidents, and perishing by such slow degrees in what we should call torture, that we are driven to conclude that it is a mistake to call it torture. I have seen a beetle, a *Scarabæus* I think, in the possession of a person in London, which he found entirely eaten up, all but the upper hard shell, by the mites which invariably infest such beetles. It lived six days after he met with it. I once found a moth, *Callimorpha miniata*, impaled alive on a thorn, which had pierced its body: it was quiet, and when I lifted it off the thorn it flew away.<sup>c</sup> Every one who is in the habit of observing what lies in his way, must occasionally have met with beetles in the foot-path, half crushed, and glued

<sup>c</sup> How could it have got into such a situation if it had felt pain as the thorn was entering its body? Could we ever expect to find a wild beast in a similar situation?



to the ground by their own entrails, yet alive, and likely to linger long in that state. Can we believe that they would be endued with such vitality if their sensibility were not diminished in proportion? To shew how fitting it is that we should make the right inference in such a case with regard to the Divine benevolence, I may be permitted to mention that I had a friend, who, by making the wrong one, actually became, for a time, an avowed sceptic. It was strange to me that he should allow his uncertainty with respect to the feelings of insects to be set in comparison with, and even to supersede, his certainty with respect to the goodness of the Deity; but the fact proves how compelled a reflecting person must be to adopt one or other alternative. I might, in order to strengthen my argument, refer to the apparently cruel economy of the flies which belong to the *Ichneumonidæ* and other innumerable Hymenopterous families, and Dipterous ones too, which deposit their eggs in the caterpillars of moths.<sup>d</sup> How often do we find such a caterpillar (and it is not confined to such only), which lives not for itself, but solely for its voracious tenants, which devour its substance, sparing only its vitals for a last meal when it shall have come to complete maturity and ceased to eat. Nay, according to Mr. Newman's recent observations,<sup>e</sup> these tenants may themselves, at the

<sup>d</sup> Paley (in his *Natural Theology*, I believe) observes, with respect to the destruction of cattle for our food, that, if it does not shock us that they should die at all, if we do not go the length of demanding immortality for them, it should be pleasing to our feelings that they die as they do, in the speediest manner, in full possession of health, after living an agreeable life, during which they were plentifully provided with the best sustenance; the alternative being, if there were any alternative (for in general they are produced, as well as supported, for the purpose of yielding us food), that they would pass a half-starved existence, and endure a lingering termination to it by disease or hunger. Similar reasoning will apply to the breeding of insects with a view to the cabinet—they are gainers by it. The larvæ or caterpillars, which are in that stage of the quadripartite existence of insects, which is in some cases the only eating stage, and in all cases the principal one, are enabled to feed day and night in captivity, whilst in the open air the majority of them feed only in the night; and they are protected from their indefatigable pursuers, the ichneumons, which would deposit their eggs in them, and (on the supposition of their feeling, which I am only granting for the sake of argument) would render their life a burthen to them, and terminate it even at an earlier stage than the entomologist would.

<sup>e</sup> This remarkable discovery was published in Mr. Loudon's *Magazine of Natural History*, No. XXV. p. 252. Our readers will find it well worth perusal.—ED.

very same moment, be tenanted by devourers of another tribe; so that family within family may be living beneath the skin of the caterpillar, who, if he be a sufferer, is a very patient one, exhibiting no disposition to pine, or to forego one day of the existence which nature originally destined him to enjoy. But I need say no more on this point. The study of insects formed, we have no reason to doubt, a part of the wisdom of Solomon, without incapacitating him for higher wisdom; and the pious father of Solomon addresses the Almighty in words of inspired truth, “Thy *mercy* is over *all* thy works.”

There is a popular quotation which it is worth while to notice, which brings the authority of Shakspeare to bear on the question in dispute. We are triumphantly reminded that he tells us

“— the poor beetle that we tread upon,  
In corporal suffrance finds a pang as great  
As when a giant dies.”

But not to say that even Shakspeare is not an oracle on all points, it is somewhat amusing that his words should, in this case, be entirely wrested from their original purpose. His purpose was to shew how little a man feels in dying;—that “the sense of death is most in apprehension, not in the act; and that even a beetle, which feels so little, feels as much as a giant does.” The less, therefore, the beetle is supposed to feel, the more force we give to the sentiment of Shakspeare.

I might, before I conclude, advert to the argument we sometimes hear, of the want of Scriptural sanction for killing insects with a view to a collection. This argument must come with a bad grace from those who allow themselves to kill them, with a view merely to the removal of a personal or domestic annoyance. The exhibition of a large and most beautiful department of the creation is surely a higher object than this; and such an exhibition can be made in no other way than by means of a collection. When all scruples have vanished at the bidding of our own convenience or comfort, it is too late to be fastidious only when God’s glory is concerned. Even if it be but for scientific purposes that the collection is made, I know not how a person can consistently reproach the Entomologist, as long as he is conscious that he has not forbidden his gardener to destroy the slugs that partake of his cabbages, or the blight insects,—the *Aphides*,—that impair the

luxuriance of his roses. As to the quotation from Scripture which I have heard,—“We must not do evil that good may come,”—it can only be from want of reflection that it can be applied to the present case. Is it, *in itself*, an evil to kill an insect?

But I must not go on. I have already trespassed on the attention of my audience, and must beg pardon of those to whom I have communicated nothing new. I will only say, in conclusion, that as there must always remain some doubt with respect to the feelings of insects, it is right that they should have the benefit of the doubt. Their life should not be wantonly taken from them,—it is the only one they have. I have never tried any experiments at their expense; what I have observed has occurred when I was killing them for the cabinet. The speediest mode of putting them to death should always be resorted to; and it yet remains to confer a great obligation on Entomologists by discovering a mode which, without injury to their colours, shall be instantaneous.

ADDENDUM.—The remarkable vitality of insects might have been adduced, not only as a proof of their want of sensibility, but as a point of resemblance between them and plants. It is said that flies which have been bottled in wine, and have remained in the bottles several years, have come to life again on being released and exposed to the sun. There are some interesting facts mentioned in the *Quarterly Review*, in an article on Dwight's Travels in America, which bear upon this analogy between insects and plants. It may, indeed, be asked, without irreverence, what became of the insects in the deluge? It is not said that any thing but beasts, fowls, and reptiles were taken into the ark. Insects seem to have been left on the same footing with plants,—some individuals of each kind being likely to recover after the immersion.

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ART. XV.—*Monographia Chalcidum*. By FRANCIS WALKER,  
Esq. F. L. S.

(Continued from page 29.)

Family II.—TORYMIDÆ.

Caput transversum: oculi laterales: ocelli in triangulum dispositi: antennæ 13-articulatæ, plus minusve clavatæ: mandibulæ tridentatæ, aut una tridentata altera bidentata: maxillæ elongatæ, externè hirsutæ, internè ciliatæ: mentum plus minusve elongatum: labium elongatum, fissum: palpi maxillares articulis 4, ultimo elongato, subfusiformi: palpi labiales articulis 3, secundo brevi: thorax gibbus aut convexus: prothoracis scutellum plerumque antice angustatum: mesothoracis scutum magnum, suturis duabus lateralibus inter parapsides et scutum proprium benè determinatis, scutellum ovatum; paraptera triangula: metathoracis præscutum angustum; scutellum magnum, canaliculatum: abdomen<sup>a</sup> convexum aut gibboso-compressum: oviductus plerumque exsertus: coxæ magnæ: femora clavata aut subclavata: tibiæ apice spinis duabus armatæ: tarsi articulo 1<sup>mo</sup>. longo, sequentibus longitudine decrescentibus, ultimo longiore, crasso: ungues arcuatæ pulvilli distincti: alæ anticæ nervus solitus ramulum stigmaticalem emittens perbreve, apice furcatum.<sup>b</sup>

It may be observed that this family resembles the preceding in the developement of the thoracic segments, the abdomen, &c.; though the trophi are very differently formed, and the mandibles armed with much longer and sharper teeth: the stigmal branch is very short, curved: the apex furcate, the upper division pointing toward the extremity of the costal nerve, the lower terminated by the stigma: in some of the smaller species the furcation is indistinct.

The Eurytomidæ, and most of the pentamerous Chalcides, have very little variation in the shape of the stigmal branch;

<sup>a</sup> According to MacLeay there are nine primary abdominal segments, some of which, owing to the great developement of others, are almost evanescent. Of this fact the Chalcides offer a good illustration; where the shape of the abdomen, owing to the difference in the size and form of the segments, is almost infinitely varied; and the disposition of the ventral segments differs occasionally in the same species. As a complete description of the abdomen in each species of this tribe would alone fill a volume, and is more appropriate to their anatomy, I have omitted it here; trusting that the descriptions given will enable entomologists to recognize my genera and species.

<sup>b</sup> Forma ad hanc familiam, Leucospidem, Chalcidem et cognatos propria.

but the formation here described is peculiar to this family, and to *Leucospis*, *Thoracanthus*, *Smiera*, *Dirhinus*, *Chirocera*, *Chalcis*, *Haltichella*, and their affinities. These genera are distinguished by their gibbous bodies, large coxæ, and incrassated posterior thighs. The species are chiefly extra-European, and among their number are some of the largest in the whole tribe. Their natural situation I imagine to be immediately following this family; but having few genera or species, I shall leave them for examination to some future opportunity.

*Characteres Generum.*

Mesoscutellum	convexum proscutellum	{ elongatum . . . . . 1. MEGASTIGMUS.	{ femoribus posticis incrassatis dentatis, tibiis posticis arcua- tis . . . . . 2. PRIOMERUS.	
				breve. Pedes
	gibbum. Antennæ arti- cuto 4to.	{ subæquales . . . . 4. CALLIMOME.		
			{ brevi . . . . . 5. ORMYRUS.	

Dalman divides his genus *Torymus* (named *Callimome* long before by *Spinola*) into three sections, the second one subdivided, viz.

A. (*Megastigmus*.) *Stigma incrassatum magisque determinatum: collare majusculum: corporis color non metallicus.*

B. (*Torymus* propr.) *Stigma parvum abbreviatum; corpore metallicolor.*

(a.) *Femoribus posticis dentatis.*

(b.) *Femoribus omnibus muticis.*

C. (*Anomali*.) *Corpore brevior, abdomine gibbosiore, oviductu non exserto.*

I have reserved his name, *Torymus*, for the first division of his second section; the other division is *Callimome*, *Spinola*. It is not unlikely that his third section is allied to *Ormyrus*, *Westwood*.

GENUS I. MEGASTIGMUS, *Dalman*.

Caput medium: palpi maxillares articulis 1, 2 et 3 subæqualibus: mentum ovatum, anticè acuminatum, posticè subquadratum:

mandibulæ arcuatæ, tridentatæ: antennæ subclavatæ, pilosæ, articulo 1°. elongato, 2°. breviclyathiformi, 3°. brevissimo, 4°. et sequentibus ad 10<sup>am</sup>. latioribus longitudine decrescentibus, tribus ultimis approximatis: pedes subæquales: thorax convexus: proscutellum elongatum, anticè angustatum aut ferè subquadratum: mesoscutellum convexus: abdomen elongatum, convexus, *maris* petiolatum, *feminæ* sessile: oviductus exsertus.

Sp. 1. Meg. transversus. Fem. *Fulvus nigro variegatus, oviductu corpore longiore, alis hyalinis.*

Caput posticè et inter oculos nigrum: oculi ocellique rufo-fusci: prothorax posticè flavus: mesoscutum anticè et paraptera nigro-fusca: metathorax ater: abdomen basi nigro maculatum, fasciis 5 connectis abbreviatis fuscis; segmentorum margines postici flavi: antennæ nigræ, scapus subtus flavus: pedes flavi: coxæ nigræ: tarsi apice fusci: nervus subcostalis fuscus: stigma magnum, nigrum. (Alarum longitudo, 2½—3 lin.)

July; on grass in woods; near London.

Sp. 2. Meg. dorsalis. Mas. et Fem. *Viridis flavo variegatus, abdomine æneo, oviductu corpore brevior, alis subhyalinis.*

Ichneumon dorsalis. *Fabr. Ent. Syst. Suppl.* 231. 218.

Coqueb. . . . *Illust. Icon.* I. Tab. 5. Fig. 3.

Diplolepis dorsalis. *Fabr. Syst. Piezat.* 151. 11.

Cinips dorsalis. . *Fonscolombe, Ann. Sci. Nat.* 26. 282.

*Mas.* Caput anticè flavum: oculi flavo cincti ocellique rufi: antennæ fuscæ: scapus viridis, basi subtusque flavus: coxæ posticæ nigro-fuscæ: femora postica externè viridi-æneo maculata, basi rufo-cincta: pedes straminei: tarsi apice fusci: nervus subcostalis fuscus; stigma nigro-fuscum, magnum.

*Fem.* Caput flavum, inter oculos viride: abdomen flavum, disco-fusco-æneo: pedes straminei: tarsi apice fusci. (Alarum longitudo, 1½—3 lin.)

*Var. β.*—*Mas.* Pedes omninò flavi.

*Var. γ.*—*Mas.* Antennæ articulo secundo æneo-fusco.

*Var. δ.*—*Fem.* Thorax viridis, anticè et lateraliter flavus: paraptera basi nigra: antennæ nigro-fuscæ, apice basique fuscæ: stigma posticè in alarum discum productum.

*Var. ε.*—*Fem.* Flavus: caput inter ocellos thoracisque linea virides.

June and July; on oak trees; near London. September; Isle of Wight.

GENUS II. PRIOMERUS,<sup>c</sup> *Walker.*

Caput medium: thorax convexus: abdomen subpetiolatum: oviductus exsertus: antennæ clava articulis precedentibus multo latiore: femora coxæque posticæ elongatæ, incrassatæ; illa subtus dentata: tibiæ posticæ arcuatæ.

Sp. 1. Priom. pachymerus. Fem. *Nigro-viridis, abdomine æneo-viridi, oviductu corpore dimidio longiore, antennis fuscis, pedibus rufis, alis subhyalinis.*

Oculi ocellique rufi: antennarum clava nigra, scapus rufus: abdomen subtus rufum: coxæ nigro-virides. (Alarum longitudo,  $1\frac{3}{4}$  lin.)

The disc of the thorax is dark green, the margins brighter. July; South of France.

GENUS III. TORYMUS, *Dalman.*

Caput medium: thorax convexus: proscutellum breve: abdomen sessile: oviductus exsertus: clava articulis duobus præcedentibus multo brevior, acuminata: femora postica subtus clavata, serratæ apice abruptè graciliora.

The sutures of the mesoscutum are indistinct: the posterior thighs are dilated beneath, the dilatation increasing in breadth from the base to near the apex, where it terminates at a right angle: the stigmal branch is longer than in *Callimome*, and forms a more acute angle with the continuation of the subcostal nervure.

Sp. 1. Tor. caliginosus. Fem. *Nigro-purpureus, thorace nigro-æneo, oviductu abdomine longiore, tarsi stramineis, alis fuscis.*

Abdomen basi viride: antennæ nigræ, scapus viridis: tarsi apice fuscii: alæ basi hyalinæ, anticæ versus medium obscuriores. (Alarum longitudo, 2 lin.)

July; South of France.

GENUS IV. CALLIMOME, *Spinola.*

Ichneumon. *Lim. Deg. Fabr. Scop. Schr. Vill. Ross. Walck.*

Cynips. . . *Geoff. Schæff. Schr. Fabr. Oliv. Walck. Lat. Christ. Leach, Samouelle, Fonscolombe.*

<sup>c</sup> Πριων serra, μηρος femur.



- Diplolepis . *Fabr. Walck. Illig. Spin.*  
 Cleptes . . *Fabr.*  
 Chalcis . . *Cuvier, Lam. Jurine.*  
 Misocampus *Latr.*  
 Torymus . *Dalman, &c.*

A Megastigmo, proscutello brevi *marisque* abdomine sessili, differt : antennæ plus minusve clavatæ : thorax convexus aut gibbus : oviductus exsertus aut subexsertus.

The species of this genus deposit their eggs in the larvæ of the gall-insects, (Cynips, *Linn.*), for which purpose their long ovipositors are well adapted. Réaumur, Degeer, Olivier, Latreille, and Spinola, have published many interesting observations on their economy and structure. The basal abdominal segment is long, and, lapping over the second, extends to the base of the third joint: its extremity is not connected with the abdomen.

*Obs.* Where the colour of the antennæ is not mentioned, it is invariably black.

Sp. 1. Callim. regalis. Mas. *Purpureo-cyaneus, abdomine æneo, antennis nigris, pedibus rufis, alis subfuscis.*

Caput cyaneum, inter oculos utrinque viride: oculi fuscii: ocelli pallidi: thorax purpureo-cyaneus, punctatus, rufo-hirtus: abdomen nitidum, glabrum, æneum, basi aureo-viride: antennæ nigræ: pedes rufi: tarsi pallidi, articulis 4 et 5 fuscis: alæ fuscæ, basi hyalinæ, anticæ fusco interruptè fasciatæ. (Alarum longitudo,  $3\frac{1}{2}$  lin.)

The colour of the head and thorax is deep blue, slightly tinged with purple: the first abdominal segment is golden green, changing to æneous toward its posterior margin: the second and third segments are cupreous: the abdomen beneath, and the paraptera of the mesothorax are green: the anterior part of the superior wings is nearly hyaline, with a large fuscous spot in the centre.

July; on plants in a wood; near London.

Sp. 2. Callim. cynipedis. Fem. *Purpureus, abdomine cupreo, basi fulvo, pedibus rufis, alis subfuscis.*

Ichneumon cynipedis *Linn. Syst. Nat. II. 939. 68. Fn. Succ. 1639. Fabr. Ent. Syst. 2. 187. 223.*

Diplolepis cynipedis. *Fabr. Syst. Piez. 152. 17.*

Oculi fuscii : ocelli pallidi : thorax purpureus, anticè æneo-viridis, posticè viridi-nitens : oviductus corpore dimidio longior : antennarum articulus primus flavus, apice niger : pedes pallidè rufi : tarsi straminei, apice obscuriores : alæ anticæ fusco longitudinaliter maculatæ. (Alarum longitudo,  $3\frac{3}{4}$  lin.)

Prothorax æneous green : mesothorax purple, æneous green when viewed horizontally ; margins of the segments, and a spot near the apex of the scutellum, green : metathorax and coxæ of posterior legs bright green : abdomen dark cupreous, the two basal segments fulvous : legs pale red : two basal joints of the tarsi straw-coloured : the superior wings have a fuscous spot extending almost from their base to the stigmal branch.

July ; in a meadow ; near London.

Sp. 3. Callim. Roboris. Mas et fem. *Cyaneus, capite viridi, abdomine æneo basi flavo, pedibus rufis, alis hyalinis* (mas) aut *subfuscis* (fem.)

Caput viride : thorax cyaneus aut purpureo cyaneus : *maris* abdomen æneum aut viridi-æneum, basi flavo cingulatum ; *feminae* rufum, basi supra viride, apice æneo cupreo viridi nigroque variegatum : scapus rufus, *maris* supra viridis : oviductus corpore paullo brevior : pedes rufi : tarsi flavi, articulis duobus ultimis pallidè fuscis. (Alarum longitudo,  $1\frac{3}{4}$ — $3\frac{1}{2}$  lin.)

*Var. β.*—*Mas.* Abdomen supra viridi-æneum, immaculatum.

*Var. γ.*—*Fem.* Thoracis latera viridi variegata.

This species is very abundant on the foliage of oak trees, and amongst the grass beneath, near London, from June to September. It varies considerably in size ; the male is usually much smaller than the female. It resembles *Cinips ventralis*, *Fonscolombe*.

Sp. 4. Callim. quadricolor. Fem. *Viridis, abdomine cupreo basi rufo, pedibus rufis, alis hyalinis, anticis fusco maculatis.*

Caput cyaneo-viride : oculi ocellique rufi : thorax viridis, nitens : abdomen cupreum, basi rufum, apice viride : oviductus abdomen longitudine æquans : scapus et pedes rufi. (Alarum longitudo,  $1\frac{1}{2}$ — $2\frac{1}{2}$  lin.)

It has thick legs and antennæ, and runs much faster than most species of this genus : the base of the first abdominal

segment is green above: the tips of the posterior thighs, in some specimens, are slightly fuscous: the wings are narrow, the superior have a large fuscous spot occupying more than half their breadth, and extending from a little beyond the stigmal branch nearly to their base.

June; in a meadow; near London. September; on ferns; in the vicinity of Ambleside, Westmoreland.

Sp. 5. Callim. Geranii. Curtis. Fem. *Viridis, abdomine flavo cingulato, pedibus flavis, alis hyalinis.*

Abdomen viridi-æneum, flavo cingulatum, basi viride, apicis lateribus æneis aut nigris: oviductus corpus longitudine æquans: scapus et pedes flavi: genua tarsisque straminei, horum apices fuscii: femora antica apice pallidè virescentia. (Alarum longitudo, 3—3½ lin.)

Var. β. — Caput viridi-æneum: scapus supra niger: abdomen apicem versus viride.

The wings of this species are much longer and broader than those of *C. Roboris*, or *quadricolor*.

September; near the sea-shore; Isle of Wight.

Sp. 6. Callim. pretiosus. Mas. *Cyaneo-viridis, abdomine cupreo basi flavo, pedibus rufis, alis hyalinis.*

Oculi ocellique rufo-fuscii: abdomen apice viridi-æneum, segmentum primum flavum basi cyaneum: femora postica virentia: tarsi flavi, apice fuscii. (Alarum longitudo, 1¾ lin.)

Reared with *C. Bedeguaris*, by Mr. Curtis, from the galls of the dog-rose.

Sp. 7. Callim. Bedeguaris. Mas et Fem. *Viridis, abdomine cupreo aut æneo, oviductu corpore paullo breviorè, pedibus pallidè rufis, alis subfuscis.*

Ichneumon Bedeguaris. *Lin. Syst. Nat.* II. 993. 63. *Fn. Su.* 1634. *Fabr. Ent. Syst.* II. 185. 215. *Geoff. Ins.* II. 296. 1. *Roes. Ins.* III. Tab. 53. Fig. F. A. *Aut. Nat. Cur. Dec.* II. *Ann.* II. *Obs.* 10. *Réaum. Ins.* III. Tab. 41. Fig. 13, 14. &c. &c.

Diplolepis Bedeguaris. *Fabr. Syst. Piezat.* 150. 6.

Callimome . . . *Spinola.*

Misocampus	.	.	<i>Latr.</i>
Pteromalus	.	.	<i>Swed. Stock. Trans. 1795.</i>
Torymus	.	.	<i>Dalman.</i>
Cinips	.	.	<i>Oliv. Enc. Méth. Fonscolombe. Ann. Sci. Nat. 26. 283.</i>

*Mas.*—Æneo-viridis: oculi ocellique rufi: thorax apice viridis: abdomen æneum, basi viride: scapus totus niger: genua tarsique straminei, horum apices fusci.

*Fem.*—Viridis: caput inter oculos æneum: thorax apice subtusque æneus, segmentorum margines concolores: abdomen cupreum, basi viride: scapus basi subtusque flavus. (Alarum longitudo,  $1\frac{3}{4}$ —3 lin.)

It is narrower than *C. pretiosus*: the wings also are narrower and longer, the nervures darker.

This insect, and several other species, are parasites of the larvæ which inhabit the galls of the dog-rose. Mr. Curtis has reared it from the galls during the months of July, August, and beginning of September. Mr. Wailes has taken it in the North of England.

Sp. 8. *Callim. varians. Fem. Viridis, nitens, abdomine apice æneo, oviductu corpore paullo longiore, pedibus flavis, femoribus supra viridibus aut æneis, alis subfuscis.*

Oculi ocellique rufi: thorax posticè subtusque viridi-æneus: abdominis segmentum primum viride, cupreo notatum: scapus flavus: genua tarsique straminei. (Alarum longitudo,  $1\frac{3}{4}$ — $2\frac{1}{4}$  lin.)

*Var. β.*—Scapus fuscus, basi subtusque flavus: tibiæ posticæ femoraque 4 antica fusco maculatæ.

The basal joint of the antennæ above has sometimes a fuscous line near the apex, extending occasionally almost to the base: the thorax beneath, the margin of its segments above, and the whole metathorax, are æneous: the basal abdominal segment has several small cupreous spots on its disc: the thighs have a green or æneous spot above, larger and brighter in the posterior pair.

August; in meadows; near London.

Sp. 9. *Callim. formosus. Fem. Cupreus, nitens, oviductu corporis dimidio longiore, pedibus flavis, alis subfuscis.*

Caput cupreo-æneum, anticè viride: oculi ocellique rufo-fusci: thorax anticè posticèque viridi-æneus: abdominis segmentum

primum versicolor, cupreo æneo viridique micans: scapus flavus, apice æneo-fuscus: femora fulva, postica fusca: alæ anticæ ramulum prope stigmaticalem fuscescentes. (Alarum longitudo,  $3\frac{1}{2}$  lin.)

The paraptera of the mesothorax are green: the basal abdominal segment, and the posterior coxæ, have a brilliant gold colour, changing to cupreous or green, according to the direction in which they are viewed: the posterior thighs have a cupreous or æneous tinge: the inferior wings are almost colourless.

July; on grass, beneath an oak tree; near London.

Sp. 10. Callim. scutellaris. Fem. *Viridis, cupreo micans, scutello cupreo, abdomine cupreo-æneo, oviductu corpore vix brevior, pedibus stramineis, femoribus posticis fuscis, alis subhyalinis.*

Thorax posticè abdominisque segmentum basale viridi micantes: scapus flavus: tibiæ posticæ femoraque 4 antica fulvæ: alæ superiores anticè subfuscæ. (Alarum longitudo, 3 lin.)

The head and thorax, being seen in different directions, vary in colour from green to cupreous, occasioned probably by the punctures having cupreous bases, while their sides and edges are green: the metathorax is golden green, as likewise is the abdomen, excepting the first segment and the anterior part of the second, which are green: it has more slender antennæ than the preceding species.

August; on grass, beneath trees; near London.

Sp. 11. Callim. Hederæ. Fem. *Cupreo-æneus, oviductu abdomine paullò longiore, pedibus pallidè rufis, alis anticis pallidè flavescentibus.*

Oculi ocellique fusco-rufi: abdominis segmentum primum supra: thorax anticè posticèque virides: scapus flavus, apice fuscus: tarsi 4 postici pallidè flavi: alæ hyalinæ, superiores marginem versus anticum pallidè flavescentes. (Alarum longitudo,  $2\frac{1}{2}$ — $2\frac{3}{4}$  lin.)

The body is small: the head and thorax vary in colour from cupreous to green, like the preceding species: the first, and sometimes the second abdominal segment is green above: the antennæ are rather slender: the wings broad.

October; on the flowers of the ivy; near London.

Sp. 12. Callim. Arundinis. Curtis. Fem. *Æneo-iridis, oviductu corpore rix longiore, pedibus rufis, alis anticis subfuscis.*

Caput æneum: oculi ocellique rufi: abdomen basi viride: tarsi 4 postici straminei, apice rufi: alæ elongatæ, angustæ. (Alarum longitudo,  $2\frac{1}{4}$  lin.)

Narrow, bright æneous green: legs slender: two basal joints of four posterior tarsi pale straw colour: wings slightly fuscous.

September; near the shore; Isle of Wight.

Sp. 13. Callim. macropterus. Fem. *Viridis, abdomine æneo, oviductu corpore rix brevior, pedibus flavis, alis subfuscis, quàm in C. Bedeg. latioribus.*

Caput posticè viridi-æneum: oculi ocellique rufi: thorax lateraliter posticèque æneus: abdomen basi viride: scapus viridis, subtus flavus: tarsi 4 postici basi genuaque straminei: alæ latæ. (Alarum longitudo,  $2\frac{3}{4}$  lin.)

Bright green: abdomen bright æneous, changing to bright green toward the base: wings long and broad.

August; on grass beneath trees; near London.

Sp. 14. Callim. flavipes. Mas et fem. *Æneo-iridis, oviductu abdomine paullò longiore, pedibus flavis, alis subhyalinis.*

Oculi ocellique rufi: *maris* abdomen viride, basi apiceque æneum: *feminæ*, scapus flavus, apice fuscus: tarsi 4 postici genuaque straminei. (Alarum longitudo,  $1\frac{3}{4}$ — $2\frac{1}{4}$  lin.)

*Var. β.*—*Fem.* abdomen basi æneum.

*Var. γ.*—*Mas*, femora postica viridi, tibiæ posticæ fusco, maculatæ.

Apical joints of tarsi fuscous: wings much paler and rather narrower than those of the preceding species.

May and June; oak trees; near London. September; Isle of Wight. July; Forest of Fontainebleau.

Sp. 15. Callim. Dauci. Curtis. Fem. *Viridis, nitens, oviductu abdomen longitudine æquante, pedibus flavis, alis hyalinis.*

*Cynips. auratus. Fourc. Oliv. &c.?*

Oculi ocellique rufi: antennarum scapus flavus apice fuscus, articulus secundus fusco-æneus: genua tarsique 4 postici straminei, horum apices fusci. (Alarum longitudo,  $1\frac{3}{4}$ —2 lin.)

It resembles the preceding species, but the colour is entirely brilliant green: the body is narrower and longer: the wings are quite hyaline, their nervures paler.

May and June; on oak trees; near London.

During the month of August, Mr. Curtis found, on the *Daucus Carota*, near Niton in the Islè of Wight, some galls containing bright orange-coloured larvæ. They produced this insect at the beginning of September.

Sp. 16. Callim. *basalis*. Fem. *Æneo-viridis, nitens, abdomine viridi basi æneo, oviductu abdomen longitudine æquante, pedibus flavis, alis subfuscis.*

Oculi ocellique rufi: scapus fuscus, subtus flavus: genua tarsique straminei: tarsi 4 postici apice fuscii. (Alarum longitudo, 2 lin.)

Body shorter: wings darker than of *C. flavipes* or *Dauci*: abdomen bright green: base of the first segment bright æneous.

July, August; in fields; near London.

Sp. 17. Callim. *confinis*. Fem. *Viridis, nitens, oviductu abdomen longitudine æquante, pedibus pallidè rufis, tibiis posticis fusco-maculatis, alis hyalinis.*

Oculi ocellique rufi: scapus viridis, subtus flavus: tarsi apice fuscii, 4 postici genuaque straminei: nervus subcostalis flavus. (Alarum longitudo,  $1\frac{1}{2}$ — $1\frac{3}{4}$  lin.)

*Var. β.*—scapus flavus.

*Var. γ.*—thorax æneo-viridis, posticè viridis.

The antennæ are shorter and more clavate than those of *C. flavipes*, *Dauci*, or *basalis*; there is sometimes a fuscous spot on each of the posterior tibiæ.

August; in fields; near London. September; Isle of Wight.

Sp. 18. Callim. *autumnalis*. Fem. *Viridis, nitens, abdomine æneo basi viridi, oviductu abdomine paullo longiore, pedibus flavis, alis hyalinis.*

Oculi ocellique rufi: thorax posticè viridi-æneus: scapus flavus, apice niger: genua tarsique straminei, horum apices fuscii: femora tibiæque posticæ nonnunquam subtus fuscae: nervus subcostalis stigmaque pallidi. (Alarum longitudo,  $1\frac{3}{4}$  lin.)



It is smaller and narrower, and has narrower wings than *C. flavipes*, *Dauci*, or *basalis*: the antennæ are more slender and less clavate than those of *C. confinis*: the subcostal nervure and stigma are pale fuscous, the latter small.

September; Isle of Wight.

Sp. 19. *Callim. nitens*. Fem. *Viridis, nitens, abdominis disco æneo, oviductu rix exserto, pedibus stramineis, femoribus posticis supra viridi maculatis, alis subfuscis.*

Oculi ocellique rufi: abdominis linea dorsalis abbreviata ænea: scapus flavus, supra viridis: articulus secundus æneo-fuscus. (Alarum longitudo,  $2\frac{1}{3}$  lin.)

The base of the abdomen beneath, and its second and third segments above, are æneous: the apical joints of the four posterior tarsi are yellow: the claws slightly fuscous: the wings long and broad.

July; near London.

Sp. 20. *Callim. brevicauda*. Fem. *Viridis, nitens, præcedenti angustior, abdominis disco æneo, oviductu subexserto, pedibus pallidè rufis, femoribus viridi-æneis, tibiis posticis fuscis, alis subfuscis.*

Oculi ocellique rufi: thoracis abdominisque latera viridi-ænea: scapus, genua tarsisque flavi, postici straminei. (Alarum longitudo,  $2\frac{1}{4}$  lin.)

The abdomen has an æneous line above, extending from the second segment to the apex: the alary nervures are pale: the stigma very small.

September; Isle of Wight.

Sp. 21. *Callim. abdominalis*. Fem. *Viridis, nitens, abdominis basi æneo-cyaneo purpureoque micante, oviductu rix exserto, pedibus flavis, femoribus viridibus, tibiis posticis fuscis, alis hyalinis.*

Oculi ocellique rufi: abdominis segmentorum margines viridi-ænei: scapus viridis, subtus flavus: tarsi 4 postici genuaque straminei, illorum apices fusi. (Alarum longitudo,  $2\frac{1}{4}$  lin.)

It is more slender, and has much narrower wings than the preceding species: the margins of the different thoracic parts are æneous green: the first abdominal segment has its base

æneous, changing to æneous green, green, blue; the apex is purple; the other segments are green, their bases æneous: the stigma is very small.

September; Isle of Wight.

Sp. 22. Callim. mutabilis. Mas et fem. *Viridis, nitens, abdomine æneo-viridi, oviductu abdomen longitudine æquante, pedibus flavis, femoribus viridibus, alis hyalinis.*

Oculi ocellique rufi: thorax posticè æneo-viridis: *maris* abdomen æneum, basi apiceque viride: *femine* viride, anticè cyaneo-viride, lateraliter viridi-æneum: scapus viridis, *femine* basi subtusque flavus: coxæ virides: trochanteres flavi: tibiæ posticæ fusco cingulatæ: genua tarsique straminei, 4 postici apice fusci. (Alarum longitudo,  $1\frac{1}{4}$ —2 lin.)

*Var. β.*—*Mas*, scapus basi flavus: abdomen apice æneum: tibiæ posticæ femoraque fuscæ: tibiæ intermediæ supra pallidè fuscæ.

*Var. γ.*—*Fem.* abdomen æneo-viride, basi viride: femora 4 antica flava, supra virentia.

*Var. δ.*—*Fem.* omnino viridis: pedes flavi: femora tibiæque posticæ pallidè fuscæ.

This species varies considerably in size and colour: the prothorax of the male has a bluish, the metathorax an æneous tinge: the abdomen of the female is green, or æneous green, the base sometimes bluish green: the tips of the four anterior thighs are yellow.

July; on grass beneath trees; near London. September; Isle of Wight.

Sp. 23. Callim. microstigma. Fem. *Viridis, nitens, oviductu abdomine paullò longiore, pedibus flavis, femoribus viridibus, tibiis posticis nigro-fusco cingulatis, alis hyalinis.*

Oculi ocellique rufi: abdomen aureo viride, basi æneum: scapus niger, subtus flavus: trochanteres flavi: genua tarsique straminei, 4 postici apice fusci: nervus subcostalis pallidus: stigma minimum. (Alarum longitudo, 2— $2\frac{1}{4}$  lin.)

*Var. β.*—abdomen viride: apice æneo-viride: scapus basi flavus: femora 4 antica flava, supra virentia.

Bright green: anterior part of the thorax darker: tips of the four posterior tarsi dark fuscous: it has broader wings and a paler stigma than the preceding species.

August; on grass in woods; near London.

Sp. 24. Callim. chloromerus. Mas et fem. *Viridis, nitens, oviductu corpore vix brevior, pedibus flavis, femoribus viridibus, tibiis posticis fusco cingulatis, alis hyalinis.*

Oculi ocellique rufi: *maris* abdomen æneum, basi viride: *femine* scapus viridis, basi flavus: trochanteres, et femora 4 antica basi apiceque, flavi: genua et tarsi straminei, *femine* antici apice flavi: nervus subcostalis pallidus: stigma minimum. (Alarum longitudo  $1\frac{1}{2}$ —2 lin.)

*Var. β.*—*Mas*, femora 4 antica subtus flava.

*Var. γ.*—*Fem.* abdominis segmentum primum cyaneo micans.

*Var. δ.*—*Fem.* thoracis dorsum lateraque viridi-ænea.

The male has the mesoparaptera æneous green: the two basal, and the sides of the two following abdominal segments, green: the apical segment æneous green: the female is entirely bright green: this species is narrower than either of the two preceding, and may also be distinguished from *C. mutabilis* by its smaller and paler stigma.

September; Isle of Wight. On the banks of Windermere, in Westmoreland.

Sp. 25. Callim. latus. Mas et fem. *Viridis, nitens, oviductu abdomen longitudine æquante, pedibus flavis, femoribus viridi-fuscis, alis subfuscis.*

Oculi ocellique rufi: *maris* abdomen æneum, basi viride: scapus viridis aut fuscus, basi subtusque flavus: trochanteres flavi: genua tarsique straminei, postici apice fuscis: *femine* femora viridi, tibiæ posticæ fusco cingulatæ: nervus subcostalis pallidus: stigma minimum. (Alarum longitudo,  $1\frac{1}{2}$  lin.)

The metathorax of the male is darker and less punctured than the pro or mesothorax: the body is short and broad: the posterior tibiæ are fuscous, their tips yellow: the wings are rather short.

July; near London. September; Isle of Wight. North of England; Mr. Wailes.

Sp. 26. Callim. microcerus. Mas. *Viridis, nitens, abdomine æneo, antennis fuscis, basi nigris, pedibus flavis, femoribus posticis viridi-fuscis, alis hyalinis.*

Oculi ocellique rufi: thorax posticè et lateraliter viridi-æneus: abdomen basi viride: scapus et articuli tres sequentes nigri, ille subtus

flavus : tibiæ posticæ fusco cingulatæ : genua tarsique straminei, horum apices fusci : nervus subcostalis pallidus : stigma minimum. (Alarum longitudo,  $1\frac{1}{2}$  lin.)

Head slightly æneous : prothorax dark green : mesothorax bright green : first and second abdominal segments green : antennæ short and slender : subcostal nervure pale fuscous, yellow towards its base.

July ; near Clermont, in Auvergne.

Sp. 27. Callim. æqualis. Fem. *Viridis, abdomine viridi-æneo, oviductu dimidio abdomine longiore, pedibus flavis, tibiis posticis femoribusque fuscis, alis hyalinis.*

Oculi ocellique rufi : thorax posticè æneo-viridis : abdomen basi viride : scapus fuscus, basi subtusque flavus : femora postica supra virentia : genua tarsique 4 postici straminei, horum articuli duo ultimi fusci : nervus subcostalis pallidè fuscus : stigma parvum, obscurius. (Alarum longitudo,  $1\frac{1}{2}$  lin.)

Tips of thighs and posterior tibiæ yellow : it has narrower, shorter, and rather less hyaline wings than C. chloromerus, mutabilis, or microstigma : from the two latter it may also be distinguished by its more slender body.

June ; near London.

Sp. 28. Callim. chlorinus. Fem. *Viridis, nitens, oviductu abdomine brevior, pedibus flavis, femoribus viridibus, tibiis fuscis, alis hyalinis.*

Oculi ocellique rufi : abdominis segmentum primum cyaneo-viride : scapus flavus, apice fuscus : tibiæ fusco maculatæ, posticæ nigro-fuscæ : genua tarsique straminei, horum apices fusci : nervus subcostalis pallidè fuscus : stigma parvum. (Alarum longitudo,  $1\frac{1}{2}$  lin.)

Narrower and more linear than the preceding species : tips of thighs and posterior tibiæ yellow : four anterior tibiæ yellow, with a pale fuscous spot near the base.

June ; near London.

Sp. 29. Callim. leptocerus. Mas et fem. *Æneo-viridis, nitens, oviductu abdomine longiore, pedibus fulvis, femoribus viridifusco, tibiis posticis fusco cingulatis, alis subhyalinis, quàm in C. æquali aut chlorino latioribus.*

Oculi ocellique rufi : mesoparaptera ænea : abdomen viride segmentorum margines viridi-ænei : scapus fuscus, basi subtusque flavus :

genua tarsique straminei, horum apices fuscì : nervus subcostalis fulvus : stigma parvum. (Alarum longitudo,  $1\frac{1}{3}$ — $1\frac{2}{3}$  lin.)

Var.  $\beta$ .—Fem. abdomen basi cyaneo-viride.

Var.  $\gamma$ .—Fem. abdomen viride, basi æneum.

Var.  $\delta$ .—Fem. abdomen totum viride.

Var.  $\epsilon$ .—Mas, pedes flavi, immaculati.

Body and wings much broader than those of the two preceding species : antennæ slender.

September ; Isle of Wight. North of England. Scotland.

Sp. 30. Callim. micropterus. Fem. *Viridis, abdomine æneo-  
viridi, oviductu corpore paullo breviorè, antennis quàm in  
C. æquali tenuioribus, pedibus fulvis, femoribus viridibus,  
tibiis posticis nigro-fuscis, alis hyalinis, quàm in C. chloro-  
mero brevioribus.*

Oculi ocellique rufi : abdomen basi viridi nitens : femora tibiæque apice flavæ : genua tarsique straminei, horum apices fuscì : nervus subcostalis fulvus : stigma fuscum, parvum. (Alarum longitudo,  $1\frac{1}{3}$  lin.)

The head and thorax are dark green ; the antennæ short, more slender than of *C. æqualis* : the trochanters are fulvous : it resembles *C. chlorinus* in shape, and has narrower wings than *C. leptocerus*.

July ; near London.

Sp. 31. Callim. bicolor. Fem. *Æneo-viridis, C. mutabili  
angustior oviductu abdomen longitudine æquante, pedibus  
flavis, tibiis posticis femoribusque fusco cingulatis, alis  
hyalinis.*

Oculi ocellique rufi : abdominis segmentum primum viride, cupreo variegatum : scapus fuscus, basi subtusque flavus : femora postica supra virentia : genua tarsique straminei, horum apices fuscì : nervus subcostalis pallidè fuscus : stigma parvum. (Alarum longitudo,  $1\frac{1}{3}$  lin.)

This species is more slender than *C. latus*, has a shorter and much broader abdomen than *C. chlorinus*, and may be distinguished from *C. leptocerus* by its narrower wings.

August ; in fields ; near London.

Sp. 32. Callim. leucopterus. Fem. *Viridis, nitens, abdomine  
basi cyanco micante, oviductu corpore vix breviorè, pedibus*

*flavis, femoribus viridibus, tibiis posticis fuscis, alis hyalinis, C. chloromeri angustioribus.*

Oculi ocellique rufi : scapus viridis, basi flavus : femora 4 antica subtus flava : tarsi apice fusci : nervus subcostalis pallidè flavus stigma parvum, concolor. (Alarum longitudo,  $1\frac{1}{2}$  lin.)

The four anterior thighs are sometimes almost fuscous above : it is longer, has more slender antennæ and narrower wings than *C. æqualis* : the latter character will also distinguish it from *C. leptocerus*.

September ; Isle of Wight.

Sp. 33. *Callim. viridi-æneus. Fem. Viridis, abdomine viridi-æneo, oviductu abdomine paullo brevior, pedibus fulvis, alis subfuscis.*

Oculi ocellique rufi : caput subtus et thoracis latera ænea : abdominis segmentum primum æneum, apice viride : scapus fuscus, subtus basique flavus : genua tarsique straminei, horum apices fusci : nervus subcostalis pallidè fuscus : stigma parvum, concolor. (Alarum longitudo,  $1\frac{1}{2}$  lin.)

The apex of the metathorax is æneous.

September ; Isle of Wight.

Sp. 34. *Callim. curtus. Fem. Viridis, nitens, oviductu abdomen longitudine æquante, antennis quàm in C. Dauci aut confini clarioribus, pedibus flavis, alis hyalinis.*

Oculi ocellique rufi : scapus viridis, basi subtusque flavus : genua tarsique 4 postici straminei, horum apices fusci : nervus subcostalis pallidè fulvus : stigma parvum, concolor. (Alarum longitudo,  $1-1\frac{1}{3}$  lin.)

The body and legs are short and thick ; the antennæ more clavate than of most species in the genus : the posterior thighs and tibiæ have sometimes a green or fuscous spot above.

September ; Isle of Wight. Near London.

Sp. 35. *Callim. meridionalis. Fem. Viridis, nitens, thorace cupreo maculato, abdomine æneo, oviductu corpore paullo brevior, pedibus flavis, femoribus æneis, alis subfuscis.*

Caput et thorax posticè viridi-ænei : oculi ocellique rufi : macula dorsalis cuprea : abdominis segmenta posticè virentia, primum cupreo notatum : scapus fuscus, basi subtusque flavus : tibiæ

posticæ apice fuscæ: genua tarsique straminei, horum apices fuscî: nervus subcostalis fulvus: stigma parvum, fuscum. (Alarum longitudo,  $1\frac{3}{4}$  lin.)

The apex of the scutum, the base of the scutellum, and the paraptera of the mesothorax, are cupreous: the metathorax is æneous: the first abdominal segment is æneous green, speckled with cupreous: the tips of the thighs are yellow.

July; south of France.

Sp. 36. Callim. Euphorbiæ. Fem. *Viridis, pubescens, oviductu corpore paullò breviorè, pedibus flavis, femoribus viridibus, tibiis posticis fuscis, alis hyalinis.*

Oculi ocellique rufi: tibiæ posticæ subtus, femora apice basique, flavæ: tarsi straminei. (Alarum longitudo,  $1\frac{3}{4}$  lin.)

I am indebted to M. F. Delaporte for this species, taken by him on the spurge in the vicinity of Paris.

Sp. 37. Callim. caprææ. Fem. *Viridis, nitens, oviductu abdominis dimidio paullò longiorè, pedibus flavis, femoribus viridibus, tibiis fuscis, alis hyalinis.*

Oculi ocellique rufi. (Alarum longitudo,  $1\frac{1}{2}$  lin.)

Taken by M. F. Delaporte on the young shoots of the willow; in the vicinity of Paris.

Sp. 38. Callim. terminalis. Mas et fem. *Viridis aut viridi-æneus, oviductu corpore vix breviorè, pedibus flavis, femoribus viridibus, tibiis posticis fuscis, alis hyalinis, nervis quàm in C. chloromero obscurioribus.*

Oculi ocellique rufi: fem. caput posticè thoracisque segmentorum margines ænei: abdomen æneum, basi viride: pedes virides: trochanteres, tibiæ 4 anticæ tarsique flavi: nervus subcostalis fuscus: stigma parvum, concolor. (Alarum longitudo,  $1-2\frac{1}{4}$  lin.)

*Var. β.*—Mas, thorax totus viridis: pedes flavi: femora postica virentia: tibiæ posticæ femoraque 4 antica fusco cingulatæ.

*Var. γ.*—Fem. caput supra, thoracis apex lateraque cyaneo-virides: abdomen viride aut viridi-æneum, anticè cyaneo-viride: scapus subtus flavus.

*Var. δ.*—Fem. viridis: thorax anticè cyaneo-viridis: caput supra abdominisque segmentum primum cyanea: antennæ articulo secundo viridi: scapus concolor, basi subtusque flavus: femora 4 antica apice flava.

*Var. ε.*—Fem. tibiæ intermediæ subfuscæ.



In some specimens the metathorax is entirely æneous: the knees and tarsi straw-coloured, the apical joints of the latter fuscous.

July; on grass in woods; near London. September; Isle of Wight.

Sp. 39. Callim. inconspicuous. Mas. *Viridis, pedibus flavis, femoribus posticis et nonnunquam 4 anticis viridibus, tibiis 4 posticis fusco cingulatis, alis subhyalinis.*

Oculi ocellique rufi: tibiæ intermediæ apice fusca: genua tarsisque straminei, horum apices fusci: nervus subcostalis fuscus: stigma parvum, concolor. (Alarum longitudo,  $1\frac{1}{3}$  lin.)

Var.  $\beta$ .—tibiæ posticæ femoraque intermedia flavæ, fusco cingulata: tibiæ intermediæ femoraque antica flavæ.

Broad, thick: colour dark green: antennæ short and robust. September; near London. Isle of Wight.

Sp. 40. Callim. mæstus. Mas. *Nigro-viridis, pedibus nigris, tarsis flavis, alis hyalinis.*

Oculi ocellique rufo-fusci: scapus nigro-viridis: tibiæ nigro-fusca: genua tarsisque flavi, horum apices fusci: nervus subcostalis fuscus: stigma parvum, concolor. (Alarum longitudo, 1 lin.)

Tarsi fuscous: two basal joints yellow.

September; near London.

Sp. 41. Callim. apicalis. Mas. *Æneus, thorace anticè et posticè, capite pedibusque viridibus, tarsis flavis, alis subfuscis.*

Oculi ocellique rufi: antennæ crassæ: trochanteres genuaque flavi: tarsi apice fusci: nervus subcostalis fuscus: stigma parvum, concolor. (Alarum longitudo,  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.)

Var.  $\beta$ .—Viridis, nitens: abdomen æneo maculatum.

The abdomen is sometimes green, with a small æneous spot in the centre: the antennæ are very thick.

August; near London.

Sp. 42. Callim. affinis. Mas et fem. *Viridis, abdomine æneo, oviductu corpore duplo longiore, pedibus fulvis, femoribus viridibus, alis subfuscis.*

Cinips affinis. Fonscolombe, Ann. Sci. Nat. 26. 283.

Oculi ocellique rufi: *femine* thorax anticè posticèque cyaneo-viridis: *maris* abdominis segmentum primum viride, *femine* cyaneo-viride: antennæ crassæ: scapus viridis, basi flavus: tibiæ posticæ fuscæ, apice flavæ: genua tarsique flavi, horum apices fusi: nervus subcostalis fuscus: stigma parvum, concolor. (Alarum longitudo, 1—2 lin.)

*Var. β.*—*Mas*, thorax æneo-viridis.

*Var. γ.*—*Mas*, tibiæ 4 anticæ supra-fuscæ.

*Var. δ.*—*Fem.* abdomen viride, segmentum primum anticè viridi-æneum.

Abundant near London; on oak trees; from June to August.

Sp. 43. Callim. littoralis. Fem. *Viridis, præcedenti similis, at multò gracilior, oviductu brevior.*

(Alarum longitudo, 1½ lin.)

In *C. affinis* the ovipositor is more, in this species it is less, than twice the length of the body.

May; near the sea-shore; Southampton.

Sp. 44. Callim. tarsalis. Fem. *Cyaneo-viridis, oviductu dimidio corpore longiore, pedibus stramineis, femoribus viridibus, tibiis fuscis, alis subfuscis.*

Oculi ocellique rufi: abdomen viride: scapus viridis, basi flavus: trochanteres flavi: tarsi apice fusi: nervus subcostalis pallidè fuscus: stigma minimum, concolor. (Alarum longitudo, 1½ lin.)

It is more slender than *C. quercus*, and in shape much resembles the preceding species.

April; on grass in woods; near London.

Sp. 45. Callim. arvernicus. Fem. *Viridis, oviductu abdomine brevior, pedibus viridibus, genibus tarsisque stramineis, alis subfuscis.*

Oculi ocellique rufi: antennæ graciles: scapus viridis: trochanteres flavi: tarsi apice fusi: nervus subcostalis pallidè fulvus: stigma minimum, concolor. (Alarum longitudo, 1½ lin.)

July; near Clermont, in Auvergne.

Sp. 46. Callim. notatus. Mas et fem. *Viridis, thoracis lateribus abdominisque segmento secundo æneis, oviductu abdomine multò longiore, pedibus viridibus, genibus tarsisque fulvis, alis subhyalinis.*

Oculi ocellique rufi : scapus viridis : trochanteres fulvi : tarsi apice fuscii : nervus subcostalis fulvus : stigma magnum, nigro-fuscum. (Alarum longitudo,  $1\frac{1}{4}$ — $1\frac{2}{3}$  lin.)

*Var. β.*—*Mas*, abdomen apice viridi-æneum : tarsi antichi fuscii.

*Var. γ.*—*Fem.* thorax viridi-æneus, posticè æneus, lateraliter cupreus : scapus basi flavus.

Colour dark green : second joint of the antennæ æneous black.

May and June ; on grass in woods ; near London. Southampton.

Sp. 47. *Callim. nigri-tarsus.* *Mas et fem. Viridis, oviductu corpus longitudine æquante, pedibus viridibus, tibiis subtus tarsisque nigris, alis fuscis.*

Oculi ocellique rufi : *maris* abdomen viridi-æneum, basi viride : scapus viridis : nervus subcostalis fuscus, apice fulvus : stigma magnum, nigro-fuscum. (Alarum longitudo,  $1\frac{3}{4}$  lin.)

The abdomen of the female has a slight æneous tinge, the basal segment is bluish green : the subcostal nervure is fuscous till it joins the margin, it then becomes fulvous.

August ; on grass in woods ; near London.

Sp. 48. *Callim. straminei-tarsus.* *Mas. Æneo-viridis, abdomine cupreo-æneo, femoribus viridibus, tibiis fuscis, tarsis 4 posticis stramineis, alis subhyalinis.*

Caput viride : oculi ocellique rufi : abdomen cupreo-æneum, basi viridi-æneum : thorax anticè posticèque viridis : scapus viridis, basi flavus : tibiæ anticæ flavæ : tarsi apice fuscii : nervus subcostalis fuscus : stigma parvum, concolor. (Alarum longitudo,  $1\frac{3}{4}$  lin.)

Apex of the abdomen æneous : antennæ slender : the intermediate tibiæ much paler than the posterior, yellow beneath.

July ; on grass in fields ; near London.

Sp. 49. *Callim. antennatus.* *Mas. Viridis, abdomine cupreo, pedibus rufis, femoribus viridibus, tibiis posticis tarsisque rufo-fuscis, alis subfuscis.*

Oculi ocellique rufi : thoracis discus abdominisque segmentum primum æneo-virides : scapus viridis : nervus subcostalis fuscus : stigma minimum, concolor. (Alarum longitudo, 2 lin.)

*Var. β.*—Abdomen æneo-cupreum : tibiæ pallidè rufæ, supra viridifusæ, posticæ nigræ.

Mesothorax slightly tinged with æneous: abdomen cupreous beneath: antennæ long: trochanters and knees red: tips of the tarsi slightly fuscous.

May; Southampton. August; on grass in woods; near London. Scotland.

Sp. 50. Callim. lætus. Mas. *Æneo-viridis, nitens, abdomine cupreo, pedibus rufis, femoribus externè viridibus, alis hyalinis.*

Abdominis segmentum primum viride: tarsi flavi, apice fusci, antici rufi: alæ superiores marginem versus anticum flavescentes: nervus subcostalis nigro-fuscus: stigma concolor. (Alarum longitudo, 3—3½ lin.)

Var. β.—Alæ subfuscae: tarsi omnes rufi.

July; near London.

Sp. 51. Callim. versicolor. Mas. *Viridis, nitens, abdomine cupreo, pedibus fuscis, femoribus viridibus, alis subhyalinis.*

Oculi ocellique rufi: abdomen basi viride: scapus viridis: tibiis posticæ nigræ, anticæ rufæ: tarsi basi flavi: nervus subcostalis fuscus: stigma minimum, concolor. (Alarum longitudo, 1¾—2 lin.)

Var. β.—Thorax posticè abdominisque segmentum primum æneo-virides, hujus apex cupreus: tibæ posticæ nigro-fuscae.

Var. γ.—Scapus æneus: femora 4 postica concolores: tarsi omninò fusci: alæ subfuscae, anticæ fusco prope stigma maculatae.

Stouter than C. antennatus: antennæ thicker: wings broader: the superior wings have a large fuscous spot, occupying more than half their breadth, and extending along the nervure from whence it becomes costal, as far as the stigmal branch: sometimes this spot is indistinct, and the wings are nearly hyaline. Another and a very elegant variety has the head and thorax æneous green; the mesoscutum green; the first abdominal segment bright æneous green, cupreous toward the base; the apex and the second segment dark æneous, the others bright cupreous tinged with æneous; the coxæ and posterior thighs bluish green; the tibæ and four anterior thighs æneous green; the anterior tarsi pale fuscous; the four posterior yellow, with the fourth and fifth joints fuscous.

September; near London. Isle of Wight. North of England. July; near Clermont, Auvergne.

Sp. 52. Callim. fuscipennis. Mas. *Æneo-viridis, abdomine cupreo, antennis apice fuscis, pedibus viridibus, tarsis flavis, alis fuscis.*

Caput viride: oculi ocellique rufi: abdominis margo æneus: antennæ crassæ: scapus viridis: tarsi apice fuscis: alæ anticæ ramulum versus stigmaticalem obscuriores: stigma parvum, fuscum. (Alarum longitudo,  $1\frac{1}{2}$  lin.)

The antennæ, from the second to the sixth joint, are black, the following joints fuscous.

July; near London.

Sp. 53. Callim. minutus. Mas et fem. *Viridis, nitens, C. mutabili obscurior angustior, maris abdomine cupreo, oviductu abdomen longitudine æquante, pedibus flavis, femoribus viridibus, alis hyalinis.*

Maris abdominis segmentum primum viridi-æneum: scapus viridis: tibiæ supra pallidè fuscæ, posticæ et tarsorum apices obscuriores: nervus subcostalis fulvus: stigma parvum, concolor. (Alarum longitudo,  $\frac{3}{4}$ — $1\frac{1}{3}$  lin.)

Var.  $\beta$ . — Mas, abdomen æneum, basi viride: tibiæ 4 anticæ omninò flavæ.

Var.  $\gamma$ . — Fem. scapus basi et pedes flavi: femora postica basi virentia: tibiæ posticæ fusco cingulatæ.

July and August; on grass in woods; near London. May; Southampton.

Sp. 54. Callim. gracilis. Fem. *Viridis, nitens, oviductu abdomine paulò longiore, pedibus flavis, alis hyalinis quàm in præcedenti latioribus.*

Antennæ quàm in C. minuto tenuiores: femora postica basi virentia: tibiæ posticæ fusco cingulatæ. (Alarum longitudo, 1— $1\frac{1}{3}$  lin.)

July; on grass in fields; near London.

Sp. 55. Callim. posticus. Fem. *Viridis, oviductu abdomine longiore, pedibus fuscis, tarsis flavis, alis subfuscis.*

Oculi ocellique rufi: scapus viridis: femora nigro-fusca: tarsi apice fuscis. (Alarum longitudo,  $1\frac{1}{2}$  lin.)

Dull green: longer than C. gracilis or minutus: legs more slender; wings longer: subcostal nervure and stigma pale fuscous; the latter small.

September; near Keswick, in Cumberland.

Sp. 56. Callim. exilis. Fem. *Viridis, oviductu abdomine paullò longiore, antennis fuscis, pedibus flavis, tibiis posticis femoribusque fusco cingulatis, alis hyalinis.*

Scapus flavus, apice fuscus: tarsi concolores: nervus subcostalis pallidè flavus: stigma parvum, concolor. (Alarum longitudo,  $\frac{3}{4}$ —1 lin.)

*Var. β.*—Antennarum articulus secundus niger.

July; in woods; near London.

Sp. 57. Callim. fusci-cornis. Mas et fem. *Viridis mas, aut æneo-viridis fem. abdomine æneo, oviductu abdomen longitudine æquante, antennis fuscis, pedibus flavis, femoribus viridibus, tibiis posticis supra fuscis, alis hyalinis.*

Abdomen basi viride, *feminae* apex lateraque concolores: scapus æneus, *feminae* basi flavus: *maris* antennarum articulus secundus nigro-viridis: tarsi apice fusci: nervus subcostalis pallidè flavus: stigma parvum, concolor. (Alarum longitudo,  $\frac{3}{4}$ —1 lin.)

*Var. β.*—*Fem.* femora fusca.

July; on grass in woods; near London.

Sp. 58. Callim. nitidulus. Fem. *Viridis, nitens, thorace anticè cyaneo-purpurascete, oviductu corpus longitudine æquante, antennis fuscis, pedibus flavis, alis hyalinis.*

Abdominis segmentum secundum æneum: scapus flavus: articulus secundus nigro-fuscus: femora basi virentia: tibiæ posticæ fusco cingulatæ: tarsi 4 postici apice fusci: nervus subcostalis pallidè stramineus: stigma parvum, concolor. (Alarum longitudo,  $1\frac{1}{4}$  lin.)

Brilliant green: anterior part of the head blue.

June; on grass in woods; near London.

Sp. 59. Callim. ater. Mas. *Ater, tibiis fuscis, tarsis flavis, alis hyalinis.*

Caput et thorax obscuri, punctati: abdomen nitidum, glabrum: tibiæ 4-anticæ pallidè fuscae, subtus flavæ: tarsi 4-postici apice fusci: nervus subcostalis fuscus: stigma parvum, obscurius. (Alarum longitudo,  $1\frac{1}{2}$  lin.)

May; near London.

Sp. 60. Callim. pubescens. Fem. *Viridis aut æneo-viridis, oviductu abdomine paullò longiore, pedibus pallidè rufis, femoribus viridi-æncis, alis subfuscis.*

Oculi ocellique rufi : abdomen æneum, pilosum, basi viride : scapus pallidè rufus : tibiæ posticæ fuscæ : tarsi straminei : alæ anticæ prope stigma fusco maculatæ. (Alarum longitudo,  $2\frac{1}{4}$  lin.)

*Var. β.*—Scapus æneo-fuscus : tibiæ posticæ rufæ.

Head green : mesoparaptera æneous : first abdominal segment green, apex æneous ; second segment æneous, base chalybeous, apex cupreous : second antennary joint æneous : subcostal nervures paler toward the base of the wings.

July ; on windows ; near London. South of France.

This species has the proscutellum more developed than any of the preceding : the stigma is longer and thicker.

It resembles *Diplolepis obsoletus*, *Fabr.*

Sp. 61. *Callim. stigma. Fem. Ater, oviductu abdomine paullò longiore, alis fuscis.*

*Ichneumon.* . . . *Fabr. Ent. Syst. II. 188. 229.*

*Diplolepis stigma.* . . . *Fabr. Syst. Piezat. 152. 21.*

*Cinips stigma.* . . . *Fonscolombe, Ann. Sci. Nat. 26. 289.*

Oculi ocellique rufi : tarsi fuscii : alæ basi subhyalinæ, anticæ prope stigma nigro-fuscæ. (Alarum longitudo,  $2\frac{1}{4}$  lin.)

This species resembles the preceding in structure. Mr. Curtis has reared it, with *C. bedeguaris*, from the galls of the dog-rose, in the months of July, August, and September.

#### GENUS V. ORMYRUS. *Westwood.*

Caput magnum : palpi maxillares articulis 1° et 2° brevibus, 3° medio, 4° crassiore elongato subfusiformi : mentum ovatum, posticè quadratum : mandibulæ arcuatæ, tridentatæ, dens interna obtusa : *maris* antennæ clavatæ, articulo 1° elongato, 2° brevi, 3° et 4° brevissimis, 5° et sequentibus ad 10° cyathiformibus, tribus ultimis approximatis clavam componentibus obliquè truncatam ; *feminæ*, articulo 2° cyathiformi, 5° et sequentibus ad 10<sup>um</sup> gradatim brevioribus, tribus ultimis clavam componentibus ovatam duos præcedentes longitudine æquantem : thorax gibbus ; prothoracis scutellum breve ; mesothoracis scutum magnum, scutellum gibbum ovatum apice acuminatum, super metathoracis præscutum extendens ; metascutellum magnum, canaliculatum : *maris* abdomen convexum, elongato ovatum, basi elevatum : *feminæ* subcompressum : tibiæ posticæ arcuatæ : alæ pilosæ.

*Cinips tubulosa*, *Fonscolombe*, may perhaps belong to this genus.



Sp. 1. Orm. punctiger. Mas et fem. *Æneo-viridis*, maris abdomine nigro, pedibus nigro-viridibus, tibiis anticis tarsisque fuscis, alis fuscis.

Ormyrus punctiger. Westwood. Lond. & Edin. Phil. Mag. & Journ. of Science, Third Series, No. II. p. 127.

Mas. Viridis, pilosus: oculi ocellique rufi: thorax posticè æneo-viridis: abdomen obscurum, segmentum primum nigro-viride, secundum punctis transversò unifasciatum, tertium et quartum eodem modo trifasciata: antennæ nigræ, apice fuscae: genua fusca: nervus subcostalis nigro-fuscus: stigma parvum, concolor.

Fem. Viridi-æneus: scutellum cupreo-æneum: abdominis segmentum secundum et sequentia punctis bifasciata: oviductus subsertus: alæ flavo-fuscae: nervus subcostalis fuscus: stigma concolor. (Alarum longitudo,  $1\frac{1}{2}$ — $2\frac{1}{2}$  lin.)

Var.  $\beta$ .—Fem. viridis: abdomen æneo-viride: tarsi flavi.

Var.  $\gamma$ .—Fem. abdomen nigro-æneum, segmentum primum viride.

June to August; on grass beneath oak trees; near London.

Sp. 2. Orm. nigro-cyaneus. Mas. *Cyaneus*, abdomine nigro, pedibus nigro-viridibus, tibiis anticis tarsisque fuscis, alis hyalinis.

Caput viride: oculi ocellique rufi: abdomen præcedenti simile: antennæ fuscae, articulis 1° et 2° nigris: nervus subcostalis fuscus: stigma parvum, concolor. (Alarum longitudo,  $1\frac{1}{3}$  lin.)

More depressed than the preceding species: antennæ and legs slenderer.

June; on grass in a wood; near London.

#### GENUS VI. PERILAMPUS. Latreille, Dalman.

Cynips. Fabr. Oliz. Lat.

Diplolepis Fabr. Panz.

Chalcis. Jur. Panz.

Caput maximum: palpi maxillares articulo 1° medio, 2° 3° que brevioribus, ultimo elongato, subfusiformi, internè sinuato: mentum elongatum, posticè conicum: mandibulæ arcuatae, una bidentatae, altera tridentata: labrum minutum, quadratum, anticè spinosum: antennæ articulo, 1° elongato, 2° minuto, 3° minutissimo, 4° magno, 5° et sequentibus ad decimum, cyathiformibus, tribus ultimis clavam componentibus ovatam: thorax gibbus,

profundè punctatus: prothoracis scutellum breve; mesothoracis scutum gibbum, scutellum magnum, apice acuminatum, supra metathoracis præscutum extendens; metascutellum benè determinatum, canaliculatum: abdomen subpetiolatum, convexum, breve, latum, contractum: oviductus absconditus.

Dalman has given an elaborate description of the external anatomy of this genus, and has added the characters of several species. He supposes *Perilampus micans* to be a parasite of *Lyctus canaliculatus* and *Dendrophilus picipes*, particularly of the latter.

Sp. 1. *Peril. pallipes*. *Curtis*. Mas et fem. *Æneo-viridis*, abdomine pedibusque cyaneis, antennis fulvis, genubus tarsisque flavis, alis subhyalinis.

*Diplolepis ruficornis*. *Fabr.?* *British Entomology*. Pl. 158.  
*Perilampus ruficornis*. *Latr. Fonscolombe.?*

Caput æneum: antennæ articulis primo et secundo nigris. (Alarum longitudo, 4—6 lin.)

Taken in July at Dover, and beaten out of the juniper bushes at Birch Wood, by Mr. Newman and Mr. Davis, in April and May.

Sp. 2. *Peril. nigricornis*. *Newman*. Mas et fem. *Æneus*, abdomine cyaneo, antennis nigris, pedibus nigro-viridibus, tarsis flavis alis hyalinis.

*Diplolepis violacea*. *Fabr. Syst. Piezat.* 149. 4. &c.?

*Chalcis violacea*. *Panz. Faun. Germ.* 88. p. 15.?

*Perilampus violaceus*. *Dalman. Stock. Trans.* 1822. 398.?

Id. . . *Fonscolombe. Ann. Sci. Nat.* 26. 300.?

Oculi ocellique fuscii: scapus viridis: tarsi apice genuaque fuscii. (Alarum longitudo, 2—3 $\frac{3}{4}$  lin.)

*Var. β.*—Abdomen viridi-cyaneum.

*Var. γ.*—Thorax æneo-viridis.

Fonscolombe's description of *Perilampus violaceus* agrees very well with the above. Dalman says, that the 4 anterior legs are yellow, the thighs blue. Panzer represents them as entirely yellow.

Taken by Mr. Newman, in company with the last.

Sp. 3. Peril. Italicus. Mas et fem. *Cupreus*, abdomine antennisque nigris, pedibus nigro-viridibus, tarsis flavis, alis subhyalinis.

Cynips et Diplolepis Italica. *Fabr.*, &c.

Perilampus Italicus. . . . *Latr. Fonscolombe*, &c.

Caput viridi-æneum: oculi ocellique fuscii: metathorax nigro-viridis: scapus viridis: tarsi apice genuaque fusca: nervus subcostalis fuscus: stigma parvum, concolor. (Alarum longitudo,  $3\frac{1}{2}$  lin.)

It resembles *Perilampus splendidus*, Dalman, but the abdomen is quite black. Fonscolombe's description does not well agree with the specimens that I have seen.

July; on oak, box, and lime trees; near London.

Sp. 4. Peril. aureo-viridis. *Stephens. Viridi-æneus*, abdomine aureo nitido, antennis nigris, pedibus piceo-viridibus, geniculis tarsisque rufo-flavis, alis hyalinis.

Rather less than *P. nigricornis*; taken near London, in July.

Sp. 5. Peril. auriceps. *Stephens. Nigro-æneus*, abdomine atro nitido, capite viridi-aureo, antennis nigro-piceis, pedibus rufo-ochraceis, femoribus basi viridibus, tibiis posticis medio fuscis.

Size of No. 4.—This and the following species are narrower than the others of the genus, and the abdomen is dissimilar in form, being somewhat lanceolate acute. The size of *P. nigricornis*.

Found amongst grass near Ripley, in June, 1827.

Sp. 6. Peril. femoralis. *Stephens. Viridi-æneus*, abdomine atro nitido, antennis piceis, tibiis anticis et intermediis tarsisque omnibus rufo-ochraceis.

Perilampus micans. *Dalman. Stock. Trans. 1822. var.?*

Rather larger and broader than the last; taken near Hertford in July.

Mr. Stephens, hearing that I was engaged in describing the genus *Perilampus*, most obligingly transmitted me the above descriptions of the three last species through the hands of Mr. Newman.

ART. XVI.—*Observations on Blight.* By RUSTICUS.

## EPISTLE II.

SIR,—I don't know why our brethren on the other side the Atlantic are charged with sending us the greatest pest of our orchards, but so it is. We call an insect the American blight, which for aught I could ever make out, may have come from China or Botany Bay. However, a name once in vogue will have its day; and one might as well attempt to turn a pig in an entry as argue against an established belief; so American blight it shall be. In very hot weather you may now and then see this blight on the wing; it has just the look of a bit of cotton, or a downy seed, floating in the air, and is driven by every breath of wind quite as readily. If you catch and examine it, you will find it to be just like the plant-louse which infests our rose-trees, &c.; but, unlike all other plant-lice, it is clothed and muffled up with cotton-wool, in such quantities, that you would at first have no more idea that the lump contained an insect, than that the mass of clothes on a stage-coach box in winter, contained a man. Some folks wonder what can be the use of so much clothing; I am not much of a theorist, but I should guess that the vermin came from the torrid zone, and Nature kindly furnishes this garment to protect them from the cold of our climate.

These blights wander wherever it pleases the wind to carry them; and if bad luck should drive one of them against the branch of an apple-tree, there it will stick, creep into a crack in the bark, bring forth its young, and found a colony; the white cotton soon appears in large bunches; branch after branch becomes infected; the tree grows cankered, pines, and dies. How this is effected no one knows, though the cause and effect are too evident to escape the notice of the commonest clown. In large orchards it is vain to hope for a cure, but not so in gardens. Directly you see the least morsel of cotton, make up your mind to a little trouble and you will get rid of it. In the first place, get a plasterer's whitewashing-brush, then get a large pot of double size, make your man heat it till it is quite liquid, then go with him into the garden and see that he paints over every patch of white, though not

bigger than a sixpence; the next morning have the size-pot heated again, and have another hunt; and keep on doing so every morning for a fortnight. Your man will tell you it's no use; tell him that's your business, not his: your neighbours will laugh at you for your pains: do it before they are up. I have tried it and know it to be effectual. Spirit of tar has been used with partial effect, so also has resin; whitewashing has been often tried, and, as it contains some size, is not entirely useless, and some horticulturists think it ornamental: I do not.

Now for the moth. This is a beautiful little creature, its wings are studded with silvery shining specks, as though they were inlaid with precious gems. It is the most beautiful of the beautiful tribe to which it belongs, yet from its habits not being known, it is seldom seen in the moth state, and the apple-grower knows no more than the man in the moon to what cause he is indebted for his basketsful of worm-eaten windfalls in the stillest weather. To find the moth in the daytime, the trunks of the apple-trees should be carefully looked over; or if your orchard be surrounded by a wooden fence, it may frequently be found sitting against it, with its pretty wings neatly folded round it. Towards evening, in fact, just at sunset, it begins to move, and may then be seen hovering about the little apples, which, by the time the moth leaves the chrysalis, the middle of June, are well knit, and consequently fit for the reception of its eggs, which it lays in the eyes, one only in each, by introducing its long ovipositor between the leaves of the calyx, which form a tent above it that effectually shields it from the inclemency of the weather, or any other casualty. As soon as the egg hatches, the little grub gnaws a hole in the crown of the apple, and soon buries itself in its substance; and it is worthy of remark that the rind of the apple, as if to afford every facility to the destroyer, is thinner here than in any other part, and consequently more easily pierced. The apple most commonly attacked is the coddling, a large early sort, which ripens in July and August.

The grub, controlled by an unvarying instinct, eats into the apple obliquely downwards, and by thus avoiding the core and pips in no way hinders its growth: at first it makes but slow progress, being little bigger than a thread, but after a fortnight its size and its operations have much increased; it

has now eaten half way down the apple, and the position of the hole at the top, if the apple continue upright, or nearly so, is inconvenient for a purpose it has up to this time been used for, that is, as a pass to get rid of its little pellets of excrement, which are something like fine sawdust or coarse sand; another communication with the outer air is therefore required, and it must be so constructed as to allow the power of gravity to assist in keeping it clear; it is accordingly made directly downwards towards that part of the apple which is lowest, and thus the trouble of thrusting the pellets upwards through the eye of the apple is saved, and a constant admission given to a supply of air without any labour. The hole now made is not, however, sufficiently open for an observer to gain by its means any knowledge of what is going on within; this is only to be obtained by cutting open a number of the apples as they gradually advance towards ripeness; the hole is, however, very easily seen, from its always having adhering to it on the outside an accumulation of the little grains which have been thrust through. Having completed this work the grub returns towards the centre of the apple, where he feeds at his ease. When within a few days of being full fed, he for the first time enters the core through a round hole gnawed in the hard, horny substance which always separates the pips from the pulp of the fruit, and the destroyer now finds himself in that spacious chamber which codlings in particular always have in their centre. From this time he eats only the pips, never again tasting the more common pulp which hitherto had satisfied his unsophisticated palate: now nothing less than the highly flavoured, aromatic kernels will suit his tooth, and on these for a few days he feasts in luxury.

Some how or other, the pips of an apple are connected with its growth, as the heart of an animal with its life;—injure the heart, an animal dies: injure the pips, an apple falls. Whether the fall of his house gives the tenant warning to quit, I cannot say, but quit he does, and that almost immediately; he leaves the core, crawls along his breathing and clearing-out gallery, the mouth of which, before nearly closed, he now gnaws into a smooth, round hole, which will permit him free passage without hurting his fat, soft, round body; then out he comes, and for the first time in his life finds himself in the open air. He now wanders about on the ground till he finds the stem of a

tree: up this he climbs, and hides himself in some nice little crack in the bark. I should remark, that the fall of the apple, the exit of the grub, and his wandering to this place of security, usually take place in the night time. In this situation he remains without stirring for a day or two, as if to rest himself after the uncommon fatigue of a two yards' march; he then gnaws away the bark a little in order to get further in out of the way of observation; and having made a smooth chamber big enough for his wants, he spins a beautiful little milk-white silken case, in which, after a few weeks, he becomes a chrysalis, and in this state remains throughout the winter and until the following June, unless some unlucky, blackheaded tit, running up the trunk, peeping into every cranny, and whistling out his merry see-saw, happen to spy him, in which case he is plucked without ceremony from his retreat, and his last moments are spent in the bird's crop; but supposing no such ill-fortune betide him, by the middle of June he is again on the wing, and hovering round the young apples on a midsummer evening as before.

By burning weeds in your gardens at this time of year you will effectually drive away this little moth. If you have trees the crops of which you value, make a smoking (mind, not a blazing) fire under each; it will put you to some inconvenience if your garden be near your house, but the apples will repay you for that.

If you think these observations on the blights of the apple worth recording, you shall hear from me again, (as I have made similar notes on the hop-fly, turnip-fly, &c.) I have sent Mr. Loudon a few notes on birds, which I believe do not come within the compass of your Mag.

Yours, &c. RUSTICUS.

*Godalming, Aug. 14, 1832.*

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ART. XVII.—*Catalogue of Diptera occurring about Holywood in Downshire.* By A. H. HALIDAY, Esq., M. A.

[TO THE EDITOR OF THE ENTOMOLOGICAL MAGAZINE.]

SIR,—I send you a list of some Diptera occurring about Holywood, in the county of Down. Should you think it not unsuited to the pages of the Entomological Magazine, the Notes appended will afford the necessary explanations of the nomenclature adopted, where it differs from that of Meigen or of the published British Catalogues. As I am aware that a bare local catalogue may not seem of sufficient general interest to occupy so many pages, I should probably not have thought of it had time allowed me to offer any contribution of greater labour and detail. Perhaps, however, as referring to a district in this respect nearly unexplored, this list may afford some hints for the advancement of our Insect Geography. I am sorry therefore to present it in so meagre a form, many of the most extensive genera being unexamined in detail. These are indicated by the asterisk prefixed; and some of them I have thought it better to pass over entirely. Perhaps, however, a few facts may be gleaned from it, such as it is. The total absence of the families of *Bombylii* and *Asili* is observable; and, considered in connexion with the small proportion which the British species bear to the European in the aggregate, seems a result partially determining the law of progressive distribution among these forms. The disappearance or extreme rarity of the finer genera (the *Optimates*) among the *Tabani*, *Stratiomydes*, *Syrphi*, &c. may also be remarked, as well as the absence of various conspicuous (and in this point of view more insulated) groups, such as *Ctenophora*, *Aspistes*, *Pachygaster*, *Platypeza*, *Diaphorus*, *Echinomyia*, *Gymnosoma*, *Micropeza*, *Platystoma*, &c. On the other hand, the predominance of particular tribes may afford some indications; the *Dolichopi*, as a family, are pretty full (so also the minuter *Tipulidæ*, though not appearing from this catalogue); the *Muscidæ*, of less typical structure (all the genera after *Cænosia*, or perhaps *Scatophaga*?) are by no means scanty. A few groups seem to approach their culminant point; *Cælopa*, a genus unknown to the shores of the continent, and even on the Scanic peninsula confined to one described species, here

numbers five or six, all rich in individuals, and exercising no unimportant functions in the economy of nature. *Tachypeza arenaria*, which sometimes swarms upon our coasts, has many analogies of structure with its companions, the swift-footed but heavy-winged *Orygmæ* and *Cælopæ*, and like them is probably confined to a northern range. Not to detain you further with remarks that may appear obvious or trivial, I will only add my best wishes for the success of your undertaking; and am,

Your very obedient, &c.

ALEX. HENRY HALIDAY.

*Clifden, near Holywood, Oct. 10th, 1832.*

Culex	Limnobia *	Trichocera	Scatopse *
annulatus	E. fuscipennis	hyemalis	nigra
cantans	nitidicollis	fuscata	B minuta
nemorosus	F. nemoralis	annulata	infumata, N.S.
detritus, N.S.	F.a. senilis, N.S.	regelationis	Diloplus
picipiens	G. ferruginea	Dixa	vulgaris
Anopheles	H. littoralis	nebulosa	femorata
maculipennis	O. albifrons	maculata	Biblio
bifurcatus	tripunctata	aprilina	Marci
plumbeus	nubeculosa	æstivalis	leucopterus
Corethra *	pabulina	serotina?	Pomona
culiciformis	P. Xanthoptera	Macrocera	Johannis
Tanytus *	quadrinotata	lutea	nigriventris, N.S.
Chironomus *	R. tenella	phalerata	lanigerus, m. }
virescens?	U. immaculata	fasciata	vernalis, f. }
Culicoides *	V.a. demissa, N.S.	Bolitophila	clavipes
palustris	V.b. pavida, N.S.	fusca	Simulia *
scutellatus	DICRANOMYIA, Sl.	Platyura *	sericea & 3
pulicarius	modesta	Sciophila	Rhyphus
obsoletus	chorea	marginata	punctatus
nubeculosus	lutea	rufa	fenestralis
subsultans	musta	Leja *	ochraceus, Curtis?
Ceratophogon	oscillans, N.S.	fuscipennis	Beris
stigma	GLORHINA, Meig	bimaculata	geniculata, E.E.
albicornis	[VI.?	Winthemi	chalybeata
ornatus	lenocephala	Cordyla	vallata
annulipes	dumetorum	crassicornis	clavipes
distinctus, N.S.	Geranomyia, N.G.	fusca	Hæmatopota
brachialis, N.S.	unicolor, N.S.	fasciata	pluvialis
gracilis, N.S.	Rhamphidia	Mycetophila *	ocellata
flavipes	longirostris	limata, Meig.	Chrysops
rufipes	Symplecta *	arcuata	viduatus
ferruginea	stictica	cingulum	Spania
Sphæromyias	Rhipidia	lineola	Fallenii, N.S.
concinns, Meig.	maculata	lunata, Fabr.	Rhagio
varipes, Sl.	Pedicia	nigra	scolopaccus
annulitarsis, Sl.	rivosa	Sciara *	tringarius }
Serromyia	Dolichozeza	Thomæ	vanelus }
femorata	sylvicola	morio	lineola
morio	Ptychoptera	flavipes	Leptis
Psychoda *	albimana	Orphnephila	aurata
phænonides	scutellaris	devia, Z.J.	Thereva
nervosa	paludosa	ANARETE, N.G.	cincta
fuliginosa	lacustris	candidata, N.S.?	Hybos
palustris	Tipula *	Lestremia	funcbris
ocellaris	gigantea	leucophæa	vitripennis
Erioptera *	lutescens?	CATOCHA, N.G.	Cyrtoma
maculata	paludosa	latipes, N.S.	nigra?
varia	oleracea	Campylomyza *	atra
atra	dispar, N.S.	atra	melæna, N.S.
ULA, N.G.	luteipennis?	Cecidomyia *	Ocydromia
mollissima, N.S.	flavo-lineata	pictipennis	scutellata
Limnobia *	nubeculosa? & G	annulipes	glabricula
C. fasciata	A.a. anaticornis	Lasioptera *	rufipes
marmorata	B. crocata	Scatopse *	Trichina
decora, N.S.	cornicina	A. punctata	clavipes

Trichina elongata, N.S.	Medeterus notatus	<i>Hypophyllus</i> , H.Z.J. obscurellus	Eristalis * zepluchralis
Rhamphomyia * sulcata	viridis	Scenopinus niger	tenax
tephrea	conspersus, Z.J.	Sargus pallidus	intricarinus
cinerascens	bipunctatus	flavicornis	similis
nigriceps	balticus	formosus	Volucella
tenuirostris	scambus	flavipes	bonibylaas
cæsia	curvipes	cuprarius	mystacea
flava	loripes, Z.J.	Nemotelus	pelluceus
longipes & 6	prodromus, Z.J.	uliginosus	Myopa
Empis	truncorum	nigrinus	atra
tessellata	muralis	Oxycera	testacea
pennipes	tenellus	trilineata	Siphona 1
pennaria	Chrysotus * lesus	Odontomyia	cinerea
chioptera	copiosus	Hydroleon	tachinaria
pilipes	neglectus	Stratiomyis	Stomoxys
livida	femoratis	furcata	calcitrans
stercorea	nigriceps	Chrysotoxum	stimulans
testacea	Psilopus	bicinctum	Tachina & 6. *
Pachymeria, St.	platypterus	Paragus	Mesembrina
ruralis	Machærium	femoratus	meridiana
Hilara * globulipes	Maritimæ, Z.J.	Ascia	Sarcophaga * carnaria
chorica	<i>Rhaphium</i> macrocerum	podagrica	Dexia * canina
clypeata	caliginosum	floralis	Musca
nigrina	Porphyrus	dispar	A.Cæsar
litorea	B. decoratus, Z.J.	Baccha	regalis
modesta	pallipes	nigripennis	Chloris, N.S.
flavipes	— N.S. ?	elongata	B. Vomitoria
Hemerodromia	pumilus	scutellata	erythrocephala
A. Monostigma	— N.S. ?	Xylota	rudis
præcatoria	insulsus, Z.J.	pipiens	degener, N.S.
melanocephala	riparius	segnis	macellaria, N.S.
albicornis	ripipes	sylvarum	domestica
B. supplicatoria	riparius, Z.J. m. }	Pipiza	stabulans
HELEODROMIA, N.G.	obscuratus	noctiluca	hortorum
A. immaculata, N.S.	flavicollis	signata	cyanella
B. bipunctata, N.S.	A. diaphanus	vitrea	maculata
stagnalis, N.S.	leucocephalus }	funebribr	meditabunda
fontinalis, N.S.	fulgens, Z.J. }	virens	Anthomyia *
LEPTOCSELES, N.G.	argyreus	Rhingia	lardaria
irroratus	argentinus	rostrata	assimilis
exoletus, N.S.	vestitus	campestris	notata
guttatus	anicus	Chrysogaster *	dentimana
TACHYPEZA, Meig.	C. annulipes	Cheilosia, * Meig.	erratica
[VI. 341]	flaviventris	cestracea	pagana
arrogans	— N.S.	variabilis	Angelicæ
cinicoides	— N.S.	flavicornis	impuncta
umbrarum, N.S.	Dolichopus	Syrphus *	strigosa
truncorum	A. nitidus	Pyrastri	manicata
arenaria, N.S.	jucundus, N.S. ?	Ribesii	canicularis
Tachydromia	festivus, Z.J.	Corollæ	dentipes
flavipes	Diadema, Z.J.	albostriatus	ciliata
fasciata	popularis	bifasciatus	triquetra
annulipes	pennatus	tricinctus	diaphana
albocapillata	urbanus	nectareus	inauis
albiseta	pennitarsis	scutatus	Drymeia
nigritarsis	thalassinus, Z.J.	peltatus	obscura
minuta	acuticornis	clypeatus	Lispe
annulata	linearis	manicatus	tentaculata
Drapetis	inquinatus, Z.J.	Ocymi, f. }	litorea
aterrima, B.E.	trivialis, Z.J.	lobatus, m. }	? adscita, N.S.
Opetia	actæus, Z.J.	Rosarium	Cænosiæ *
nigra	vitripennis	Syrphus, p.	verna
lonchopteroides,	fuscipes, Z.J.	Menthastri	tigrina
[N.S. ?]	clavipes, Z.J.	Melissæ	pedella
Callomyia	A. a. litoreus	scriptus	Schaenomyza, N.G.
antennata	plumipes, Z.J. }	tæniatus	{ fasciata }
leptiformis	B. plantaris	Sericomyia	{ Sciomyza fasciata }
Pipenculus	fastuosus, Z.J.	borealis	{ litorella [Meig.] }
A. campestris, f. }	brevipennis	Helophilus	{ Ochthiphila lito. }
ater, m. }	equestris, Z.J.	pendulus	Cordylura [rella, M.]
varipes	ungulatus	trivittatus	pubica
flavipes	campestris	lineatus	albipes
B. aactus	B. b. cupreus	Eristalis *	spinimana
C. spurius	aerosus	floueus	punctipes
exiguus, N.S.	sarus, Z.J.		obscura
Medeterus	nigripennis		hydromyzina
regius			

- Scatophaga  
 scybalaria  
 stercoraria  
 merdaria  
 analis  
 lutaria  
 spurca  
 inquinata  
 eximia, B. E.  
 Ostiorum, B. E.  
 squalida  
 rufipes  
 rudis, B. E.  
 litorea  
 decipiens, B. E.  
 Dryomyza  
 flaveola  
 mollis, N. S. ?  
 præusta  
 Cælopa  
 frigida  
 gravis, N. S.  
 simplex, N. S.  
 parvula, N. S.  
 sciomyzina, N. S.  
 Orygma  
 luctuosa  
 Actora  
 buccata, Fall.  
 Helomyza  
 A. pallida  
 præusta  
 tigrina  
 rufa  
 B. ustulata ?  
 serrata  
 inscripta  
 Heteromyza  
 oculata  
 atricornis  
 Sciomyza \*  
 A. nigrimana  
 griseola  
 albocostata  
 B. monilis  
 cinerella  
 uana  
 Tetanocera  
 marginata  
 rufifrons  
 obliterata  
 Hieracii  
 Umbrarum  
 arrogans  
 elata  
 media  
 sylvatica  
 vittata, N. S.  
 aratoria  
 dorsalis  
 lineata  
 Sepedon  
 sphegeus  
 Hæffneri  
 Piophilta  
 luteata, N. S.  
 atrata  
 Casei  
 nigriceps  
 Pandora, N. G.  
 scutellaris, Fall.  
 basalis, N. S.  
 Sepsis  
 A. Punctum  
 hilaris  
 cynipsea  
 B. cylindrica  
 annulipes  
 Leachii  
 putris  
 superba, N. S.  
 minor, N. S.  
 Ortalis  
 pulchella  
 crassipennis  
 Cerasi  
 vibrans  
 Tephritis  
 Zoë  
 cotinna  
 cognata  
 Onopordinis }  
 Centaureæ }  
 Aretii  
 marginata  
 cuspidata  
 Arnicæ  
 Plantaginis, N. S.  
 flavicauda  
 Leontodontis  
 radiata  
 Sonchi  
 Lonchæa  
 chorea  
 Lauxania  
 ænea  
 amica, N. S.  
 sordida, N. S.  
 lupulina  
 Sapromyza, p.  
 pallidiventris  
 trimaculata  
 ustulata  
 umbellatarum  
 arcuata  
 10-punctata  
 Sapromyza, sicut St.  
 flava  
 præusta  
 rorida  
 pallida  
 Palloptera, Fall.  
 unicolor  
 Heteroneura  
 albimana  
 ? spurca, N. S.  
 Psila  
 pallida  
 Rosæ  
 nigricornis?  
 Calobata  
 petronella  
 Loxocera  
 elongata  
 ichneumonea  
 Stegana  
 annulata, N. S.  
 Ochthiphila  
 aridella  
 Ochthiphila  
 polystigma  
 Leucopis  
 puncticornis  
 obscura, N. S.  
 Agromyza \*  
 nigripes  
 mobilis  
 bimaculata  
 anthracina  
 acuticornis }  
 deucicornis }  
 variegata  
 luctuosa  
 ænea  
 strigata  
 Orbona  
 Phytomyia \*  
 festiva  
 lateralis  
 affinis  
 flavicornis  
 Ochthera  
 Mantis  
 Ephydra  
 glabricula  
 cæsta, N. S.  
 rufipes  
 infecta, N. S.  
 aquila  
 coarctata  
 litoralis  
 fossarum, N. S.  
 hecate, N. S.  
 spilota, B. E.  
 curvicauda  
 albula?  
 riparia  
 micans, N. S.  
 pygmæa, N. S.  
 . sibilans, N. S.  
 leucostoma  
 æstuans, N. S.  
 stagnalis  
 paludum  
 lutosa, N. S.  
 compta, N. S.  
 noctula  
 Graminum, N. S. ?  
 quadrata  
 defecta, N. S.  
 picta  
 interrupta, N. S.  
 interstincta  
 flavipes  
 posticata  
 stictica  
 Notiphila \*  
 cinerea  
 leucostoma  
 griseola  
 chrysoptoma  
 erythroptoma  
 albiceps  
 albilabris  
 flaviventris  
 madizans, Fall.  
 Drosophila  
 flava  
 graminum  
 Drosophila  
 tristis }  
 cellaris L. ? }  
 melanogaster  
 ingrata, N. S.  
 virginea ?  
 phalerata  
 transversa  
 cameraria, N. S.  
 fenestrarum  
 funebris  
 Diastata  
 obscuripennis  
 punctum  
 obscurella  
 Opomyza  
 Germinationis  
 florum  
 var. punctata  
 combinata  
 tripunctata  
 tremula, N. S.  
 astica, N. S.  
 Asteia  
 amæna  
 Gymnopa  
 glabra  
 Chlorops \*  
 A. lateralis, N. S.  
 fulvifrons, N. S.  
 Cereris  
 agnata, N. S.  
 messoria  
 tæniopus  
 glabra  
 lineata?  
 hypostigma  
 B. brevipennis  
 cornuta  
 albiseta  
 maura, &c.  
 Meromyza  
 variegata  
 saltatrix  
 pratorum  
 Borborus \*  
 subsultans  
 denticulatus  
 hamatus, N. S. ?  
 equinus  
 sylvaticus  
 limosus  
 clunipes  
 ochripes  
 nivalis, N. S.  
 nigerrimus, N. S.  
 Phora \*  
 A. incrassata  
 B. thoracica  
 bicolor  
 nigra  
 flava  
 lutea  
 C. crassicornis  
 abdominalis, Fall.  
 E. debilis, N. S.  
 G. Dauci, f. [Meig. ?  
 Conicera a'ra, m. }  
 similis, N. S.  
 F. aterrima  
 galeata, N. S.

Taken at Tullymore Park, and on the Mountains of Mourne.

- Orphnephila devia  
 Sciara bicolor  
 Dicranomyia oscillans  
 Limnobia 4 notata  
 Tachydromia gilvipes  
 Callomyia elegans, f.  
 Pipiza interrupta, N. S.  
 Sphegina clunipes  
 Medeterus alpinus, N. S.  
 Dolichopus patellatus  
 atratus  
 Dolichopus rupestris, N. S.  
 Conops 4-fasciata  
 Sapromyza inusta  
 Phylomyza litura,  
 Sapromyza litura, Meig. }

*Among the Sandhills, Dundrum Bay.*

Thereva annulata	Myopa ferruginea Stomoxys Siberita	Meromyza viridula, n.s.
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*County Wicklow, Vale of Clara; Avondale, and the Seven Churches.*

Orphnephila devia	Trichina clavipes	Dryomyza anilis
Limnobia picta	Medeterus alpinus	Sepsis superba
Dolichopeza sylvicola	Diaphorus Winthemi	Ortalis Syngenesiæ
Bibio dorsalis	Porphyrops crassipes	Tephritis Florescentiæ
Asilus æstivus	Dolichopus plumipes	Lauxania cylindricornis
Bombylius minor	atratus	Ochthera Mantis
Hilara matrona, n.s.	cyaneus	Agromyza securicornis
Tachydromia lutea	patellatus	flavo-notata, n.s.
pectoralis	urbanus	
cursitans	Sphegina clunipes	

*In the County Galway.*

Orphnephila devia	Callomyia antennata leptiformis	Sapromyza femorella, Fall.
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*Taken in different parts of England.*

Ceratopogon pictus	Diocelia Baumhaueri	Dorycera Graminum
Sciophila pictipennis, n.s.	Tachypeza Graminum	Tetanocera cucularia
Bibio fulviventris	Myopa pusilla	var. $\beta$ . $\gamma$ .
leucopterus	occulta	Eurina lurida
albipennis	Pipunculus modestus, n.s.	Camarota aurifrons, n.s.
varipes	Cordylura apicalis	Borborus pedestris
hybridus, n.s.	Lauxania longipennis	

*On the Sands of Portmarnock, near Dublin.*

Pipunculus sylvaticus	Lucina fasciata.	Ephydra puncto-nervosa
Thereva annulata	Psila atra	
Scatophaga decipiens	Chlorops fulvifrons, n.s.	

## ABBREVIATIONS.

B. E. Curtis' British Entomology.

St. Stephens' Systematic Catalogue.

Z. J. Zoological Journal, No. XIX.

The remaining synonyms are from Meigen, unless otherwise expressed.

## NOTES.

*Culex detritus.* *Nigro-fuscus, abdomine pallido-annulato, ventre trifariam fusco-punctato, femoribusque basi luteis.*

Size of *C. pipiens*. Palpi of male rather thick, as long as the proboscis. Wings thickly clothed with dusky black scales: disk of the thorax nearly naked.

In multitudes during the day among hedges on the sea-coast: in the evening, in columns about the tops of trees, appearing like smoke at the distance of a furlong.

*Anopheles plumbeus.*

Probably a small variety of *A. bifurcatus*, but my original specimens have fallen a prey to *Psoci*.

## Chironomus virescens.

This little fly caused no little alarm this summer : its appearance in swarms being adjudged by vulgar rumour a precursor of cholera. In some places they appeared in such numbers, that the inhabitants had some trouble in *shovelling* them out of their houses (in my informant's words). At Donaghadee, clouds (of this species) were observed coming from seaward. To prevent any error about the species, I add a description of mine :—

Length .08 :<sup>a</sup> colour light yellow, with three faint reddish stripes on the thorax, the middle one not extending as far as the scutel : abdomen greenish yellow : antennæ and ends of feet darker : poisers pale : wings naked, hyaline, with pale nervures.

*Ceratopogon distinctus.* *Flarus; capite, antennis basi, thoracis dorso, metathorace genubusque nigris.*

Size of *C. ornatus*. Antennæ dusky yellow : thorax shining, scutel yellow : hind shanks dusky : wings hyaline : poisers milk white : fore thighs thick spinous.

*C. brachialis.* *Niger, nitidus, abdominis basi, pedibus anterioribus et femoribus posticis luteis, geniculis nigris.*

Form of the last : hind shanks black, rufescent at both ends : hind feet yellowish at the base : wings hyaline, with thick nervures : poisers black : antennæ dusky yellow, the root black.

*C. gracilis.* *Flarus; vertice, thoracis dorso, abdomineque nigris, nitidis.*

All the thighs slender, fore pair bristly beneath the tip, hind thighs and shanks dusky : wings hyaline, with distinct nervures, smaller, and more slender than the preceding.

*Sphæromyas concinnus.* *Abdomine albo, postice fasciis tribus nigris.*

*Cer. concinnus.* *Meig. 1.*

Resembles *S. varipes* in almost every respect, but the black bands of the abdomen are constant.

It is very abundant about Lough Neagh, less so at Holywood.

*Sph. varipes.*

Male scarcely half as large, pencil of antennæ glossy white.

<sup>a</sup> The measurements are all in decimal parts of an English inch.

ULA. (*e Tipulariis rostratis*. Meig.)

Antennæ porrectæ; 17-articulatæ; articulis 2 baseos brevibus crassis, reliquis oblongis, subæqualibus; palpi incurvi quadri-articulati, articulo ultimo longiore: alæ incumbentes pubescentes.

U. mollissima.

Head cinerous yellow: 2d joint of antennæ yellow, the following 15 brown, pubescent, with a long hair about the middle of each: palpi long, pubescent: 2d joint thickest, the rest increasing in length and diminishing in thickness, the last as long as the 2 preceding: thorax dull yellow, clothed with loose scattered hairs: poisers pale brown: abdomen and feet brown, pubescent: base of thighs yellowish: wings brownish cinereous, with a faint purple line dividing the anterior long cell of the disk, the whole surface thickly clothed with fine hairs: nervures disposed like those of *Limnobia immaculata*, but the two forked ones of the margin are here replaced by three simple nervures, proceeding from a small middle cell as in *L. pictipennis*. (Length .23; antennæ .1; exp. .58.)

A single male taken in a shady spot by a rivulet the beginning of October.

*Limnobia decora*. *Cinerea; thorace fusco lineato, abdomine silaceo, alis antice testaceis macula punctisque costæ hyalinis.*

Belongs to division C. resembling *L. fasciata*, but the ground colour of the wings is pale brown, only the costal spots being whitish hyaline, the nervures of the posterior portion are bordered with testaceous. The general disposition of the markings may be derived from that of *L. fasciata*, supposing the testaceous colour diffused along the anterior half, and the spots on the nervures of the rest to become irregularly confluent.

*L. senilis*. *Lurida: abdomine, antennis, pedibusque fuscis, alis obscuris.* (Long. 2; dilat. .46.)

The neuration nearly as in division F. (*L. nemoralis*, &c.) but the middle cell is smaller, producing both the anterior nervures from its anterior angle, and the fork of the first is nearer to the margin. Resembles *Ula mollissima* in general character, but the short antennæ and palpi are like others of the *Limnobiæ*. Colour of the wings as in that species, and their surface pubescent: base of the thighs yellowish.

Common in shady spots in autumn.



*L. demissa.* *Fusco-cinerea; thorace trivittato, alis stigmatate fusco.* (Long. .3; dilat. .7; antennæ, ♂.12.)

Wings as in division U. (*L. immaculata*) but the subcostal nervure is connected with the 1st of the apex by two transverse nervures, and the first branched one of the margin has a shorter fork: antennæ of 13 joints longer than in *L. immaculata*: in the male the antennæ are twice as long, with very distinct oblong compressed joints: the antennæ, feet, and abdomen are dusky: legs longer than in *L. immaculata*.

*L. pavida.* *Obscure flavida: thorace trivittato, antennis fuscis, alis hyalinis, stigmatate pallido.* (Long. .26; dilat. .6.)

Wings as in the last; but the first of the two nervures that are forked in that, is in this unbranched; the nervures are delicately pubescent: the wings hyaline, with a very pale brown stigma: the form slender, as in *L. tenella*: the legs long and slender: the borer of the female reddish.

*Dicranomyia oscillans.* *Flavido-cinerea; dorso obscurius, alis cerulescentibus, nervis fusco limbatis, maculis tribus costæ distinctioribus.* (Long. .28; dilat. .68.)

First joint of the antennæ, and the legs, are pale yellow, the ends of the thighs and shanks dusky: the back of the prothorax and of each humeral lobe brownish: wings bluish hyaline: the nervures, as in *D. chorea*; but the 1st longitudinal springs nearer the base, all are very delicately pubescent; those of the margin, the transverse, and the 3d longitudinal, are bordered with brown: the stigma diffused brown, produced backwards, as in *D. chorea*, another spot surrounds the origin of the 1st longitudinal nervure, and a third is placed at an equal interval along the subcostal nervure, the portion of which within the spots are nearly black.

I found this species abundantly on the ascent of Sliebh Donard, resting on the underside of rocky masses in the shade, swinging itself constantly on its long legs as a carriage on its springs. It has also occurred at Holywood.

GERANOMYIA. (*e Tipulariis rostratis.* Meig.)

Antennæ 14-articulatæ: articulo 1° cylindrico, 2° cyathiformi, reliquis globosis decrescentibus: proboscis porrecta, rigida, longitudine thoracis, ante medium palpigera: palpi brevissimi exarticulati: alæ incumbentes parallelæ: oculi subtus contigui.

*G. unicolor.*

Resembles a *Dicranomyia* in figure: the cylindrical rostrum is longer than the head: the palpi are inserted under its lateral margins, consisting of one minute ovate-conic joint: the tongue and lip are elongated into a rigid slender proboscis, twice as long as the rostrum: the lip terminates in two slender flattened lobes applied to each other, and containing between them the tongue, as fine as a bristle, and admitting of being pushed out a little. (The whole apparatus has a very blood-sucking appearance.) The eyes are separate on the upper side of the head: the thorax is glossy brown, immaculate, with very deep sutures: the incisures of the abdomen darker, borer reddish: poisers, legs, and proboscis, pale yellowish: antennæ and rostrum dusky: wings bluish: the nervures finely pubescent, disposed as in *D. chorea*: subcostal pale yellow, with two short dusky lines, placed as those included in the costal spots of *D. oscillans*. (Length from tip of proboscis, .32; expans. .66.)

Taken among the rocks near the harbour of Donaghadee; middle of July, 1832.

*Trichocera fuscata.*

Was produced from putrescent fungi. October.

*Tipula gigantea.*

Some years back was common here, but has now disappeared.

*Tipula dispar. Cinerea; antennis pedibusque nigris, pedicello et coxis luteis, alis obscuris immaculatis.* Mas. *Thorace bivittato.* Fem. *Alis thoracis longitudine.* (Long. .5±.)

Antennæ of the male longer than in *T. oleracea*; the second joint yellowish: rostrum and palpi shorter: legs slender, the feet longer than the shanks, extreme base of thighs yellowish: poisers bright reddish ferruginous: wings without a stigma, nervures dusky, at the base yellowish, the second entering the middle cell a little behind its central line: the female has short and thick antennæ and legs: wings contracted, very short, but with distinct nervures: poisers darker: thorax dusky on the back: borer yellowish ferruginous, rather thick and bent.

Appears after the autumnal equinox; the female generally on the short grass in plantations.

*Sciophila pictipennis*. *Ferruginea*: abdomine postice nigro-fasciato, alis hyalinis, fasciis, duobus sinuatis fuscis.

(Belongs to division B.) Smaller than *Leja Winthemi*: the 3d and 4th segments of the abdomen dusky at the base, the 5th and 6th nearly black: spines of the legs very delicate: 1st band of the wings comprehending the areolet, and diffused along the thinner margin, 2d before the apex, scarcely reaching to the margin.

Taken in Devonshire.

*Mycetophila lunata*, M.

The larvæ gregarious in the growing stems of hollow stalked agarics, spin for their transformation a long pouch of white silk with a flat circular lid.

*Myc. lunata*, F.

Differs much from the *lunata* of Meigen: is more like his *M. distigma*, but wants the black bands of the thorax.

Is not common here.

*Orphnephila devia*.

At all seasons of the year about shaded brooks. A dull timid creature, very unlike the active insects belonging to the section *fungicolæ*.

ANARETE. (*e Tipulariis Gallicolis, M.?*)

Antennæ breves, 9-articulatæ, articulis 2 baseos majoribus: oculi emarginati: ocelli tres: alæ incumbentes nudæ: nervus furcatus costæ mediæ insertus: tibiæ ecalcaratæ.

*A. candidata*. *Tipula Pini. De Geer?*

Glossy black: the wings pure white: legs pale, hind shanks and feet white; legs of the male much longer: nervures colourless, except the 2 subcostal, which are rosy, in newly disclosed specimens: nearly as large as *Lestremia leucophea*, from which it differs principally by the antennæ: the wings are alike in neuration.

CATOCHA. (*e Tipulariis Gallicolis, M.*)

Antennæ porrectæ, articulis 2 baseos crassioribus, *maris* 16-articulatæ articulis globosis remotis plosis, *femine* breviores 10-articulatæ: ocelli tres: alæ incumbentes pilosæ: nervus furcatus prope basin, costæ insertus.

*C. latipes*.

Glossy black, with dusky yellow legs, and darker tarsi: the fore pair

in the female have the last 4 joints dilated ovate, successively diminishing: wings greyish, hyaline: resembles a *Campylomyza*: the wings are of the same form, and the subcostal nervures even so disposed, but the inner is curved backwards at the transverse nervure, and emits a forked one to the margin, and the hind forked one of *Campylomyza* is replaced by two separate simple ones.

### *Cecidomyia annulipes.*

Meigen's description must have been made from a rubbed specimen.

In mine the wings are bluish, with annular rosy spots, appearing in oblique lights, the whole disk clothed with grey down: the tip of the wing has a small velvety spot of a cream colour.

### SCATOPSE B.

Metatarsus posticus *maris* haud abbreviatus, antennarum articuli tres apicales arcte connati.

*S. infumata.* *Nigra, holosericea, alis fuliginosis, halteribus nigris, tibiis antice albis.* (Long. .075.)

### *Bibio leucopterus.*

Female glabrous black, with slender legs, otherwise like the female of *B. Marci*.

Occurs at Coombe Wood: also about Holywood.

*B. nigriventris.* Fem. *Nigra; pedibus rufis, alis fusco-nervosis, stigmatate nigro.* (Long. .26.)

The male being unknown, the specific character cannot be fully drawn up. It most resembles *B. fulviventris*, with which it agrees in the length of the legs, the distinct nervures, and black stigma: it is smaller, with black body and rufous legs: it appears about a fortnight later than *B. Johannis*, for which it seems to be commonly mistaken.

### *B. hybridus.*

Half the size of *B. lanigerus* ♂, with which it agrees in general character, wings, and colour; but the pubescence is more scanty and black, except on the abdomen, where it is somewhat pale: that of the thighs is yellow, in *B. lanigerus*: from *B. ferruginatus* ♂, it differs by the finer pubescence, more obsolete stigma, rather shorter tarsi, and ferruginous tibiæ.

### *B. varipes* ♂.

Taken at Bexley in the summer, when most of the other species had long disappeared.

**B. clavipes.**

Is abundant in the autumn throughout Ireland. All the females I have taken have the legs more or less red or pale; a character unnoticed by Meigen.

**Cyrtoma.**

This genus should come next to *Ocydromia*, from which it differs little in the trophi, &c.

**Cyrtoma melæna. *Nigra, alis hyalinis, tibiis posticis gracilibus.***

Size of *C. atra* and *nigra*: the hind shanks longer than in either, and very slender: the wings whitish hyaline ♀.

Rare about Holywood.

**Trichina clavipes.**

Rare about Holywood; common in Wicklow.

**T. elongata. *Gracilis, nigra, nitida, pedibus fuscis.***

Half the size of *T. clavipes*, but as long, the abdomen of the female being very much produced and pointed: legs slender: in the male the hind shanks are somewhat clavate: in the female the fore thighs are pale, as well as the base of the others and of the shanks: wings with a light brown stigma: thorax of the male bronzed.

Rare; generally on larches.

**Hilara matrona. *Nigricans; alis fumatis, halteribus et femoribus luteis, metatarso antico maris dilatato elliptico, margine ciliato.* (Long. .22; dilat. .53.)**

Larger than *H. cilipes*: fore legs of similar structure: coxæ, thighs, and half of fore shanks, as well as the base of the rest, dirty yellow: wings with an oblong costal spot of deeper colour.

Taken beside a mountain torrent, flowing to the upper lake of the Churches.

**HEMERODROMIA.**

A: *Alis nervo transverso apicis: seta antennarum brevissima.*

**H. melanocephala. *Flava: antennis palpisque concoloribus, capite griseo, abdominis dorso fusco, alis immaculatis, nervis disci transversis tribus.* (Long. .15.)****Empis melanocephala. *Fabr. E. S.***

The size of *H. monostigma*: the wings as in it, except that the second nervure is not rounded at its termination, and does not include any

stigma: face white: thorax with a light ferruginous line down each side: tip of the abdomen, and the whole under side, pale yellow.

A rare species, inhabiting woods. Holywood, and the vale of Clara.

HELEODROMIA. (*e Fam. Tachydromiarum, M.*)

Caput orbiculatum transversum, fronte lata, hypostomate lineari: antennæ porrectæ, articulo primo minuto 2° globoso, tertio infundibuliformi seta apicali: pedes graciles: coxis anticis elongatis: alæ incumbentes parallelæ, areola media completa.

A. *Proboscis perpendicularis, capite longior, palpis brevibus incumbentibus.*

H. *immaculata. Cinerea: antennis pedibusque nigris, alis ferrugineis immaculatis.* (Long. .1.)

Wings as in *H. bipunctata*, but without the oblique apical nervure: hypostoma narrow silvery: front and thorax inclining to ferruginous: poisers yellow, the tip dusky: hypopygium of ♂ reflected ventricose.

In woods; rare.

B. *Proboscis brevis crassa subexserta: alæ nervo obliquo apicis.*

H. *bipunctata. Cinerea: vitta dorsali fusca, pedibus testaceis, alis stigmatate fusco.* (Long. .12.)

Wings narrower than in the next, the oblique apical nervure longer, and the middle cell narrower, and nearer the base: obscure, with a brown dot beyond the middle of the rib: hypostoma narrow silvery: antennæ black, thorax with a dusky stripe down the middle, sides pearly grey: poisers dusky.

About ditches in summer; very rare.

H. *stagnalis. Olivacea, subtus schistacea, genubus rufis, alarum nervis transversis infuscatis.* (Long. .16.)

Hypostoma silvery: antennæ black: front and thorax olive: back of the abdomen blackish, indented at the sides by grey spots: underside slate colour, the thighs glossed with the same: nervures of the wings as in *Brachystoma, Meig.* *Brachystoma longicornis* also resembles the present genus in its elongate fore-coxæ, but by its antennæ it belongs properly to the preceding family (*Empidæ*).



Inhabits duck-meat (*Lenma*) on the surface of ponds early in the spring, skipping very actively in small troops, and scarcely to be taken without sweeping up the surface of the water.

*H. fontinalis.* *Olivacea, subtus schistacea, thorace vittato, pedibus luridis, alis obscuris maculis tribus testaceis.*

Size of the last, which it greatly resembles: hypostoma silvery: antennæ black: legs dark red: fore thighs at the base dusky, glossed with grey: beneath their apex in the male is a tuft of hairs: front and thorax deep olive, the last with two chesnut stripes, divided by a pale line: underside slate grey: the blackish indented band down the back of the abdomen is narrower than in the preceding: hypopygium as in the last reflected forcipate, with a long bristle rolled up spirally at the end: wings dusky, the rib and nervures of the tip bordered with a deep tinge: the small transverse nervures of the base bordered with deep brown: another spot surrounds the fork of the apical nervure, and a third includes the ordinary transverse nervure: these markings are rather diffused and cloud-like, but deeply coloured.

Inhabits the shady beds of small rivulets in summer, but is rare.

LEPTOSCELES. (*Genus Heleodromiæ proximum.*)

Caput nutans, ellipticum: oculis magnis, ovatis, approximatis: hypostoma lineare attenuatum: proboscis brevis crassa palpis incumbentibus: antennæ articulo primo minuto, tertio ovato compresso: apice seta longissima: pedes graciles: coxis anticis elongatis: alæ incumbentes areola media completa.

*L. guttata.* *Nigra, nitida, linea dorsali albomicante, alis fuscis, postice albo guttatis; pedibus testaceis.*

*Hemerodromia irrorata.* *Meig.* III. T. 23. Fig. 11. *ala.*

Face silvery: thorax brassy, with a glossy white line down the middle, and other markings at the sides and in front: nervures of the wings nearly as in *Heleodromia stagnalis*; but the oblique apical nervure is connected with the preceding by a small transverse one, and the wings are narrower at the base; their colour varies from dusky cinerous to deep ferruginous: the costal margin has no spots: between the forks of the apical nervure is a round white spot, two more between the 3d and 4th longitudinal, and one between the 4th and 5th near the margin; these 4 are placed in a lozenge form: the remaining spots of the hinder area are less conspicuous. (Length .12.)



This little insect is to be found on grass throughout the summer; but is difficult to capture, flying off as soon as it is in the net.

*L. irrorata.* *Nigra, nitida, thorace olivaceo-pruinoso, linea dorsali albomicante, alis fuscis, albo guttatis et tessellatis, nervuris undulatis, pedibus testaceis.*

*Tachydromia irrorata.* *Fall. Empid. 13, 17.?*

Size of the last, inhabiting the same situations, but more common: the thorax is opaque, with more evident white markings: wings dark ferruginous, the base yellowish, the intervals between the 1st, 2d, and 3d nervures, and the oblique one of the tip, are chequered with large white spots: the rest of the wings, except the portion of the disk between the 3d and 4th, more faintly marked with small irregular dots.

*L. exoleta.* *Nigra, nitida, alis cinereis.*

This may be a variety of *L. irrorata*, as the wings in some lights appear very faintly spotted: the nervures are not undulate: the thorax is opaque black, without apparent markings (probably discoloured): a single male with the others.

*Tachypeza umbrarum.* *Nigra, nitida, antennis pallidis, alis fasciis 2 fuscis, antice subconnexis.*

The bands of the wings are connected by a very narrow line along the costa: the joints of the legs are pale, the middle shanks end in a produced sharp tooth.

*T. arenaria.* *Nigro-fusca, opaca, alis abbreviatis, fuscis, pedibus brevibus, rufo piceis.*

A singular insect, not arranging well either with this genus or with *Drapetes*: the body is coriaceous and opaque, the wings not longer than the abdomen, but with distinct nervures, nearly as in *Drapetes*: the costa thick; they are useless for flight: abdomen of 8 segments: feet very short for this family, coriaceous, unarmed, fore thighs thick, ovate, fore shanks clavate: proboscis thick, conical, inflected to the breast: antennæ with the second joint compressed, orbicular, much larger than the third: seta 2-jointed pubescent.

Inhabits sandy coasts under marine rejectamenta, running with extraordinary swiftness. Taken at Midsummer; did not occur late in autumn.

*T. graminum.*

This is probably congenerous with the last, which it resembles in the

short body, thick legs, wings unfit for flying, &c. : the antennæ have the first joint so minute as not to appear ; the second very large, orbicular, with a bristly top : obliquely on its outer side is inserted the very minute third joint, terminating in a long seta, reflected towards the sides of the breast.

Taken in swampy spots about Bexley.

*Opitia nigra.*

The males are common in September ; the females rare.

*O. lonchopteroides.*

The specimen not being before me, I defer the description of it.

*Pipunculus modestus. Ater opacus, abdominis maculis, later-alibus cinereis, antennis acuminatis. Fem.*

Front silvery, above glossed with black : antennæ black : knees and base of fore feet yellowish : hypopygium of ♀ short, globular, with a blackish spine : spots of the abdomen triangular, almost meeting in the middle : half as large as *P. campestris*. (Belongs to division A.)

Taken in Kent.

*P. exiguus. Cinereus, alis hyalinis, pedibus fusco-pallidis, halteribus albis.*

(To division C.) One half smaller than *P. spurius* (of which it may be the female, as I have only males of that species, and the colour and wings of the sexes differ greatly in this genus) : obscure cinerous, with pale poisers : wings hyaline, with a faint brown costal spot : legs dusky yellow, thighs and middle of hind shanks brown.

*Spania Fallenii. Nigra, alis denigratis, antennarum articulo tertio lineari elongato. (Long. .12.)*

Agrees with the description of *S. nigra*, except in the antennæ, which are entirely different : the third joint is longer than the head, elongate linear : the base a little thicker : the remaining portion flattened and curved outwards, the tip suddenly and obliquely attenuate, probably the insertion of a small style (but if so, it is concealed by the close pubescence, as well as the articulations of the flagellum, if any). The place of this genus is undoubtedly wrong in Meigen's work ; but whether it belongs to the *Rhagio-nidæ*, or rather to some of the neighbouring families, I cannot

positively say, without a more detailed examination than I have materials for, possessing only a pair, and the fragments of a third wanting the head. These were all taken at Holywood, about eight years since. The trophi are prominent, with fleshy lips, and long exerted linear palpi. A single *Spania* occurred this summer near the waterfall in the Devil's Glen, but as it escaped from me, I cannot identify the species.

*Medeterus alpinus*. *Nigro-æneus, pedibus ferrugineis, alis fuliginosis plagâ hyalinâ, hypostomate argenteo*. Mas. *Oculis confluentibus, alis intus angustatis*.

(To division B.) A minute species, half the size of *M. curvipes*: mouth prominent, silvery: eyes of the male contiguous, of the female divided by a very narrow line: front steel blue: body metallic, greenish black: legs ferruginous, thighs above with a dusky line, feet brown: wings dusky black, the disk whitish hyaline, transverse nervure and a dot on the 4th dusky. In the male the wings are much narrowed from the 5th nervure to the base, the tip is more determinately coloured, and the nervures suffused with black.

Near the summit of Sliebh Donard, upon spots of black springy peat; elevation nearly 3000 feet. In moory uplands of Wicklow.

*Porphyrops riparius*.

The *male*, described under this name in the 19th number of the Zoological Journal, is the other sex of *P. rufipes* there mentioned as a native; but as it does not exactly accord with Meigen's description of the *male* of that species, the synonym may be doubtful.

*P. pumilus*.

The *males* of this and some cognate species, have no spine on the hind metatarsus: my divisions A and B, should be re-united as they stand in Meigen, (and probably the genus *Rhaphium* reduced to the same;) but *P. flavicollis* seems to differ from the rest by its reflected hairy palpi, &c.

*Dolichopus jucundus*. *Viridi-æneus, incisuris nigris, antennis basi rufis, coxis anticis pedibusque pallidis, tarsis apice nigris, alarum nervo quarto rectangulatim fracto*. Mas. *Femoribus imberbibus, lamellis longius ciliatis*.

Resembles *D. nitidus* (Fallen), but the third joint of the antennæ is shorter and blunt, black at the end, the rest ferruginous with a

dark line above: face silvery: wings broad, in the male more hyaline, with a minute costal line as in that species: the hind tarsi are pale at the base: the lamellæ are fringed with longer hairs.

Inhabits marshes near Holywood. August.

*D. linearis* ♂.

Resembles *D. acuticornis*, in the form of the wings and all other characters, except the short antennæ: very rare.

*D. plumipes*. *Thorace ferruginoso, antennis rufis, apice nigris, tibiis et metatarsis anterioribus rufis, alis puncto nervoque transverso fuscis. Mas. Articulis 4 ultimis tarsorum articularum brevibus latissimis nigris, candido micantibus.*

*D. litoreus*. *Thorace ferruginoso, antennis basi subtus, tibiisque rufis, alis puncto nervoque transverso fuscis. Mas. Articulis quatuor ultimis tarsorum anticorum crassioribus ultimo albo micante.*

*D. plumipes*. H. in *Zool. J.*

These two species agree in all particulars but the following; the 4th longitudinal nervure is slightly bent at the dusky spot, and the transverse sinuate in the first, which has also the antennæ, and shanks of a brighter red: the fore metatarsus of the male is long and rufous, the following joints very broad, the end of the shanks and all the joints of the feet glossed with pure white: in the other the fore metatarsus is black, rather short, and incrassate at the end, the remaining joints are not nearly so broad as in *D. plumipes*, the last only with a dull whitish gloss: the antennæ have only a very obscure red spot on the underside of the first joint; and the red colour extends over a smaller portion of the thighs.

*D. litoreus* is not rare on the sea-coast; *D. plumipes* in the moory uplands of Wicklow.

*D. rupestris*. *Obscure æneus, femoribus posterioribus, tibiisque ferrugineis, alis intus subrotundatis obscuris. Mas. Femoribus imberbibus, tibiis posticis medio constrictis. (Long. .16.)*

Colour darker than in *D. campestris*: face obscure sulphureous; in the female almost grey: whitish above the mouth: coxæ black: thighs ferruginous, fore pair almost to the tip, hind only at the ends, dusky: tips of hindshanks and the feet black, the shanks

thicker before the middle in the male, but less conspicuously than in *D. pennatus*: wings as in *D. fuscipes*, but the 4th nervure is less curved; the 1st terminates in a black costal dot in the male.

*D. campestris.* Mas. *Femoribus posticis, nigro-pubescentibus, lamellis fuscis.*

Face sulphureous: lamellæ, below fringed with whitish down, and long black hairs at the tip: the rib of the wing has no incrassate line or dot: the hairs on the hind thighs are very short.

*D. patellatus.* Mas. *Femoribus imberbibus.*

Very rare; no females taken.

*D. urbanus.*

The dusky wings are a character of the species.

*Pipiza interrupta.* *Obscure ænea, antennis capite longioribus, genibus ferrugineis, alis hyalinis, nervurâ transversâ apicis abruptâ.*

Half the size of the small variety of *P. virens* which it resembles, but the body is much less pubescent, and the front and face have only a few very inconspicuous greyish hairs: third joint of the antennæ more oblong than in that species.

Taken at Tullymore Park in August 1831. (To division B.)

*Musca Chloris.* *Viridi-ænea, frontis vitta nigra, palpis nigris, hypostomate et antennis albidis.* (Long. .27.)

(To the division *Nobiles.*) Smaller than *M. Cæsar*, the angle of the fourth nervure less acute: the cheeks are darker than the rest of the body: the front is tolerably broad in the male, much broader in the female, with a deep black stripe, coppery, round the eyelets: the front is clothed with soft hair and not with bristles: the 3d joint of the antennæ is glossed with dull white: this is with us the most common of the *Muscæ nobiles*, but seems to be undescribed.

*Musca degener.* *Nigricans, abdomine cinereo tesselato, palpis nigris, antennis basi rufis.* (Long. .3.)

Resembles *M. rudis*, but is smaller, and the thorax without ferruginous scales: the antennæ always ferruginous or reddish at the base.

Common in Autumn.

*M. macellaria.* *Nigricans, palpis ferrugineis, abdomine olivaceo.* (Long. .26.)

Wings, as in *M. rudes*: head grey, with a broad black frontal stripe: antennæ black: thorax in front with greyish reflections, but not in distinct lines: abdomen brassy olive, with greyish reflections in the usual place.

### *Lispe litorea*.

More common on the sea-coast than *L. tentaculata*: the middle feet of the male are very short.

*L. adscita*. *Cinerea, thorace vittis, abdomine maculis nigricantibus, fronte aterrimâ maculâ acuminatâ candidâ.*

Differs from the characters of the genus by the naked seta, and the linear palpi scarcely thicker at the end: the face is most brilliant silvery white: the antennæ in the male as long as the face: the whitish triangle of the vertex is produced to the base of the antennæ, and in front is silvery white: thorax blackish, with very obscure cinereous lines: the sides slate colour: the abdomen is flat ovate, with a blackish triangular spot on each side of the second and third segments, leaving a grey line down the middle: the fourth segment is grey, with a blackish spot: legs black, with long slender tarsi, the middle pair very long: wings hyaline: the transverse nervure straight and perpendicular. (Length .22; exp. .41.)

In the female, the antennæ are shorter than the face, with the third joint obliquely attenuate: the triangle of the vertex is dull white, not reaching to the antennæ: the black front is bordered along the eyes with straw colour: the thorax is cinereous, with three broad and very conspicuous blackish stripes: the scutel blackish at the sides: abdomen as in the male; the last segment has only a narrow black line: legs scarcely shorter than in the male. (Length .26.)

Though not perfectly agreeing with *Lispe*, this species has more similarity in general form and character to this than any other genus. The hypopygium of the male is more thickened; but not inflated as in *Cænosia*.

### SCHOENOMYZA.

*Os mystacinum*: oculi æqualiter remoti: antennæ basi approximatae, apice devaricatae, subdeflexae, articulo tertio oblongo obtuso, basi seta dorsali nuda: abdomen quadriannulatum, pilosum: alae incumbentes parallelæ, nervo transverso apicis nullo.

This genus may be known from *Cænosia*, which it most resembles, by the incumbent antennæ and inflated hypopygium

of the latter. The two species referred to it are minute, and have been placed by Miegen far apart, in two genera to which they have little affinity. Both occur on the sea-coast at Holywood, but are not common.

*Dryomyza mollis. Pallide ferruginea, tomentosa, antennis apice tarsisque fuscis, alis hyalinis.* (Long. .36.)

Probably an immature variety of *D. flaveola*.

#### COELOPA.

A.—*Thorax depressed, coriaceous, with three impressed lines.*

*C. frigida.*

Fore metatarsus of ♂ toothed at the tip, below as in all the rest: the face and legs are clothed with soft dense fur without any bristles.

*C. gravis. Fusca, antennis ore pedibusque ferrugineis. Mas. Tibiis et metatarsis intermediis nigro villosis.* (Long. ♂ .3, ♀ .25.)

Front face and legs bristly: middle metatarsus concave, and as well as the shank, clothed with very long woolly black hair: fore metatarsus ending below in a blunt tooth. Female half as large: legs less bristly.

Abundant with the last on marine rejectamenta, upon sandy coasts, and equally so in the flowers of orchards.

*C. simplex. Fusca, antennis ore pedibusque ferrugineis. Mas. Tibiis et metatarsis intermediis subnudis.* (Long. ♂ .25.)  
Female smaller.

In the same situations with the last, and like it in other respects, but the characters of the male seem constant: the legs are less bristly: the metatarsus of the middle pair not arched, &c.

*C. parvula. Nigra, antennis basi ferrugineis, pedibus piceis.* (Long. .17.)

Thorax not so opaque as in the two preceding, the impressed lines very faint: legs less bristly.

Inhabits rocky coasts.

B.—*Thorax convex, soft, pubescent, without impressed lines.*

*C. sciomyzina. Pallida, tomentosa, vertice et thorace cinereis.* (Long. .17.)



Pubescence very thick and soft on the abdomen and legs: the middle shanks and metatarsi in the male, within, clothed with longer black hairs; and the fore metatarsus terminates in a smaller tooth than in the others: tips of fore shanks and the feet dusky: wings hyaline with yellowish nervures.

*Var. β.*—Smaller: the back of the abdomen dusky: the anus pale: legs clouded with brown: middle shanks and metatarsi of male scarcely bearded: pubescence not so dense. Probably a distinct species.

Inhabits marine rejectamenta.

### *Actora buccata.*

*Heteromyza buccata*, *Fallen*; but does not agree with that genus, the mouth and legs being without bristles, and thickly clothed with soft furry down as in *Actora Æstum*. (*Helcomyza ustulata*, *B. E.* 68.) From that species it differs in having the face rather less perpendicular, the 2d joint of the abdomen proportionally shorter, and the rib of the wing destitute of bristles, characters, I think, quite insufficient to separate generally two species so allied in habit.

### *Heteromyza oculata. Fall.*

*Male*, eyes large, approximate, fiery: front linear rufous: face pale rufous: antennæ black: thorax dull black, beneath grey: abdomen linear, rufous, villous: legs long, rufous: fore thighs dusky: wings blackish, the interval between the 1st and 2d costal nervures yellowish: about the middle of the rib are a few minute bristles.

*Female*, front of the usual breadth, rufous: occiput and margin of the eyes cæsius: thorax behind light grey, before blackish (discoloured?): abdomen rufous, not villous: wings as in the male, but without the yellowish space at the rib: legs not so long. (Length .26.)

### *Helomyza ustulata?*

*Female*, ferruginous: abdomen, with a hoary tinge, and narrow blackish incisures: transverse nervures, and three spots at the clip of the wings, dusky; these spots are not produced into the disk or connected as in *H. ustulata*: third joint of the antennæ elliptic, with the seta delicately pubescent (Length .26.)

### *Tetanocera vittata. Ferruginea, vittis, frontis luteis, thoracis canis, alis fusco-cancellatis. (Long. .19.)*

(To division A. h.) Front not much produced, orange, with the margin of the eye and the glossy middle stripe ferruginous: occiput

with two glossy white spots: antennæ short, ferruginous; third joint obtuse, black: seta black, feathered with long hair: face pale yellow: thorax glossy ferruginous, with three pearl grey lines down the back, separated by two of a deep chesnut; down each side a less distinct grey band: scutel dark in the middle: abdomen darker above except at the tip: legs yellow, ferruginous: fore pair brown, except the base of the thighs and shanks: wings obscure iridescent, yellowish at the base: the transverse nervure straight and perpendicular, and all the nervures bordered with deep brown.

*Tetanocera cucularia*,  $\beta$ .

The front has no black spots; on the back of the head is one dark, one bordered with white: the thorax is not grey, but yellowish ferruginous, with four deeper bands: wings yellowish, with markings deeper than in *Var. a*, but similar in disposition.

*Var.  $\gamma$* .—Colour of the body as in *Var.  $\beta$* ; the wings hyaline with very faint markings.

*Piophila luteata*. *Nigra, nitida, capite pleuris pectore pedibusque posterioribus luteis.*

More robust than *P. Casei*; the legs shorter and thicker: back of the thorax, scutel, and the entire abdomen, shining greenish black: fore legs blackish, with the knees and base of the shanks yellowish: hind thighs and shanks with brown rings, tips of the feet dusky: wings shorter than in *P. Casei*, yellowish, with thick yellow nervures.

PANDORA.

Antennæ incumbentes, articulo tertio elliptico, compresso; seta dorsali nudâ: hypostoma subdescendens foveolatum mystacinum: oculi rotundi remoti: frons lata glabra setosa: abdomen oblongum, depressum, glabrum, 5-annulatum: alæ incumbentes (erectæ vibrantes.)

The wings differ much from *Piophila*, are small and narrowed to the tip, with the 3d and 4th longitudinal nervures there approaching; the 4th is not continued quite to the root of the wing, but curved to meet the 5th; the first is double, with the branches entirely separated, as in *Ortalis*, and neither merging in the costa as in *Piophila*: the face is more convex, the antennæ reposed in deep foveolæ: the legs long and thicker than in *Piophila*.

*P. scutellaris*. *Piophila scutellaris*. *Fall.*

*P. basalis*. *Nigra, nitida, hypostomate, antennis basique pedum luteis.*

Half the size of the preceding: glossy black: wings hyaline, nervures light brown, yellowish at the base: the long fore coxæ, all the trochanters, and the base of the hinder thighs yellow: face, mouth, and antennæ yellow-ferruginous, tip of the last brown.

## SEPSIS. B.

*S. putris.* *Nigra, nitida, pedibus concoloribus.* Mas. *Metatarso antico bræxi incrassato, hypopygio brevius setoso.*

Fore thighs with a strong tooth and spines beneath, the middle of the fore shanks within emarginate, with a flattened brown tubercle: the tufts of curled hairs on each side of the hypopygium are not half as long as the abdomen.

*S. superba.* *Nigra, nitida, pedibus concoloribus.* Mas. *Metatarso antico longissimo, hypopygio longius setoso.* (Long. .125.)

Half as large as the preceding, and very like it: the fore thighs are twisted and armed below with four spinous teeth in a cluster: the fore shanks are deeply notched, with a strong tooth on the inner side; above this a spine, a small tooth nearer the base; before the tip on the outer side is a long spine: the fore metatarsus is very long and straight, the next joint is the shortest: the tuft of hairs on each side of the hypopygium is as long as the abdomen.

The male of this very distinct species was taken near Holywood, and again in Wicklow.

*S. minor.* *Nigra, nitida, pedibus concoloribus.* Mas. *Tarsis simplicibus, hypopygio nudo.*

Varies from one-half to one-fifth of the size of *S. putris*: fore thighs of the male have a few bristles below: the fore shanks have a bifid spine about the middle.

Occurs in company with *S. putris*, and is often almost as common.

*Tephritis Plantaginis.* *Flavido-cinerea, capite, scutello, pedibusque, fulvis, alis ferrugineo-reticulatis maculâ costali geminatâ nigra.* (Long. .22.)

Borer of the female black-brown: wings reticulate with ferruginous, outwardly the ground colour is ferruginous, with circular white spots; about the middle of the rib two black spots divided by a white one: the transverse nervures are approximate in three portions of the wing, the proportion of the dark colour is greatest,

sometimes appearing as three tolerably defined spots; the double costal spot forms the nucleus of one, another larger embracing the whole tip of the wing, the third surrounding the ordinary transverse nervure.

This species occurs on the sea-coast, in spots overgrown with *Plantago maritima*.

*T. Centaurea* and *T. Onopordinis* are one species, all intermediate varieties occurring.

*Lauxania amica*. *Nigra, subænea, vitta frontali cupreâ, genubus tarsisque posticis fuscis, alis subhyalinis.* (Long. .14.)

Smaller than *L. cylindricornis*, with ferruginous antennæ (short as in *L. longipennis*), the seta scarcely pubescent: face glossed with dull white: above the base of the antennæ is a transverse line, coppery or reddish: the wings are entirely obscure hyaline, or with a very faint yellowish tinge.

*L. longipennis*, *Meig.* *L. basalis*, *Steph.?*

*L. sordida*. *Ferruginea, nitida, anticis femoribus apice tarsisque fuscis, alis luteis.* (Long. .2.)

Antennæ short as in *L. longipennis*, but the seta scarcely pubescent abdomen short, broad, and rounded, with scattered black hairs.

#### PHYLLOMYZA.

Antennæ deflexæ, articulo ultimo oblongo compresso, apice obtuso, basi setâ, dorsali pubescente: hypostoma subdescendens planum nudum: oculi distantes rotundi: abdomen ovatum quinque-annulatum: alæ deflexæ nervo longitudinali primo duplicato.

1. *Ph. litura*. *Sapromyza litura.* *Meig.*

Inhabits oak trees; Tullymore park.

*Heteroneura spurca*. *Ferruginea, nitida, occipite bimaaculato, alis apice nervoque transverso late infuscatis.* (Long. .17+.)

This species differs from the others in having the transverse nervures rather distant, the double subcostal nervure more obviously divided, and the face is a little more inclined inwards; but there is no other genus with which it can be so well placed: the third joint of the antennæ has a dusky spot above, the back of the head two large brown spots: the abdomen in the female ends in an arti-

culated style: the segments are darker in the middle: face and legs paler: wings yellowish, the tip and transverse nervure surrounded with brown.

The first longitudinal nervure in this genus is distinctly doubled, though the branches are generally very near each other: in general character it seems rather related to *Psila* or to *Palloptera* than to any of the genera near which it stands in Meigen.

*Stegana annulata.* *Nigra, nitida, alis fuliginosis, hypostomate pectore pedibusque pallidis, horum annulo nigro.* (Long .14.)

The tips of all the thighs and the base of the hinder shanks black.

*Camarota aurifrons.* *Nigra, pedibus luridis, thorace opaco punctato, fronte glabra lutea.* (Long. .1.)

Face pale yellow: antennæ black, the base ferruginous: front shining glabrous, except a single series of very fine hairs near the margin of each eye, the raised triangle is golden, the rest of the front deep orange: poisers dusky: wings brown: the fore legs, the ends of the shanks, and the feet, are lighter coloured than the rest.

Taken in oak copses near Bexley.

*Meromyza viridula.* *Elongata, dilute prasina; vittis thoracis tribus discretis, scutelli et abdominis unicâ nigris.* (Long. .22; dilat. .35.)

Elongate, the front more produced than in the rest (approaching to the genus *Eurina* in this respect), palpi immaculate, a black dot on the vertex: back of the head immaculate, or with two small reddish lines: stripes of the thorax separate, the middle one continued over the scutel, all with a greyish shade: dorsal line of the abdomen not extending to the base, a dot on each side of the same colour: breast with two pale ferruginous spots: legs immaculate green: wings hyaline, with green nervures.

*M. variegata.*

In the pair of this species which I possess, the ground colour is tawny yellow without any greenish tinge: the bands of the thorax are ferruginous, the metathorax and markings of the vertex and abdomen black: the front less produced than in any of the others.

*Chlorops lateralis.* *Straminea, triangulo frontali atro, thoracis abdominisque dorso antennisque nigris, pectore maculato.* (Long. .16.)

Head shaped as in the genus *Therina*, the face being concave, and the margin of the mouth sharply projecting; but the front and mouth are naked: head yellow, front more orange, triangle of the vertex very large, not touching the eyes, in front with a produced point almost reaching to the antennæ: disk of the thorax, scutel, and abdomen above greenish black not shining: the breast has two large black spots, and above these a chain of smaller ones running from the neck to the base of the hind coxæ: legs yellow, mottled with ferruginous: the thighs generally with an oblong spot, blacker in the fore pair; a faint ring round the hind shanks, and the tips of the feet dusky: poisers milk-white: wings hyaline with blackish nervures. (To division A.)

*C. fulvifrons.* *Nigra, nitida, pubescens, fronte et antennis ferrugineis, tibiis tarsisque fuscis.* (Long. .1.)

(To division A.) Size of *C. maura*: face a little impressed: triangle of the vertex extending to the middle of the front, black behind, in front passing into ferruginous: seta of antennæ pale, the base dusky: wings obscure hyaline, nervures yellowish brown, colourless towards the tip: poisers milk-white.

*C. agnata.* *Nigra, nitida, antennis pectore pedibusque ferrugineis fusco-variis, scutello flavo.* (Long. .12.)

Resembles *C. Cereris*, is smaller: the hypopygium is not inflated nor ferruginous: the base of all the thighs and a band round the hind shanks black, fore shanks at the tip, fore feet entirely, and the end of the rest dusky: the breast is more spotted and the front darker: the antennæ dusky at the tip. (To division A.)

*Agromyza flavo-notata.* *Nigra, scutello flavo.*

(To division C. a.) Perhaps a variety of *A. scutellata*.

*Leucopis obscura.* *Canescens, thorace immaculato, antennis pedibusque nigris, metatarsis posticis luteis.* (Long. .08.)

Half the size of *L. puncticornis*, colour dark grey: poisers cream-colour: on the vertex are a few bristles.

*Notiphila madizans.* *Fall.? Obscure ænea, abdomine opaco plano, antennis basi femoribus anticis pedibusque posterioribus ferrugineis.* (Long. .11; dilat. .18.)

Abdomen oblong and flattened, rugulose, first segment very short, almost concealed, 4th large, 5th minute: wings not longer than the abdomen, obscure, with the transverse nervure dusky: face whitish: fore shanks and feet black.

Not uncommon on grass.

*Drosophila tristis.* Fall.

The two first joints of the fore feet in the male are short and broad, with a black edge; the colour called by Meigen "testaceous" appears from many instances to be a different shade from that usually so named with us: in this insect it is almost a dull black: the brown tinge at the tip of the wing is not very remarkable: the eyes are fiery red: the abdomen, at least behind, is glossy black; but in all the females very soon after their appearance it becomes from distention black, with a pale band at the base of each segment, and I doubt not that the *Musca cellaris* of Linné, is the same, as his description agrees very tolerably with the female, while no one could call the tinge of *D. funebris*, black.

The present species is exceedingly abundant in autumn, and not uncommon throughout the whole winter and early spring.

*D. ingrata.*

Distinguished from the last by the broad and short hind shanks and feet.

Only one female taken.

*D. melanogaster.*

Fore feet of the male have the 1st and 2d joint dilated.

*D. cameraria.* *Thorace testaceo opaco vittâ fuscâ, abdomine rufo, incisuris fuscis.*

Resembles *D. fenestrarum*, but the opaque and more hairy head and thorax at once distinguish it.

In windows in autumn. Bred from Boleti.

*Ephydra defecta.* *Nigro-ænea, scutello violaceo nitido, alis obscuris hyalino-guttatis, antennis subtus luteis.* (Long. .08.)

(To division B.) Seta of antennæ pectinate: face silvery: semicircle of the vertex steel blue: markings of the wings nearly as in *E. noctula*: base of the metatarsi obscure yellow.

*E. pygmæa.* *Glaucâ, capite dorso prothoracis et scutello cinereis, antennis et tarsis ferrugineis.* (Long. .05.)

The face is not convex, but rather like a *Notiphila*; but the massive mouth and general character are more like *Ephydra*: antennæ with a dusky line above, third joint orbicular, seta short and pectinate:



poisers milk-white : feet dull yellow : wings obscure, the transverse nervure darker. (To division B.)

On the sea-coast.

*E. fossarum.* *Fusco-ænea, hypostomate æneo, pedibus nigris, alis fuscans, nervis transversis obscuris.* (Long. .11; dilat. .26.)

(To division C. b.) Resembles *E. coarctata*; but the second longitudinal nervure has not the little branch: seta of antennæ pubescent: abdomen brassy green.

A very abundant species.

*E. hecate.* *Nigro-ænea, alis fuliginosis, nervis transversis obscuris utrinque hyalino guttatis.* (Long. .11; dilat. .22.)

(To division C. b.) Resembles the last; but the wings are much shorter and darker, at the end of the second nervure a dusky spot, and a distinct white one above and below each transverse nervure: the nervures of the tip bordered with brown: hind feet brown.

*E. infecta.* *Nigro-ænea, pedibus nigris, scutello chalybeo, alis obscuris, nervis transversis fuscis.* (Long. .08.)

(To division C. b. but the termination of the 2d longitudinal nervure is farther from the tip): wings greyish, transverse nervures clouded with brown, a hyaline spot above and below the inner: face cinereous: seta pubescent.

*E. micans.* *Obscure viridis, fronte violacea, antennarum seta subnuda, hypostomate candido. Mas. Aut flavescente. Fem.*

Size of *E. riparia*; but distinguished by the nearly naked seta and intense colour: face below the antennæ violet: thorax dark green with violet lines: abdomen of the male hoary green, of the female intense green with depressed tawny incisures.

*E. sibilans.* *Cinerea aut olivacea, capite thoraceque ferruginosis, hypostomate luteo, alis obscuris.* (Long. .11.)

(To division C. b.) Face convex, orange: antennæ black: seta finely pubescent: head and thorax with a ferruginous tinge, sides pearly grey: abdomen brassy olive: eyes brilliant green and coppery: legs black: transverse nervures darker: like *E. leucostoma*, but twice the size.

Early in the spring and summer, on the sea-coast. The other *Ephydræ*, except *E. curvicauda*, appear later.

*E. æstuans.* *Cinerea, capite thoracisque dorso ferruginosis, hypostomate luteo, alis cinereis (vel ferrugineis) macula punctisque albis.* (Long. .11; dilat. .3.)

(To division C. b.) Head very large, face convex, tawny yellow front ferruginous, generally paler in the middle: thorax opaque ferruginous above, generally with grey lines and spots, sides extending above the wings: scutel, metathorax and abdomen opaque grey: poisers yellow: seta of antennæ pubescent: markings of the wings placed as in *E. stagnalis*, but more conspicuous, and the spot between the 2d and 3d nervures is very large and square.

On marine rejectamenta; common in autumn.

*E. paludum.*

None of the species with similar markings have the wings so ample as the present.

*F. lutosa.* *Cinerea, capite thoraceque ferruginosis opacis, alis cinereis, guttis 5 hyalinis.* (Long. .09.)

Half as large as *E. stagnalis*, and constantly distinct: the thorax has no gloss or markings: the wings are lighter grey or ferruginous, the spots less evident: face yellowish.

I have seen yet another species with the wings similarly marked, but it does not occur about Holywood.

*E. graminum.* *Thorace cinereo punctis quinque pallidis, abdomine pedibusque nigris, tarsis flavis, alis cinereo-maculatis.* (Long. .08.)

Marking of the wings nearly as in *E. quadrata*, of which it may be a variety.

*E. compta.* *Nigro-ænea, abdomine pedibusque nigris, alis cinereis, albo guttatis, seta antennarum villosa.* (Long. .08.)

Markings of the wings as in *E. noctula*, and it may possibly not be distinct.

*E. interrupta.* *Thorace olivaceo fusco, vittato, abdomine postice nigro-nitido, hypostomate antennis tarsisque flavis, alis fuscis, disco hyalinis, nervis transversis infuscatis.* (Long. .1.)

(To division C. c.) Larger than *E. stictica*, which it resembles; the transverse nervures are much more approximate, and the dusky tip of the wings includes two deeper spots placed nearly as in *E. stictica*.

*E. cesta*. *Nigro-ænea, nitidissima, abdomine magno punctatissimo pubescente cyaneo.* (Long. .07.)

Head and thorax formed as in *E. rufipes*: seta villose above: abdomen very large and rather convex, 1st segment evanescent, 4th comprehending half of the entire, 5th minute deflected; the whole surface except the incisures deeply and coarsely punctured and pubescent: wings rather small, hyaline, nervure as in *E. rufipes*.

Neither this species nor *E. rufipes* agree well with the present genus; in some characters they rather approach *Notiphila mazedans*. *Fall.*

*Opomyza florum*. *Var.*

Along the third nervure, between the transverse one and the tip, are from 4 to 7 dusky dots: the body is lighter coloured than in the common variety, and also smaller.

*O. tremula*. *Castanea, hypostomate antennis pedibusque flavis, thoracis dorso cinereo, abdomine nigro, alis basi apice nervoque transverso fuscis.* (Long. .15.)

More robust than *O. tripunctata*, the wings narrow and more pointed, the spots as in *O. bipunctata*: a spot on the hind thighs, and the base of the tibiæ are deep brown.

*O. asteia*. *Nigra, nitida, vertice concolore, capite abdominis basi pedibusque flavis, alis hyalinis.* (Long. .1.)

Form of *O. gracilis*: front face and antennæ ferruginous: seta naked: poisers pale yellow: thorax glossy greenish black.

Inhabits larch trees in autumn; rare.

*Borborus pedestris*.

Taken at mid-winter, on the banks of the Wandle, near London.

*B. hamatus*. *Nigro-æneus, nitidus, hypostomate nigro, alis ferrugineis, halteribus albidis.* (Long. .2+.)

(To division C.) Segments of the abdomen of nearly equal length: hind feet clothed with glossy yellow hair: 1st joint in the female shorter and dilated, 2d scarcely dilated; both in the male much broader, and the hind thighs at the base armed with a strong hooked tooth.

In woods; not common.

Division e. may be subdivided thus

† *Disk of the scutel glabrous, sides bristly.*

†† *Disk of the scutel pubescent or bristly.*

To C. † belong *B. sylvaticus—limosus—fenestralis?—clunipes—ochripes—zosteræ—nivalis*; and many more which it is difficult to distinguish.

To C. †† *B. fuscipennis—vagans, &c.*

*B. nivalis. Niger, hypostomate ferrugineo, alis abbreviatis.* (Long. .08.)

Dull black: face rusty yellow: legs rufescent: thighs and hind shanks dusky: 2d joint of hind feet twice as long as 1st, scarcely thickened: wings shorter than the abdomen.

About the roots of trees during the winter; leaping far.

*B. Zosteræ. Niger, tarsi luteis, alis denigratis, thorace scutelloque opacis planis, antennarum seta albida.* (Long. .06.)

Thorax with an obsolete depressed line down the back: scutel with only about two pair of bristles at the sides and tip: feet short, yellowish, 2d joint of the hind pair somewhat thickened: wings of an uniform opaque smoky tint: knob of the poisers deep brown.

Common upon *Zostera*, drying on the shore.

*B. fuscipennis. Niger, pedibus piceis, thorace scutelloque ferruginosis setosis, alis fuscis, halteribus luteis.* (Long. .09.)

Resembles *B. limosus*, but is smaller, and the wings darker: the disk of the scutel, as well as the thorax, set with bristles; both have a very dull ferruginous tinge: 1st joint of hind feet very broad, 2d twice as long, scarcely at all thickened: seta of antennæ black.

Common on marine rejectamenta.

*B. vagans. Niger, opacus, scutello pubescente, alis denigratis, halteribus luteis.* (Long. .06.)

Resembles *B. Zosteræ*, but the disk of the scutel is pubescent and not so flat: feet short, fore pair a little dilated.

(— Division F.) Transverse nervures approximate, 4th and 5th longitudinal not approaching each other, 3d curved to the rib beyond the middle.

*Borborus aterrimus. Ater, holosericeus, alis albis, seta antennarum albida.* (Long. .04.)

Feet short, fore pair a little dilated: seta pubescent whitish: wings opaque, milk-white: rib blackish, the other nervures inconspicuous.

*Phora abdominalis.* Fall.

(To division C.) The termination of the 2d subcostal nervure forked: larger than *P. thoracica*; a female taken but once.

*P. debilis.* *Fuscus, thorace cano-lineato, alis et pedibus inermibus testaceis.*

(To division E.) Wings deep brown, with darker nervures and hyaline streaks between.

*P. Dauci.* Meig.

This is the female of *Conicera atra*.

*P. similis.* *Nigra, tibiis et tarsis anticis testaceis, alis subhyalinis.* Mas. *Antennis conicis ascendentibus.*

(To division F.) Half the size of *P. Dauci*, (*Conicera atra*), the antennæ shorter: wings more obscurely hyaline, with conspicuous nervures, those of the rib thick and bristly.

*P. galeata.* *Nigro-fusca, thorace compresso, pedibus inermibus.*

(To division G.) Head compressed, with the dilated front overhanging the eyes: seta of antennæ ascending, feathered, thickened at the root: palpi prominent divaricate, pale: thorax entirely compressed: wings hyaline, rib pubescent: abdomen depressed very broad behind.

This insect is very unlike the rest of the genus, and is still more active than any of them. It occurs on umbelliferæ in autumn, but is not common.

*P. aterrima.*

In all my specimens the fore shanks and feet only are testaceous, but the difference is too slight to indicate another species, as the like is not uncommon in other species of the genus.

*Bibio lanigerus.*

The first time I met with this species was in the beginning of April, some years back: walking one sunny morning on a low sandy spit, that runs into the bay at Holywood, and is used for grazing cattle, I was struck by an appearance of innumerable sparkles of light over the short herbage, as far as I could see, resembling the reflections of the sun on a gentle ripple. On looking for the cause, I found the sward covered with this species, principally males, who were in busy movement, exploring and quartering their ground with the skill of a trained setter. The evident object of their search was the

females, who in the proportion of about one to fifty of their partners, were sitting sluggishly on the stems of the grass. I continued my walk for about three hundred yards, without perceiving any diminution of numbers. I then measured off a square foot, and counted within that space thirty-seven; and they did not appear thicker in that spot than in others. Though the species is still abundant in the season, I have never since witnessed an assemblage like this. About noon, they may be seen in sunny gravel-pits, the males soaring about in hawk-like circles; and when they alight, resting with the wings expanded, and ready to take flight on the least shadow approaching. I know of no species in which the disparity of numbers is so great as in the present. In this respect, *B. Johannis* perhaps come next. In *B. Marci* and *B. clavipes*, the difference is still less, and I believe scarcely exists in *B. hortulanus*. This difference of numbers in the sexes is a remarkable point, and must be connected with something in the economy of the species which exhibit it. To mention another instance, I have seen hundreds of *Pezomachus fasciatus* ♀, yet never met with a male, nor has any collector of my acquaintance one of that sex. This circumstance might seem to give support to Geoffroy's opinion, that the males of the *Pezomachi* are winged, in which case it would be more easily overlooked, were there any of our common-winged male *Crypti* at all resembling it, and did we not know the males of several closely allied species to be like their partners. For other instances of the males being quite unknown, I may mention *Megaspilus rubi* (*Microps Rubi mihi*), *Ceraphron melanocephalus*, *Cryptus sticticus*, *F.* &c. <sup>b</sup>

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ART. XVIII.—*Entomological Tour in South Devon.* By  
Messrs. CHANT and BENTLEY.

SIR,—If you consider the following remarks worthy a place in your Magazine, they are quite at your service. We thought they might in some degree amuse the general reader, and also

<sup>b</sup> We regret to see no reference in this valuable paper to Macquart's "*Insectes Diptères du Nord de la France*," a work in which so many new species of Diptera have been described, that we fear there is a probability of some confusion as to names.—Ed.

furnish some useful hints to the practical entomologist, who may be disposed to visit that part of the country.

We arrived at Exeter in the evening of the 28th of May; but as we had been travelling twenty-eight hours, and had experienced both wet and cold during the journey, we did not feel disposed to commence operations that evening.

May 29th. Fine morning; reconnoitred the ground to the left of the city, in a lane near the Plymouth road: took *Orthotania Hastiana* and *Adela cuprella* in the afternoon; went to Haldon Hill, to the right of the city; *Brachinus crepitans*, and a few species of *Harpalus* taken: a fine view of the city.

30th. Walked on the banks of the river Exe: fished for *Dyticidæ*: *Hydroporus depressus* and *Colymbetes maculatus* taken; in the marsh near the river took *Saperda cylindrica*. On our return near the canal, *Peryplus agilis* and *Tachypus striatus* were also taken; we could find no good entomological ground about Exeter; therefore we left in the afternoon for Ashburton, a fine ride through Chudleigh, to the right of which place you see the Hayter rocks, that supplied a great portion of the granite for the erection of new London Bridge. Ashburton is about twenty miles from Exeter, pleasantly situate amongst hills, of which the Buckland Beacon and the Hazel Rock are the most conspicuous.

31st. Collected about the Hazel Rocks: they are situated near two miles to the right of Ashburton, upon an ascent; the whole of the way from the summit of which, we had one of the finest prospects in Devon: there is a fir plantation; also a small copse near the rocks, where, from the appearance of the place, we anticipated much success: took a new *Tortrix*, for which we propose the name *Myrtillana*; we beat it out of the *Vaccinium myrtillus*, which was growing in abundance. In returning to Ashburton, from under stones in a running brook, *Colymbetes guttatus* was taken. In the afternoon went to the Old Bridge: collected about the banks of the Dart; several species of *Bembidiidæ* taken.

June 1st. Fine morning; in the fields near the town, from umbelliferous plants, took many Hymenopterous insects.

2d. The morning rather showery: paid another visit to the Hazel and the Buckland Beacon; from the former place we captured *Ptychopoda fumata*, rare, and some more



*Tortrices* from the *Vaccinium*; and from under stones, at the latter place, *Elater cupreus*.

3d. Cold and dull: collected on the banks of the Dart, about two miles from Ashburton: took more *Peryphus agilis* and *Tachypus striatus*: wet night.

4th. The weather still unfavourable: left Ashburton for Totness, where we arrived about 12 o'clock; and by the passage-boat sailed to Dartmouth, a delightful sail down the river Dart, which place we reached at 3 o'clock.

5th. This morning went to Blackwell Sands: collected about the beach; *Phycita nebulella*, *angustella* and *Gemina* taken; also *Crambus pygmaeus* and *auriferellus*; both rare: returned to Dartmouth: wet evening.

6th. The morning showery, with cold winds: crossed the ferry to King's Wear; from thence to Brixham and Torbay; near the latter place we found *Harpalus annulicornis* and *ignavus*: returned to Dartmouth. In the evening mothed near the castle: *Miselia compta* and *Lobophora varietata* taken.

7th. This morning visited Slapton Lea, a fresh water lake below Blackwell Sands: it is about one mile in length, and parallel with, and in some places not more than forty yards distance from the sea: it abounds with fresh-water fish and sea fowl: from the margins of which we took *Blethisa multipunctata*; and from the sands, *Dromius quadrillum*, rare: we also found *Malachius marginellus*, and *Dasytes viridis* in profusion, in flowers growing on the sands.

8th. Fine morning: not out entomologizing this day: walked to the hill at the top of the town, and to the castle hill in the evening: a fine promenade for the towns-people, and from which place we had a fine view of the sea and harbour.

9th. Again visited the sands: took more *Phycita*; also *Orthotænia politana* and *Argyrolepia luteloana*, rare.

10th. The morning very hot: walked again to Blackwell Sands: collected more Lepidopterous insects, likewise *Mordella ventralis* and *aculeata*: in the evening, mothed behind the castle: *Deilephila Elpenor* taken.

11th. The weather still fine, we again collected upon the sands: found *Opatrum sabulosum* and *Lixus sulcirostris* in profusion; *Lygæus Apteris* and *micropterus* also taken. This evening we engaged beds at the Star Inn on the beach,

for the purpose of mothing, as there was growing on the sands a number of plants; we thought it would be worth a trial; but to our surprise not an insect was seen.

12th. Fine morning: collected about the lake: the waters of which we observed had greatly decreased by evaporation; from the parts that were still damp we took *Peryphus atrocæruleus*, and *Notaphus obliquus* in great abundance: we also took from the roots of grass, *Elater 4-pustulatus*, *Anchomenus oblongus*, *Pæderus littoralis* and *fuscipes*. After dinner returned to Dartmouth: in the evening, *Harpalyce Galiata* taken.

13th. This morning returned again to Slapton, and from the lake we had the pleasure of fishing five specimens of *Gyrinus lineatus*, a new species, and *Gyrinus Villosus*: near the lake, *Cassida splendidula*, *Galeruca Sagittariæ* and *lineola* were likewise taken: lodged at the Star Inn this night.

14th. Walked to Tor Cross on the sands: took *Ocys tempestivus*, and more *Dasytes viridis* from *Statice Armeria*. In the evening we proposed trying once more our success in mothing at the lake, but were compelled to make a precipitate retreat in consequence of a tremendous storm of thunder and rain. Stormy all night: the sea very rough.

15th. Dull morning: walked towards King's Bridge: saw the old tower at Slapton; a very ancient ruin, belonging to the Rev. — Page. The sea still very rough, although the wind had abated many hours: wet night.

16th. The morning more fine: beat *Donacia simplex* from reeds growing in the lake; also a *Tortrix*, that does not appear to be described. After dinner we left Slapton for Dartmouth.

17th. The morning stormy: left Dartmouth in the passage-boat for Totness, where we arrived in three hours, after experiencing one of the most dreadful storms of thunder and rain that we ever witnessed: after a good dinner, and getting ourselves somewhat dry, which we were enabled to do at the Town Arms Inn, we proceeded on to Ashburton, where we arrived at 5 o'clock: it rained in torrents all night.

18th. Notwithstanding the wet, we walked to Holne, Spitchwick and Buckland, a delightful walk along the banks of the Dart: woody for two miles. *Notiophilus rufipes*, and *4-punctatus*, *Odontonyx rotundatus*, *Synuchus vivalis*, *Calathus piceus*, *Margaritia longalis*, *Cordulegaster Amulatus*,

and *Libellula Donovanii* taken: in the evening, *Thyatira Batis* taken.

19th. Wet morning: not out till after dinner: paid another visit to Spitchwick and Buckland: captured *Erastria fuscula*, *Electra populata*, rare; a new *Eupithecia*, which we have named *nigro-punctata*,<sup>a</sup> *Ptychopoda fumata*, and *Hypena crassalis*; of the last species there were only three specimens known, and they were all females, taken at Westerham, in Kent, about thirty years since; two by the late Mr. Plastead, and the other by Mr. Haworth: we found both sexes, but the males were considerably the rarest, and are much darker than the female.

20th. Dull morning: went again to Buckland: took more *Hypena crassalis*; also *Eudorea subfusca*, and *Chrysomela varians*, &c.

21st. Again wet and dull: went to Holne Chace, the seat of Sir Boucher Wray; from thence to Spitchwick park, the late residence of that eminent entomologist, Dr. Leach: returned to Ashburton through Buckland; *Cychnus rostratus*, *Argyrolepis tesserana* and *decimana*, and a new *Cnephasia*, also *Quedius lateralis*, rare, taken in Spitchwick park. Near Buckland, we observed *Thecla rubi* in the greatest profusion, hovering over a bank where a species of *Thymus* was in bloom: the bank was sheltered from the wind, which was blowing rather strong at the time: this, together with the attractive scent of the thyme, was sufficient to account for their congregating together in such prodigious numbers.

22d. More wet with thunder: not out till after dinner; then started for Spitchwick, where we lodged that night at the Tavistock Inn: the evening fair but windy.

23d. Fine morning: walked across Dartmore Forest to Tavistock, a distance of eighteen miles, over hills of an immense altitude, composed of granite, sterile and uninviting; not a tree or bush to be seen, excepting a few willows at Two

<sup>a</sup> *Eupithecia nigro-punctata*, Chant. *Alæ late virentes strigâ mediâ transversâ undulatâ macularum nigrarum, intus quam anteriores maculas 6 aut 7 nigras habent.*

Alarum dilatio, 9—10 lin.

Eup. V-atæ simillima at satis distincta, paullò major et striga numquam continua sed macularum nigrarum confecta.

Habitat apud *Spitchwick* in *Devon*. imago diebus Junii haud infrequens.

Bridges; near which place we saw *Silpha nigrita* in abundance; but on our return, two days after, scarcely one was found; *Carabus arvensis*, *Blemus paludosus*, *Silpha opaca* and *tristis*, *Byrrhus oblongus*, and several specimens of *Pæcillus versicolor*, the whole of them entirely black, and on Tavistock Bridge, a specimen of *Atherix Ibis*, were taken.

24th. Fine morning: we were determined, if possible, on finding the locality of *Carabus intricatus*: after several hours perseverance and toil, we found ourselves in the little wood on the banks of the Tavey, opposite the Virtuous Lady Copper Mine, the identical place where Dr. Leach discovered the first specimen that was taken in Britain: but our search was in vain; we could find no *Carabus*, but *catenatus*. On our return to Tavistock, we took *Bombylius minor*, *Elater cupreus* and *æneus*, *Geotrupes vernalis* and *lævis*. In the evening walked to Prince Town, where we lodged that night.

25th. After breakfast we returned to Spitchwick: in the evening mothed in the park. *Pedicia rivosa*, and *Dolichopeza sylvicola* taken.

26th. The weather still fine, collected at Spitchwick and Buckland on our return to Ashburton; and in the evening mothed in the fir plantation, near the Hazel Rocks: nothing new taken.

27th. Very fine and hot weather; packed up and left Ashburton at noon for Exeter, from thence to London, where we arrived at 5 o'clock in the afternoon of the following day.

In taking leave of this interesting county, we must acknowledge that we were rather disappointed in not meeting with more rarities than we did, particularly as the county had been cried up for producing so many; but as we were entire strangers to the place, it may account for it in some measure; taking into the account also that the weather was generally unfavourable for entomologizing.

C.

ART. XIX.—*Characters of some undescribed Genera and Species, indicated in the "Guide to an Arrangement of British Insects."* By JOHN CURTIS, Esq. F. L. S.

ORDER.—COLEOPTERA.

Fam.—CORTICARIDÆ. *Curt.*

GEN. 239.\*—HOLOPARAMECUS. *Curt.*

Oblong, depressed: head rounded, eyes small and lateral: thorax obcordate, quadrate, broader than the head: scutellum concealed: elytra elliptical: antennæ capitate, nearly as long as the thorax, inserted close before the eyes, 9-jointed, basal joint sub-globose, 2d and 3d long, 4 following sub-globose, the remainder forming a compressed club, the 8th joint semiovate, 9th somewhat ovate, the apex internally angulated: thighs incrassated: tibiæ simple, compressed: tarsi triarticulate? basal joints short, terminal one long and clavate, claws minute.

1. *Depressus. Curt.*

Testaceous, shining, sparingly punctured: eyes black, granulated: thorax with a transverse suture behind, the margins of the posterior angles a little raised, with a deep abbreviated longitudinal channel on each side at the base: elytra with a channel down each side the suture (Length  $\frac{1}{2}$  a line.)

This insect appears to connect *Scydmaenus*, and the group I have called *Corticaridæ*, which has hitherto been included in the family of *Engidæ*. I took a single specimen in Norfolk many years since, and believe it is granivorous.

GEN. 241.—PARAMECOSOMA. *Curt.*

Elongate-ovate, sub-depressed: antennæ longer than the thorax, capitate pilose: 11-jointed, first 8 joints gradually diminishing in length, the 1st and 2d robust, especially the former, the latter ovate, the 9th, and following, forming a compressed club, 9th joint obtrigonal, 10th subturbinate, 11th orbicular, the apex produced internally: head trigonal, eyes lateral: thorax slightly transverse-quadrate, the sides a little convex: scutellum transverse-ovate: elytra elliptical: thighs and tibiæ simple: tarsi 5-jointed, 4th joint minute, 5th the longest: claws slender.

1. *Bicolor. Curt.*

Shining, ferruginous, clothed with short ochreous pubescence: head, eyes, thorax, and scutellum black, strongly and thickly punctured,

\* The numbers throughout refer to the "*Guide*."

the thorax convex, with a small fovea on each side at the base, near the posterior angles: elytra with strong lines of punctures very close together. (Length  $\frac{2}{3}$  of a line.)

My specimen was taken at Southgate, and presented to me by Mr. F. Walker.

GEN. 245.<sup>a</sup>—LISSODEMA. *Curt.*

Elliptical, convex: antennæ inserted in cavities close to and before the eyes as long as the thorax, clavate, pubescent, and 11-jointed, the first 8 joints short, the 1st and 2d but slightly larger than the 3d, the following gently increasing in stoutness, the 3 terminal forming a long robust club, the 9th and 10th joints cup-shaped, the 11th longer and ovate-conic: head trigonate, eyes lateral; thorax orbicular, the sides dentated: scutellum triangular: elytra very long and elliptic: legs short: thighs and tibiæ simple: tarsi 5-jointed; posterior pair 4-jointed? the basal joint being as long as the terminal one: claws slender.

1. Heyana. *Curt.*

Pitchy chesnut, shining, strongly and rather regularly punctured: thorax with 4 or 5 denticulations on each side, and a fovea near each posterior angle: elytra with numerous irregular lines of punctures: mouth, antennæ, and legs, pale castaneous. (Length  $1\frac{1}{2}$  line.)

Taken by the Rev. Samuel Hey, of Ockbrook, after whom I have the pleasure of naming this curious beetle; it has the habit of a *Rhizophagus*, but the antennæ are different; and, if I mistake not, the tarsi are heteromerous.

ORDER. — HYMENOPTERA.

*Fam.*—ICHNEUMONIDÆ.

GEN. 546.—MACROCENTRUS. *Curt.*

Mandibles notched at the apex: maxillary palpi very slender, and as long as the thorax, 5?-jointed, basal joint short, terminal ones nearly of equal size and length: labial palpi tri?-articulate, basal joint the shortest, terminal one the longest: antennæ longer than the body, slender, filiform, basal joint robust and ovate: head transverse: thorax elongate-ovate: abdomen, subsessile, fusiform, or clavate: ovipositor as long as the antennæ: superior wings, with the marginal cell nearly reaching the apex, 3 sub-marginal cells, the central one oblong; 2 discoidal cells, the superior one large: inferior wings, with distinct nervures.



1. *Bicolor. Curt.*

Piceous, shining, pubescent: mouth and thorax orange-ochre: post-scutellum rugose, stigma ochreous, nervures pale brown: base of abdomen subcastaneous, the back, excepting at the apex, finely sculptured in vermiculated striae: oviduct ferruginous: legs pale ochreous, tips of posterior tibiae and tarsi fuscous. (Length 3 lines, ovipositor  $4\frac{1}{2}$  lines.)

GEN. 548.—*PLANCUS. Curt.*

Antennae filiform: not so long as the body, composed of 13 joints, basal joint rather the stoutest, and chalice-shaped, 2d globose, 3d long, the remainder decreasing in length: palpi minute: head transverse: eyes large: ocelli 3, very large: thorax small and globose: abdomen long and clavate: ovipositor shorter than the groove that receives it: superior wings, with a long narrow stigma placed in the marginal cell, which is of the same form: sub-marginal cell 1, arising at the angle of the marginal one, and extending to the posterior margin; discoidal cells 2, the superior one reaching the stigma: inferior wings, with 2 longitudinal and a transverse nervure: posterior legs rather long: coxae and thighs slender: tibiae rather clavate, tarsi thicker than the thighs, the basal joint longest, very long in the 1st and 2d pair.

1. *Apicalis. Curt.*

Ochreous, shining: antennae, excepting the 2 basal joints, and head excepting the mouth, blackish: back of thorax and apex of abdomen black, the base and middle of the latter fuscous: stigma and nervures brown: legs pale ochre, posterior pair testaceous. (Length  $1\frac{1}{2}$  line.)

Of this remarkable insect, I have seen only the female in my cabinet, which I believe I took in the neighbourhood of London.

## ORDER.—TRICHOPTERA.

GEN. 757.—*SILLO. Curt.*

Palpi pubescent only, maxillary the longest, the 3 terminal joints of equal length: antennae not longer than the wings, inserted in front of the head, setaceous: basal joints porrected and parallel, long, stout, cylindric, and hairy, the remainder very short: head small, transverse, very hairy on the crown: eyes lateral and prominent, abdomen short: wings nearly twice as long as the body, rather obtuse-lanceolate: superior, with 2 costal nervures, and below them 3 furcate ones, and 3 others united near the disk,



with a curved one near the posterior angle: inferior wings rather small, with 4 furcate, and several other nervures, cilia short: intermediate and posterior tibiæ spurred at the apex, with a pair of spurs also below the middle.

4. *Flavipes*. *Curt.*

Rather silky ochreous: thorax and abdomen piceous, inferior wings, and under side, also the coxæ and thighs, fuscous. (Length 3, breadth 11 lines.)

The *Phryganea atrata* of Fabricius, which I did not possess at the time the *Guide* was published, does not belong to this genus, but his *P. pallipes*, I think, may be considered the type of it.

ORDER.—LEPIDOPTERA.

Fam.—NOCTUIDÆ.

GEN. 846.—*RHIZOLITHA*. *Curt.*

Palpi hairy, not projecting beyond the head, porrected horizontally: antennæ rather long and stout, slightly ciliated beneath: head with a conical brush of hair projecting over the face: thorax crested: abdomen subdepressed, truncated, and tufted at the apex: wings incumbent when at rest, superior, long, and narrow, with a bifid line at the base, posterior margin rounded, and slightly dentated: inferior wings, with the margin undulated.

I am totally averse to changing names, especially generic: I therefore think the practice a very bad one, of raising a specific name to designate a genus, by which both are disturbed, except as in the present case, where the name is merely a synonym, the type being the *Noctua Lambda* of Haworth's *Lep. Brit.*

GEN. 867.—*LAMPETIA*. *Curt.*

Palpi densely clothed with short scales, forming a beak: maxillæ shorter than the antennæ, which are long: thorax with a sub-conic crest on the back: abdomen very flat on the back in the males, and rounded at the apex: wings decumbent when at rest; superior rounded at the shoulder, truncated at the apex, which is acute: inferior slightly scalloped: thighs and tibiæ broad and compressed.

I do not know a better characterized form amongst this difficult family, than the *Noctua croceago* of *Fab.* the type of

our genus; and am surprised that neither Duponchel nor Stephens has made a genus of it.

*Fam.*—PYRALIDÆ, or CRAMBIDÆ.

GEN. 992.—HOMŒOSOMA. *Curt.*

Labial palpi porrected horizontally considerably beyond the head, slender and tapering: maxillæ much shorter than the antennæ, which are simple and setaceous, the palpi minute: abdomen terminated by a pencil of scales: wings convoluted, I believe, when at rest; superior narrow, sublanceolate, and rather obtuse; inferior ample.

1. *Gemina*. *Haw. Lep. Brit.*

Dirty ochre, shining: superior wings with an irregular fuscous bar at the middle, another, forming a fimbria, and a 3d between them; inferior wings fuscous. (Length  $3\frac{1}{2}$ , breadth 9 lines.)

This insect is distinguished from *Crambus* by the shortness of the labial palpi, and from *Phycita* by their straightness. Mr. Stephens has included it with the *Phycitæ*.

*Fam.*—TINEIDÆ.

GEN. 998.—DASYSTOMA. *Curt.*

Male, rough, hairy: palpi forming 2 hairy brushes: antennæ rather long, distinctly ciliated: head broad and hairy: abdomen rather short and stout: superior wings lanceolate, the costa arched, 2 nervures at the base, and a transverse one beyond the middle elevated: legs rather robust, the spurs stout.

1. *Salicella*, *Hüb. Tin. Pl. 2, Fig. 9. a dark variety of the male*: *incompletaria*, *Haw. Lep. Brit.* ♀.

Our British specimens are generally rosy in colour; this insect approaches nearest to *Tinea Phryganella*, *Hüb.*; but is distinguished from it by the obtuse hairy palpi.

GEN. 1000.—CHEIMAPHASIA. *Curt.*

Male, smooth, shining: palpi very minute, slightly hairy: antennæ short, slightly pubescent beneath: head small, pubescent on the crown: abdomen rather slender: superior wings sublanceolate, very much narrowed towards the base: legs slender, the spurs small and acute. Wings of the female lanceolate, hairy, shorter than the body.

1. *Gelatella*, *Lin. Faun. Suec.* 1450. *Hüb. Tort.* Pl. 42, Fig. 266. ♂, ♀.

Both the above insects are included under the same head, by Mr. Stephens.

GEN. 1027.—*EDERESA*. *Curt.*

Palpi slender and drooping, longer than the head, the crown of which is clothed with a tuft of hairs : superior wings linear-lanceolate, the costa arched, with a pale or white interior margin, interrupted by a dark oblique fascia.

8. *Semitestacella*. *Curt.*

Testaceous, shining : palpi, crown of head, and antennæ white ; the latter beautifully spotted with black : superior wings, with a white flame-shaped stripe on the inferior margin, and 2 pale spots on the costa towards the apex : inferior wings gray, cilia fuscous : tibiæ and tarsi spotted above with black. (Length 2, breadth 7 lines.)

The type of this genus is the *Tin. pruniella*, *Linn.* : the form of the superior wings, and their pale inferior margin, will distinguish this group from my *Argyromiges*, as well as from *Argyrosetia*. *Tin. semitestacella* was taken in the New Forest by Mr. Lyell ; and it is possible that my *E. semipurpurella* may only be a dark variety of the same.

GEN. 1039.—*CHRYSOCORYS*. *Curt.*

Palpi slightly curved, slender, and attenuated, longer than the head, composed of 3 joints, apparently of nearly equal length : antennæ rather short, and serrated with whorls of short scales : head and thorax clothed with metallic scales lying close to the surface : abdomen short and slender : wings narrow and lanceolate : superior long, and slightly disposed to be falcated : cilia long : spurs to hinder tibiæ exceedingly long and slender.

1. *Angustipenella*, *Guide*. *Scissella*, *Haw. Lep. Brit.* 580, 69.

I think there is little doubt but this pretty and curious little moth is the *Tin. Festaliella*, *Hübner*, Pl. 67, 449 ; but I am doubtful if it be his *Tin. scissella*, Pl. 39, 270, the wings being of a different shape.

ORDER.—HOMOPTERA.

Fam.—*TETTIGONIDÆ*. *Curt.*

♂ GEN. 1053.—EUPTERYX. *Curt.*

Face subtrigonate, the head appearing crescent-shaped above; rostrum short and lanceolate: antennæ inserted in a cavity under each eye, triarticulate, 1st and 2d joints stout, the former subglobose, the latter oblong, 3d very slender, and terminated by a fine long seta: ocelli none: thorax small, transverse, scutellum triangular: superior wings narrowed and rounded, with a few indistinct nervures; inferior transparent with a few nervures: legs rather slender, posterior long; the tibiæ clothed with spiny bristles from the base to the apex outside; pectinated with spines on the inside, except at the base: tarsi triarticulate, elongated in the hinder pair, the basal joint being the longest, the terminal one the shortest.

♂ 7. *Hortensis. Curt.*

Greenish sulphur: sides of face, 2 minute dots in front, and 2 spots on the crown black: thorax with 8 black spots, scutellum with 2 at the base, the former with a double fuscous line down the back: abdomen black: superior wings with many brownish spots between the nervures, leaving 2 yellow oval ones on the costa, and a minute one towards the apex: posterior thighs spotted with fuscous, their tibiæ black, except at the base, the tarsi white tipped with fuscous. (Length  $1\frac{1}{2}$  line.)

I found several of these insects in a garden in the Isle of Wight, the middle of October; it is distinguished at once from the type of our genus (C. picta, *Fab.*) by its black posterior tibiæ.

♂ GEN. 1054.—AMBLYCEPHALUS. *Curt.*

Face elongate-trigonate including the clypeus: head viewed above, lunate: ocelli 2 on the crown: eyes prominent: rostrum short, stout, and cylindrical: antennæ inserted before the eyes in a cavity, triarticulate, basal joint the stoutest, chalice-shaped, 2d shorter ovate, 3d a bristle as long as the head: thorax narrower than the head, transverse ovate: scutellum triangular: abdomen rather long and conical in the female: superior wings a little longer than the body, subovate, the inferior margin nearly straight, inferior wings rounded, all with many distinct nervures: posterior tibiæ long, thin, and slightly curved, clothed irregularly with spines externally, pectinated internally, except at the base: tarsi triarticulate, basal joint the longest in the posterior pair.

√ 3. *Germari. Curt.*

Dull ochreous white, finely pubescent: head piceous, round the eyes

and a transverse spot on the forehead ochreous: thorax and scutellum piceous, the former with 2 ferruginous spots at the base: abdomen variegated with fuscous: superior wings fuscous between the nervures, especially towards the apex, leaving 2 large pearly spots on the costa. (Length  $2\frac{1}{4}$  lines.)

The type of our genus is the *Cicada viridis*, *Linn.* The above species (which I have named in honour of the learned Professor Germar,) as well as the *C. interruptus*, differ in some measure, in having the crown of the head slightly excavated.

♁ GEN. 1055.—*AGALLIA*. *Curt.*

Rather short and ovate: face ovate-trigonal: clypeus narrow: head from above forming a very narrow lunule: ocelli 2 in the forehead: antennæ triarticulate setiform: rostrum neither short nor stout, attenuated: thorax narrower than the head, transverse-ovate: scutellum triangular; wings very much deflexed, superior, with the costa considerably rounded, the interior margin nearly straight, the nervures reticulated towards the apex: anterior legs short, posterior the longest: the tibiæ spined externally, pectinated internally: tarsi triarticulate, basal joint long in the hinder pair.

♁ 2. *Consobrina*. *Curt.*

Pale testaceous: head prettily pencilled with ferruginous, with 2 remote black spots at the base: thorax with 4 black dots in a transverse line before, a ferruginous lanceolate line down the centre, and a triangular one on each side: scutellum with 2 triangular black spots at the base, and 2 dots in the middle: nervures, and 2 spots on the internal margin brown, the former more or less suffused: posterior tibiæ with a line of black dots down the outside. (Length  $1\frac{1}{2}$  line.)

The form of the head and the situation of the ocelli, well distinguish this from the foregoing genera.

♁ GEN. 1057.—*MEGOPHTHALMUS*. *Curt.*

Somewhat ovate: antennæ inserted on each side the middle of the face, as long as the thorax, 1st and 2d joints stout and ovate, 3d setiform: head, viewed from above, forming a very narrow lunule with the anterior edge, forming an elevated margin: face ovate-trigonal, with two elevated oblique lines at the top, forming a transverse  $\times$  with the margin of the forehead: rostrum rather long, and tongue-shaped: eyes projecting beyond the thorax:

ocelli 2, placed in the angles of the cavities formed by the  $\times$ : thorax transverse, anterior margin convex, posterior slightly concave, the angles truncated: scutellum trigonate, slightly cuspidate: superior wings very much deflexed, the costa very convex, the suture straight, nervures raised: inferior wings very small: posterior tibiæ with a few external spines, ciliated internally towards the apex.

✓ 0 1. *Bipunctatus*. *Curt.*

Dirty ochre, face and thorax spotted with pale brown, 2 blackish spots on the crown of the head: scutellum with 2 spots at the base, the tip, and a sub-rhomboidal one in the centre, black: superior wings variegated with brown, the spots largest and darkest on the disc, with 2 on the suture: thighs spotted with brown. (Length  $1\frac{1}{2}$  line.)

This genus most resembles Fallen's *Ulopa*; but it is totally different to any other group; it is not improbable that Fabricius's *C. reticulatus*, belongs to this genus. I found the specimens under stones in the Isle of Portland, in June; and if I be not mistaken, they were much handsomer when alive.

3 GEN. 1058.—*PHRYNOMORPHUS*. *Curt.*

Oblong, smooth and shining; head crescent-shaped above, the forehead slightly angulated, face very broad, subcordate or scutiform: antennæ short, inserted in a cavity before the eyes, triarticulate, 2 first joints sub-ovate, 3d forming rather a short and stout seta: eyes projecting, subconical: ocelli 2, very remote and minute, placed on the margin of the forehead: thorax transverse: scutellum rather small and trigonate: superior wings obtusely rounded, the nervures very obscure; inferior ample: abdomen short: hinder legs very long, especially the tibiæ, which are compressed, and slightly curved, thickly set with spines externally, and ciliated internally.

0 1. *Nitidus*. *Curt.*

Black, shining, head with three ochreous spots at the base, edge of the clypeus, 2 lines at the apex, one under each eye, and a dot above the antennæ ochreous, centre of the face transversely striped with the same colour: thorax and scutellum variegated with ochre, the superior wings fuscous, freckled with ochre: thighs, and spines of tibiæ, variegated with ochre. (Length  $1\frac{1}{2}$  line.)

I have seen but one specimen of this distinct insect, which I took many years back, I believe, in Norfolk.

○ GEN. 1059.—APHRODES. *Curt.*

Suboval: head flat or hollowed above, subtrigonal-lunate, wedge-shaped in profile, face suborbicular, clypeus slightly emarginate on each side: antennæ inserted in cavities under the forehead, small, triarticulate, 2 first joints very short, 3d slender and setiform: rostrum short and cylindric: eyes ovate, scarcely projecting beyond the thorax: ocelli very minute, remote, and placed above the margin of the forehead: thorax transverse ovate-lunate; scutellum trigonate, cuspidate: superior wings convex-deflexed, not longer than the body: posterior tibiæ very long, broad and curved, with series of long spines on the margins.

○ 9. *Testudo. Curt.*

Shining, pale dirty ochre, an interrupted brown band across the middle of the wings, and another near the apex: tips of tibiæ and tarsi piceous, hinder legs, with the tips of the thighs, the tibiæ, and tarsi, excepting the base, of the same colour. (Length  $1\frac{3}{4}$  line.)

I have a single specimen of this insect, and have scarcely any doubt that Linnæus's *Cicada bifasciata* belongs to this genus, which, as well as the others above described, are at once distinguished from *Tettigonia* by their long spined posterior tibiæ, as well as by their shorter rostrums.

*Fam. FULGORIDÆ.*

○ GEN. 1066.—CRIOMORPHUS. *Curt.*

Cylindric-ovate: head narrow, semicircular, face trigonate with longitudinal carinæ, eyes large and not very remote, with a notch beneath, and a large groove to receive the antennæ, which are triarticulate, 1st and 2d joints large, the latter ovate and tuberculated, the 3d a very fine long hair: rostrum rather long and linear: thorax very short and broad, overlapped by the eyes: scutellum broad, cuspidate-trigonate: superior wings very short, subquadrate or ovate, with a few longitudinal nervures: inferior none: abdomen extending far beyond the wings, conical: posterior legs a little the longest, their tibiæ subcylindric, dilated towards the apex, where there are several small and one large serrated spine: tarsi triarticulate, terminal joint the longest, except in the posterior pair in which the basal one is elongated.

○ 3. *Albomarginatus. Curt.*

Subochraceous: antennæ, head, thorax, and abdomen piceous, the 1st with the tips of the joints ferruginous, the 2d with the carinæ



ochreous, the margins of the thorax and scutellum, and a line down the middle, ochreous: segments of the abdomen margined with white, and a line down each side of the same colour. (Length  $1\frac{1}{3}$  line.)

The shortness of the basal joint of the antennæ will distinguish this group from <sup>3</sup>Asiraca, and the abbreviated elytra from Delphax.

ORDER.—HEMIPTERA.

Fam. CIMICIDÆ.

GEN. 1085.—GALEATUS. *Curt.*

Rostrum long and slender, received into a groove under the head and between the coxæ: head bidentate, the clypeus emarginate: antennæ slender, hirsute, and 4-jointed; 2 first joints short, 3d long and slender, 4th elongate-ovate: thorax with the sides dilated, the anterior angles lobed, the centre forming a hood over the head, carinated behind, and assuming the figure of an acute triangular scutellum: superior wings slightly overlapping at the apex, orbicular ovate, beautifully reticulated with raised nervures, with the part over the margin of the abdomen elevated.

1. Spinifrons. *Fall.*

The form of the antennæ and the size of the hood distinguish this genus from Dictyonota of *Curtis's Brit. Ent.* Pl. 154.

GEN. 1089.————— *Curt.*

Head small, and produced over the rostrum, which is long and slender: antennæ approximating, inserted in front of the head, clavate and 4-jointed, basal and 2d joints short, subovate, 3d very long and slender, 4th elongate clavate, hirsute: thorax rhombiform, being scutelliform behind, with a carina down the back, the sides thickened: superior wings ovate, with two elevated lines, forming a loop on each.

1. Humili. *Fab.*

I indicated this insect as a genus in my *Guide*, but I think it quite unnecessary to separate it from Tingis.

GEN. 1090.—ASPIDOTOMA. *Curt.*

Subelliptical, depressed: head rather broad, with a spine before each eye, and two conniving ones over the clypeus: eyes prominent: ocelli 2 at the base of the head: antennæ inserted in a notch on each side the head before the eyes, 1st and 2d joints

small, 3d long and slender, 4th stouter and ovate: thorax subquadrate, the angles rounded convex, the anterior margin thin, the sides slightly emarginate: scutellum trigonate minute: superior wings elongate-ovate, with 2 elevated nervures forming a loop on each.

1. *Capitata*. *Wolff*.

This genus is at once distinguished from the other Tingidæ by its thorax being truncated behind, and the scutellum being visible.

*Fam. COREIDÆ.*

GEN. 1104.—*PANTILIUS*. *Curt*.

Elliptical,-depressed: head small, subtrigonate: eyes very prominent: rostrum not long, but very slender: antennæ inserted before the eyes, almost as long as the body, subsetaceous and geniculated, 4-jointed, basal joint rather long, robust, and cylindrical, 2d thrice as long and slenderer, 3d not so long as the 1st, and more slender, 4th the shortest, somewhat tongue-shaped: thorax trapezoid: scutellum triangular: wings considerably longer than the body, superior very long and linear, a little dilated and rounded at the apex, with 2 strong nervures forming a loop on the membranous part: inferior wings ample: legs nearly of equal length, the posterior tibiæ rather the longest, and not bristly: tarsi very short, basal joints minute.

1. *Tunicatus*. *Fab*.

This genus is identified by the shortness of the terminal joints of the antennæ, by its smooth and comparatively short hinder tibiæ, and the short tarsi.

GEN. 1114.—*LORICULA*. *Curt*.

Folliform: head elongated, cylindrical, the nasus produced: antennæ attached to 2 scapes before the eyes, which are lateral, but not very prominent, shorter than the body, slightly clavate, and 4-jointed, basal joint short and subovate, 2d the longest, subclavate, the others nearly of equal length, the terminal joint rather stouter, and ovate at the apex: rostrum long and attenuated: thorax considerably broader than the head, subtrapezoid, anterior margin concave, posterior nearly straight: scutellum rather large and triangular: superior wings ovate-trigonate, very

<sup>b</sup> As this is a term not mentioned by Mr. Kirby, it may be as well to state that it signifies, of the shape of bellows; viz. pear-shaped, but depressed.

short, not covering more than half the abdomen, which is nearly orbicular, and a little acuminate at the apex: posterior legs a little the longest.

1. *Pselaphiformis*. *Curt.*

Black, shining: head ferruginous, red at the base: 2d joint of antennæ ochreous at the middle: thorax, scutellum, and elytra dull, sparingly clothed with short yellowish pubescence, the latter with the margins suffused, dirty testaceous: legs ochreous, thighs black, except at the tips. (Length  $\frac{3}{4}$  of a line.)

Taken by Mr. Booth, near Halifax, Yorkshire, and presented to me by Mr. A. H. Davis.

GEN. 1120.—*CHLAMYDATUS*. *Curt.*

Subovate: head rather large and trigonate: eyes projecting beyond the thorax: antennæ inserted before the eyes, shorter than the body, filiform and 4-jointed, basal joint the shortest, and a little the stoutest, 2d the longest, 3d and 4th a little shorter and slenderer, of equal length: rostrum nearly as long as the antennæ, and very slender: thorax nearly semiorbicular: scutellum triangular: abdomen large, flat, and ovate: the superior wings not covering much more than half, ovate, and not lapping over at the apex: posterior legs long, the thighs incrassated, tibiæ very long, tarsi long and thin, triarticulate, basal joint short, truncated obliquely, 2d and 3d nearly of equal length.

1. *Marginatus*. *Curt.* *Grylloides*. *Guide*.

Pitchy, sprinkled with yellowish pubescence: posterior margin of head and eyes ferruginous: superior wings ochreous, with a large patch of piceous in the centre, leaving a sinuated pale margin all round, broadest at the base: legs dull ferruginous, thighs black, except at the tips. (Length 1 line.)

GEN. 1123.—*HEBRUS*. *Curt.*

Somewhat elliptical: head oblong, the nasus produced and quadrate: eyes not very prominent: antennæ shorter than the body, subfiliform: inserted near the apex of the head, 5-jointed, basal joint the stoutest, and as long as the 3d and 5th; the 2d and 4th rather shorter, terminal joint subfusiform: rostrum as long as the thorax, attenuated and acute: thorax somewhat trapezoid, gibbose, concave before, very much rounded behind, forming 2 large obtuse angles: scutellum triangular obtuse: abdomen semi-elliptical: superior wings somewhat elongate-spatulate, with a

very thick abbreviated costal nervure, and another beneath it: inferior wings membranous: posterior legs the longest, thighs thickened, posterior a little thinner and bent: tarsi triarticulate, 2 basal joints minute, 3d rather large: claws only one to each tarsus.

1. *Pusilla. Fall. Walkeri. Curt.*

Black, head shining, with a channel on the crown, the base and eyes subferruginous: thorax velvety, with aureous pile, the angles on the side gibbose, a large channel down the middle, and a smaller one on each side: scutellum with 2 large excavations, leaving a ridge down the middle: superior wings, when folded, with a pearly white spot on each side the scutellum, and three on the membranous apex in triangle: 1st joint of antennæ and base of 2d joint ferruginous, legs of the same colour, tips of tarsi black. (Nearly 1 line long.)

This remarkable and pretty little insect was first discovered at Southgate, by F. Walker, Esq.; and afterwards in the west of England, by J. C. Dale, Esq. It inhabits ponds, where it is found on duckweed.

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ART. XX.—*Notice of the Habits of Charæas Graminis, &c.* By GEORGE WAILES, Esq.

[TO THE EDITOR OF THE ENTOMOLOGICAL MAGAZINE.]

SIR,—I beg you will correct an error in my list of Castle Eden insects, published at page 41, by substituting *Emmelesia tæniata* for *E. ericetata*. Upon a re-examination of my captures at that place in 1831, I have detected another specimen of the above moth, though, from the injury it received in the capture, I was unable to ascertain its name at the time. I met with it near the top of the north branch of the Dean, where the yews almost totally exclude the rays of the sun. On a trip to the Dean in August last, in company with my friend, the Rev. G. T. Rudd, I took a remarkably small specimen of *H. Blanchina*, measuring only one inch five lines from tip to tip. It was quite perfect, and had just quitted the pupa state. I mention the circumstance, because it has been reported that

*H. Cassiope* had been taken at Castle Eden in company with *H. Blandina*; and most probably that report originated in the capture of a similar dwarf specimen, which, to an unexperienced eye, would not appear to differ very perceptibly from some females of *H. Cassiope*.

The following notice of the habits of *Charæas graminis* may not be unacceptable.

Though the devastations committed by the larvæ of this moth in our island do not in general appear to bear any comparison with its ravages in the Swedish pastures, yet when, from the failure of some of the checks appointed for keeping it within proper bounds, the species is left to increase unmolested, its effects are very apparent, as the following instance will shew. Some years ago (in 1824, I believe), during the spring and early summer, the herbage of a large portion of the level part of the mountain of Skiddaw, near the well which most tourists visit on the ascent, previous to climbing to the summit of the first *Man*, comprising at least fifty acres, and extending some distance down the western side of the mountain, was observed, even from the town of Keswick, to assume a dry and parched appearance; and so marked was the line, that the progress made by the larvæ down the mountain could be distinctly noted. Nor was the change of colour of the herbage the only thing that attracted the attention of the good folks of Keswick; large flocks of rooks, attracted, no doubt, by the abundance of food which these larvæ afforded them, were every morning seen wending their way to the spot, both from the rookeries at Lord's Island, and other places in the Vale of Keswick, and also from those of distant ultramontane parts of the neighbourhood, and, after spending the day in preying upon the unfortunate caterpillars, on the approach of night, rising in one dense cloud, and dispersing to their respective homes. Though their numbers must have been in this manner greatly reduced, yet I was informed, by a very intelligent friend residing at the foot of the mountain, that in August the moths literally swarmed throughout the neighbourhood. So completely was vegetation destroyed, that, on a visit to the spot in 1830, the extent of their ravages was distinctly visible, being very similar to the effect produced by the burning of heath, which is so much practised on all our hills. Of course the quality of the newly grown herbage was materially improved;

thus affording another instance of indirect advantages derived from insects.

Another very remarkable fact, illustrative of the natural habits of this moth, fell beneath my observation in the beginning of August, 1831. I was staying at Meldon Park, on an entomological excursion, and, by chance, one morning visited some old pastures about a mile from that place; this was about eight o'clock; and my astonishment was very great to find the fields swarming with moths upon the wing. I managed to capture one with my hat, having neglected to take out my net, and was delighted to find it was the above *Noctua*, of which I had only captured an occasional specimen or two, flying amongst thistles in the middle of the day. I returned to breakfast, fully calculating on getting an ample supply during the forenoon. Accordingly, big with expectation, and completely prepared for the onslaught, I reached the spot about ten o'clock; and if my first surprise on beholding the countless myriads on my morning walk was great, it was not less so on my return, to find that in the same place where, not three hours before, I could scarce step without treading on them, a single specimen was all that rewarded my incessant search for some hours, over the space of at least one hundred and fifty acres. Chagrined at my ill-luck, I determined that the peep of the morrow's dawn should find me prepared to profit by the experience of that day; and accordingly, taking an assistant with me, we reached the place early; but not a moth was to be seen. The wind had changed to the east, and the drifting mist threatened to end in rain; and having fixed that day for my return to Newcastle, I felt somewhat disappointed, and wandered over the ground in the hopes that some single specimen might venture forth, but in vain; not a solitary moth was to be seen. Despairing of success, and wet and uncomfortable, from the heavy dew on the grass and moist fog overhead, about half-after seven I was about to return, when suddenly the whole field, as far as the eye could reach, was once more the scene of their gambols. Struck with the suddenness of their reappearance, and rejoicing at their unexpected return, I put Horace's truly entomological recommendation—

“Carpe diem, quam minimum credula postero”—

into force. And now the difficulty was, not where to find a

moth, but which one of the numberless thousands on the wing to select for an object of capture, as their flight was so rapid and irregular, that the eye became bewildered with their motions, and, like the *Gyrini*, they were lost in the mazes of their evolutions. After securing what specimens I wanted, I could not help watching the scene before me; and, as in the study of all nature's works, the trouble, or rather the time spent, was more than amply repaid; for sudden as their appearance had been, their disappearance was equally so, when, as with one general consent, about half-after eight, they again settled; and their flight for the morning being over, scarce a solitary specimen was anywhere to be seen. The moths flew about three or four inches from the ground, and apparently very seldom alighted, but threaded their way most dexterously amongst the long culms of the grasses. I reached home, not only pleased with my capture, but infinitely more so with the interesting habits of this insect; and I regret that I have not had an opportunity of again witnessing them. The species, though common hereabouts, has been considered rare in the south of England, probably from our being ignorant of its habits.

GEORGE WAILES.

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ART. XXI.—*Monographia Notiophilôn Angliæ*.—By GEORGE R. WATERHOUSE, Esq.

GENUS.—NOTIOPHILUS.—*Dumeril*.

*Cicindela*, *Linné*. *Elaphrus*, *Fabricius*.

Head deeply sulcated between the eyes: palpi, with the terminal joint moderate, subovate, truncate: labrum entire, rounded, and nearly covering the mandibles: mandibles slightly dentate interiorly: mentum with the central lobe bifid: antennæ as long as the head and thorax, and thickening towards the extremity: eyes large: thorax as broad as the head: elytra depressed, elongate, and nearly parallel: tarsi the same in both sexes.

A. *Elytris concoloribus*.

Sp. 1. Not. aquaticus. *Æneus*, *nitidus*, *capite angustiore*, *fronte striatâ*: *elytris punctato-striatis*, *interstitiis striarum*



*tertio quartoque angustioribus: pedibus nigris.* (Long. corp.  $2\frac{1}{2}$ — $2\frac{3}{4}$ .)

*Cicindela aquatica.* *Lin. Syst. Nat.* II. 658.

Above of a brassy hue: beneath bronze black: head about the same width as the thorax, with seven parallel furrows on the forehead, the two outer ones larger and deeper than the rest, leaving a broad ridge next the eye with a deep puncture in the ridge: thorax narrowed posteriorly, the margins coarsely punctured, disk smooth, the dorsal channel rather deep, wrinkled transversely, and curved at the base, so as to join the lateral foveæ, which are rather deep: elytra elongate, with seven punctate striæ on each, the first next the suture, the six following close together and parallel with, but leaving a broad smooth surface between them and the first, and also next the outer margin: the striæ vanish towards the apex, except that near the suture and the seventh, which meet at the apex: between the seventh stria and the outer margin, at the apex of the elytra, is a short deep furrow: the space between the third and fourth stria is broader than the following, and has a deep impression, about one third of the distance from the base to the apex of the elytra: legs, antennæ, and palpi, entirely bronze black.

*Var. β.*—Totally black.

Common in damp situations throughout Britain.

Sp. 2. Not. metallicus. *Æneo-cupreus, elongatus, nitidus, capite thorace angustiori, fronte profundè striatâ, thorace longiori, posticè angustato, elytris elongatis punctato-striatis.* (Long. corp.  $2\frac{3}{4}$ .)

Of a rich brassy copper above, beneath brassy black: head rather narrower than in *N. aquaticus*, the frontal sulci close together: the thorax is longer and more attenuated posteriorly, the puncturing finer, but less close together: elytra more elongate and narrower, the striæ not so deeply punctured: legs, antennæ, and palpi, totally black.

I have one specimen of this insect, but am ignorant of its locality.

✓ Sp. 3. Not. nitidulus. *Æneo-niger: capite æneo-cupreo; thorace elytrisq; cæruleo-nigris marginibus æneis; capite thoraceque ejusdem latitudinis, sulcis frontalibus parallelis thorace convexo, posticè attenuato; marginibus anticis posticisque densè punctatis; disco foveâ utrinque impresso; elytris paulò convexis, elongatis, ovatis, punc-*

*tato-striatis, striis æquidistantibus, lævibus, ad apicem evanescentibus, inter strias, tertiam et quartam, punctato-impressis: antennis, articulis quatuor basalibus rufo-testaceis; palpis articulo basali rufescente; tibiis ad medium piceo-testaceis.* (Long. corp.  $2\frac{1}{4}$  lin.)

Head brassy copper: thorax and elytra of a rich blue black, the margins rather brassy: head about the same width as the thorax, with the frontal sulci parallel: thorax convex, narrowed behind, the anterior and posterior margins thickly punctured, the lateral margins less so: a small fovea about the centre of each half of the thorax: elytra rather convex, elongate, slightly ovate, punctate, striated: the striæ equidistant, not very deep, and vanishing before the apex: a small impression between the third and fourth striæ on the disk: antennæ black, with the four basal joints rufo-testaceous: palpi black, with the basal joints rufous: legs black, the tibiæ testaceous in the middle. Allied to *N. aquaticus*, but may be distinguished by its greater size and convexity: the head is larger in proportion: the dorsal channel of the thorax is not so deep, and the margins are not so broadly punctured: the striæ of the elytra are less deeply impressed. In *N. Newmanni* (which is a smaller insect) the head is broader in proportion: the thorax more attenuated posteriorly. From *N. parallelus*, which is about the same size, *nitidulus* differs in being much more convex: the head is broader: the thorax rather longer, and not so broadly, but more coarsely punctured: the elytra are not so long, and more ovate: the striæ more remote.

Halifax. A. H. Davis, Esq.

Sp. 4. Not. *parallelus*. *Æneus, nitidissimus, parallelus; capite thorace angustiori, fronte sulcis parallelis striatû; thorace lateribus rectis, posticè levitèr angustato, marginibus densè punctatis, sulco dorsali levitèr impresso; elytris longis, lateribus parallelis, punctatò-striatis, striis ad apicem evanescentibus; disco elytrorum puncto impresso; pedibus nigris, tibiis piceo-testaceis; antennis nigris, basi piceo-rubro.* (Long. corp.  $2\frac{1}{4}$ .)

*Æneous*, very glossy, long, and parallel: head narrower than the thorax, the frontal sulci parallel: thorax broad, slightly attenuated posteriorly, the margins thickly punctured, dorsal channel slightly impressed: elytra long, the sides parallel, punctate striated, the striæ vanishing before the apex, with an impressed

point on the disk : legs black, tibiæ pitchy-testaceous : antennæ black, with the base pitchy-red.

Allied to *aquaticus*, but may be distinguished by the elongate parallel form, and pale tibiæ. It is also more elongate than *tibialis*; the head is narrower, and the thorax is less attenuated posteriorly.

I have seen but one specimen of this, sufficiently distinct, species, which belongs to E. Newman, Esq.; and was taken on Snowdon.

Sp. 5. Not. *Davisii*. *N. parallelo similis et forsan ejus speciei varietas; differt in colore nigro, in thorace posticè angustiori, in elytris minùs profundè striatis, et apicem versùs elytrorum ducto utrinque piceo; tibiis, antennarumque tres vel quatuor articulis piceo-rubris.*

Similar to, and may be a variety of *N. parallelus*, differing in being quite black: the thorax also is a little more narrowed behind, and the elytra are less deeply punctate-striated, with a pitchy dash on each side near the apex: the tibiæ and three or four basal joints of the antennæ are pitchy-red.

Snowdon. A. H. Davis, Esq.

Sp. 6. Not. *Newmanni*. *Æneus, longior; capite thorace longiore, fronte striatâ, striis ab medio divaricantibus; thorace posticè valdè attenuato marginibus punctatis, sulco dorsali levissimè punctato; elytris amplis, punctato-striatis, striis ad apicem evanescentibus; plagâ discoidali angustiore; tibiis et antennarum basi piceo-rubris.* (Long. corp.  $2\frac{1}{2}$ .)

*N. tibiali similis, at multò major; capite latiore, sulcis frontalibus haud parallelis, thorace longiori, et posticè angustiori.*

Æneous, long: head broader than the thorax, forehead striated, the striæ diverging from the middle: thorax very much narrowed posteriorly, the margins coarsely punctured: elytra ample, punctate striated, the striæ vanishing before the apex, the discoidal space rather narrow. Allied to *tibialis*, but much larger: the head is broader: the frontal sulci are not parallel: the thorax is longer and more attenuated posteriorly: tibiæ and base of the antennæ pitchy-red.

I have seen but three specimens of this insect, which belong to Mr. Newman: they came from Snowdon. *One from Hacılar*  
*March 1833 AHC*

Sp. 7. Not. tibialis. *Æneus, nitidus, fronte striatâ, elytris punctato-striatis, tibiis testaceis.* (Long. corp.  $2\frac{1}{2}$ .)

*N. aquatico similis, at fermè minor; capite paulò latiori.*

Not. tibialis. *Stephens' MSS.*

Above brassy: head a little wider than the thorax, the frontal sulci as in *N. aquaticus*: thorax attenuated posteriorly, the margins thickly punctured, the dorsal channel rather rugose: elytra moderately long, punctate-striated, the striæ equidistant, vanishing towards the apex: legs black, tibiæ æneo-testaceous, the three basal joints of the antennæ pitchy-testaceous, the rest pitchy-black, basal joint of the palpi red.

Allied to *N. aquaticus*, but generally smaller and shorter, the head rather broader. It may also be distinguished from that species by the pale tibiæ.

Sp. 8. Not. brevis. *Nigro-æneus, brevis, nitidus; capite latiori, fronte profundè striatâ; thorace brevi, marginibus valdè rugosis, posticè angustiori; elytris brevibus, leviter ovatis, profundè punctato-striatis, striis seorsùm æquidistantibus, disco elytrorum inter strias tertiam et quartam a suturâ puncto impresso, punctoque indistincto ad apicem; tibiis testaceis.* (Long. corp.  $2\frac{1}{4}$ — $2\frac{1}{2}$ .)

Brassy black, very glossy: head broader than the thorax, very short, with seven irregular furrows between the eyes, the two outer ones very broad and deep: thorax rather short, much narrowed behind, the posterior angles slightly curved outwards, the margins, together with the base and apex of the dorsal furrow, are very coarsely punctured, the disk smooth and very convex: elytra short, slightly ovate, punctate-striated, the punctures large, not confluent, the striæ rather wide apart and equidistant, an impression between the third and fourth striæ from the suture on the disk, and another less distinct at the apex of the elytra; the space between the first and second striæ is narrower towards the apex of the elytra than at the shoulders: legs black, tibiæ pitchy-red in the middle: antennæ black, with the base pitchy-red: palpi black, basal joint testaceous.

Shorter than *N. aquaticus*, and also differs in having an impressed point on each side at the apex of the elytra:—the head is broader, thorax more narrowed behind, the six lateral striæ of the elytra are equidistant, the punctures deeper, but not so close together: the tibiæ are pale.

Taken near London. Newcastle upon Tyne; by G. Wailes, Esq. Inverness; H. Smith, Esq."

Sp. 9. Not. latior. *Æneus, nitidus, latus; capite thorace latiori, fronte striatâ elytris punctato-striatis; tibiis testaceis.* (Long. corp.  $2\frac{1}{2}$ — $2\frac{3}{4}$ .)

Brassy, beneath black: head rather broader than the thorax, very short, the frontal sulci as in *aquaticus*: thorax broad, attenuated posteriorly, the margins and dorsal channel thickly punctured: elytra punctate-striated, the striæ deeply impressed towards the base, the fourth and fifth approximating and continuing indistinctly to the apex of the elytra: an impression between the third and fourth striæ on the disk: tibiæ and base of the antennæ rufo-testaceous: palpi testaceous, with the terminal joint black.

Allied to *tibialis*, but is larger and broader; the elytra are more rounded at the sides; the space between the first and second striæ is narrower in proportion.

I have two specimens of this species, taken in the neighbourhood of London.

Sp. 10. Not. pusillus. *Suprà æneus; fronte striatâ, elytris angustioribus, punctato-striatis, plagâ longitudinali ad suturam nitidissimâ, discô elytrorum punctô impressô, punctôque ad apicem; antennis pedibusque nigris: palpis nigris, basi pallidè testaceis.* (Long. corp.  $2\frac{1}{4}$ .)

Above brassy, beneath black: head about the same width as the thorax, irregularly striated between the eyes: thorax short, and rather broad, attenuated posteriorly, the hinder angles slightly curved outwards, the margins coarsely punctured: the foveæ, on each side in the hinder angles, rather deep, the dorsal channel transversely wrinkled: elytra narrow, the sides very straight, punctate-striated, the striæ continuing indistinctly to the apex of the elytra; the second and third are wider apart than the following, in which the punctures are confluent: an impressed point between the third and fourth striæ on the disk, and another at the apex of the elytra: antennæ and legs totally black: palpi black, with the basal joint pale testaceous.

This species may readily be distinguished from all the foregoing, by its minute size and narrow form, together with the pale basal joint of the palpi, combined with the black legs and antennæ. I am indebted to Mr. Bentley for the loan of the only

specimen of this insect which I have seen, and from which the above description was taken: its locality is unknown.

Sp. 11. Not. parvulus. *Æneus, nitidus, angustatus, fronte profundè striatâ; thorace angustato, ad partem posteriorem valdè attenuato, lateribus rectis; elytris punctato-striatis, striis secundâ, tertiâ, quartâque æquidistantibus, puncto impressis; antennis, pedibus, palpisque nigris.* (Long. corp.  $2\frac{1}{4}$ .)

The same size as *N. pusillus*: the head is longer, the frontal sulci are deeper and more regular: the thorax is much narrower, particularly behind, and the sides are straight: the elytra are less deeply striated, the striæ vanishing before the apex, which is without the impressed point: the second, third, and fourth striæ are equidistant, the following are very close together: the usual impressions between the third and fourth striæ on the disk are very deep: legs, antennæ, and palpi, totally black.

I have a single specimen of this species, which is very distinct from all the foregoing, and am sorry its locality is unknown to me.

B. *Elytris ad apicem piceis aut flavescentibus.*

Sp. 12. Not. rufipes. *Æneo-cupreus, capite latissimo, fronte profundè striatâ; thorace ad partem posteriorem valdè angustato; elytris punctato-striatis, plagâ nitidâ et latissimâ ad suturam, puncto impressis, apicibus piceis; antennis pedibusque rufis.* (Long. corp.  $2\frac{1}{2}$ — $2\frac{1}{4}$ .)

Not. rufipes. *Heysham's MSS. Curtis B. E. 254.*

Above brassy-copper, very glossy: head very broad, the usual frontal sulci irregular: thorax very much narrowed posteriorly, with the hinder angles slightly curved outwards, the dorsal channel and the margin broadly and very thickly punctured, the disk slightly rugose: elytra moderately long, rather ovate, deeply punctate-striated, the punctures confluent, and the striæ very close together, continuing to the apex, which is rather pitchy, and has a shallow impression on each side; the six lateral striæ are not parallel with the suture, but slightly curved outwards in the middle, in which respect this species differs from all the foregoing: legs testaceous red: femora pitchy red: antennæ testaceous, the terminal joint fuscous: palpi fuscous with the basal joint testaceous.



This species may be distinguished from the foregoing by the pale hue of the legs and antennæ, also by the form of the thorax, which is more attenuated posteriorly, and more thickly punctured; the elytra are more rounded at the sides, the striæ are closer together; the polished surface between the first and second striæ is broader than in any of the foregoing.

Sp. 13. Not. striatus. *Æneo-niger, suprâ æneo-cupreus, nitidus; capite thorace latiori, fronte striatâ; thorace valde rugoso, posticè levitei attenuato; elytris profundè punctato-striatis, interstitiis angustissimis, plagâ longitudinali nitidissimâ ad suturam, apice flavescente, punctis duobus impressis; tibiis antennarumque basi rufo-testaceis,* (Long. corp.  $2\frac{1}{2}$ .)

Broad: above brassy-copper, beneath brassy-black: head broader than the thorax, striated between the eyes: thorax short, very slightly attenuated posteriorly, sides rather straight, very coarsely punctured, disk sometimes nearly smooth: elytra deeply punctate striated, the striæ very close together and continuing to the apex, which is pitchy testaceous, and has a small puncture on each side; a deep puncture also on the disk, between the third and fourth striæ: legs black, tibiæ bright rufo-testaceous: antennæ black, basal joints red.

I believe this species to be common throughout Britain, having seen many specimens from various parts. Common at Inverness; H. Smith, Esq. Newcastle upon Tyne; G. Wailes, Esq. Cambridge; Alex. Griesbach, Esq.

Sp. 14. Not. latus. *Æneo-niger, suprâ æneo-cupreus, latus, capite profundè striato; thorace brevi, sulco dorsali, marginibusque valdè rugosis; elytris profundè punctato-striatis, interstitiis angustissimis, plagâ longitudinali ad medium latâ; tibiis rufis.* (Long. corp.  $2\frac{1}{2}$ .)

Very broad: above brassy-copper, beneath brassy-black: head rather broader than the thorax, deeply striated between the eyes: thorax short, attenuated posteriorly, the margins and dorsal channel rugosely punctured: elytra deeply punctate-striated, the striæ close together and continuing to the apex, which is pitchy-testaceous, and has an impressed point on each side; the longitudinal space is rather broad in the middle: tibiæ and base of the antennæ rufo-testaceous.

Allied to *N. striatus*, but is much broader, the longitudinal



smooth space on the elytra is broader in proportion, particularly in the middle. The only specimen I have seen of this insect was captured at Inverness, by Henry Smith, Esq.

Sp. 15. Not. nitidus. *Æneo-niger, suprâ æneo-cupreus, angustior, fronte striatâ, thoracis lineâ dorsali, marginibusque punctatissimis; elytris profundius punctato-striatis, interstitiis angustioribus, apice flavescenti, punctisque duobus impressis, tibiis antennarumque basi rufo-testaceis.* (Long. corp.  $2\frac{1}{4}$ .)

Narrow æneo-piceus above, beneath brassy-black: head a little wider than the thorax, the forehead deeply striated: thorax short, attenuated posteriorly, the lateral margins slightly waved, the dorsal channel and margins coarsely punctured, the disk smooth, and rather convex; the foveæ, in the hinder angles, rather deep: elytra punctate-striated; the striæ are close together and continue to the apex, which is pitchy testaceous, and has an indistinctly impressed point on each side, another on the disk of the elytra between the third and fourth striæ: tibiæ and base of the antennæ testaceous.

Allied to *N. striatus*, but not more than half the size, and much narrower in proportion, the disk of the thorax is perfectly smooth. I have seen but one specimen of this insect, which was taken by myself in the neighbourhood of London.

Sp. 16. Not. biguttatus. *Æneo-niger, suprâ æneus, capite thorace angustiori, fronte striatâ, thorace brevi, punctatissimo; elytris lævissimè punctato-striatis, interstitiis striarum secundo, tertio, quartoque latioribus; puncto impresso; apice flavescenti, antennarum basi rufo-picco-pedibus nigris.* (Long. corp.  $2\frac{1}{2}$ — $2\frac{1}{2}$ .)

*Elaphrus biguttatus.* Fab. E. i. 247.

Above æneous, beneath brassy-black: head narrower than the thorax, striated between the eyes: thorax broad, slightly narrowed posteriorly, the margins and dorsal channel rugosely-punctured, the disk very finely punctured, the foveæ on the hinder angles not very deep: elytra delicately punctate-striated, the third and fourth striæ wider apart than the following: an impressed point between the third and fourth, on the disk, and another less distinct at the apex which is flavescent: legs and antennæ black, the base of the latter pitchy testaceous.

In this species the head is narrower than in its allies; the

elytra are very delicately striated; the space between the second, third, and fourth striæ is wider than in the following.

Common in the neighbourhood of London. I have also received it from Inverness, where it appears to be rare.

Sp. 17. Not. substriatus. *Angustior, æneo-niger: frontestriatâ, thorace longiori, posticè valdè attenuato, densè, et lævissimè punctato, disco lævi, sulco dorsali transversè rugato: elytris, striis quinque lævissimè punctatis, apicibus pallidis, tibiis antennarumque basi rufo-piceis.* (Long. corp.  $2\frac{2}{3}$ .)

Narrow brassy black: head as wide as the thorax, the frontal sulci not very deep: thorax rather long, considerably narrowed behind, the margins very delicately, but thickly punctured, the disk indistinctly wrinkled: elytra with six very delicately impressed punctate striæ, one next the suture, and five on the disk, of which the third and fourth are close together: apex pale, pitchy-testaceous: base of the tibiæ and antennæ the same.

Allied to *biguttatus*, but rather smaller, and more elongate; the thorax is narrower and more attenuated behind; the elytra are more delicately striated.

Halifax; A. H. Davis, Esq.

Sp. 18. Not. Quadripunctatus. *Suprà æneus, nitidus; fronte profundè striatâ; elytris profundè punctato-striatis, plagâ longitudinali nitidissimâ ad suturam, apice flavescens, punctisque duobus impressis.* (Long. corp.  $2-2\frac{1}{2}$ .)

Not. Quadripunctatus, *De Jean.* Sp. Col. 2. 280. 3.

Very much resembles *N. biguttatus*, but differs in having two rather deep punctures between the third and fourth striæ, and a little above the middle of the elytra, *biguttatus* having only one.—(*Translated from De Jean's Description.*)

## ART. XXII. — Varieties.

(Continued from p. 93.)

14. *Insensibility in Insects.*—SIR, In 1828, I reared several Gypsy moths from the caterpillars: as fast as the moths appeared, I pinned them on a setting-board: some of the males however got loose with the pins still in them, and joined

the females. In due time the females laid their eggs, from which I succeeded in rearing caterpillars. I beg to instance this fact, in support of the argument against insects having the same feeling as warm-blooded animals, which is given in the very interesting article, called *Colloquia Entomologica*, in your last number.

WILLIAM BOND.

15. *Capture of Leptura scutellata*.—SIR, This insect may be taken in Hainault Forest, from the middle of June to the end of July, on and in the decayed stems of the hornbeam. In 1829, another collector and myself took upwards of a hundred, besides a great many caterpillars and chrysalides; both these are white: the latter as they come to maturity growing darker, particularly about the legs and antennæ.

WILLIAM BOND.

16. *Locality and habit of Clytus arcuatus*.—SIR, These insects are also taken in Hainault Forest in June, on the trunks of felled oak-trees, particularly those which are not stripped of their bark: they run very quick, and are difficult to capture, concealing themselves in the chinks of the bark, or dropping down into the grass as soon as they perceive your approach. They only appear when the sun is very hot: the males are great combatants, frequently fighting until one or both have lost parts of their antennæ and legs.

WILLIAM BOND.

17. *Capture of Platypus cylindrus*.—SIR, These insects were taken by my old friend and instructor in entomology, Mr. Bydder, out of the stumps of newly felled beech-trees in the New Forest, Hampshire. In these they bore round holes, from which it is very difficult to extract them: after trying the smoke of tobacco and several other modes, he thought of pouring water on the stumps, at which they came running out in droves, and he took upwards of two hundred of them.

WILLIAM BOND.

18. *Monument to Cuvier*.—All our readers are aware of the death of this great man: in him naturalists lost the great preceptor, whose extraordinary talent and unrivalled research have made them, in some degree, acquainted with the wonderful

works of a Creator, who has made nothing in vain, and therefore nothing beneath our notice, and who has Himself pronounced his creatures to be good. The loss of this philosopher will long be felt. It requires ages to produce a Homer or a Shakspeare; and ages elapse between the lives of an Aristotle and a Cuvier. We feel that we should be rendering an acceptable service to our readers, by giving some account of the life of this great man: our limits preclude it. His countrymen, with that fine taste for which they are so remarkable, have planned a monument to his memory, the expense of which is to be defrayed by the sale of works on any branch of natural history, which their respective authors are invited to transmit to agents appointed to receive them; first, however, writing their own names in each, and some short observation, demonstrative of their respect for the deceased. We call on our countrymen to assist in such an undertaking; let not Britain be behind other nations in demonstrating esteem for sterling merit. M. Baillièrè, 219, Regent street, is appointed one of the agents to receive and transmit such works.—ED.

19. *Capture of Polypogon derivalis*.—SIR, I perceive it is your intention to devote a page or two of your magazine, to record the capture, &c. of rare insects: I therefore transmit to you the following account of the capture of that scarce Lepidopterous insect—*Polypogon derivalis*. On the 9th of last August, I took one specimen in Collyer's Wood, Green Hithe, Kent; I believe it is only the second specimen that has been taken for nearly thirty years: the other was taken at Birch Wood, about three years since, and is now in the cabinet of Mr. Bentley.

J. CHANT.

20. *Cause of Sound emitted by Cychrus rostratus*.—SIR, Among the comparatively small number of insects which have the power of emitting voluntary sounds, *Cychrus rostratus* has long been known; but I am not aware that the manner in which it produces its sound, has ever been correctly described. Neither Curtis nor Stephens allude to it at all. Mr. Kirby says, "Two other Coleopterous genera, *Cychrus* and *Clytus*, make their cry of *noli me tangere*, by rubbing their thorax against the base of the elytra;" and the form of these parts, in *Cychrus*, seems such as might justify the opinion. An addition

may sometimes be thus made to the noise; but the principal effect is otherwise caused. The insect, when disturbed or alarmed, utters a low, angry, hissing sound, distinctly audible at some distance. On the inner edges of the inflexed margins of the elytra, are two small grooves, extending from near the base, to within a line or two of the apex, where they rather suddenly expand. The lateral edges of the plates which cover the under side of the abdomen, are, when at rest, lodged in these grooves; and it is by their friction, (particularly of the last segment but one, which works in the widest part of the grooves) that the sound is produced. An imitation of it may be made, by rubbing the edge of a piece of stiff paper in the channel.

Yours, &c.

Bridgnorth, Nov. 22, 1832.

THOMAS MARSHALL.

21. *Capture of the Larvæ of Deilephila Elpenor.*—During a visit to Chelmsford in August last, I was fortunate enough to meet with twelve larvæ of *Deilephila Elpenor*, feeding on *Galium palustre*, among the flags and rushes by the river side.

They varied greatly in size as well as colour, some being dark brown, marked with black streaks and ocelli on each side of the thorax, and others of a beautiful green with similar markings. This difference in colour I since find is considered by some authors as showing the distinction in sex. On bringing them home, I was unable to procure *Galium palustre*, and therefore tried them with *Epilobium angustifolium*, and other plants, on which they commonly feed on the continent. In place of one of these, *Impatiens noli tangere*, I offered them the American *Impatiens biflora*, on which they fed voraciously, and soon attained their full size.

Understanding from my friend, Mr. Newman, that the larvæ of some species of *Deilephila* change under dead leaves, &c. on the surface of the earth, I placed some thin pieces of turf in the cage, under which they immediately crept, and completed their metamorphosis. The larvæ of *Deilephila Elpenor* are remarkable when feeding, for the extraordinary elongation of the head, resembling a snout, a character I understand peculiar to some individuals of this genus, of which this is the only species I have seen in the larva state.

Shortly after the discovery of these larvæ, I had a very fine

one of *Acherontia atropos*, brought me by a green-grocer's boy in the neighbourhood.

WM. CHRISTY, Jun.

Clapham road, Nov. 1, 1832.

22. *On the different appearance of Insects in different localities and Seasons.*—SIR, I feel some hesitation in requesting the favour of your inserting the following, as I cannot even call myself an entomologist, and am about to ask for, not give, information. I am, however, somewhat encouraged to do so, when I see your first number is not entirely devoted to Latin monographs and reviews of entomological works; but contains some papers, which will be read with pleasure by many as unentomological as myself, and indeed, I think, by most interested in the study of natural history.

I have often observed a difference in the insect inhabitants of our counties, and wished to ascertain its cause, without being able to do so: I allude more particularly to butterflies, and some other kinds most likely to attract the notice of a casual observer; some of which are comparatively common in one district, being never or but seldom met with in another. I could not attribute it to the slight difference of temperature, produced by variety of elevation or soil, even in the instance of those warmth-loving creatures, butterflies. Some remarks of one of your correspondents, G. Wailes, Esq. of Newcastle, show, however, I think, that the fact has not escaped the notice of entomologists. Mr. W. indeed, seems to assign a very probable reason for it: after observing, "he is persuaded the connexion between geology, entomology, and botany, especially the two former, has not been sufficiently attended to;" he adds, "a good idea may be formed of the insects likely to be found in any district, if its geological features are taken into consideration." I cannot but think this is likely to be the case. The intimate connexion between the strata and vegetation of a country is well known; the nature of the soil exerts an influence in our hedge-row flowers, as well as on our forest trees. From the great variety of the soil of our island, we naturally expect to find, what in each we do observe, a variety in its *flora*: and since many, perhaps it is not too much to say all plants have their peculiar insect inhabitants, we may probably, as the same writer says, from attention to the prevailing



strata, form a good idea of the insects most likely to occur in any district.

Perhaps you or some of your correspondents may also be able to inform me the cause of the difference which in different years is observable in the brightness of colour and size of insects of the same species; most must have noticed how much finer and more beautiful butterflies are some summers than in others,—can this be at all owing to the nature of their food when in the caterpillar state? As the wet or drought of various seasons so much affects vegetation, bringing plants to perfection or stunting their growth, it may perhaps render them more or less nutritious to the insect tribes to which they afford sustenance. It is supposed, and perhaps with reason, that the nature of their food exerts a decided influence on the colour and size of the higher animals;—why may it not affect in the same way creatures so much more frailly-formed?

Any information in a future number on these subjects, which are probably well understood by the initiated in your pleasing science, would, I believe, be interesting to many of your readers besides myself,

And oblige yours, &c.

Y.

Ludlow, Nov. 10, 1832.

23. *Ignis Fatuus*.—“This appearance has been strongly surmised to be a luminous insect. It is many years since the similarity of its motion was observed to that of an insect avoiding pursuit. A subsequent examiner has stated, that he approached one near enough to see distinctly the form of an insect, with wings like a dragon fly. Two or three years ago, an anonymous article in a country paper announced, that some person, in digging up the mud of an old pond, had discovered two creatures, which he surmised to be the insects in question, and which he described as looking like cray-fish with wings. The Entomologist, who can ascertain the fact, by securing an *Ignis Fatuus* in a bottle, will have drawn a tooth from the jaws of superstition and human suffering.”—*From the Westminster Review for October, 1832.*

We shall feel much obliged by any information our correspondents may be able to furnish us with on this subject. Is the insect in question the mole-cricket? Our readers will bear in mind that we want facts only; we have theories on the subject in abundance.—ED.



THE  
ENTOMOLOGICAL MAGAZINE.

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APRIL, 1833.

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ART. XXIII. *Observations on Blight.* By RUSTICUS.

SIR,—I have another little rascal that eats my apples and pears; but, as I have not made myself master of his history, I will leave him over for another summer for examination; he eats down the stalks of the pears, particularly when they are about the size of gooseberries, and causes them to tumble down by hundreds: I dare say I shall find him out by and by, and in the meantime, I will give some account of the regular blight—the true blight—the only insect which I will acknowledge to be blight.

The true blight, or *Aphis*, is a quiet, dull, stupid looking insect, mostly without wings, but sometimes it has four, two of which are much larger and longer than the other two, and fold over and hide them, reaching beyond the body and meeting together behind it; these wings are generally as clear as crystal, with a few veins in them, yet if you hold the insect in the sunshine, and examine him through a glass, you will find they take all the colours of the rainbow; you will also find he has a long trunk or sucker, which is used as a pump or syphon, through which the sap of plants is drawn. I have sometimes seen this sucker so long as to pass under the breast and legs, and reach a considerable distance behind the body, but it is not generally so. All blights infest the young and juicy shoots, and leaves of plants, for the purpose of sap-sucking; and the plants honoured by their operations

forthwith play the most amusing and incredible vagaries; bearing blossoms instead of leaves, leaves instead of blossoms; twisting into corkscrews stems which ought to be straight, and making straight as sticks those which, as the scarlet-runner and hop, ought to twine; sometimes, as in the peach, making the leaves hump up in the middle, and causing the tree to look as though it had a famous crop of young fruit; making apple-trees bear blossoms on their roots, and causing roots to grow out of their young shoots; and, by tormenting orchards in this way, preventing the fruit from ripening, and making it woolly, tasteless, and without juice. Our china-asters often owe a good deal of their beauty to these vermin; they act as a spur to make them blossom beyond their strength and nature, and then die off without bearing seed. It is amusing to see with what regularity the blights station themselves on the young shoots of the guilder-rose, crowding so close together that not a morsel of the rind is to be seen, and not unfrequently forming a double tier, or two thicknesses; the poor sprig losing its formal unbending upright position, and writhing itself into strange contortions.

Blights are of all colours, but green is their most fashionable hue; those of broad-beans are black as soot, and velvety,—and these, if attended to, do but little harm; they cluster at the very top, and each bean should be topped just below the blight, and the top carried away and burnt,—not thrown on the ground,—or else they are sure to climb up the bean-stalks again, and, stopping here and there at the best landing-place, increase and multiply, and soon cover the whole plant; nor should they be buried in the ground, for they take care to outwit you by living underground for months, and when the gardener's spade turns them up again, they make for the beans directly: the plan of topping the beans does not injure the crop, but, if carefully done, rather improves it. The blight of the willow is very large, and, at first sight, looks greyish, but under a glass is beautifully variegated with black and white; when crushed it gives out a deep blood-coloured die, which stays on your hand several days in spite of frequent washings.

I have taken a good deal of pains to find out the birth and parentage of true blights; and for this purpose have watched, day after day, the colonies of them in my own garden, and single ones which I have kept in-doors, and under tumblers

turned upside down ; the increase is prodigious ; it beats every thing of the kind that I have ever seen, heard, or read of. Insects in general come from an egg,—then turn to a caterpillar, which does nothing but eat,—then to a chrysalis, which does nothing but sleep,—then to a perfect beetle or fly, which does nothing but increase its kind. But blights proceed altogether on another system :—the young ones are born exactly like the old ones, but less ; they stick their beaks through the rind, and begin drawing sap when only a day old, and go on quietly sucking away for seven or eight days ; and then, without love, courtship, or matrimony, each individual begins bringing forth young ones, and continues to do so for months, at the rate of from a dozen to eighteen every day, and yet continues to increase in size all the while ; there seem to be no males, no drones,—all bring forth alike. Early in the year these blights are scattered along the stems, but as soon as the little ones come to light, and commence sap-sucking close to their mother, the spaces get filled up, and the old ones look like giants among the rest,—as here and there an ox in a flock of sheep ; when all the spare room is filled up, and the stalk completely covered. The young ones, when they make their first appearance in the world, seem rather posed as to what to be at, and stand quietly on the backs of the others for an hour or so ; then, as if having made up their minds, they toddle upwards, walking on the backs of the whole flock till they arrive at the upper end, and then settle themselves quietly down, as close as possible to the outermost of their friends, and then commence sap-sucking like the rest ; the flock by this means extends in length every day, and at last the growing shoot is overtaken by their multitude, and completely covered to the very tip. Towards autumn, however, the blights undergo a change in their nature, their feet stick close to the rind, their skin opens along the back, and a winged blight comes out—the summer generations being entirely wingless. These are male and female, and fly about and enjoy themselves, and, what seems scarcely credible, these winged females lay eggs, having first lived through the winter ; and whilst this operation is going on, a solitary winged blight may be observed on the under-side of the leaves, or on the young shoots, particularly on the hop, and differing from all its own progeny, in being winged and nearly black, whereas its young are green and

without wings. These are mysteries which I leave you entomologists to explain. In May, a fly lays a lot of eggs; these eggs hatch and become blights; these blights are viviparous, and that without the usual union of sexes, and so are their children and grandchildren,—the number of births depending solely on the quantity and quality of their food: at last, as winter approaches, the whole generation, or series of generations, assumes wings, which the parents did not possess, undergoes frequently a total change in colour, and in the spring, instead of being viviparous, lays eggs.

To this singular tribe belongs the hop-fly, an insect which has more rule over the pockets and tempers of mankind than any other; its abundance or scarcity being the almost only criterion of a scarcity or abundance in the crops of hops: and of every article of merchandize the hop is consequently the most liable to variation in price. Owing to the interest taken in the crop of hops, much more close attention has been paid to the hop-fly than to any other insect; and you find men conversant in its habits, who would blush if you were to suppose them possessed of enough natural history to know the name of the commonest beetle or even bird; but let me assure these, that there is nothing derogatory to their manhood, their common sense, or their dignity, in knowing something of the works of nature; I never met with an individual who was the worse man for it. I don't myself go the length of some of your contributors, who measure the joints of an insect's *ears*, as Professor Rennie, I see by your Magazine, has called them. But, perhaps, even this is necessary to acquire an accurate knowledge of each kind.

The hop counties are Kent, Sussex, Surrey, Worcester, and Hereford. The produce of these are termed, on the market, Kent, Sussex, Farnham, and Worcester hops. The Farnham are invariably the highest priced, and the Sussex the lowest. The Worcester hops never come on the London market, and have a price of their own, which is not much influenced by the general price, as no hops are ever, or very rarely indeed, introduced to supply a deficiency of the

\* I should judge, from the asinine and blundering stupidity of Professor Rennie's compilations, that he is peculiarly elongate in this organ; and so, from the similarity of his own ears to antennæ, infers a corresponding use in the two different kinds of organs.—RUSTICUS.

Worcester crop, should that fail. The hop affords scope for the speculator in two ways: first, the hop itself; and, secondly, the hop-duty; the last is the subject of betting to a very large amount annually. The old duty on hops is 10*s.* 8*d.* per cwt.; the new duty, imposed in 1802, is 12*s.* 7*d.*; making, with the fractions, 23*s.* 4*d.*; in 1805, 4*s.* 8*d.* per cwt. was reduced; so that the actual duty paid is 18*s.* 8*d.* per cwt. In betting on the duty, the old duty is always understood; and so generally adopted is this plan of expressing the probability of a crop by the betted duty, that the common question is, "What is the duty laid at?" and as the duty falls, the price of hops, of course, rises; and *vice versâ*. This duty is however too much guided by a few men in the Borough, who frequently rise and fall it to answer their own purposes; yet, as the day of picking approaches, the near correspondence of the betted duty and the old duty actually paid, is truly surprising. In the year 1802, on the 14th of May, the old duty was laid at 100,000*l.*; the fly, however, appearing pretty plentifully towards the end of the month, it sunk to 80,000*l.*; the fly increased; and, by the end of June, the duty had gone down to 60,000*l.*; by the end of July, to 30,000*l.*; by the end of August, to 22,000*l.*; and by the end of December to 14,000*l.*; the duty actually paid this year was 15,463*l.* 10*s.* 5*d.* In 1825, the duty commenced at 130,000*l.*, but, owing to the excessive increase of the fly, had in July fallen to 16,000*l.*; at the beginning of September it rose to 29,000*l.*, but towards the end fell again to 22,000*l.*; the amount paid was 24,317*l.* 0*s.* 11*d.* In the following year, the summer was remarkably dry and hot; we could hardly sleep of nights with the sheets on; the thermometer for several nights continued above 70° all the night through: the crop of hops was immense, scarcely a fly was to be found, and the betted duty, which began in May at 120,000*l.*, rose to 265,000*l.*; the old duty actually paid was 269,331*l.* 0*s.* 9*d.*; the gross duty, 468,401*l.* 16*s.* 1*d.*, being the largest amount ever known. From this it will appear that, in duty alone, a little insignificant looking fly has a control over 450,000*l.* annual income to the British Treasury; and supposing the hop-grounds of England capable of paying this duty annually, which they certainly are, it is very manifest, that in 1825, these creatures were the means of robbing the Treasury of 426,000*l.* This seems a large sum, but it is not

one-twentieth part of the sums gained and lost by dealers during the two years in question.

The hop-fly makes its first appearance generally about the 12th of May, sometimes two days earlier, but almost invariably between the 10th and the 30th; and it is worth noticing, that it usually appears on the same day in the four districts of Kent, Sussex, Farnham, and Worcester. It always makes its first appearance in the winged state, a solitary fly being found settled very quietly here and there under the young leaves. If the weather is warm, with mild kind rains during the last twenty days of May, these flies begin to produce young ones, which are very small, and are called *deposit*, or *knits*. These grow very fast, and in a few days become green *lice*, which is merely a larger form of the same animal. These lice very soon begin to breed, and so keep on, knits and lice, knits and lice *only*, to so great an extent as to destroy the plant, when they appear to die with it. I have never found that the deposit of the hop-fly leaves the plant at all, or ever becomes a fly while there; in this respect differing from the *Aphis* of the rose, guilder-rose, bean, &c., of which I have spoken above. Frequently, when the weather in May has been dry, and cold, and windy, the fly has been known to leave the plant, and entirely disappear, even after remaining several days; yet whilst it tarried showing very evident signs of being uneasy, continually crawling about on the upper as well as under side of the leaves, and leaving no deposit whatever. The direction of the wind has nothing whatever to do with their first appearance, but in a warm westerly wind they will take flight most readily, and be thus distributed. The lice, when half grown, change the skins; and I have often found the skins of very large ones stuck to the leaves, and yet showing no opening where the insect could have got out. I believe these are the prey of a little parasitic fly, whose history I don't know enough of at present to attempt to give it you here; they have, however, other enemies; and as these seem to offer the only hope of checking the increase of these destructive wretches, I shall give you a little account of them.

You will never find a plant of any kind infested with the *Aphis*, without also observing a number of ants and lady-birds among them, and also a queer-looking insect, like a fat lizard, which is in fact the caterpillar of the lady-bird. The connexion



of the ant and the *Aphis* is of the most peaceful kind that can be conceived; their object is the honey-dew which the *Aphis* emits; and, far from hurting the animal which affords them this pleasant food, they shew it the greatest possible attention and kindness,—licking it all over with their little tongues, and fondling it, and patting it, and caressing it with their antennæ in the kindest, prettiest way imaginable:—not so the lady-bird, or its lizard-like caterpillar; these feed on the blights most voraciously, a single grub clearing a leaf, on which were forty or more, in the course of a day. The perfect lady-bird is a decided enemy to them, but not so formidable a one as the grub. The eggs of the lady-bird may often be seen on the hop-leaf; they are yellow, and five or six in a cluster placed on their ends; these should on no account be destroyed, as is too often the case, but on the contrary every encouragement should be given to so decided a friend to the hop-grower.

Besides the lady-bird and its grub, there are two other terrible enemies to the poor *Aphis*; one of which is a green ungainly-looking grub, without legs, which lays flat on the surface of the leaf, and stretches out its neck, just like a leech, till it touches one of them; directly he feels one he seizes it in his teeth, and holds it up, wriggling in the air till he has sucked all the goodness out of it, and left it a mere empty skin. This curious creature turns to a fly which has a body banded with different colours, and which in summer you may often observe under trees and about flowers, standing quite still in the air as though asleep, yet, if you try to catch him, darting off like an arrow.<sup>b</sup> The other has six legs, and very large strong curved jaws, and is a most ferocious looking fellow, strutting about with the skins of the blights which he has killed on his back. This fierce fellow comes to a very beautiful fly, with four wings, all divided into meshes like a net, and two beautiful golden eyes.<sup>c</sup> All these creatures, which thus live on the plant-lice, have a very strong and disagreeable smell in the perfect state.

For a favourite plant infested with blight there are several remedies,—smoke of tobacco, snuff, &c.; but the most effectual, and the least hurtful to the plant, is to let it stand in a

<sup>b</sup> One of the *Syrphidæ*. Vid. Int. to Ent. I. 265, &c.—ED.

<sup>c</sup> *Chrysopa Perla*.—ED.



tank of cold water for half an hour, when all the blights will leave it and swim on the surface of the water. For hops, none of these plans are available; and, unless a way could be discovered of increasing the number of the blight-eaters, I fear the chance of discovering a remedy is very small.

Your's, &c. RUSTICUS.

Godalming, Sept. 16, 1832.

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ART. XXIV. — *Opinions on MR. NEWMAN'S Sphinx Vespi-*  
*formis.*

1. *Comments on Sphinx Vespiformis.* By SCRUTATOR, F.R. & L.S.
2. *Notes upon the Natural System, &c.* By I. O. WESTWOOD, ESQ., F.L.S., &c.
3. *Observations on the Newmannian or Septenary System.* By CLERICUS.<sup>a</sup>

1. *Comments on Sphinx Vespiformis, &c.* — SIR, Your review, at p. 44 of the Magazine, has made me acquainted with one of the most delightful books I ever read; and as a few ideas have occurred to me which I noted down on perusing it, on subjects which you have passed over in silence, I shall feel greatly obliged if you will make them public; and if they tend to correct minor errors, and at the same time promote the circulation and reception of Mr. Newman's opinions, they will answer the end for which I have intended them.

I will begin with what I consider the errors of *Sphinx Vespiformis*, and then pass to the more pleasing task of pointing out its merits, taking care not to interfere with anything you have said, or to give an opinion where you have already expressed one. In the first place, I would suggest

<sup>a</sup> We are reluctant to occupy so much space with anything in the shape of retrospective criticisms; but so great has been the interest that has been lately excited on the subject of arrangement, that we doubt not these opinions will be read with considerable interest.—ED.

that for the division below *class* there is a great impropriety in the use of the word *subclass*; first, because Mr. MacLeay has already given the name *stirps* to precisely the same division; and secondly, because the adoption of all *subdivisions* implies either a poverty of thought or a degree of carelessness, quite inadmissible in a work like Mr. Newman's. In the next place, the adoption of a generic name, as a designation of such *subclass*, is an error quite as inexcusable, as the same writer has proposed the elegant termination *ina* for the designation of his *stirps*; and besides, a perpetual confusion would arise from the use of the same name for two groups so very different in their importance. These alterations are not proposed on the thought of a moment, still less are they laid before you in that petty, and to me excessively disagreeable, spirit of criticism which I have so often seen displayed in some of our scientific periodicals. Greatly grieved indeed shall I be, if I am considered as holding out a precedent for such paltry fault-finding; and I would much rather that you suppress this, as you did my last (of which I do not complain), than see your Magazine, or any portion of it, allotted to the petty and jealous criticisms of those who have neither the research nor ability to furnish original papers.

The returning to the term *Class* for the *Orders* of Linné, and the proposition of *Natural Orders* equivalent to those in use in botany, are two grand steps in entomology; and let me press upon their author the great necessity there is for immediately following up so important an alteration, or he may depend on being anticipated in the task by some aspirant for fame, eager to place his name after a series of his own *natural orders*; and let me remind Mr. Newman, that these names, however inappropriate, or however ill-judged the divisions to which they are applied, must stand by the now universally received law of priority.<sup>b</sup> On referring to my Kirby and Spence, I find no division has been so variously denominated as the *class* of Mr. Newman; *class*, *tribe*, *section*, *order*, *division*, &c., have been applied to it; but *class* has the double claim of priority and appropriateness. Linné has made sad havoc with his *orders*, in applying the

<sup>b</sup> We do not ourselves attach the value to this *naming* that some of our contemporaries seem to do. We frequently see appended to new genera and species names which are utterly unknown in science.—ED.

term to three groups of very different degrees of importance. Let me observe also, in this place, how completely the chicanery, the mystification of natural history, is removed by Mr. Newman's plan. *Class, Stirps, (Subclass, N.) Order, Family, Genus, Species*, are all the divisions which will now be required; and such terms as *Lepidoptera, Tineina, (Tinea, N.) Tortices, Halias, Fagana*, all old acquaintances, are alone to be applied as names to such divisions. I would entreat your readers to compare this series of names with the divisions and subdivisions proposed even by that prince of British entomologists, Mr. Kirby, in the Introduction to Entomology, a mass of names which, if carried through the system, no human life would be long enough to acquire—no human memory powerful enough to retain.<sup>c</sup>

It is with a feeling of proud satisfaction that I look back on the labours of my fellow-countrymen in that highest department of Physics, the just and natural arrangement of animated beings. Writers on system are of two distinct classes; and though each may pursue his inquiry by analysis or synthesis, accorded to his own peculiar views, or rather the peculiar constitution of his mental faculties, yet neither ever oversteps the line of demarcation, or if he attempt to do so that attempt is sure to be unsuccessful. One of these classes, comprehending at a view the whole expanse of nature, strives to mould her according to some vast and preconceived idea; the other aims at placing each species, genus, and family, in its proper situation as regards its neighbours, being perfectly indifferent to, or considering of but small importance, the uniformity of the whole. The first class of these systematists, however they may dislike the appellation, must be called theoretical; the second are practical. The theorists certainly take the higher ground, but must ever be indebted to the practical naturalists for the facts from which their own deductions have resulted. In the first class we have had, in this country, MacLeay and Newman. In the second, Leach and Stephens.<sup>d</sup> Between the views of two of these writers I shall now attempt to prove a very striking similarity, in which, if I succeed, I think it

<sup>c</sup> *Introd. to Ent. Vol. IV. p. 402.—Ed.*

<sup>d</sup> Our correspondent must confine himself to entomology, or he could never omit the great names of Ray, Lister, &c. among our ancestors, and our illustrious contemporary Swainson.—Ed.

follows, that both of them have made a very near approach to truth.

My friend Stephens appears to have followed Clairville's binary division of insects, more for the sake of convenience in publishing than from any conviction of its worth. It is scarcely possible that a comprehensive mind like his should attach any value to a theory so fantastical; but, having adopted it, consistency compels him to adhere to it, and forces him into the most obvious errors. I presume it to be known to all your readers, at least all who will trouble themselves with the perusal of these remarks, that Mr. Stephens divides insects into two groups: I. *Mandibulata*, comprising seven orders, 1. *Coleoptera*, 2. *Dermaptera*, 3. *Orthoptera*, 4. *Neuroptera*, 5. *Trichoptera*, 6. *Hymenoptera*, and 7. *Strepsiptera*; and II. *Haustellata*, including likewise seven orders, 1. *Lepidoptera*, 2. *Diptera*, 3. *Homaloptera*, 4. *Aphaniptera*, 5. *Aptera*, 6. *Hemiptera*, and 7. *Homoptera*; that each seven orders form the circumference of a circle, and that the two circles touch or approach at the orders *Trichoptera* and *Lepidoptera*. The errors are in the combination of the seven Haustellate orders. The intervention of *Aphaniptera* (an order of which the flea<sup>e</sup> is the only example), between the pupiparous *Homaloptera* and the ametabolous *Anoplura* (*Aptera*), is extravagant and capricious in the extreme, and will not bear a moment's investigation; the flea is closely allied to the Dipterous genus, *Micetophila*, both in the final structure and metamorphosis, but is very far removed from either of the groups between which it stands; the *Anoplura*, (for I must thus call them, although I see the term *Aptera* misapplied to them), have no right whatever among true insects, whose main distinguishing and unvarying character it is to have a distinct triple metamorphosis, whilst in these the change has dwindled to a mere ecdysis. The same fault

<sup>e</sup> We have just received M. Audouin's *Annales des Sciences Naturelles*, for October, 1832, in which M. Dugés, in a paper on the structure and affinities of the flea, has, we think, incontrovertibly proved its natural situation to be between the orders Diptera and Hymenoptera, thus also shewing that those two orders are very nearly allied. The position assigned by M. Dugés to the other winged insects tends to prove the accuracy of our valued correspondent's views, and also to demonstrate the very near approach to a natural system made by Messrs. Stephens and Newman.—Ed.

does not apply to the orders of *Mandibulata*, which seem to be perfectly natural in their arrangement; but to require, as well as the *Haustellata*, some reduction in their number.

The French entomologists have ascertained, by dissection and profound investigation, that the orders, *Homoptera*, *Trichoptera*, and *Dermaptera*, are not anatomically to be distinguished from the orders from which they have been separated, *Hemiptera*, *Neuroptera*, and *Orthoptera*; and we must ever bear in mind, that these philosophers have no theories either to oppose or support, and have arrived at their conclusions on purely scientific grounds, unbiassed by any other motives than the highly praiseworthy ones of satisfying themselves, instructing their pupils, and promoting science. *Strepsiptera* is obviously of less importance than the others.

The author of "Sphinx Vespiformis" limits his classes to the number seven; six of these, 1. *Lepidoptera*, 2. *Diptera*, 3. *Hymenoptera*, 4. *Coleoptera*, 5. *Orthoptera*, 6. *Hemiptera*, are arranged around the circumference of a circle, the centre of which is occupied by the seventh, *Neuroptera*. I am by no means inclined to attach any great value to a particular number, or to the cabalistic regularity of a diagram; on the contrary, I do not imagine that any number is universally prevalent through nature; but in this particular instance I do believe, and I think no reasonable person will deny, that the number seven is most apparent and most appropriate. In inferior divisions the number two is remarkably conspicuous; as in *Lepidoptera*, butterflies and moths; in *Diptera*, gnats and flies; in *Hymenoptera*, the provident and the parasite insects; in *Coleoptera*, the carnivorous and the herbivorous; in *Orthoptera*, the jumpers and the runners; and in *Hemiptera*, the Homopterous and Heteropterous tribes: but I am neither capable nor desirous of entering on this discussion at present; my object is to show the similarity between the conclusions of a practical and a theoretical systematist.

Allow me then to submit a view of Mr. Stephens's orders, printing those which appear to me ill-placed in italics; those which the French entomologists have decided to be untenable, and *Strepsiptera* as being of less value, in small Roman characters; and those which appear good orders, and in their place, in Roman capital letters; and below this to place Mr. Newman's in the position in which he places them, leaving

the numbers before each, as applied by the respective authors, to show that, on my part, there has been no alteration of position.

STEPHENS.

I. LEPIDOPTERA.

- |                    |                          |
|--------------------|--------------------------|
| VII. Homoptera.    | II. DIPTERA.             |
| VI. HEMIPTERA.     | III. Homaloptera.        |
| V. <i>Aptera</i> . | IV. <i>Aphaniptera</i> . |
| IV. NEUROPTERA.    | V. Trichoptera.          |
| III. ORTHOPTERA.   | VI. HYMENOPTERA.         |
| II. Dermaptera.    | VII. Strepsiptera.       |

I. COLEOPTERA.



NEWMAN.

I. LEPIDOPTERA.

- |                  |                   |
|------------------|-------------------|
| VI. HEMIPTERA.   | II. DIPTERA.      |
| VII. NEUROPTERA. |                   |
| V. ORTHOPTERA.   | III. HYMENOPTERA. |
| IV. COLEOPTERA.  |                   |

Can this similarity be the effect of chance? If one man set out from Dover on foot, and another from Holyhead, and walked to London by these two opposite roads, would their meeting in London be the effect of chance? No one would be so hardy as to assert so; and yet I have heard those to whom I have pointed out the above similarity assert, that it was a matter of chance; that Mr. Stephens did not ever intend the orders to be placed as I have placed them. I grant that: the relative position he proposes for the orders is not, by any means, so consistent with the contents of the body of his work as the one I propose; the only difference I have ventured, is, that I begin with the *Lepidoptera* because Mr. Newman has done so, and because also that by so doing I do away with the very outrageous connexion between the two



tribes of orders at *Stylops* (783), and *Papilio* (784), a connexion resulting from accident, and certainly never for a moment entertained by the author as natural. And I would willingly inquire of Mr. Stephens himself, whether the position in which I have placed his orders is not more in accordance with his own observations of affinities, than the one which he has himself proposed.

It is undeniably a sound argument in favour of the truth of the septenary system, that it so very well agrees with the arrangement of a Catalogue, composed by an author pre-eminently qualified for the task, and who had no peculiar views of system which could induce him to alter the position of any group, having once decided on that position by a close investigation of characters.

In the next place, it is just to infer that, if one group contains insects closely allied to insects in each of three other groups, that group cannot be placed naturally without touching all the other three; and not binding myself to the instances proposed by the author of "Sphinx," which I consider are far from being the best he could have selected, I shall select others; for instance, the Neuropterous insects, *Perla*, *Psocus*, and *Tinodes*, with *Acheta* (the common cricket), *Aphis*, and any of the tribe *Tinea*; and let not any one who is disposed to make the inquiry shrink from a close scrutiny,—consulting and comparing the mouth, antennæ, thorax, wings, legs, abdomen, and even the appendices of the abdomen; and if, after the examination, he does not find an affinity between *Perla* and *Acheta*, between *Psocus* and *Aphis*, and between *Tinodes* and *Tinea*, and consequently draw from this the conclusion that *Neuroptera* is related, and very closely, to *Orthoptera*, *Hemiptera*, and *Lepidoptera*, then certainly there is nothing in any affinities which are now allowed. For my own part, having, during the present month, turned my attention almost exclusively to this interesting subject, I have found exotic genera in *Diptera*, *Hymenoptera*, and *Coleoptera*, nearly as closely allied to *Neuroptera* as the instances above given for the other classes; but these are at present little known, and therefore may induce doubt and discussion; and I rest my argument solely on the affinities which I have already pointed out; and maintain that, to arrange the four classes in question naturally, they must touch each other where those genera



occur, and this can only be accomplished by placing them as Mr. Newman has placed them.

Lastly, I turn to what I consider the greatest of modern discoveries in natural history, viz. the existence of central types; and on this subject I must remark, that I think Mr. Newman has very injudiciously selected the most difficult and intricate part of the whole system for the exemplification of his theory; and in this he seems to rejoice, and to hew down and trample on the labours of the numberless industrious drudges who have been, so long and with such little success, toiling in the same path; the cavalier-like manner in which these, the ladders by which he has mounted, are thrown down, may, perhaps, be supposed indicative of conscious superiority, but certainly not of that kind and indulgent feeling which every naturalist ought to entertain towards his fellow-labourers; nor can I hold it in any way safe or creditable to one who stands himself upon a slippery place. The *Carabi*, the *Staphylini*, the *Dytici*, present groups in which, from their excellently described distinctive character, the number of their species accessible in cabinets, and from the little necessity there is of reverting to their larvæ, might readily be made useful in pursuing an inquiry of this kind; but the *Phalænæ* have very few characters, and these ill-recorded or almost undiscovered, and the accessible species are very limited and principally unnamed. How far Mr. Newman has succeeded in his conclusions from these, I am not capable of deciding, but no one can doubt for an instant the existence of central types; indeed, it seems one of those obvious truths which remain for a long time hidden, and which, when discovered, astonish us by their very simplicity. I can scarcely describe the pleasure I have felt in ranging the aberrant groups round the types, *Procerus*, *Dyticus*, *Hydroïus*, *Lucanus*, &c. In my *Tenthredines* I have given *Cimbex* the centre, and have surrounded my hornet by a phalanx of wasps. These remarks may perhaps appear of little value: my object is to induce entomologists to go into the subject thus practically as I have done, and to impress on them this mathematical inference, that, granting the existence of circles, and of a central circle surrounded with others, then six is the only number that can so surround it, and the number seven consequently becomes established.

It is time for me to conclude; I fear I have already extended this letter to a length which you will consider unreasonable. In conclusion, let me say, that I consider the system proposed in "Sphinx Vespiformis" the system of nature; first, because the most capable writer of the present or any past era has placed the principal divisions in the same relative situations; secondly, because, unconfined by the "connecting links," proposed by Mr. Newman, I have discovered others incapable of refutation; thirdly, because I plainly discern the existence of centres; and fourthly, by mathematical reasons I infer seven is the number which must surround them.

Accept my best wishes for the prosperity of your Magazine, and believe me

Yours, &c.

SCRUTATOR, F. R. & L. S.

Sept. 29, 1832.

2. *Notes upon the Natural System, &c.*—The establishment of a Magazine, devoted solely to entomology, appears to offer a channel through which the wish expressed by Mr. Newman, to hear the opinions of others respecting the merits of his "Sphinx Vespiformis" may be gratified; and I therefore propose to avail myself of its pages to record a few Notes, made during my perusal of it. There are various portions of the work, however, respecting which I beg to offer no opinion of my own; such as the circularity of groups, their septenary subdivision, the centrality of a typical group, or the mode of progression, hoping that these subjects will be discussed by naturalists more competent than myself to the task.

The first two pages of the "Sphinx Vespiformis" form one of the neatest introductions which I have ever met with. The small clear-winged *Sphinges* have long been objects of interest with me; and being anxious to verify the account given of the true *Sphinx Vespiformis*, I too paid it a visit, and was gratified to find that we are thus enabled to clear up the doubts which have been raised respecting the synonymy of this species, in consequence of the Linnæan description having been decidedly drawn from a rubbed specimen of the *Asiliformis* of Fabricius, Haworth, &c., (which latter name must consequently fall); and further, that the reference made by Mr. Curtis, alone, of the *Æstriformis* (or *Cynipiformis*) to the *Vespiformis* of Linnæus (which reference Mr. Newman has omitted to

notice in his *Mon. Ægeriar.*), was an extension of the confusion. I am the more willing to add my testimony upon this subject, because I perceive, from the 33d page of the first number of this Mag., that the Fabrician nomenclature has since been retained, notwithstanding its incorrectness.

I was glad to perceive (*Sph. Vesp.* p. 6) that an attempt was about to be made, in the subsequent pages of the "Sphinx Vespiiformis," to discover the situation of a small group of insects, whose economy as well as structure had rendered them a very decided group amongst the species of Crepuscular Lepidoptera, with which they had been associated; having felt surprise that, in proposing the twenty-five groups into which Dr. Horsfield had distributed the five tribes of *Lepidoptera*, this most natural group had been dismissed in the following passage:—"The divisions do not embrace *Ægeria*, and several other genera, commonly arranged amongst the *Sphingidæ*, which, if my observations are correct, have a different metamorphosis, and will probably, at least in part, find a place in the next tribe," (*Bombycidæ*, divided into five forms, to one of which the name of *Lignivoræ* was given, with *Pygæra*, *Cossus*, and *Hepialus*, as its types), "but this remains for future discussion." *Lep. Jav.* p. 23. Mr. Stephens had likewise noticed the approach of the *Sphinx Apiiformis* towards the *Bombycidæ*.

The corroboration of the circularity of natural groups and the existence of a central primary typical subgroup, supposed (*Sph. Vesp.* p. 13—17) to be afforded by the plan of the solar system, does not appear to me to be entitled to much weight. In like manner, is it not presumptuous in endeavouring to discover the plan according to which the Creator distributed natural objects, even to suppose that He whom the heaven of heavens cannot contain should have assigned himself a situation in a system of His creatures? And yet this is the only way in which we can construe Mr. Newman's introduction of the subject (p. 14). So also the endeavour to uphold a given number of groups in natural history from passages of Scripture, and the reference of a septenary arrangement (with one seventh superior to the others) to the result of the six days' creation and the seventh day of rest, appears equally improper. I had hoped, after the caustic remarks of Mr. MacLeay upon this subject, that naturalists would not again

have been induced to employ such arguments. "It is," says he, "a very convenient mode of getting rid of an antagonist; as they have only to raise the hue and cry against him for disputing a Bible-truth, and the affair is settled. Here, however, are an English, Scotch, and American divine quoting Scripture against each other, each for his favourite number, seven, two, and three. The Bible was intended to direct our moral conduct and religious belief. No one but a madman, a fanatic, or an interested knave, can pretend to tell us that it is an encyclopædia of science."

Setting, however, these Scriptural references aside, the idea which Mr. Newman has stated in the pages referred to, viz., that of the superiority of one of the divisions of any natural group, and of *its central situation*, is an extremely happy one and deserves much consideration; and it is worthy of observation, that Fries had, ten years ago, employed the terms *centrum* and *radii* to distinguish the typical and aberrant divisions of any groups. Mr. MacLeay, indeed, asserts that the former term did not imply the *centre* of a circle, but that site in its circumference occupied by the normal form or perfection of the particular structure common to the superior group of which it forms a part; in like manner, the term *radii* is stated by him to be applied to those groups, likewise in the circumference, which lead from one *centrum* or type to another. Although such, indeed, may be a fair interpretation of M. Fries' words, I can scarcely think that he would have employed such unequivocal terms as *centrum* and *radii*, without wishing to impress the idea of the former occupying the centre of the circle.

Mr. Newman observes, "Be the system of nature discovered when it may, it will never be found that *Appia via* which Linnæus has made it out to be, but rather like the Cretan labyrinth; and whoever may happen to be the fortunate Theseus, must undertake the task of showing the way to his competitors, until it becomes so well known that a map of the road (a systematic catalogue) may be drawn for the use of all." Let us, however, who are the disciples of this great man, be careful that not a single gem be withdrawn from his gorgeous coronet. Linnæus knew well that the natural system was very different to that artificial one set forth in his works, although he gave to the latter the name of *Systema*

*Naturæ*; indeed, it is rather remarkable that, in describing the former, he has employed the very expression which, in the paragraph quoted above, is set in opposition to what is called his *Appia via*: "*Plantæ omnes*," says he, in his "*Philosophia Botanica*," "*utrinque affinitatem monstrant uti territorium in Mappa Geographica*." How far a continuous systematic catalogue can ever be made, to afford a clue to the intricacies of this map-like labyrinth, appears rather dubious.

Respecting the distribution of the animal kingdom (or, as Mr. Newman terms it, first primary group) into seven subkingdoms (kingdoms, *Newm.*), that gentleman has merely ventured to give a supposition, that the *Vertebrata* will be found to constitute a central seventh of all animated nature; at p. 54 (*Sph. Vesp.*) he, however, gives the *Annulosa* as another of these first divisions. So that it is evident that the remaining five subkingdoms must be formed from the residue of the unvertebrated animals; it will, however, be quite impossible to discover five such groups, which shall respectively be of equal value with the *Vertebrata* and *Annulosa*.

In like manner, the author has given no clue to his proposed septenary distribution of the Annulose subkingdom into classes (or, as he terms them, subkingdoms); it is true that he considers the insects as forming the central one of the seven Annulose classes; and he is not unwilling to introduce the *Ametabola* of Dr. Leach (*Pediculi*, &c.), into the outermost circle of the *Hemiptera*; so that his six remaining classes (or subkingdoms) must be constructed from the *Crustacea*, *Arachnida*, and *Myriapoda*; but, if such a step were adopted, it is equally evident that such six groups would not respectively be of equal value, either with his group *Insecta*, or even with the two divisions of insects adopted by some other naturalists, *Mandibulata* and *Haustellata*.

From the preceding paragraph, it will be seen, that the author proposes to alter the value of those higher sectional terms, which are tolerably well established; of these the term kingdom is so universally employed for animals, vegetables, and minerals, that the innovation appears neither warranted by necessity nor good taste. So also, in p. 21, he informs us that he has invariably used the term class to designate the orders of Linnæus. If entomologists of all countries are



agreed upon any one point of nomenclature, it is in preserving for the *Coleoptera*, &c. the name of orders. What possible benefit does the author suppose can arise, by thus transposing and altering well-established sectional names? With myself, at least, confusion has been the result; since whilst studying the pages of the "Sphinx Vespiiformis," I was constantly tripping over the misapplied terms, kingdom, class, order, &c. I trust entomologists will set their faces against the attempted innovations.

Yours, &c.

The Grove, Hammersmith,  
Oct. 1832.

I. O. WESTWOOD.

(To be continued.)

3. *Observations on the Newmannian, or Septenary System.*—SIR, I conceive it to be my duty to send you my opinions on the subject which has lately engrossed so large a portion of the attention of the scientific naturalists of this country. I need not say you are at liberty to publish my opinions, or not, as you may think fit; but I appeal to you, as Editor of a scientific magazine, whether such a magazine should not be always open to the free expression of opinion. My strictures may be unpalatable to many,—they certainly will be to some of your readers; but as truth must sooner or later triumph, the sooner that delusion which obscures it is dispelled the better. In your review of "Sphinx Vespiiformis," what have you said? Every entomologist of my acquaintance was eagerly expecting a decisive opinion from an entomological magazine: your number comes amongst us, and contains no opinion. You merely recommend us to read what we had all read at least a dozen times. Permit me to say, Sir, that in your review there appears a kind of suppressed disapprobation, which, to myself, who am not in your confidence, is quite unintelligible. Did you believe in the theory of a septenary series of circles, you would, with the friendly feeling you manifest towards its author, have openly avowed that belief; but you do not believe; then, Sir, why not boldly say so? You say, the Essay "will be read with pleasure by those who may not be disposed to coincide with the peculiar views of the author:" so it will; but should you not have added, "Such is the plausibility which his extraordinary talent has given to a theory, the most absurd and extravagant

that man ever presumed to palm upon his fellow-creatures." Let me not, however, seek to write down Mr. Newman by the mere force of words, and let him not imagine that I suppose myself capable of doing so; he is an antagonist against whom a giant's arm were ineffectual; and but for the sure and certain knowledge that I am right, and that he is wrong, I dare not thus provoke him to the combat.

I enter not into the subject of the first chapter,—it is as dazzling as I believe it fallacious. I have only to do with the three grand points of the theory, as demonstrated by Mr. Newman, from the class *Insecta*; first, that the class *Insecta* is divisible into seven groups only; second, that *Neuroptera*, the supposed central group, is connected with, or related to, each of the other six, which form a circle round it; third, that of every seven the central one forms a type of the rest.

*First.* That the number seven prevails in the divisions of the *Insecta* I must unequivocally deny; and I trust I have only to prove the existence of an eighth class,<sup>f</sup> to prove the fallibility of the number seven. For this purpose I select the *Trichoptera*, Kirby,—subclass *Phryganea*, Newman,—and place its characters in contrast with those of the *Neuroptera*, with which Mr. Newman has thought fit to incorporate it.

NEUROPTERA.<sup>g</sup>

Mouth perfect, i. e. with perfect mandibles and maxillæ.  
Wings four, reticulated.  
Prothorax, distinct.  
Larva, hexapod, active.  
Pupa, active, voracious.

## TRICHOPTERA.

Mouth imperfect, i. e. without mandibles or maxillæ.  
Wings four, clothed with hair.  
Prothorax, replaced by a collar.  
Larva sluggish, in a case.  
Pupa, quiescent.

These characters are given in Mr. Newman's own way, and from them it appears that *Neuroptera* and *Trichoptera* have no single character in common. Thus an eighth class is

<sup>f</sup> I observe Mr. Newman terms the *orders* of Linnæus *classes*, thus following Fabricius; and introduces orders as much more limited groups. This is so clearly an improvement, that all scientific men will at once adopt it. The next division, *subclass*, Newm. is *Stirps*. MacL. and must yield to priority.

<sup>g</sup> We are little disposed to criticise the performances of our contributors; but an obvious misstatement must not be passed over in silence. These characters are those of the genus *Libellula* Lin., not those of the order Neuroptera. If this error arise from ignorance, Clericus ought to study before pronouncing so authoritative an opinion; if intentional and for the sake of argument, we pity him: in either case, he is wise in so positively declining a controversy.—ED.



introduced, and the uniformity of the figure, as well as the imaginary value of the number, destroyed. *Homoptera*, *Dermaptera*, and *Strepsiptera*, seem also to claim an equal rank.

*Second.* That the class *Neuroptera* is related to each of the other six classes. Let us try this also. In order to make good his position, Mr. Newman places *Psyche*, a genus of moths, with his subclass, *Phryganea*, in *Neuroptera*, and thus connects *Lepidoptera* and *Neuroptera*! He next fancies a relationship between the *Ephemera* and the gnats, because "they dance together in the sunshine!" This is as profound reasoning as that by which "the erroneous Rennie" proves antennæ to be ears,—a piece of besotted ignorance which you have very laudably exposed. This is the mode of connecting *Neuroptera* and *Diptera*! The white ants in *Neuroptera* (being larvæ) are supposed to be related to the common ants in *Hymenoptera* (being perfect insects), because both build houses! No relation between *Coleoptera* and *Neuroptera* is attempted; but the next class, *Orthoptera*, is robbed of a genus, *Mantispa*, which is placed in *Neuroptera* for the sake of making a relation between these two. Lastly, *Aphis*, in *Hemiptera*, meets *Psocus*, in *Neuroptera*, and there seems, in this single instance, to be a distinct analogy. To sum up, two of these relations depend on genera being misplaced; two more on accidental similarity in habits; a fifth on analogy; and the sixth is, even by the ingenious author, not attempted.

*Third.* That the central class, *Neuroptera*, is any way a type of the others, cannot be for a moment upheld. Mr. Newman has not descended to any explanation of this; he must have been well aware that any thing that could have been urged in favour of such a proposition must have been met with instant refutation.

This is a fair view of the *Newmannian theory*,—system I cannot call it: it is lamentable that entomologists shall have regarded it as entitled to serious consideration; it bears its refutation on its very face; and yet the author tells one, with the coolest effrontery, that "no one," but himself, "since the days of Linnæus, has ever thought at all," and speaks as though he were perfectly confident that "that great *arcantum*, the *systema naturæ*," were at length discovered.

I see Mr. Newman's name so prominent in your Magazine,



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and I see his "Essay" handled so tenderly, and treated with so much respect, that I flatter myself these observations will not altogether escape his notice, and I may reasonably expect that I shall draw on myself his angry reply. I wish now most positively to state, that I shall decline a controversy; and to all who may desire to commence one, I merely say, reperuse *this*.

It is scarcely allowable thus to point out the *errors*, without making any allusions to the *merits* of a work: permit me, therefore, to add, that I have never seen any summary of the characters of the different classes of insects given in so clear, concise, and unexceptionable a manner, as in Mr. Newman's table; neither did I ever read a work on natural history containing such profound ideas, and displaying such varied and great talent, as the one, the main theory of which it has been my endeavour to point out as being completely imaginary. How often is this the case! how often does talent, like the "ignis fatuus," dazzle to mislead.

I am, Sir,

Your subscriber, and generally your admirer,

CLERICUS.

October 1, 1832.

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ART. XXV.—*Observations on the Circulation of the Blood in Insects.* By JAMES BOWERBANK, Esq., F. G. & Z. S.

THE larva of the *Ephemera marginata*<sup>a</sup> is the insect which best exhibits the general circulation of the blood, and is the one which has been the principal subject of the following observations. It is figured and described in Dr. Goring and Mr. Pritchard's "Microscopic Illustrations;" but, for my first introduction to the living larva, I am indebted to my friend, Mr. Tulley, with one of whose splendid instruments my observations have been made. These larvæ may be found

<sup>a</sup> It does not appear quite certain of what particular species of ephemera the insect described here is the larva.—ED.

in considerable numbers in small pools of water in boggy or marshy places; mine were procured from similar situations on Hampstead Heath. They may be preserved for many months in glass jars, or other vessels, with a little duck-weed floating upon the surface of the water. In selecting them for the purpose of exhibiting the circulation of the blood, care should be taken to choose such as have not yet attained a greater length of body than about one-eighth of an inch, as the whole insect may then be subjected to examination, with a reasonable expectation of seeing the full extent of the great dorsal vessel; particularly if one be selected which has the intestinal canal free, or nearly free, from food, as the success of the observation will greatly depend upon this circumstance. In fixing the larva for observation, which of course must be in water, great care must be taken not to compress the body, as, although the central circulation may be seen proceeding with considerable vigour, that through the lateral vessels, and those of the tail, legs, and antennæ, will either be much impeded or entirely stopped. Having fixed the insect, with the above precautions, and with its back towards you, a truly beautiful and astonishing sight presents itself. The blood, abounding in flattened oat-shaped particles, will be seen circulating in every part of the body, not in a continuous stream, but at regular periods, agreeing in its motion with the pulsations of the great dorsal vessel. This vessel (Fig. 1, *a, a, a, a,*) extends nearly the whole length of the body, and is of great comparative magnitude. It is furnished, at regular intervals, with double valves, about equal in number to the sections of the body. Both above and below each of these sets of valves is a pair of singular looking appendages, (Fig. 2, *a.*) They are, probably, nervous ganglions, auxiliary to the motions of the vessel, but so exceedingly pellucid as scarcely to be defined with the highest power which can be applied to them. The action of the valves is a most interesting and beautiful sight. While in their greatest state of collapse, the point of the lower valve is seen closely compressed within the upper one, (Fig. 3, *a.*) At the commencement of the expansion of the artery, the blood is seen flowing in from the lateral apertures, (Fig. 2, *b*); and, at the same time, the stream in the artery commences its ascent. When it has nearly attained its greatest state of expansion, the sides of the lower valve are forced

upwards by the increased flow of the blood from the section below the valve, the lateral openings are closed, and the main current of the blood is projected through the two valves, as shewn in Fig. 4, *a*.

It is not easy to see this beautiful structure of the valves of the great dorsal vessel, for it is only when the insect is in a state of great exhaustion, or has been just so much compressed as to destroy voluntary motion without entirely depriving it of life, that it is possible to subject it to a power sufficiently high to discern these extremely delicate and transparent tissues; and even then, to see them to the greatest advantage, recourse should be had only to such as are in the last three or four sections of the body.

The structure of the upper valve appears to be a reflecting inwards and upwards of the inner coat or coats of the artery; and of the under one, to be a contraction and projection of the like parts of a portion of the artery beneath, so as to come within the grasp of the lower part of the valve above it. The exterior portion of the artery may be seen as an exceedingly fine line, connecting the parts above and below the valves, as represented at *c*, Figs. 2, 3, and 4.

The blood does not appear to be confined within any specific vessels, previously to its entering the lateral openings before-mentioned, as, when they open, the particles are seen converging towards them, as shewn by the curved and straight arrows, Fig. 2.

The whole of the blood received throughout the course of this vessel is conveyed to the extremity of the anterior part of the body, where the vessel makes a curve inwardly, and is lost to view at *b*, Fig. 1. To all appearance, the main current of the blood is now discharged into the cavity of the body, as it is seen pursuing its course downwards, in a wide spreading stream, on each side and beneath the great dorsal vessel. As it descends, portions are again absorbed by the valves of the dorsal vessel, and, at the same time, vessels passing down each side of the body convey another portion of the blood to its lower extremity. These are decidedly vessels, not portions of the great abdominal cavity, their boundaries being clearly definable. They communicate at each junction of the sections of the body with the great abdominal cavity, as a part of the blood they convey is discharged at these points, to supply



the place of that absorbed by the valves of the great dorsal vessel; *c*, Fig. 1, shews the course of these vessels, and *d*, Fig. 1, the points at which they communicate with the abdominal cavity. These vessels terminate at *e*, Fig. 1, by discharging their contents into the lower end of the great dorsal vessel.

The circulation is also strikingly and beautifully exhibited in the tail. Here the ascending and descending vessels, like vein and artery, accompany each other; and, at the same instant that the blood is seen to pass up the one, with the usual pulsatory motion, it descends in the other in a similar manner. This is the more apparent, as the sides of the vessels are well defined, and each perfectly distinct from the other.

Although the blood passes with the same pulsatory motion through these minute vessels as it does in other parts of the body, yet no pulsation of either the ascending or descending vessels themselves can be detected. The motion, therefore, seems to be entirely dependent on the action of the great dorsal vessel, which evidently performs in the insect the same functions that the heart does in vertebrated animals.

Supplying and returning vessels may also be seen in the legs, although they cannot be so clearly defined as in the tail; and in the antennæ they pass up on the one side of the first joint, and, turning round at the extremity, they again descend into the head.

Upon fixing the insect so as to obtain a side-view, the great dorsal vessel presents a very interesting appearance. It is seen continually and regularly oscillating backwards and forwards, upwards and downwards, and at the same time the main current of the blood in the great abdominal cavity winds its way in all directions towards the hinder extremity of the insect. Scarcely any larvæ exhibit the circulation of the blood in so beautiful a manner as the one described, although there are few in which it is not more or less to be seen, as I have been able to detect the great dorsal vessel in almost all I have examined. In one, figured in the work before quoted of Dr. Goring and Mr. Pritchard, and said to be the larvæ of a *Culex*, no particles are visible in the blood; but the great dorsal vessel, its valves, and their singular appendages, are distinctly and beautifully apparent.

Next to the larvæ of the *Ephemera marginata*, the larvæ of *Agrion* affords the best view of the blood and its circulation.

In all the species of these larvæ I have yet examined, I have found it as nearly similar as possible in appearance to that which we observe in the Ephemera, and in some instances it has afforded even more satisfactory results. The head of this larva is much more transparent than that of the larva of the Ephemera; we therefore had a better view of the circulation of the blood in the head of this insect than can possibly be obtained in the other. In this object the blood is seen rushing like a beautiful intermittent fountain towards the mouth, and dividing, right and left, into two jets, a portion of each of which flows within a given boundary past the back of the eye, whilst the remainder winds its way through other channels, deep in the side of the head, and returns again into the body.

The antennæ of this insect also afford another beautiful instance of the circulation being carried forward within well-defined vessels. They are each composed of six joints, up four of which the blood is seen to take its course, and turning round the extremity of the fourth joint, it returns by a distinct vessel into the head.

In the leg, likewise, the circulating fluid and its vessels are clearly and distinctly to be traced, even to the very extremity of the tarsus, where, as in the antennæ, the particles of the blood are seen to descend on the one side of the leg, and, turning the extreme point, to return up the contrary side to the one by which they came down.

I regret much that I have not yet had an opportunity of examining the Ephemera in its perfect state; but in two species of *Culex*, one of which was first observed and brought to me by my friend, Mr. Tulley, I have seen the great dorsal vessel performing its functions in a manner similar in every respect to its appearance in the larvæ of Ephemera, Agrion, &c. &c.; but, from the body of the fly being more opaque than that of the larvæ, and nearly covered with its striated scales, neither the valves nor the particles of the blood could be detected. On another occasion, after having carefully cleared the wings of *Phlogophora meticulosa* of their coloured scales, both Mr. Samouelle and myself clearly saw a fluid pass down the side of one of the principal ribs of the wing. We may therefore, I think, fairly conclude, that the circulation is carried forward in the perfect insect as well as in the larva, although, perhaps, not with so much vigour as when young and growing.

In describing what I have seen, I have abstained from using the word vessel, except where the margins were distinctly to be defined, although I am inclined, from what I have seen, to be of opinion, that a much greater portion of the circulation than we can clearly define is carried on within given vessels, as the blood may frequently be seen flowing in curved and other lines, and confined within very narrow limits, but so deeply seated amidst the muscles and intestines as totally to prevent the boundaries of the current from being clearly observed. This is strikingly the case in the side-view of this insect, where currents are seen winding about in many different directions, but, from the intervening muscles and intestines their boundaries are not visible; nor can it be expected under such circumstances, when we consider that the blood is a perfectly colourless and transparent fluid, visible only from its containing a number of particles of a somewhat flattened oat-shape; and that the great dorsal vessel itself is only to be seen distinctly with a very high power, and even then can only be defined with certainty whilst it is in motion.

I cannot omit observing a singular coincidence between the flattened oat-shaped particles of the blood in the insect, and of the circular double concave plates in the human blood, which is, that the particles of the former, like those of the latter, assume a globular form immediately on coming in contact with water.

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ART. XXVI. — *Observations on the British Species of Sepsidæ.* By FRANCIS WALKER, ESQ. F. L. S.

*Micropeza* was the generic name given by Meigen to *Musca corrigiolata*, of Linnæus; or, *Calobata corrigiolata*, of Fabricius, who has placed in the latter genus some Dipterous insects, having not the slightest affinity to each other; one species being a *Sepsis*; another, a *Tachydromia*; a third, a *Borborus*; their only mutual resemblance consisting in the rapidity of their movements. Latreille, in his *Genera Crust. et Insect.*, has placed *Musca cyuipsea*, of Linnæus, and *Tephritis macula*, of Fabricius (both belonging to *Sepsis*,

Fallen); in *Micropeza*; also, *Musca cothurnata* and *petronella*, of Linnæus, to which *Calobata* is now restricted. He has removed *Musca vibrans*, of Linnæus, (placed with *Micropeza* in the *Hist. Nat. des Crust. &c.*) to *Tephritis*, which he places next to the other genus, its natural situation, if *Musca cynipsea* and *vibrans* are taken as their respective types, though the affinities of some species included in the two genera are very remote. He has formed nearly the same arrangement in the *Règne Animal*, but in the *Familles Naturelles* it is more artificial; as *Dictya* and *Dacus* are placed between *Tephritis* and *Micropeza*, constituting with *Platystoma*, his *Carpomyzæ*, which, with his *Dolichoceræ*, and a part of his *Gonocephalæ*, form the *Ortalides* of Fallen, containing, among other genera, *Ortalis* and *Sepsis*, *Musca vibrans*<sup>a</sup>, *Tephritis cerasi* and *Syngenesiæ*, &c. being the types of the former;—*Musca cynipsea* and *punctum*, of the latter genus; while *Tephritis cardui*, *solstitialis*, *radiata*, &c., and *Micropeza corrigiolata*, remain in the same genera. The last-mentioned species is placed with *Calobata*, by Latreille, in the *Dict. de l'Hist. Nat.*, while *Musca cynipsea* and *punctum* are left under *Micropeza*. R. Desvoidy follows this arrangement, and makes a new genus (*Phantasma*) of *Musca filiformis*, which, with *Calobata*, *Nerius*, *Sepsis*, &c. he calls *Thelidomydæ*, the 2d tribe of his 5th gens, *Phytomydæ*. In the new edition of the *Règne Animal*, Latreille places the following genera under *Carpomyzæ*. 1. *Diopsis*, Lat. 2. *Cephalia*, Meig. 3. *Sepsis*, Fall. 4. *Ortalis*, Fall. 5. *Tetanops*, Meig. 6. *Tephritis*, Lat. 7. *Platystoma*, Meig.

#### Fam. SEPSIDÆ.

Caput medium, subproductum, posticè latum: oculi medii, remoti, rotundi: frons lata: ocelli tres, supra verticem in triangulo dispositi: hypostoma depressum: labrum breve, latum, excavatum: proboscis magna, apice lata, rugosa: palpi elongati, graciles, setosi, aut vix conspicui: antennæ capitebre vires, 4-articulatæ; 1°. brevi, 2°. latiore, 3°. magno, ovato, compresso; 4°. setiformi, nudo aut minimè pubescente, articulis multis conspicuis vel indistinctis, supra 3<sup>um</sup>. basi inserto: thorax elongato ovatus: prothorax supra inconspicuus: mesothoracis scutum maximum, scutellum parvum, productum: metathoracis scutellum

<sup>a</sup> Kirby has called this insect *Scioptera vibrans*.

benè determinatum aut fere inconspicuum : abdomen subpetiolatum aut sessile, convexum, arcuatum, cylindricum aut depressum, lineare aut elongato-ovatum, *maris* nonnunquam apice cornubus aut ciliis vestitum, 4-annulatum : pedes elongati aut breves, *maris* femoribus et tibiis anticis sæpe subtus dentatis et spinosis, coxis anticis elongatis, *maris* tarsis intermediis nonnunquam dilatatis : alæ angustæ, nervis longitudinalibus subrectis : halteres capitati, ab alis remoti.

The insects of this family and of *Ortalis*, may be frequently seen running on leaves in the sunshine, driving away any of the larger *Muscides* which may chance to alight near them, and continually vibrating their wings; their economy is unknown. Sepsis is nearly allied to *Ortalis*, *Nemopoda* to *Calobata*, and *Themira* to *Piophilæ*.

Characteres Generum.

Abdomen	}	subpetiolatum <i>Alæ.</i>	{	maculatæ. <i>Mas</i> , Femoribus tibiisque anticis, subtus dentatis et spinosis . . . . . 1. SEPSIS.
				in utroque sexu simplices . . . . . 2. NEMOPODA.
				<i>Mas</i> , Femoribus tibiisque anticis subtus dentatis et spinosis, tarsis intermediis dilatatis. <i>Fem.</i> Tarsorum articulo 1 <sup>o</sup> . basi compresso . . . . . 3. ENICOPUS.
}	}	immaculata <i>Pedes.</i>	{	Metathoracis scutellum benè determinatum . . . . . 4. THEMIRA.
				Metathorax supra inconspicuus . . . . . 5. SALTELLA.
		sessile	{	

GENUS I.—SEPSIS. *Fallen.*

Musca . . *Linn. De Geer, Harris, Fabr. Gmel. Schrank, Panzer, Berk. Stew. Turt. Olivier, Coquebert.*

Tephritis . *Fabr.*

Micropeza, *Meigen, Latr. R. Desvoidy.*

Sepsis . . *Fallen, Meig. Wied. Latr. Curtis.*

Corpus setosum : palpi vix conspicui : antennæ seta indistinctè articulata : metathoracis scutellum benè determinatum : abdomen subpetiolatum, convexum, arcuatum, apice subtus incurvum, segmento 1<sup>o</sup>. elongato, apice supra tumido, reliquis brevioribus, *maris* subclavatum, *fem.* elongato-ovatum : pedes setosi, graciles, elongati ; *maris* femora antica subtus dentata et spinosa ; tibiæ

subarcuatæ, *maris* subtus dentatæ et spinosæ; tarsi articulo, 1°. elongato, sequentibus longitudine decrescentibus: alæ apice nigro maculatæ.

Sp. 1. *Sepsis cynipsea*. Mas et fem. *Nigro-viridis, hypostomate nigro, abdomine cupreo purpureoque micante, antennis fuscis, pedibus nigris, alis hyalinis.*

*Musca cynipsea* . . . *Linn. Syst. Nat.* 2. 997. 113.  
*Faun. Suec.* 1868. *De Geer. Ins.*  
 6. 33. 18. 12. *Scop. Ent. Carn.*  
 947. *Fabr. Ent. Syst.* 4. 351.  
 160. *Sp. Ins.* 2. 451. 82. *Mant.*  
*Ins.* 2. 351. 100. *Schrank*  
*Fauna Boica*, III. 2461. *Ins.*  
*Austr.* 956. *Gmel. Syst. Nat.* V.  
 2855. *Stew.* 262. *Turt.* III.  
 618. *Encycl. Method.* No. 128.

The lesser *Musca vibrans*, *Harris Ex.* 122. Pl. 35. fig. 43.

*Tephritis cynipsea* . . *Fabr. Syst. Antl.* 324. 41.

*Micropeza cynipsea* . . *Latr. Gen. Crust.* IV. 355. *Règne*  
*Anim.* III. 646.

*Sepsis cynipsea*. . . *Fallen Ortol.* 23. 5. *Meigen Dipt.*  
*Europ.* V. 287. *Latr. Règne*  
*Anim. Nouv. Edit.* V. 532.

*Micropeza fulgida* . . . *R. Desvoidy, Essai sur les Myo-*  
*daïres*, 742. 3.

Caput nigrum, posticè nigro-æneum: oculi rufo-fusci: antennæ fuscæ, seta nigra: thorax glaber; latera æneo-micantia: abdomen pubescens, sparsè setosum, nitidum, æneo-cupreum, segmentis purpureo cingulatis: pedes pubescentes; coxæ fuscæ, anticæ rufæ; femora nigro-viridia, apice basique fusca, *maris* antica subtus versus medium dentata et spinosa; tibiæ intermediæ apice fuscæ, anticæ fuscæ apice rufæ, *maris* subtus bidentatæ; tarsi nigri aut nigro-fusci, subtus pallidè pubescentes: alæ hyalinæ, basi fuscæ: halteres flavi. (Alarum longitudo,  $1\frac{3}{4}$ — $2\frac{1}{4}$  lin.; corporis,  $1$ — $1\frac{1}{2}$  lin.)

Var.  $\beta$ .—*Mas*, metathoracis scutellum æneum, nigrens.

Var.  $\gamma$ .—*Mas*, abdomen cupreo-æneum, unicolor.

Var.  $\delta$ .—*Mas*, abdomen æneum, segmentis 1°. et 2°. cyaneo-cingulatis: tibiæ anticæ rufæ; tarsi articulo 1°. rufo.



Var.  $\epsilon$ .—*Fem.* abdomen cupreum, segmento 1<sup>o</sup>. apice æneo-viridi, 2<sup>i</sup>. disco purpurascente : femora postica basi rufa.

Common near London, in the spring, summer, and autumn, on trees, plants, &c. Its scent has been compared to that of balm.

Sp. 2. *Sep. fulgens.* *Præcedenti similis, hypostomate rufo.*

*Sepsis fulgens.* *Hoffmansegg, Meigen. Dipt. Europ. V. 287.*

With the preceding species, in nearly equal abundance.

Sp. 3. *Sep. hilaris.* *Præcedenti similis, tarsis omnibus rufis.*

*Sepsis hilaris.* . . . *Meigen. Dipt. Europ. V. 288.*

*Micropeza vivida, var.?* *R. Desvoidy, Essai sur les Myodaires. 742. 4.*

It has been found near London.

Sp. 4. *Sep. flavimana.* *Præcedenti similis, pedibus anticis femoribusque 4 posticis basi flavis.*

*Sepsis flavimana.* *Meigen. Dipt. Europ. V. 288.*

July; south of France. It has been found near London.

*Note.*—The three preceding species are perhaps only varieties of *Sep. cynipsea*.

Sp. 5. *Sep. maculipes.* *Mas et fem. Nigro-ænea, hypostomate nigro, abdomine cupreo, antennis fuscis, pedibus nigris, anticis flavis fusco maculatis, alis hyalinis.*

Caput anticè nigrum: oculi rufo-fusci: antennæ fuscae, seta nigra: thoracis latera metathoracisque scutellum ænea, nitida: abdomen nitidum: pedes antichi flavi, femoribus supra fusco maculatis, tarsis nigro-fuscis; coxæ flavæ; femora 4 postica nigro-ænea, basi et *fem.* apice flava; tibiæ 4 posticæ nigro-fuscae; tarsi concolores, subtus nigro-pubescentes: alæ hyalinæ; basi fuscae: halteres flavi. (Alarum longitudo,  $1\frac{3}{4}$ —2 lin. corporis, 1— $1\frac{1}{4}$  lin.)

*Var.  $\beta$ .*—*Mas*, pedes postici tibiis tarsisque nigris; tibiæ anticæ fusco cingulatæ.

*Var.  $\gamma$ .*—*Fem.* pedes intermedi tibiis apice tarsisque basi flavis; tibiæ anticæ fuscae, basi flavæ.

July; near London. September; near Ambleside, Westmoreland.

Sp. 6. Sep. concinna. Fem. *Nigro-viridis, abdomine purpureo-cupreo, antennis fuscis, hypostomate pedibusque nigris, alis hyalinis.*

Caput anticè nigrum: oculi rufo-fusci: antennæ fusæ, seta nigra: thoracis latera metathoracisque scutellum ænea, nitida: abdomen nitidum: femora nigro-ænea; tibiæ anticæ nigro-fusæ; tarsi 4 antici basi nigro-fusci: alæ hyalinæ, basi fusæ: halteres flavi. (Alarum longitudo, 2—2 $\frac{1}{4}$  lin.; corporis, 1 $\frac{1}{4}$ —1 $\frac{1}{2}$  lin.)

July; on grass, beneath trees; near London.

Sp. 7. Sep. ruficornis. Mas et fem. *Nigro-ænea, antennis rufis aut fuscis, pedibus nigris, tibiis anticis flavis, alis subhyalinis.*

Sepsis ruficornis. *Meigen, Dipt. Europ. V. 288.*

Caput anticè nigrum: oculi rufo-fusci: antennæ rufæ, seta nigra: thoracis latera mesothoracisque scutellum nitida: abdomen nitidum: coxæ flavæ; femora nigro-ænea, basi flava; tibiæ anticæ flavæ, intermediæ apice fusæ; tarsi nigro-fusci: alæ subhyalinæ, basi fusæ: halteres flavi. (Alarum longitudo, 1 $\frac{1}{4}$ —1 $\frac{1}{2}$  lin.; corporis,  $\frac{2}{3}$ — $\frac{3}{4}$  lin.)

Var.  $\beta$ .—*Mas et Fem.* tibiæ anticæ, coxæ et antennæ fusæ.

June; on grass beneath trees; near London.

Sp. 8. Sep. nigripes. Mas et fem. *Nigra, abdomine nigro-æneo, antennis rufis aut fuscis, pedibus nigris, alis subfuscis.*

Sepsis nigripes. *Meigen, Dipt. Europ. V. 289.*

Micropeza nitida. *R. Desvoidy, Essai sur les Myodaires. 743. 5.*

Oculi fusci: antennæ rufæ, seta nigra: thoracis latera metathoracisque scutellum nitida: abdomen nigro-æneum, nitidum: coxæ anticæ rufæ: alæ subfusæ, basi fusæ: halteres flavi. (Alarum longitudo, 1 $\frac{1}{4}$ —1 $\frac{1}{2}$  lin.; corporis,  $\frac{2}{3}$ — $\frac{3}{4}$  lin.)

Var.  $\beta$ .—*Mas et Fem.* antennæ et coxæ anticæ fusæ.

June to September; on grass beneath trees; near London.

Sp. 9. Sep. violacea. Mas et fem. *Nigro-viridis, abdomine purpureo, antennis fuscis, pedibus rufis, alis hyalinis.*

Sepsis violacea. . . . *Meigen, Dipt. Europ. V. 289.*

Micropeza pygmæa, var.? *R. Desvoidy, Essai sur les Myodaires. 743. 7.*

Caput anticè nigrum : oculi rufo-fusci : antennæ fuscae, seta nigra : abdomen, thoracis latera metathoracisque scutellum nitida : coxæ anticæ tibiæque posticæ fuscae ; tarsi apice fusci : alæ hyalinæ, basi fuscae : halteres flavi. (Alarum longitudo,  $1\frac{1}{4}$ —2 lin. ; corporis,  $1$ — $1\frac{1}{4}$  lin.)

July ; on grass, beneath trees ; near London.

Sp. 10. Sep. punctum. Mas et fem. *Nigro-viridis, abdomine purpureo basi aureo, antennis fuscis, pedibus rufis, alis hyalinis.*

Musca punctum. . . *Fabr. Entr. Syst. IV. 351, 159. Coqueb. Illustr. 109. Tab. 24. Fig. 14.*

Tephritis punctum. . *Fabr. Syst. Antl. 324. 40. Encycl. Method. Pl. 395. Fig. 27—29. Schell, Dipt. Tab. 4. Fig. 2.*

Musca stigma. . . *Panzer. Faun. Germ. LX. 21. Encycl. Method. Pl. 394. Fig. 26.*

Micropeza punctum. *Latr. Gen. Crust. &c. IV. 355. Nouv. Dict. d'Hist. Nat. XX. 520.*

Sepsis punctum. . *Fallén Ortol. 22. 4. Meigen, Dipt. Europ. V. 289. 10.*

Micropeza cynipsea. *R. Desvoidy, Essai sur les Myodaires. 741. 1.*

Caput anticè nigrum : hypostoma rufum : oculi rufo-fusci, antennæ fuscae, seta nigra : thoracis latera et metathoracis scutellum nitida : abdomen cupreo-purpureum, nitidum, basi aureum : femora 4 postica fusco cingulata ; tibiæ posticæ fuscae, intermediæ apice fuscae ; tarsi apice fusci : alæ hyalinæ, basi fuscae : halteres flavi. (Alarum longitudo,  $2\frac{1}{2}$ — $2\frac{3}{4}$  lin. ; corporis,  $1\frac{3}{4}$ —2 lin.)

*Var. β.*—Mas, abdominis segmentum 1<sup>um</sup>. rufo-viride.

*Var. γ.*—Mas, pedes femoribus omnibus et tibiis 4 anticis fusco cingulatis.

*Var. δ.*—Fem. abdomen purpureo cingulatum : pedes tibiis intermediis tarsisque posticis fuscis.

July ; near London ; on trees, plants, &c.

Sp. 11. Sep. ornata. *Nigro-viridis, abdomine aeneo, segmento primo chalybeato, antennis fuscis, pedibus rufis, alis hyalinis.*

Sepsis ornata. *Meigen, Dipt. Europ. V. 290. 11.*

It has been found near London.

GENUS II.—NEMOPODA, *R. Desvoidy*.

Corpus minimè setosum: palpi elongati, graciles, setosi: antennæ seta distinctè triarticulata: metathoracis scutellum benè determinatum: abdomen pubescens, subpetiolatum, convexum, arcuatum, apice subtus incurvum, segmento 1<sup>o</sup> elongato, apice supra tumido, reliquis brevioribus, *maris* subclavatum, *fem.* elongato-ovatum: pedes graciles, elongati, non setosi, in utroque sexu simplices; tibiæ subarcuatæ; tarsi articulo 1<sup>o</sup> elongato, sequentibus longitudine decrescentibus: alæ immaculatæ.

Sp. 1. *Nem. cylindrica*. Mas et fem. *Nigro-æneus thoracis lateribus anticè et posticè rufis, abdomine æneocupreo, antennis rufis, pedibus flavo-fuscis, alis hyalinis apice obscuris.*

*Musca cylindrica*. . . . . *Fabr. Ent. Syst. IV.*  
336. 104.

*Musca alis vibrantibus immaculatis.* *Geoffrey, Ins. 2.* 536. 84.

*Calobata cylindrica*. . . . . *Fabr. Syst. Antl.* 263. 11.

*Sepsis nitidula*. . . . . *Fallén Ortal.* 21. 2.

*Sepsis cylindrica* . . . . . *Meigen, Dipt. Europ.*  
V. 290. 12.

*Nemopoda putris*. . . . . *R. Desvoidy, Essai sur*  
*les Myodaires.* 744. 1.

Caput nigrum, posticè nigro-æneum: hypostoma rufum: oculi rufo-fusci: oculi rufi: antennæ rufæ, seta nigra basi rufa: thoracis latera metathoracisque scutellum ænea, nitida: abdomen nitidum: pedes flavi; femora 4 postica supra medio fusca; tibiæ posticæ fuscæ, intermediæ supra pallidè fuscæ; tarsi fusci, 4 antichi basi flavo-fusci: alæ hyalinæ, basi flavescentes, apice fuscæ: halteres albi. (Alarum longitudo,  $2\frac{1}{2}$ — $2\frac{3}{4}$  lin.; corporis  $1\frac{3}{4}$ — $2\frac{1}{4}$  lin.)

*Var. β.*—*Mas*, tibiæ intermediæ fuscæ.

May to August; on plants; near London.

Sp. 2. *Nem. stercoraria*. Mas et fem. *Nigro-viridis, thoracis lateribus anticè et posticè rufis aut fuscis, abdomine æneo, antennis rufis, pedibus flavo-fuscis, alis subfuscis.*

*Nemopoda stercoraria.* *R. Desvoidy, Essai sur les Myodaires.*  
745. 3.

Caput nigrum : hypostoma rufum : oculi ocellique rufi : antennæ rufæ, seta nigra basi rufa : thoracis latera nitida, anticè et posticè rufa ; metathoracis scutellum nitidum, nigro-æneum : abdomen nitidum, apicis latera chalybea : pedes pallidè fuscii : femora basi et femora antica subtus flava : tibiæ anticæ coxæque flavæ : tarsi obscurè fuscii : alæ basi flavescentes : halteres albi. (Alarum longitudo, 2 lin. ; corporis,  $1\frac{1}{2}$  lin.)

*Var. β.*—*Mas*, thoracis latera anticè et posticè fusca.

June ; on plants ; near London.

Sp. 3. *Nem. nigricornis*. *Mas* et *fem.* *Nigro-viridis*, abdomine purpureo-cupreo, antennis nigro-fuscis, pedibus fusco-flavis, alis hyalinis.

*Sepsis nigricornis*. *Meigen*, *Dipt. Europ.* V. 291. 13.

Caput nigro-æneum, posticè cyaneo-nigrum : oculi rufo-fuscii : ocelli rufi : antennæ nigro-fuscæ, seta nigra : thoracis latera et metathoracis scutellum nigro-ænea, nitida : abdomen nitidum, segmento 1°. apice purpureo : pedes flavi ; femora 4 postica apice æneofusca, antica apice pallidè fusca ; tibiæ 4 posticæ fuscæ, apice pallidiores : tarsi fuscii, 4 antici basi flavo-fuscii : alæ hyalinæ, basi flavescentes : halteres pallidè flavi. (Alarum longitudo, 2 lin. ; corporis,  $1\frac{1}{2}$  lin.)

*Var. β.*—*Mas*, abdomen cupreo-æneum ; segmentum 2<sup>um</sup>. purpureo cingulatum : tibiæ anticæ fuscæ.

June ; on plants ; near London.

Sp. 4. *Nem. tarsalis*. *Mas*. *Nigro-viridis*, abdomine nigro-cupreo, antennis nigro-fuscis, pedibus fusco-nigris, alis subfuscis.

Caput nigrum, posticè nigro-viride : hypostoma rufum : oculi rufo-fuscii : ocelli rufi : antennæ nigrofuscæ, seta nigra : thoracis latera nitida, anticè rufa : metathoracis scutellum nigro-æneum, nitidum : abdomen nitidum : pedes nigri ; coxæ flavæ ; femora basi flava, apice supra flavo notata, antica fusca apice basi subtusque flava ; tibiæ intermediæ apice fuscæ, anticæ flavo-fuscæ ; tarsi fuscii : alæ subfuscæ, apice basique fuscæ : halteres flavi. (Alarum longitudo, 2 lin. ; corporis,  $1\frac{3}{4}$  lin.)

August ; near London. September ; near Ambleside, in Westmoreland.

Sp. 5. *Nem. fumipennis*. Fem. *Ater, abdomine nigro-cupreo, antennis nigro-fuscis, pedibus nigris, alis fumosis.*

Oculi ocellique rufo-fusci: antennæ nigro-fuscæ, seta nigra: thoracis latera et metathoracis scutellum nitida: abdominis segmentum 3<sup>um</sup>. fere nigrum: coxæ flavæ; femora basi flava, apice supra flavo notata; tibiæ 4 anticæ apice supra flavo notatæ; tarsi postici basi flavi: alæ fumosæ, anticè versus apicem obscuriores: halteres flavi. (Alarum longitudo,  $1\frac{3}{4}$  lin.; corporis  $1\frac{1}{2}$  lin.)

July; on plants; near London.

GENUS III.—ENICOPUS,<sup>b</sup> *Walker.*

Sepsis. *Meigen, Curtis.*

Corpus minimè setosum: metathoracis scutellum benè determinatum: abdomen pubescens, subpetiolatum, convexum, arcuatum; *maris* cylindricum, apice cornubus duobus munitum, incurvum, segmento 1<sup>o</sup>. elongato; *fem.* elongato-ovatum: pedes graciles, elongati, pubescentes; *maris*, femoribus anticis subtus dentatis et spinosis, tibiis anticis subtus bidentatis, tarsis intermediis dilatatis; *fem.* simplices, tarsorum articulo 1<sup>o</sup>. basi compresso; tibiæ subarcuatæ; tarsi articulo 1<sup>o</sup>. elongato, sequentibus longitudine decrescentibus: alæ immaculatæ.

Sp. 1. *Enic. annulipes*. Mas et fem. *Nigro-æneus, antennis fuscis, pedibus nigris, alis subfuscis* (mas), *aut subhyalinis* (fem.)

Sepsis annulipes. *Meigen, Dipt. Europ. V. 292. 16. Curtis, Brit. Ent. 245.*

*Mas.*—Niger: oculi ocellique rufo-fusci: antennæ basi rufæ, seta nigra: thoracis latera metathoracisque scutellum nigro-ænea, nitida: abdomen nigro-æneum, nitidum, segmentis 1<sup>o</sup>. et 2<sup>o</sup>. cupreo-æneis, apice brevè setosum: coxæ flavæ; femora nigro-ænea, basi flava; tibiæ apice supra flavo notatæ, 4 anticæ fusæ; tarsi intermedii atterimi, articulis 1<sup>o</sup>. et 2<sup>o</sup>. basi albis: alæ subfusæ: halteres flavi.

*Fem.*—Nigro-æneus: tarsi intermedii nigri, articulo 1<sup>o</sup>. flavo: alæ subhyalinæ. (Alarum longitudo,  $1\frac{1}{2}$  lin.; corporis  $1\frac{1}{4}$  lin.)

Var.  $\beta$ .—*Mas*, abdominis segmenta 1<sup>um</sup>. et 2<sup>um</sup>. viridi-ænea, 3<sup>um</sup>. et 4<sup>um</sup>. nigro-ænea.

July; on grass beneath oak-trees; near London.

<sup>b</sup> 'Ενικὸς singularis, ποῦς pes.



GENUS IV.—THEMIRA, *R. Desvoidy*.

Musca . . . *Linn. List. Goed. Merian, Frisch. Berk. Scop. Gmel. Fabr. Schrank.*

Sepsis . . . *Fallen, Meigen, Curtis, Haliday.*

Seta minimè pilosa, distinctè triarticulata: metathoracis scutellum benè determinatum: abdomen sessile, depressum; *maris* ferè lineare, apice plerumque setosum, segmento 1°. elongato; *fem.* elongato-ovatum, segmentis subæquis: pedes elongati, graciles, *maris* femoribus tibiisque anticis subtus dentatis et spinosis.

Sp. 1. Them. putris. Mas et fem. *Atra aut nigro-ænea, nitida, abdomine maris apice brevè setoso, alis subhyalinis aut subfuscis.*

Musca putris. *Linn. Syst. Nat. 2. 993. 89.*

Var. fimeti . *Faun. Suec. 1. 1110. 2. 1850.*

Musca putris. *List. Goed. 132. Goed. Ins. 1. Tab. 73. Merian, Europ. Tab. 43. Fig. 83. Frisch. Ins. I. Tab. 7. Berk. Synop. 1. 165. Scop. Ent. Carn. 904. Gmel. Syst. Nat. V. 2849. 89. Fabr. Sp. Ins. 2. 445. 51. Ent. Syst. IV. 334. 92. Mant. Ins. 2. 347. 61. Syst. Antl. 323. 34.*

Musca fimeti. *Schrank, Fauna Boica, III. 2471.*

Sepsis putris. *Fallen, Ortal. 21. 1. Meigen, Dipt. Europ. V. 292. 15. Haliday, Ent. Mag. II. 170.*

Oculi ocellique rufo-fusci: antennæ nigrae: abdomen glabrum, *maris* apice brevè setosum: pedes nigri; tarsi subtus fusco pubescentes: alæ subhyalinæ, costa nigra: halteres flavi, basi fusci: *maris* femora antica subtus dentata et spinosa. (Alarum longitudo,  $2\frac{3}{4}$ —3 lin.; corporis  $1\frac{1}{2}$ — $1\frac{3}{4}$ .)

Var.  $\beta$ .—Mas et fem. corpus nigro-æneum: alæ subfuscae.

July; on grass beneath trees; near London.

*Note.*—Linnæus and other authors supposed this species to be a variety of his *Musca casei*.

Sp. 2. Them. pilosa. Mas et fem. *Nigra aut nigro-ænea, nitida, abdomine maris apice longè setoso, alis subhyalinis.*

Themira pilosa. *R. Desvoidy, Essai sur les Myodaires, 746. 1.*

Sepsis superba. *Haliday, Ent. Mag. II. 170.*

*Mas.*—Nigra: oculi ocellique rufo-fusci: antennæ nigrae: abdomen glabrum, apice setis vix brevioribus vestitum: pedes nigri; femora antica subtus basi 4-dentata; tibiæ anticæ subtus dentatæ et spinosæ, supra spina elongata valida armatæ; tarsi subtus fusco pubescentes, anticum articulus 1<sup>us</sup>. elongatus, 2<sup>us</sup>. 3<sup>o</sup>. brevior, alæ subfuscae: halteres flavi.

*Fem.*—Nigro-ænea: pedes simplices. (Alarum longitudo, 2 lin.; corporis, 1¼ lin.)

July; on grass beneath trees; near London.

Sp. 3. Them. minor. *Mas et fem. Nigra, nitida, abdomine nigro-æneo, apice in utroque sexu nudo, alis subhyalinis aut subfuscis.*

*Sepsis minor. Haliday, Ent. Mag. II. 170.*

Oculi ocellique rufo-fusci: antennæ nigrae: abdomen glabrum: pedes nigri; *maris*, femora antica subtus spinosa, tibiæ anticæ medio subtus bidentatæ: alæ subhyalinæ: halteres flavi. (Alarum longitudo, 1½—1¾ lin.; corporis, ¾—1 lin.)

*Var. β.*—*Mas et fem.* alæ subfuscae.

September; on grass beneath trees; near London.

Sp. 4. Them. Leachi. *Mas. Nigra, nitida, pedibus basi rufis, abdominis apice setoso.*

*Sepsis Leachi. Meigen, Dipt. Europ. V. 291. 14.*

Antennæ nigrae: pedes antici femoribus tibiisque subtus dentatis: alæ subhyalinæ: halteres flavi. (Corporis longitudo, 2 lin.)

It has been found near London.

#### GENUS V.—SALTELLA, *R. Desvoidy.*

Mesothoracis scutellum usque ad abdomen productum; metathorax supra invisum: abdomen sessile, depressum, *fem.* elongato-ovatum: pedes breves, inermes; femora subclavata; tibiæ rectæ: alæ breves.

Sp. 1. Salt. nigripes. *Fem. Nigra, abdomine nigro-æneo, antennis fuscis, pedibus nigris, alis albis.*

*Saltella nigripes. R. Desvoidy, Essai sur les Myodaires, 747. 2.*

Obscura: oculi rufo-fusci: ocelli rufi: proboscis fusca, apice rufa: antennæ fuscae, seta nigra: mesothoracis scutellum apice rufum:

abdomen nitidum: coxæ flavæ; femora 4 postica basi flava: alarum nervi pallidè fusci: halteres fusci. (Alarum longitudo,  $1\frac{2}{3}$  lin.; corporis,  $1\frac{1}{4}$  lin.)

August; on a dry sunny bank; near London.

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ART. XXVII.—*Observations on the Enicoceri.*

By G. WAILES, Esq.

THE natural history of this recently discovered, obscure, but interesting genus of *Coleoptera*, appears to be little understood; probably owing either to the few habitats at present known to entomologists, or to its being confined to the northern parts of the island. If the following observations should throw a little additional light on the subject, and induce others to pursue the inquiry with more minuteness, I trust they will not be altogether useless.

For some years past I had observed the large fragments of the coarse sandstones of the carboniferous series, which were laying half exposed in the river Wansbeck, at Meldon Park, to be covered with innumerable oval cells, measuring about two lines in the longest diameter. From the aperture in each of them, they were evidently the pupæ cases of some small beetle; but as I did not then pay much attention to minute insects, I considered they were probably those of some of the smaller *Helophori*, and, being in pursuit of larger game, undeserving my particular notice. It was not till the summer of 1831 (in the spring of which year I had met with five species of *Elmis* in a brook near Meldon), when on an accustomed annual visit to our watering-place, Tynemouth, I first discovered the *Enicoceri* in this neighbourhood. Examining the stones in a rivulet, within fifty yards of its junction with the sea, in quest of specimens of *Elmis* and *Hydræna*, I observed a beetle, which a moment's inspection assured me was an *Enicocerus*. On commencing a closer search, I found all the three species in considerable abundance, lurking in the inequalities of the coarse stones, just level with, or a little above, the

surface of the water. In this respect these insects differ from the allied genus, *Elmis*, whose favourite resort is the under side of rough stones, apparently preferring such as are in the most rapid parts of the brooks, and that side of the stone exposed to the force of the stream. In the Wansbeck they were in the greatest profusion in August. I have also taken them at various places near Newcastle, in October and April, and doubt not they may be met with most months of the year, though autumn and winter must be considered their principal season. I am borne out in this supposition by the fact of having generally observed the larvæ and pupæ in company with the perfect insect, especially in the autumn. The former (larvæ) are anopluriform, measuring, when full grown, about two and a half lines in length, and half a line in width. They are of an uniform black, and have the apex of each abdominal segment fringed with very short hairs. Their food is most probably mucor, for they seem to be confined to the rough slimy stones; and I find that it is quite as great a waste of time to look for them on a smooth limestone, as to turn up a fragment of basaltic rock (vulg. *whinstone*) in search of *Geodephaga*.<sup>a</sup> When full grown, the larvæ leave the water, and crawl up the sides of the stone in search of a convenient place in which to undergo their change. After a long journey of frequently

<sup>a</sup> The apparent repugnance of beetles to basalt I have long noticed. Two or three years ago I lost a day or two in June entomologizing in Teesdale,—so far at least as my cabinet was concerned. The subjacent rock of this wild district is almost exclusively composed of the basalt of the great Whin Sill, whose formation is so knotty a point with geologists; and of course the loose stones of the surrounding country are its fragments. Botanists have made its treasures known far and wide; and though I found the exquisite *Gentiana verna*, and the equally rare, though sombre, *Bartsia alpina* in some plenty, I scarce saw a single beetle, notwithstanding I turned over multitudes of *likely-looking* stones, and even they were such as are superlatively common elsewhere, though here "*inter rariores*." So far as my observations, whether confined to single stones or extended over a whole district, go, any place having limestone, particularly the magnesian, for its subjacent stratum, will afford abundance of the *Geodephaga* as well as most other *Coleoptera*, whilst they will be found very thinly scattered over a basaltic region. It is strange to notice the almost uniform absence of these insects on turning up a Whin which has accidentally found its way into a heap of any other stones, though every one of the latter may have one or more tenants under it. Must we not look to the comparative dryness of the limestone and humidity of the Whin for an explanation? We can readily account for the great predominance of the land *Testacea* on a limestone district; but lime does not enter into the composition of beetles.

some ten or a dozen inches, as their fancy or fate may lead them, on finding a projecting angle of rock large enough to ward off any rolling stones, or deep and dreary cavern, formed in the surface by the dropping out of a grain or crystal of the sandstone, capable of affording them shelter, they commence the task of building their pigmy huts. In doing so, they agglutinate small particles of the mud which floods usually deposit on coarse stones; and, when finished, the cases resemble very closely, though on a smaller scale, the nests of the mason-bees, sometimes met with on the rough face of a large stone. So numerous are the pupæ cases of these little beetles, that they frequently almost cover a half-emerged fragment, giving it a curious appearance, and, until one is aware of their nature, looking like projecting parts of the stone itself. The inclosed inhabitant is of a bright orange colour, and after remaining a period of probably only a few days, it assumes the perfect state, and, patiently waiting till its mandibles are strong enough for the task, gnaws itself a passage, and joins its comrades by the water-side. Here a half dozen of them may often be found in one cranny, spending their brief lifetime in sipping the nourishment furnished by the stream at their door. Their travels appear very circumscribed, seldom extending beyond a trip to the extreme edge of the moist portion of the stone on which their lot has been cast, or a ramble for an inch or two below the surface of the water. When, however, an accident, or the indulgence of a roving disposition, compels or tempts them to undertake a voyage of discovery, they are soon thrown by the current into the eddy of some oasis of the watery desert, and slowly, but generally surely, reach the shore. Like the neighbouring genera, the *Enicoceri* are often covered by the stream with a deposit of mud, and then require the keen and practised eye of the entomologist to detect them in their lurking-places.

GEORGE WAILES.

Newcastle, November, 1832.

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ART. XXVIII. *An Essay on the Classification of the Parasitic Hymenoptera of Britain, which correspond with the Ichneumones minuti of Linnæus.* By A. H. HALIDAY, Esq., M.A.

[TO THE EDITOR OF THE ENTOMOLOGICAL MAGAZINE.]

SIR,—Among our indigenous insects, few seem to have obtained so little attention from the systematic writers of Britain as the tribes of *Hymenoptera*, corresponding (with a slight modification) to the *Ichneumones minuti* of Linnæus. This branch has not been equally disregarded by the continental authors; but of their methods little more than partial indications have been made accessible to the generality of British collectors. In attempting here to give an outline from those sources, and embodying the results of some of my own investigations, I must hope for the indulgence which the total want of any library of reference will suggest in my favour. During a short stay in London, some years since, the ever-ready liberality of my friend, Mr. Curtis, opened to me the stores of his rich cabinet, as well as various sources of information not otherwise accessible. Some leisure hours have since been passed, not unpleasantly, in recalling and applying the information thus afforded, and from those recollections, and from the materials afforded by my own small collection, I am induced to attempt the sketch of which these sheets form the introductory, and not the least laboured part. The plan I have proposed to myself excludes much pretension to originality. I have, however, in many cases remodelled and amplified the characters of established genera, in accordance with my own observations, and have added some subdivisions that seemed to be pointed out by nature. In addition to the genera previously determined, a few groups have been *indicated* by Mr. Stephens, in his “Systematic Catalogue,” and the great mass subsequently by Mr. Curtis, in his “Guide to an Arrangement of British Insects.” As the groups proposed by Mr. Stephens were in general unnamed, I had followed the nomenclature of the latter catalogue. A notice in the pages of the “Entomological Magazine” brought to my knowledge an Essay, by Mr. Westwood, on the *Parasitic Hymenoptera*, inserted in the “Philosophical Magazine” (Third Series, No. III.) for

August, 1832. As the genera there *characterized* for the first time appeared to me, with two or three exceptions, to be identical with those I had adopted from Mr. Curtis's Guide, and under his names, to avoid the inconvenience of conflicting nomenclature, it became necessary hastily to review these sheets, and to substitute Mr. Westwood's names in their right of priority.<sup>a</sup> The elegant conciseness and distinctness of his generic characters facilitated this task; and I believe I have succeeded in applying them correctly in general. An abrupt descent from the family to the ultimate generic subdivision, renders it difficult in all cases to combine brevity with certainty (unless by embodying the divisional characters in the generic, an object not easily effected while the divisions themselves are overleaped); accordingly, in one or two instances where no particular indication of affinities was supplied, I had to rest in doubt. The examples given with the tabular view were an after-thought, and added without an opportunity of consulting my cabinet, or any book of reference; but I believe no material errors have crept in.

Yours, &c.

ALEX. HENRY HALIDAY.

*Dublin, November, 1832.*

<sup>a</sup> There is nothing in science for which we feel a more sovereign contempt, and think more utterly at variance with all proper and gentlemanly feeling, more decidedly indicative of poverty of resource, than the plan here alluded to, of appropriating and superseding the labours of other authors. Had we, instead of Mr. Haliday, been the author thus robbed of our hard-earned property, we hope and trust we should have had the fortitude to have borne the matter as he has done: he has proved himself not merely the gentleman, but the philosopher and christian. We are not, however, a party concerned; and the performance of our duty as Editor of an Entomological Magazine demands from us the undisguised expression of our most decided disapprobation of all such transactions. We noticed Mr. Westwood's paper at p. 85; we received it when our first number was in the press, and were not then aware of its nature.—ED.



I. TABULA SYNOPTICA GENERUM ET SUBGENERUM ICHNEUMONUM ADSCITORUM BRITANNIÆ.

Species Ex. gr. delectæ et Synonyma.

Fam. Ichneumonenes.

\*\* *Subf. Adscitii.* Areola disci externa nulla, antica sæpius completa, sive Bracones et Bassi. *Nees von Esenbeck.*

\* Abdomen sub pectus incurvabile: areola antica disci contigua vel incompleta: palpi maxillares 4-articulati. APHIDIUS.

I. Alæ nullæ: aculeus horizontalis . . . . . Aphidius Ehippium, *Curt. G.*

II. Areola disci antica et cubitales interiores confluentes, i. et postice definitæ.

1. Aculeus horizontalis s. suberectus obtusus . . . . . Aphidius Rosæ.

*Ichneumon Aphidum, De G.—Schra.*  
Aph. constrictus. *Nees.*

ii. et postice effusæ.

1. Aculeus simpliciter falcatus s. subconicus. *Monotonus* . . . . . Aph. Caricis, *ined.*

2. Aculeus decurvedus inter cornua bina ventralia acuta ipso longiora, *Trioxys* . . . . . Aph. Cirsii. *E. B.*

III. Areolæ cubitales 3 et antica disci completa.

i. Aculeus decurvedus tricuspis: antennæ multi-articulatæ. *Trionyx*. . . . . Aph. deltiger, *ined.*

ii. Aculeus horizontalis: antennæ 11-articulatæ. *Ephedrus*. . . . . Aph. plagiator.

*Bracon plagiator, Nees. B. M.*  
Aph. exoletus, *Nees.*

IV. Areola cubitalis unica effusa, antica disci completæ. *Praon*. . . . .

\*\* Abdomen haud penitus incurvabile.

I. Areola antica disci contigua completa.

i. Palpi maxillares 5-, labiales 3-articulati. ANCYLUS.

1. Aculeus deflexus subulatus . . . . . Ancyclus cuspidatus, *ined.*

2. Aculeus falcatus incurvus . . . . . Anc. muricatus, *ined.*

Species Ex. gr. delectæ et Synonyma.

- ii. Palpi maxillares, 6-, labiales 3-articulati.  
 1. Areola antica disci antice angulata.  
 † Abdominis segmenta 3 magna coalita. **SIGALPHUS**.  
 A. Abdomen breviter ovatum sessile . . . . . Sigalphus caudatus, Nees.  
 B. Abdomen oblongum basi angustatum. **EUBAZUS**. . . . . Sig. macrocephalus.  
 †† Abdominis segmenta discreta.  
 A. Areolæ cubitales 2. **DIOSPILUS**. . . . . *Eubazus macrocephalus*, Nees  
 B. Areolæ cubitales 2. **CHARMON**. . . . . Diospilus oleraceus, ined.  
 2. Areola antica disci antice subtruncata. **BLACUS**.  
 a. Antennæ ♂ articulis pluribus quam 20, ♀ quam 19 . . . . . Charmon cruentatus, ined.  
 b. Antennæ ♂ 19-, ♀ 17-articulate . . . . . Blacus ruficornis.  
 iii. Palpi maxillares 6-, labiales 4-articulati.  
 1. Areolæ cubitales 3.  
 † Abdomen falcatum aculeo brevi. **ZELE**. . . . . *Bracon ruficornis*, Nees.  
 †† Abdomen oblongum aculeo elongato. **MACROCENTRUS**. . . . . Blacus humilis, Nees.  
 Zele testaceator, E. B.  
*Ichn. pallidator*, Thumb. A. P. ?  
 Macrocentrus linearis.  
*Rogas linearis*, Nees, A. A.  
*Bracon linearis*, Nees, B. M.  
 Orgilus obscurator.  
 II. Areola antica disci remota vel incompleta.  
 i. Palpi maxillares 5-articulati.  
 1. Numerus articulorum antennarum determinatus in ♂ et ♀ par.  
 A. Antennæ 20-articulate. **ADELIUS**. . . . . Adelius subfasciatus, ined.  
 B. Antennæ 18 articulate: alarum posticarum areolæ radicales 2  
 cubitales 2. **MICROGASTER**.  
 a. Areolæ cubitales 2 . . . . . Microgaster glomeratus, Spin.  
*Ichn. glomeratus*, L.

Species Ex. gr. delectæ et Synonyma.

- b. Areolæ cubitales 3 . . . . .
- C. Antennæ 14-articulatæ. MIRAX. . . . .
- † Numerus articulorum antennarum incertus, in maribus auctus.
- † Areolæ cubitales 3.
- ‡ Areola radialis angustissima cuneata.
- A. Palpi labiales 3-articulati. MICRODUS.
  - a. Areola disci antica completa . . . . .
  - b. Areola disci antica incompleta . . . . .
- B. Palpi labiales 4-articulati, AGATHIS.
  - a. brevirostres. DIPLOZON? . . . . .
  - b. rostrati . . . . .
- †† Areola radialis ovata s. oblonga. BRACON.
- A. Areola brachialis inferior alarum posticarum brevissima.
  - a. Antennæ apice compressæ obtusæ. *Genuini*.
    - a. rostrati . . . . .
    - b. brevirostres . . . . .
  - b. Antennæ teretes. *Microcephali*.
    - a. rostrulati . . . . .
    - b. crostres . . . . .
- B. Areola brachialis infr. alarum posticarum magna.
  - Sphærocephali* . . . . .
- †† Areolæ cubitales 2. LEIOPHRON.
  - A. Areola radialis apicem aëæ attingens. PYGOSTOLUS.
    - Micr. globatus, *Spin.*
    - Ichn. globatus*, L.
    - Mirax rufilabris, *ined.*
    - Microdus gloriatorius, *Nees.*
    - Bassus gloriatorius*, Pz.—E. B.
    - Micr. cingulipes, *Nees.*
    - Agathis calculator.
    - Microdus calculator*, *Nees.*
    - Bassus calculator*, Pz.—E. B.
    - Agathis malvacearum, *Latr.*
    - Bracon desorator, *Spin.*
    - Bracon nominator, *F.*
    - Bracon delibator, *ined.*
    - Bracon minutator, *F.*
    - Bracon denigrator, *F.*
    - Leiophron sticticus.
    - Cryptus sticticus*, F.

- B. Areola radialis brevissima semilunata.
- a. Abdomen sessile . . . . . L. mitis, *ined.*  
 b. Abdomen petiolatum . . . . . L. apicalis, *Curt. G.*
- ii. Palpi maxillares 6-, labiales 3-articulati.  
 1. Occiput marginatum : mandibulæ forcipatæ : areola disci antica  
 parum remota. **PERILITUS**,  
 † Areolæ cubitales 3.  
 A. Alarum posticarum areolæ radiales 2 . . . . . Perilitus albiditarsus.  
 B. Alarum posticarum areola radialis 1 . . . . . *Zele albiditarsus, E. B.*  
 †† Areolæ cubitales 2.  
 A. Areola antica disci completa . . . . . Per. rutilus, *Nees.*  
 B. Areola antica disci et cubitales interior confluentes.  
 a. Areola radialis ab apice alæ remota semicordata . . . . . Per. secalis.  
 b. Areola radialis apicem alæ attingens cultrata . . . . . *Ichn. secalis, L.*  
 c. Areola radialis hiantes : areola antica disci  
 longe remota. **CHOREBUS**, . . . . . Per. idalius, *ined.*  
 Chorebus affinis.  
*Alysia affinis, Nees.*  
*Dacnusa uliginosa, Curt. G.*
- iii. Palpi maxillares 6-, labiales 4-articulati.  
 1. Occiput immarginatum : abdominis segmenta discreta.  
 † Corpus elongatum. (Labrum transverso-quadratum). **COELINIUS**. *Cœlinius anceps.*  
 †† Corpus breve. (Labrum fere trigonum). **ALYSIA**. *Chænon anceps, E. B.*
- A. Mandibulæ hiantes areolæ cubitales 2. **DACNUSA**.

Species Ex. gr. Delectæ et Synonyma.

- a. Areola radialis ante apicem alæ sinuato clausa . . .  
 Alysia rufipes, *Nees*.  
*Dacnusa pubescens*, *Curt. G.*
- b. Areola radialis amplissima in apicem effusa . . .  
 Alysia areolaris, *Nees*.  
 Alysia aptera, *Nees*.  
*Chænon apterus*, *E. B.*
- B. Mandibulæ hiantes tridentes: alæ nullæ . . . . .
- C. Mandibulæ hiantes subquadratæ trilobæ s. tridentes: areolæ cubitales 3  
 a. Stigma conspicuum. Areola disci antica completa.  
   *a.* Antennæ ♀ crassæ pilosæ turbinatæ . . . . .  
   *b.* Antennæ ♂ graciles.  
     *a.* Stigma definitum breve . . . . .  
     *β.* Stigma attenuato-elongatum . . . . .  
 b. Stigma conspicuum. Areolæ disci antica et cubitales interior confluentes . . . . .  
 c. Stigma nullum.  
   *a.* Areolæ cubitales discretæ . . . . .  
   *b.* Areolæ cubitales interiores confluentes . . . . .  
     *Al. pusilla*, *Curt. G.*
- D. Mandibulæ hiantes dente intermedio acuminato-elongato:  
 Areolæ cubitales 3. *ALLOEA*. . . . .
- E. Mandibulæ forcipatæ: areolæ cubitales 3. *GNAEMPTODON*.  
 segmentis posticis brevibus vel retractis: alarum posticarum nervus recurrens unicus.
- † Abdominis segmenta coalita postica retracta. **CHELONUS**.  
 † Areolæ cubitales 2: mandibulæ hiantes 4-dentes. **TRACHIONUS**. . . . .  
 †† Areolæ cubitales 3.  
 Chelonus mandibularis.

Species Ex. gr. delectæ et Synonyma.

- A. Areolæ disci subequales. *SPIAEROPIY* . . . .  
 B. Areola disci inferior angusta.  
   a. Abdomen triannulatum . . . . .  
   b. Abdomen exannulatum.  
     *a.* Areola disci antica completa . . . . .  
     *b.* Areola disci antica incompleta . . . . .  
     †† Abdominis segmenta discreta. *ADEMON*. . . . .  
     † Abdomen sessile *s.* sessile,  
       † et immarginatum,  
     † Segmentis 3 anticis magnis subæqualibus,  
       A. lanceolatum. *ROGAS*. . . . .  
     B. ovatum aculeo subdeflexo. *CLINOCENTRUS*. . . . .  
     †† Segmento 1<sup>mo</sup>. parvo, 2<sup>do</sup>. maximo.  
     A. Antennæ 11-articulatæ. *CHREMYLUS*. . . . .  
     B. Antennæ multi-articulatæ; aculeus brevis subdeflexus.  
       *COLASTES*. . . . .  
     C. Antennæ multi-articulatæ; aculeus elongatus ascendens.  
       *RHYSSALUS*. . . . .  
     †† Abdomen marginatum. *HORMIUS*. . . . .  
     †† Abdomen petiolatum. *SPATHIUS*. . . . .
- Chelonus irrorator*, *Nees*.  
*Chelonus dentator*, *Pz.*  
*Chelonus rufipes*, *Nees*.  
*Sigalphus rufipes*, *Latr.*  
*Chelonus sulcatus*, *Jur.*  
*Ademon decrescens*.  
*Rogas testaceus*, *Nees*.  
*Bassus testaceus*, *F.*  
*Bracon testaceus*, *Spin.*  
*Clinocentrus umbratilis*, *ined.*  
*Cremylus elaphus*, *ined.*  
*Hormius* ii.—*Nees*.  
*Colastes braconius*, *incl.*  
*Rhyssalus clavator*, *incl.*  
*Hormius moniliatus*, *Nees*.  
*Spathius clavatus*, *Nees*.  
*Cryptus clavatus*, *Pz.*  
*Cr. mutillarius*, *F.*  
*Ichn. attenuator*, *Thunb.*

De Trophis horum Ichneumonum nonnusquam auctoritati obsecutus sum, quales sunt Agathis, Bracon (*sc. Sphærocephali*), et Sphæropyx a cl<sup>mis</sup>. Latreille, Nees von Esenbeck et Curtis luculenter expressi. Perpaucos etiam (*q. s.* Mirax, Perilitus *sectio ultima*, Trachionus, et Chremylus) in ordinem redegi Analogiæ fere solæ fisus. Reliquorum trophos ipse scrutatus sum.

Desiderantur Genera Helcon, Ichneutes, Cardiochiles, Plancus, Aenone; e quibus Helcon Macrocentris proximus; Aenone sub Alysii ut subgenus disponendum videtur, Ichneutes forsitan inter Chelonos et Microgastres; Plancus genus dubii situs, Cardiochiles mihi ignotum.

Terminorum interpretatio. Occiput *marginatum* appello cujus limbum ambit undique lineola elevata aut angulata; *immarginatum* quod cum vertice leni tractu confunditur etiamsi a genis atque gulâ sat determinate discretum sit:—areolam anticam disci *contiguam* cujus angulus anticus attingit costam ad basin stigmatis; si aliter fiat *remotam*; — denique nervos *recurrentes* in alis posticis qui ex areolâ brachiali anteriore versus marginem posticum anteriorem excurrunt.

## II. EXCERPTA QUÆDAM E METHODO CHALCIDUM BRITANNIÆ.

Fam. Chalcidæ.

\* *Pupivoræ*. Nervus subcostalis elongatus, antennæ et pedes mediocres.

† Pentameri.

I. PTEROMALI. Palpi maxillares 4-articulati.

i. Macromeri.

A. CHALCIS, *F.* (*BRACHYMERIA*, *Ww.*)  
SMIERA, *Spin.*

B. HALTICHELLA, *Spin.*

ii. Isomeri.

I. Isosterni.

A. Carbonarii.

EURYTOMA, *Ill.* DECATOMA, *Spin.* SYSTOLE, *Walk.* ISOSOMA, *Walk.*

B. Metallicores.

a. Dodecatomæ.

a. PERILAMPUS, *Latr.* CRATOMUS, *Dal.* &c.

b. MEGASTIGMUS, *Dal.* TORYMUS, *Dal.*

b. Hendecatomæ.



{ ORMYRUS, *Ww.*  
 { *CYRTOSOMA*, *Curt. G.*  
 SPHEGIGASTER, *Spin.*  
 { PACHYLARTHURUS, *Ww.*  
 { *PHAGONIA*, *Curt. G.*  
 GNATHO, *Curt.*

HALICTOPTERA, *Spin.*  
 PTEROMALUS, *Sued.*  
 CHEIROPACHYS, *Ww.*  
 TRIGONODERUS, *Ww.*  
 CALLITULA, *Spin.*  
 MACROGLENES, *Ww. &c.*

## ε. Macrosterni.

### a. Dodecatomæ.

CLEONYMUS, *Latr.* STENOCERA, *Curt. G.* EUPELMUS, *Dal.*

b. Hendecatomæ. Antennarum articuli pauciores quam 12 præter annellos sive articulos minutos ad basin flagelli.

CERCHYSIUS, *Ww.*

ENCYRTUS, *Latr.*

ERICYDNNUS (*Curt. G.*). Nervus subcostalis costam longius occupans ante originem ramuli cubitalis.

CRANTOR. Corpus brevissimum contractum apterum thoracis suturis lævigatis.

APHELINUS, *Dal.* (*CYLLOMUS*, *Curt. G.*) Nervus subcostalis ultra medium costæ abruptos ramulo cubitali nullo. Antennæ 8-articulatæ.

MICROMA, *Curt. G.*

## II. SPALANGLÆ. Palpi maxillares biarticulati.

i. Palpi labiales biarticulati maxillaribus vix duplo breviores. Collare elongatum.

SPALANGIA, *Latr.* alati : caput oblongum fere rostratum.

LAESTHIA, *Curt.* apteri : caput ovatum.

ii. Palpi labiales minutissimi punctiformes. Collare transversum.

PIRENE, *Curt. G.*

†† EULOPHI. Tetrameri : palpi biarticulati subconici.

EULOPHUS, *Geoff*  
 { DICLADOCERUS, *Ww.*  
 { DIOZUS, *Curt. G.*  
 { OMPHALE, *Curt. G.*  
 ENTEDON, *Dal.*  
 CIRROSPILUS, *Ww.*  
 { EUPECTRUS, *Ww.*  
 { PERISTUS, *Curt. G.*  
 PTEROMALUS, *Spin.*  
 ELACHERUS, *Spin.*  
 MICROTHERUS, *Spin.*  
 ♂c.

\*\* *Ovitroæ*, s. MYMARES. Nervus subcostalis brevissimus : antennæ et pedes gracillimi.

#### I. Pentameri.

OOCTONUS. Antennæ maris 13-articulatæ flagello filiformi, feminae 11-articulatæ capitulo exannulato.

LITUS. Antennæ maris 13-articulatæ flagello filiformi, feminae 9-articulatæ capitulo exannulato.

#### II. Tetrameri.

1. Antennæ feminae 10-articulatæ capitulo biarticulato.

##### EUSTOCHUS.

2. Antennæ feminae 9-articulatæ capitulo exannulato.

##### A. Abdomen petiolatum.

MYMAR, (*E. B.*) Alæ anticae capillares apice spatulatæ, posticae setaceæ.

POLYNEMA. Alæ anticae obovatæ, posticae lineares.

##### B. Abdomen sessile.

ANAPHES. Abdomen ovoideum : antennæ maris 12-articulatæ.

ANAGRUS. Abdomen conico-elongatum : antennæ maris 13-articulatæ.

Familiam hancce integram consultò transilui, generibus a meipso olim vulgaris modo in ordinem revocatis, quippe quæ peritiori in manibus jam versatur optimo angurio.

#### CONSPECTUS STIRPIUM ET GENERUM OXYURORUM BRITANNIÆ.

##### OXYURI. *Latr.* (*PROCTOTRUPINI. Latr. CODRONI. Daln.*)

I. PLATYGASTRES. Abdomen sessile depressum segm<sup>to</sup>. 1<sup>mo</sup>. haud campanulato, ventre marginato : antennæ prope os insertæ fractæ 10—12-articulatæ, radícula sæpe exserta : maxillarum lobus membranaceus integer :

Species Ex. gr. delectæ et Synonymia.

\* Palpi breves frons rotundata.

† Thorax oblongus, collari amplo bilobo :

vii. **SCELIO.** Antennæ feminae 12-articulatae : palpi maxillares 3-articulati : areola radialis elongata trigona, nervus subcostalis a costa remotus . . . . .

i. **PLATYGASTER.** Antennæ 10-articulatae : palpi maxillares biarticulati : alæ exareolatae : pedes haud saltatorii :

1. **INOSTEMMA.** Nervus subcostalis abruptus capitatus : antennarum clava 4-articulata . . . . .

2. **PLATYGASTER.** Alæ anticae aveniæ :

a. Antennarum clavæ abruptæ 4-articulatae : scutellum mucronatum.

b. Antennæ apice sensim vel parum crassiores articulo 3<sup>to</sup>. minuto vel penitus oblitterato . . . . .

a. Scutellum mucronatum s. fasciculatum . . . . .

b. Scutellum obtusum . . . . .

Thorax brevis collari lineari-arcuato : pedes saltatorii.

†† Scutellum nullum :

v. **BAEUS.** Corpus brevissimum contractum apterum : antennæ feminae breves clavâ compactâ 5-annulata, ovato-acuminata. —

Mas, incognitus . . . . .

*Teleadi* affinis etiam generi *Crantori* inter *Incyrtos* haud dissimilis ob "faciem subcoleoptratam." (*Dalm.*)

†† Thoracis segmenta aligera discreta : nervus subcostalis marginem longius occupans et ramulum stigmaticalem emittens, vel alæ nullæ.

*Scelio rugosulus, Latr.*

*Platygaster Boscii, Lat. Curt. B. E.*  
*Psilus Boscii, Jur.*

*Platygaster Tipulæ recentiorum,*  
*Ichn. Tipulæ, Linn. F. S.*  
—————*Kirb. L. T. v.*

*Platygaster ruficornis, Latr.*  
*Platygaster elongatus, Curt. G.*

*Bæus seminulum, ined.*

ii. **TELENOMUS.** Ramulus stigmatalis in discum alæ oblique descendens: abdominis segmentum primum brevissimum, secundum longe maximum: antennæ femine apice sensim clavata: palpi maxillares biarticulati: mandibulæ arcuatae apice denticulatae (saltem in *T. branchiali*.)

- a. Antennæ ♂ 12-articulatae flagello filiformi: abdomen ovatum . . .
  - b. Antennæ ♀ 10-vel 11-articulatae: abdomen ovatum caput transversum . . .
  - c. Antennæ ♀ 11-articulatae: caput subcubicum:
    - a. Abdomen ob-ovatum . . .
    - b. Abdomen conicum elongatum . . .
- iii. **GRYON.** Antennæ 12-articulatae maris flagello filiformi crassiusculo, feminae clavâ 5-annulata: ramulus stigmatalis brevis: abdomen ovatum segmentis anterioribus æqualibus tertio brevioribus . . .

Cum *Teleade* jungendus sub sectionem propriam si trophi satis convenient id quod adhuc est incomptum.

iv. **TELEAS.** Antennæ 11-articulatae maris flagello lineari elongato articulo 5<sup>to</sup>. angulato; feminae clavâ quinque-annulata: palpi maxillares 3-articulati: mandibulæ apice emarginate. Ramulus stigmatalis brevissimus: metathorax mucronatus: abdomen obovatum segmentis anterioribus subæqualibus 3<sup>to</sup>. majore: species plurimæ apterae . . .

vi. **THORON.** Antennæ 12-articulatae radicula elongatâ, maris flagello filiformi, feminae clavâ 5-annulata: palpi maxillares

*Telenomus ater*, *ined.*

*Telenomus brachialis*, *Curt. G.*

*Telenomus heteropterus*, *Curt. G.*  
*Telenomus othus*, *ined.*

*Gryon misellum*.  
*Telenomus misellus*, *Curt. G.*

*Teleas clavicornis*, *Latr.*

Species Ex. gr. delectæ et Synonyma.

4-articulati: labiales subulati 2-articulati: mandibulæ  
 latæ tridentes: ramulus stigmatalis in discum alæ  
 oblique descendens: abdomen obovatum segmentis  
 anterioribus subæqualibus 3<sup>to</sup>, majore. *Corpus æneo-*  
*nitens* . . . . .

\*\* Palpi maxillares prælongi: frons elevata.

viii. SPARASION. Antennæ 12-articulate . . . . .

II. CERAPHRONTES. Abdomen subsessile immarginatum campanulatum, segmento ultimo ventrali carinato aculeum lanceolatum e rima verticali emitente: antennæ fractæ supra os insertæ: alæ fere exareolate: maxillarum lobus membranaceus integer: mandibulæ arcuatæ apice emarginatæ.

\* Antennæ 11-articulate, feminae apice crassiores: abdominis segmentum primum basi constrictum.

ix. MEGASPILUS. Ocelli 3: oculi magni vel mediocres: stigma crassum, ramulus stigmatalis arcuatus abruptus: vel alæ nullæ: palpi maxillares 5-articulati . . . . .

x. MICROPS. Ocelli 0: oculi minuti: palpi maxillares 4-articulati: corpus apterum . . . . .

\*\* Antennæ maris 11-articulate: feminae 10-articulate: abdominis segmentum 1<sup>num</sup>, maximum basi truncatum.

xi. CERAPHON. Palpi maxillares 4-articulati: stigma 0: ramulus stigmatalis arcuatus abruptus, vel alæ 0 . . . . .

Thoron metallicus.

*Teleas metallicus*, Curt. G.

Sparasion frontale, *Latr.*

*Ceraphron cornutus*, Jur.

Megaspilus dux, *Westw.*

*Ceraphron dux*, Curt. B. E.

Microps Rubi.

*Ceraphron Rubi*, Curt. B. E.

*Ceraphron sulcatus*, *Jur.*

III. DRYINI. Abdomen convexum immarginatum haud campanulatum: segmento ventrali ultimo carinato aculeum subulatum e rima verticali emittente: antennæ porrectæ 10-articulatæ inter oculos insertæ: alæ areolatæ (secundum typum *Evanice*) nervis costalibus discretis: mandibulæ dentatæ. Maxillarum lobus membranaceus integer.

\* Os minutum: palpi reflexi breves.

xii. DICONDYLIUS. Palpi maxillares 5-articulati: caput latum antice et postice retusum, oculis magnis prominulis: antennæ inferius insertæ: thorax elongatus constrictus apterus: pedes antici remoti coxis longis: tarsis ♀ chelatis:—♂ incognitus . . . . .

xiii. LABEO. Palpi maxillares 3-articulati: caput postice truncatum, facie convexa; thorax brevis compactus: alarum stigma angustum: tarsi omnes maris simplices.—Femina incognita . . . . .

\*\* Os latum: palpi longi penduli, maxillares 6-articulati:

xiv. DRYINUS. Antennæ longiores: tarsi antici feminæ chelati: collare ejusdem sapius elongatum: alæ distincte areolatæ stigmatate trigono . . . . .

xv. APHELOPUS. Antennæ breves: tarsi simplices: collare brevissimum: areolæ disci inconspicuæ: stigma trigonum . . . . .

IV. PROCTOTRUPES. Abdomen sessile campanulatum valvulis aculei exertis sub formâ tubi cornei falcati subulati: antennæ porrectæ

Dicondylus pedestris, Curt. G.  
 Dryinus (G.) pedestris, Dalm. A. E.  
 Dryinus formicarius, Dalm. A. H.

Labeo vitripennis.  
 Dryinus vitripennis, Curt. G.

[Dryinus formicarius, Latr.]

Aphelopus melaleucus, Dalm.  
 Aph. atratus, Dalm. ♂

filiformes 12-articulatæ infra frontem insertæ : maxillanem lobus bipartitus : palpi mediores, maxillares 4-articulati : areolæ disci oblitteratæ, nervi costales discreti.

xvi. PROCTOTRUPES . . . . .

*Proctotrupes brevipennis*, Latr.  
*Serphus brachypterus*, Schra.  
*Ichn. Gravidator*, Linn. F. S.

V. DIAPRIÆ. Abdomen petiolatum campanulatum aculei structurâ variante : antennæ fronti insertæ 12—15-articulatæ. Maxillarum lobi connati : palpi maxillares longi 5-articulati.

\* Antennæ porrectæ 15-articulatæ : palpi labiales 3-articulati : alæ areolatæ nervis costalibus discretis.

xvii. HELORUS . . . . .  
\*\* Antennæ fractæ : alarum discus exareolatus.

† Palpi labiales 3-articulati.

xviii. CINETUS. Antennæ maris 14-articulati, feminae 15-articulatæ apice crassiores : areola radialis parva trigona completa : vel alæ 0 . . . . .

†† Palpi labiales 2-articulati.

A. Antennæ utriusque sexus 13-articulatæ.

xix. PARAMESIUS. Antennæ prælongæ, maris articulis 2<sup>do</sup>. et 3<sup>to</sup>. minutis : femine apice crassiores articulo ultimo majore : areola radialis angusta elongata parum distincta . . . . .

*Paramesius rufipes*, Westw. ♂  
*Ceraptilon longicornis*, Curt. G. ♂ ♀

xx. SPILOMICRUS. Antennæ crassiusculæ, maris articulo 2<sup>do</sup>. minuto reliquis subæqualibus, feminae ante apicem crassiores articulo ultimo minore quam penultimo : areolæ

*Helorus anomalipes*, Jur.

*Cinetus gracilipes*, Curt B. E.



Species Ex. gt. delectæ et Synonyma.

alarum oblitteratæ; punctum minutum retro-cuspidatum stigmatis loco . . . . .

*Spilomicrus sericeicornis*.  
*Cerapsilon sericeicornis*, Curt. G.  
*Psilus sericeicornis*, Spin. L. L. ?

B. Antennæ femine 12-articulatæ apice incrassatæ s. clavatæ :  
 xxiii. GALEsus. Caput elongatum compressum fronte valde productâ tuberculatâ: mandibulæ parallelæ descendentes: labrum longius quam latus: antennæ maris 14-articulatæ: alarum nervi indistincti diffusi. . . . .

*Galesus cornutus*, Curt. B. E.  
*Psilus cornutus*, Panz. F. G.

xxii. ANEURRHYNCHUS. Caput haud elongatum: mandibulæ forcipatæ: antennæ maris 14-articulatæ: alæ (ut in Scelione) areolâ radiali elongatâ trigonâ, nervo subcostali a costa remoto . . . . .

*Aneurhynchus galesiformis*, West. ♂  
*Mythras faunus*, Curt. G. ♂ ♀

xxi. PSILUS. Caput parum elongatum: mandibulæ forcipatæ: areolæ alarum oblitteratæ; punctum minutum callosum loco stigmatis, vel alæ 0, . . . . .

*Psilus elegans*, Jur.  
*Diapria verticillata*, Latr.  
*Psilus maritimus*, ined.

1. Antennæ maris 14-articulatæ . . . . .  
 2. Antennæ maris 14-articulatæ femine clavâ abruptâ (quadri-) nodi . . . . .

ADD: Familia hæc obscura nimis, discordiâ auctorum exagitata, nec facile serie continuâ explicanda est. Conspicuum allatus mihi ipsi minus placet, et aliis ut vereor inconcinrior reputabitur: E quinque stirpibus adumbratis quarta et quinta intimè cognatæ sunt; secunda et simul tertia a reliquis longius recedunt, forsitan vel hæc vel utraque *Evania* attingens:—*Anteon* (Latr.) *Dryinos* mares conjugibus dispares innuit ni fallor.—*Belyta* (Latr.) et *Cinetus* (Jur.) idem sonant.—*Belyta* (Jur.) *Cinetorum* nonnullas species antennis feminarum brevioribus perfoliatis et areolâ radiali contractâ insignes vel etiam apteras complecti videtur.—*Platymischus* (Westw.) ambiguum anne *Cinetis* attineat an *Psilis*: feminâ incognitâ interim palpi indicium certissimum

præstare poterunt. — Genera xix—xxiii si melius congrueret forma maxillarum lubenter conjunxissem, generis *Psili* finibus priscis vel restitutis vel auctis.

*Bethylorum* genus abnorme inter *Oryuros* jam diutius exulat, quippe cui locum [et familiæ gradum] inter *Hymenoptera Fossoria* vindicant trophi aculeus (venenatus acris) habitus et mores. Conferendæ Generis *Stigmi* species abdomine subsessili, Fx. Gr. *St. Troglodytes*. Vand. Linden.

AUCTORES LAUDATI.

- |             |          |  |
|-------------|----------|--|
| Curt. B. E. | or E. B. | Curtis' British Entomology.  |
| Curt. G.    | .        | Curtis' Guide to an Arrangement of Br. Insects.  |
| Dalm. A. E. | .        | Dalman. <i>Analecta Entomologica</i> .   |
| Dalm. A. H. | .        | Kongl. Svenska Vetenskaps Academiens Handlingar, 1820. ( <i>Pteromalini Suecicæ a Dalman.</i> )  |
| Fall.       | .        | Fallen, Specimen Methodi novæ Hymenoptera, &c.— <i>Laudatum in Ichneumologia Europæa</i> .   |
| Illig.      | .        | Rossi Fauna Etrusca; edente J. C. Illiger.   |
| Kirb.       | .        | Kirby in the Transactions of the Linnean Society, IV.—V.   |
| Nees. B. M. | .        | Gesellschaft Naturforsch: freunde zu Berlin, Magazin v. d. 1811—1816. (Ichneumones adsciti a Nees von Essenbeck.)  |
| Nees. A. A. | .        | Acta Nova Phys-med: Academiæ Cæsar: Leopold. Naturæ Curiosorum. (Conspectus Ichneumonum: linea 2 <sup>da</sup> . ab eodem)— <i>Laudatum in Ichneumonol. Europ.</i> |

*Note.* — In a few instances, where it appeared doubtful to which divisions the synonyms in the margin were intended to refer, as we had no means of consulting the author on the subject, we thought it preferable to strike them out altogether, than run the risk of creating any confusion in a paper of such great labour, and such intrinsic value.—ED.

ART. XXIX. *Abstract of M. Straus-Durckheim's "Considerations Générales sur l'Anatomie Comparée des Animaux Articulés."* By EDWARD DOUBLEDAY, Esq.

(Continued from page 12.)

“ — and what is writ is writ—  
 Would it were worthier ! but I am not now  
 That which I have been—and my visions flit  
 Less palpably before me—and the glow  
 Which in my bosom dwelt is fluttering, faint and low.”

FROM the effect of the different modes of gradation of the organs, and from the great modifications which nature has introduced into the different systems of organs, either to accommodate them to the changes which their functions have undergone, or to prepare them for other functions to which they are destined, it results that, at certain points of the scale of classification, the whole of the organization of animals is found completely changed, which marks out in the animal kingdom several large divisions, to which Cuvier has given the name of “*Embranchemens.*” The line of demarcation which separates any two of these is necessarily found at the point where the most important organs of one of these divisions have entirely disappeared, or at least have been strongly modified ; and where nature introduces successively a new series of organs which are to characterize the other division. It is evident that by the effect of these great changes in the organization of animals, a system of organs which performs the most important functions in the first division, may no longer exist in the next, or, at least, may only be found in a very secondary condition, and subordinate to another system, which has acquired over this a certain degree of preponderance. The knowledge of any organ in one single division is not then sufficient to enable us to judge of its importance ; but it is necessary to follow it throughout its whole scale of gradation, and to compare it with all those to which it is found successively in relationship. This principle, so important in classification, has not, perhaps, been sufficiently followed at present, and hence many irregularities in the methods that have been established. In fact, the anatomy of vertebrated animals having been carefully and deeply studied before much attention had been paid

to the organization of the invertebrated, all those organs and functions which are, more or less, invariably sustained in the first division, have been regarded as fundamental; and for this sole reason, the same importance in classification has been attributed to them throughout the whole animal kingdom. From this course of proceeding there naturally has resulted approximations, more or less systematic, which break the natural relationship of many divisions. For example,—in the first great division of animals, respiration and circulation being in fact two functions, to which all the rest are, more or less, subordinate, it has been imagined that we ought to regard them as essential in the whole series of animals, and employ them as the sole basis of classification. Amongst most other animals, on the contrary, these functions being only secondary, this principle has led to fresh errors and contradictions; for it often happens that some one family of *Invertebrata*, which respire by branchiæ, cannot be separated from another family in which the respiration is pulmonary or trachean, without violating relationships depending on most of the other organs. If this truth had been recognized, the *Mollusca* would not have been placed before the articulated animals, which are, in fact, the most perfect of the *Invertebrata*. On the other hand, whatever system we might wish to establish, we could never separate the *Pulmonary* from the *Trachean Arachnida*, or the *Branchiferous* from the *Pulmonary Gasteropod Mollusca*.

It has, moreover, been admitted that animals form a decreasing series from man to the lowest zoophytes; and, as in the first class of *Vertebrata*, which was the best known, the most perfect species is found placed precisely at the head of the scale, the other divisions have also been made to commence with the most perfectly organized species. In consequence of this the larger divisions have been made to appear isolated groups, between which any regular transition seems quite impossible. But the true cause of these sudden transitions is only the too regular degradation which it has been wished to introduce into each division separately, as well as to the principle of the pre-eminence of organs, which has been too much generalized.

Moreover, animals have been mostly classed in a simple series, although a rigorous observation proves that the natural method is ramose, as was first pointed out by Lamarck.

Supposing we had studied with equal care the organization of every animal, and had then placed together the species, genera, and families, which have the greatest affinities, we should easily have recognized their true connexions.

This mode of proceeding would have shown that the series of animals does not form a simple and uniformly decreasing scale, but that each division presents a peculiar mode of organization; that from the point in which the organization is most perfect in each of these great divisions, the animals decrease in perfection of structure towards the other divisions; and that the same occurs in most of the subdivisions.

Hence it results that, in any division, the species which offers the most elevated organization may be more perfect than that which is placed at the confines of an anterior division. An insect is more perfect than a *Lampreda*, though this last is nearer to man.

In arranging animals according to the relationship of all their organs, we find, with M. Lamarck, that certain families conduct, at the same time, to two or three others, which gives the whole scale a ramose disposition.

Leaving the *Annelida* by *Leodice*, we enter the *Myriapoda* by *Polyxenus*, from which class we pass, on one hand, to the *Crustacea* by *Armadillo*—on the other, to the insects by *Lepisma*.

From the *Thysanura* we are conducted to the *Coleoptera* by *Forficula*, thence to the *Brachelytra*, leading to the *Silphæ* and neighbouring genera, which precede the *Carabi*; from these last we proceed to the other *Coleoptera*, which henceforth are not connected with any other division. *Forficula* conducts also to the *Orthoptera*, of which the first genus is *Thrips*,<sup>a</sup> so that this latter order, instead of following the *Coleoptera*, forms a branch placed beside them. From the *Orthoptera* we arrive successively, on the one hand, at the *Neuroptera*, *Hymenoptera*, *Diptera*, and *Aptera* (*Aphaniptera*); on the other, at the *Hemiptera* and *Lepidoptera*; and this last order terminates the third division of the class Insecta.

The isopod *Crustacea*, after having formed a lateral branch,

<sup>a</sup> *Thrips* is mostly placed with the *Hemiptera*; but as it has trophi resembling those of the *Mandibulata*, and particularly long curved mandibles, it must belong to the *Orthoptera*, at the head of which order is its appropriate station.

comprising the *Parasita*, which constitute a separate order, containing *Nymphon*, *Phoxichilus*, *Pycnogonum*, *Cyamus*, *Cecrops*, *Caligus*, *Dichelestion*, *Chondracantha*, and *Lernæa*, are followed by the *Amphipoda*, the *Stomapoda*, the *Decapoda*, and *Limulus*, which genus forms a separate order, under the name *Gnathapoda*, conducting us to the pulmonary *Arachnida*. The *Decapoda* lead, on the one hand, to the *Ostropoda*, and, on the other, to the *Branchiopoda* and *Cirrhopoda*.

The distance is certainly considerable between the *Myriapoda* and the dorsibranchial *Annelida*; but perhaps a few links only are wanting to connect the last to the only family of *Annulosa* with solid external teguments, to which they bear any relation. Probably, if any species be found to fill this void, they will also establish a less abrupt passage from the last *Annelida* to the isopodous *Crustacea*.

The transition from the *Myriapoda* to *Lepisma* is also rather sudden, but their affinity is evident; that from *Lepisma* and *Podura* to *Forficula* is very natural, the *Thysanura* being, as it were, wingless *Coleoptera*: the genera *Ricinus* and *Pediculus* form a lateral branch of the *Thysanura*.

The opinion already noticed, that the *Annulosa* are more nearly connected with the *Vertebrata* than are the *Mollusca*, and consequently form the second great division of the animal kingdom, is true with regard to the modes of organization according to which these three divisions are formed, and also corresponds with the degree in which their faculties are developed. The *Vertebrata* are characterized by an articulated body, of which the two lateral halves are symmetrical, sustained by an internal skeleton, the central portion of which is composed of a series of parts, to which the other parts of the skeleton are attached.

In the *Annulosa*, the symmetry of the two sides of the body is still greater than in the *Vertebrata*; the body is likewise articulated, and formed by a series of central parts, to which the others are attached; but they have no internal skeleton. In both, the nervous system consists principally of a spinal marrow, from which arise most of the nerves of the body; but there is this difference in the *Vertebrata*, the spinal marrow is dorsal; in the *Annulosa*, ventral. The muscular system is as fully developed in the *Annulosa* as in the *Vertebrata*; the muscles offer nearly the same form, and are as perfectly distinct.



The *Mollusca*, on the contrary, exhibit characters totally at variance with those we have just pointed out; on the one hand, their body no longer presents that perfect parity of the two lateral halves, neither is it in the least degree articulated; on the other, the nervous system is not longitudinal, its situation is not so constant, and its mass is less considerable. The muscular system is in general much less perfect than in the *Annulosa*; and, taken in detail, the muscles are less distinct, and only form, in the greater part of the body, a mass of fibres, so interlaced that it is impossible to separate them; thus conducting us to the *Entozoa*, of which the body is only a continuous *parenchyma*, without any distinct muscles.

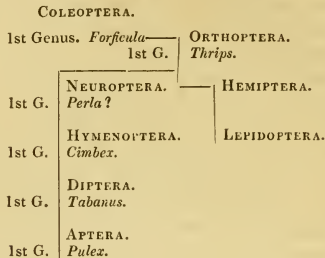
The character which eminently distinguishes the *Mollusca* from the two other divisions is, that in these the organs of *animal*—in the *Mollusca* those of *vegetable*, life—are the most predominant; whence the latter are totally devoid of that industry, and we may even say intelligence, which insects possess in a degree far superior to all other invertebrated animals.

Lastly, there exists a more natural passage from the *Vertebrata* to the *Annulosa* than to the *Mollusca*; but this connexion is by the lowest in the scale of organization of each of these groups. The *Vertebrata* having reached the most simple form compatible with their mode of organization, nature has commenced from that point a new group, that of the *Annulosa*, by introducing successively a new series of organs, altogether different from those which she has abandoned, and considerably modifying those she has retained. This point is, in the *Vertebrata*, the genus *Ammocætes*, and perhaps also the genus *Myxine*; and in the *Annulosa*, the genera *Gordius* and *Hirudo*. On both hands these animals are found placed at the lowest point of the descending scale, formed by each of these two series; and, compared with each other, these two genera of fishes and the abranched *Amelida* offer some remarkable resemblances in the few organs which they possess.

Here let me pause a moment, and consider our author's views of arrangement, more especially as relates to insects. Let any one inspect the following table, and compare it with the septenary system lately proposed by my friend, Mr. Newman.\*

\* A sketch of the position of Mr. Newman's classes is given by another contributor, at p. 229.—Ed.



M. STRAUS-DURCKHEIM'S *Arrangement of the Orders of Insecta.*

No English naturalist, I believe, doubts that the *Hymenoptera* are connected with the *Coleoptera*, consequently we must remove them a little more to the left, and place them on a level with the *Neuroptera*, with which order their affinity is generally admitted. Few, moreover, will doubt the connexion between *Lepidoptera* and *Diptera*, and that of the former with *Hemiptera*;—and what then? Why, we have the exact order of the diagram, facing p. 21, in “*Sphinx Vespiformis*.” The *Lepidoptera* are undoubtedly allied to the *Neuroptera*; and perhaps it would not be hard to prove an affinity between the *Neuroptera* and *Coleoptera*, and between the former and some Homopterous *Hemiptera*. At least here is enough to make us consider a little before we reject a system which is in harmony with so many natural affinities; for we must bear in mind that that system is nearest to the natural system which exhibits the greatest number of natural affinities, and breaks the fewest.

Our author has placed *Tabanus* at the head of the *Diptera*; but surely this is a desertion of his own principle,—“that it is the less perfect species of any one great group which approaches nearest to the group which precedes or follows it.”

Perhaps a connexion may exist between the *Hymenoptera* and *Diptera*, by means of an insect which few would suspect. In my copy of “*Sphinx Vespiformis*,” the author has written on the diagram, between these two orders, “*Pulex?*” Now of this genus M. Straus has said, “*Les puees qu'on peut considérer comme des Diptères sans ailes,*” &c., thus allowing an affinity to the *Diptera*, of course by *Hippobosca*. Recent discoveries have, however, proved that the flea has distinct

rudiments, not of *two*, but *four wings*; and every entomologist knows that the *Hymenoptera* have four.

I hope this digression will be pardoned; perhaps I have allowed feelings of esteem for a valued friend to lead me a little out of my way; but let me say, in extenuation, that I feel a deep interest in the theory, having had some little hand in it, as the author has stated in his Preface; but let me also say, that he has much exaggerated his obligations to me. All I had to do with it was this:—previous to its publication, he informed me of the outlines of his system; I, though an enthusiastic admirer of that greatest of living entomologists, W. S. MacLeay, being convinced that truth would be best elicited by full discussion, communicated to him, from my small stock of knowledge, every fact in my possession which might corroborate his theory. Although there is already “something too much of this,” I might, perhaps, say a little more in confirmation of my friend’s opinions—might venture to add some praise—but I feel that, *now*, *my* praise must be but little worth.

EDWARD DOUBLEDAY.

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ART. XXX.—*Entomological Notes.* By EDWARD  
NEWMAN, ESQ., F.L.S.

[TO THE EDITOR OF THE ENTOMOLOGICAL MAGAZINE.]

HOWEVER questionable may be the propriety of dividing an old species into several new ones, dependent on characters not generally obvious, I think no one will hesitate in admitting the utility of naming, describing, and recording *newly-discovered* species, or describing and recording those which, though known as exotic, are, for the first time, *discovered to be natives of this country*. Again, where, from the want of a sufficient series, extreme varieties have been named and recorded as species, I consider there will be an evident advantage in re-assembling such false species under one head, and allotting to them the name which may have the claim of

priority. Thirdly, where genera have become unwieldy from the numbers and heterogeneousness of their species, and are necessarily, in description, divided by asterisks, &c., into sections and sub-sections, it seems to me that a service will be rendered to science by furnishing names and characters for such divisions.

Such, then, is the object of the following sheets: their bulk, I am well aware, will preclude the possibility of their publication being completed for a considerable time, which will afford me the opportunity of making any additions which may appear needful.

Should any of our authors hereafter elaborate the subject, by describing a continuous systematic list of species, I hope they will do me the justice to adopt my names, where they are not objectionable, and adopt them as their own; for the mere display of my own name is not the object of these memoranda. Let me add, that should entomologists transmit me newly-discovered species from the country, to be described and inserted in this list, I will adopt any name they may propose, if at all appropriate.

In my descriptions, terms will occasionally be employed which are not at present in general use: these will be fully explained in another paper, sent herewith.<sup>a</sup>

CLASS.—COLEOPTERA.

NATURAL ORDER.—CARABITES, *ined.*

GENUS.—HELOBIA. *Leach.*

*Hel. lata.* *Nigra; ore, antennis, prothoracis marginibus lateralibus, tibiis tarsisque piceis.*

Black, slightly iridescent, particularly by candle-light: mandibles, palpi, antennæ, tibiæ, and tarsi, pitchy: head black, with an indentation less deep than in *H. brevicollis*: prothorax, very wide the lateral margins alone pitchy: elytra punctato-striated, very wide: shoulders obtusely rounded. Somewhat resembles *H. Æthiops*, Stephens, but is considerably larger and wider. (Length  $6\frac{1}{2}$  lin. ; breadth 3 lin.)

Taken in abundance in the neighbourhood of Cork, under stones, by Mr. J. B. Bevington.

<sup>a</sup> We have postponed the paper alluded to, in order to admit two others, the authors of which are anxious for their publication. We cannot in any future instances publish contributions in any other order than that of their arrival.—Ed.

*Hel. varicornis.* *Picea; antennis basi rufo-piceis, medio nigris, apice brunneis.*

Pitchy black: mandibles, palpi, and first joint of antennæ pitchy red: second, third, and fourth joints, deep glossy black: the remaining joints pilose, and light brown: crown of the head with a smaller, but deeper indentation than the last: prothorax black: all the margins unicolorous: elytra punctato-striated, deep brown black: legs pitchy: the tibiæ and tarsi somewhat lighter: the two last segments of the abdomen beneath red. (Length 5 lin.; breadth 2 lin.)

Taken, in considerable abundance, in the neighbourhood of Nottingham, by Dr. Howitt.

*Hel. impressa.* *Nigra, micans; elytrorum striis 3 et 5 foveis impressis.*

Black, glossy: mandibles, palpi, antennæ, and legs sometimes slightly rufous, but generally quite black: prothorax exceedingly narrow, and attenuated posteriorly: the elytra are striated, much depressed, and indented with irregular foveæ on the third and fifth striæ from the suture. (Length 5¼ lin.; breadth 2.)

This is a remarkable insect, and not to be confounded with any other; it has been supposed to be the *H. Heegeri* of Dejean, but is distinct. Taken, in considerable abundance, by Mr. Walker, in Scotland.

Of the species of *Helobia* described by the Count Dejean, under the names, *Gyllenhalii*, *Nivalis*, and *Arctica*, together with *H. Marshallana* of Stephens, I have examined 172 specimens within the last month; and though I find the greatest possible difference in size, colour, convexity of elytra, and indentations in the striæ, yet, as intermediate specimens between either extremes are continually to be met with, it seems impossible to determine how or where the line of demarcation is to be drawn. When on Snowdon, last summer, with my friends, Christy and Doubleday, we took all these supposed species within a few yards of each other, and quite a sufficient number of intervening ones to make as many more such species.

GENUS.—LEISTUS. *Frölich.*

*Leis. nigricans. Nigricans, tenuiter iridescens; ore, antennis, tarsisque piceis.*

Dull black, in some lights, with a slightly iridescent tinge: mandibles, palpi, and antennæ pitchy red: prothorax black, considerably more elongate than that of *L. spinibarbis*: elytra likewise narrower: femora and tibiæ black: tarsi pitchy. (Length  $4\frac{1}{2}$  lin.; breadth  $1\frac{3}{4}$  lin.)

The only specimen I have seen was taken by the late Mr. Hobson, near Manchester, and is now in the collection of Mr. Davis.

*Leis. Janus. Rufescens; prothorace capiteque cæruleo-nigris; ore, antennis, pedibusque ferrugineis.*

Mandibles, palpi, antennæ, and legs, ferruginous: head blue-black: prothorax blue-black, with a slender rufescent margin: elytra rufescent, with an iridescent tinge. (Length  $4\frac{1}{4}$  lin.; breadth  $1\frac{3}{4}$  lin.)

This beautiful and very distinct species is abundant in the north of England. Its head and thorax resemble those of *L. montanus* (Stephens), while it has the elytra of *L. spinilabris*; its prothorax is rather broader than in *L. montanus*, and its greatest width is precisely central.

*Leis. indentatus. Purpureo-niger; ore, antennis, pedibusque ferrugineis; elytris prope basin striga communi transversa indentatis.*

Mandibles, palpi, antennæ, and legs, ferruginous: head, prothorax, and elytra, glossy purple-black: elytra with a deep transverse indentation, common to both, near their insertion. (Length  $3\frac{1}{2}$  lin.; breadth  $1\frac{1}{4}$  lin.)

This beautiful little species was taken near Cromer, in Norfolk, by L. Rudd, Esq.

GENUS.—CALATHUS. *Bonelli.*

*Cal. apicalis. Ferrugineus; capite antennarumque apicibus nigris.*

Palpi, the three basal joints of the antennæ, prothorax, elytra, and legs, pale ferruginous: the remaining joints of the antennæ are

deep black, each slightly tipped with ferruginous : elytra striated, without any punctures. (Length 4 lin. ; breadth  $1\frac{1}{4}$  lin.)

I have only a single specimen of this remarkable insect ; it is in Mr. Davis's cabinet, but he does not know its locality.

NATURAL ORDER.——— ?

GENUS.—LEPTURA. *Linnæus*.

From the examination of a number of living specimens of *Leptura 4-fasciata* and *apicalis*, I have no hesitation in saying, that the latter is merely a variety of the former ; I have found them with five, four, three, two, one, and sometimes only half a joint of the antennæ of the pale colour which characterises the species : these varieties occur equally in both sexes, and copulation takes place as commonly between individuals of opposite varieties as between two having antennæ of the same colour. Between *Toxotus meridianus* and *chrysogaster*, I have likewise found every possible variety ; in these instances the specific character differs only in the redness of the abdominal segments. In Herefordshire, where these insects are exceedingly abundant, so great is the variety, that I have never detected a copulation between two individuals that were similar in this respect. The names *apicalis* and *chrysogaster* should therefore be discontinued.

CLASS.—HEMIPTERA.

NATURAL ORDER.—CIMICITES, *ined*.

GENUS.—ACANTHOSOMA. *Curtis*.

Acan. picta. *Flavo-viridis ; proalis fascia recurva coccinea ornatis*.

Antennæ green, more or less tinged with red : head yellow green : prothorax of the same colour, with its posterior margin at each angle tinged with red : scutellum of mesothorax green : upper abdominal segments sooty black, with green margins : ultimate and penultimate entirely green : interior half of the costal margin of fore-wings yellow-green, below which is a broad, bright, red band, superiorly concave, inferiorly convex : exterior portion of the wing hyaline, with a black transverse fascia and spot : hind wings, towards the abdomen, clouded with black, towards their apex hyaline : legs green, occasionally tinged with red. (Length  $4\frac{3}{4}$  ; breadth  $9\frac{1}{2}$  lin.)

This is by far the the most beautiful British species of the order, and is one of the most common; it may be said to swarm on the juniper-bushes in Birchwood, and many other situations in the south of England; yet so much neglected has this order of insects been, that I cannot find that it has been named or described, or was even known before I took it by hundreds in Birchwood, in March, 1830.—(*To be continued.*)

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ART. XXXI.—*Observations on the Saltatorial Powers of Insects, and upon the British Coleopterous Genus, Choragus.*  
By J. O. WESTWOOD, Esq. F.L.S. &c.

AMONGST the various means which have been bestowed by an allwise Creator upon the little animals which are the peculiar objects of our attention, for the purpose of aiding them either in escaping from the numberless enemies to which they are exposed, or of facilitating their means of obtaining food, the power which many of them possess of affecting an instantaneous change of place, is one of the most interesting; enabling them to leap to a distance, which, in proportion to their individual size, cannot but appear of extraordinary extent, when we consider that it is often several hundred times longer than the whole length of the insect's body; thus almost vying with the movements of that renowned friend of our childhood—he of the seven-league boots.

This motion is effected in different insects in different manners. Thus the well-known larvæ of the fly which infests cheese and bacon (the *Piophilæ Casei* of Meigen, &c.—a species which, although far too common, has been the subject of much confusion in systematic nomenclature.—See *Stephen's Cat. Introd.* p. xiii.), performs its astonishing leaps in the same manner (as Messrs. Kirby and Spence well observe), as the salmon, by taking hold of its tail with its mouth, contracting the rings of its body, and then suddenly letting go its tail. A somewhat similar manœuvre is effected by the caterpillars of some moths, as the *Noctua quadra* and *Pyralis rostralis*.

The voracious masked larvæ of the dragon flies are also endowed with the power of suddenly propelling themselves



forward in the water whereby they are able to dart, from a considerable distance upon their prey. The manner in which this motion is effected is very remarkable, and is possessed by no other insects; diving in the water and performing respiration without ascending to the surface for fresh supplies of air, these larvæ are furnished with an apparatus, whereby they are able to extract oxygen from the water in which they reside. This consists of five plates, affixed at the extremity of the abdomen, which are capable of opening and shutting, so as to enclose within the hollow portion of the abdomen, a quantity of water, which, after it has parted with its oxygen, by the action of various internal organs, is forcibly expelled through the same orifice, by which means the insect is suddenly propelled forward.

In the click-beetles (*Elateridæ*) this leap is produced by the sudden jerk given to the body when the insect is laid upon its back, by forcibly striking the acute spine of the breast into the corresponding cavity in front of the mesosternum.

In other insects, as the ground-fleas (*Poduridæ*), the spring is produced by the sudden unfolding or striking backward of a forked appendage, fixed beneath the extremity of the body.

It is, however, to the peculiar construction of their legs that insects are, for the most part, indebted for their saltatorial powers.

Of these the tormenting flea is the most notable example. Furnished with thighs of great muscular power, and clothed in a tough and highly-polished cuirass, no wonder that it effects an escape in almost every situation, and, to use the words of a favourite French author, "*Comme l'amour rit en sûreté de la blessure qu'elle a faite et de la colère qu'elle occasionne.*"

The grasshoppers, locusts, crickets, garden-fleas (*Halticæ*, amongst which the destructive turnip-fly is found), and flea-weevils (*Orchestes*) may be mentioned as examples of leaping powers, originating in the peculiar structure of the hind legs, the thighs being greatly thickened, so as to give support to the powerful muscles wherewith the motion is produced.

This incassation of the legs does not, however, necessarily imply the power to leap, since many insects, having very thick hind legs, are only able to walk, and that but clumsily, as though the greatly disproportionate size of their limbs were a hindrance to their motion. Thus, although the hind legs of such exotic species as *Bruchus*, *Bactris*, *Leucospis dorsiger*,

*Cissites* (*Horia*) *testacea*, or *Scarabæus* (*Chrysophora*?) *macropus* (Francillon) are very much thickened, yet it does not appear that any of them are saltatorial. In like manner our British genera, *Ædemera*, *Nothus*, and *Chalcis*, are not able to leap.

On the other hand, many species which leap well are not provided with thickened legs. Of these the whole of the Linnæan genus *Cicada*, or froghoppers, may be mentioned. So the genera *Eupelmus*, *Encyrtus*, *Cerchysius*, &c. (belonging to the *Chalcididæ*), which have simple hind legs, are able to leap to a very great distance, probably by means of the peculiar formation of their intermediate tibiæ and tarsi. But there are very many species belonging to the same family as the latter genera, the structure of whose legs appears to be in no wise capable of executing a leap, and yet they are able to do this in a very remarkable and inexplicable manner; this is the more extraordinary, since we have seen that the typical genus in the family *Chalcis* is simply a walker, although it has thick hind legs.

The only remaining insect which I shall notice as capable of leaping, although having only simple legs, is the *Choragus Sheppardi* of Kirby, upon the affinities of which I now propose to make a few observations.

This genus was first described in Mr. Kirby's admirable "Century of Insects," published in the "Linnæan Transactions," from specimens taken "*strenue saltans*" at Offton, in Suffolk, by the Rev. R. Sheppard. In Mr. Kirby's description, we find the body described as cylindrical, the antennæ clavate, with the two basal joints incrassated, and with a three-jointed club, and the clypeus elongate. Mr. Kirby was not able to discover more than three joints in the tarsi, but Mr. Curtis discovered four in one tarsus. For the reception of this genus Mr. Kirby proposed a distinct family, which he named *Choragidæ*, observing that its general habit connected it with the *Tetramera*, especially *Cis* and *Cryptocephalus*.

Mr. Stephens places this insect in the Pentamerous family, *Plinidæ* (without any observations upon its tarsi), between *Ochina* and *Cis*, stating—" *Choragus* is evidently allied to *Cis*, from which it differs, not only by having the two basal joints of the antennæ incrassated, but by the form of the body, which resembles that of a *Cryptocephalus*, the subsetaceous palpi,

acute mandibles, &c., and by the property the living insect possesses of leaping considerably." Mr. Stephens might indeed have added, that the latter statement was made from personal observation, the loss of the specimen of *Choragus Sheppardi*, which he mentions, being attributable to the insect's power of leaping.

Mr. Curtis places the genus between the *Cleridæ* and the genus *Cis*.

My friend, M. Guerin, has figured an insect in the sixteenth entomological plate of his "Magazin de Zoologie," under the names of *Anthribus pygmæus* of Robert; upon reading the description of which, together with the statement of its leaping powers, it immediately struck me that it was the *Choragus*, and that the affinity thus indicated by the French entomologist, was far more natural than any of those of our English authors. From the figure and description of this insect, the body is cylindric, and the antennæ and clypeus being exactly as in *Choragus*, the apparently penultimate joint of the tarsi is however represented as bilobed in all the legs; so that it would thence appear that they are formed upon the same type as those of the *Bruchidæ* and *Anthribidæ*, and indeed of all the subtetramerous<sup>a</sup> *Coleoptera*; a variation however seems to exist in the number of joints of the tarsi, which is probably an oversight, owing to the minuteness of the insect.

J. O. WESTWOOD.

*The Grove, Hammersmith.*

Jan. 23, 1833.

P. S. Since my notes upon this genus were penned, M. Guerin has kindly forwarded me a set of the plates of the *Mag. Zool.*; and upon that of the *Anthribus pygmæus*, is the following pencil note:—"J'ai reconnu depuis que c'est le *Choragus Schepardi* de M. Kirby, G."

<sup>a</sup> I have employed the term *Subtetramera* to designate the *Tetramera* of Latreille, considering that, although the latter denomination may not, as insisted upon by Mr. MacLeay, be grammatically correct, (in consequence of the insects having in reality five joints in the tarsi), yet the peculiar structure of the feet in this section is sufficiently distinct to warrant their separation as a *natural* group from the other pentamerous beetles.

ART. XXXII.—*Monographia Hydrænarum Anglicæ.*

By GEORGE R. WATERHOUSE, Esq.

GEN. 1.—AMPHIBOLUS.<sup>a</sup> *Waterhouse.*

Maxillary palpi shorter than the thorax: basal joint long, bent, the two terminal joints short: antennæ, with the two basal joints, very long and slender, the rest forming an elongate club: legs moderate: tarsi four-jointed: head large: eyes prominent: thorax with the sides more or less dilated: elytra convex, elongate, ovate.

This genus forms a beautiful link between the two genera, *Hydræna* and *Ochthebius*, having the usual colouring of the former, suffused with a sub-metallic tint, in which respect it approaches the latter: it also approaches nearer to the genus *Ochthebius*, in having the elytra larger than the abdomen, and in the form of the legs; but the palpi are nearly three times as long as in that genus, though not so long as those of *Hydræna*.

Not having a specimen myself, and Mr. Davis (who kindly lent me the one from which the description was made) having but one specimen, I am unable to dissect, the only means by which I might give a more accurate description of the tarsi and antennæ.

Sp. 1. Amp. atricapillus. *Piceo-testacea, submetallica; capite nigro, magno, posticè punctato; oculis prominentibus; thorace lateribus dilatatis, densè punctato, foveis quatuor impressis: elytris ad basin thorace vix latioribus, elongato-ovatis, convexis, punctato-striatis; abdomine minimo: antennis, pedibus, palpisque pallidè fulvis.* (Long. corp.  $\frac{5}{8}$  lin.)

I have seen but one specimen of this interesting species, which was taken at Hebden-bridge by Mr. Gibson.

GEN. 2.—HYDRÆNA. *Kugellan.*

Head large, triangular, truncated in front: thorax subquadrate, with the sides more or less dilated: scutellum minute: elytra more or less ovate, elongate: legs long: tarsi very slender, the terminal joint very long: antennæ minute, 8?-jointed, the

<sup>a</sup> 'Αμφίβολος, dubius.

two basal joints long, the rest forming an elongate club: palpi as long as the head and thorax, three-jointed: the basal joint long, bent, and clavate, second moderate, thickened at the apex: terminal joint long, thickened in the middle, attenuated at each end.

Sp. 1. Hyd. riparia. *Atra, nitida; capite thorace angustiore, inter oculos profundè punctato; thorace longo, lateribus dilatatis, densè punctato, sulco longitudinali utrinque ad marginem: elytris piceo-brunneis, lineari-elongatis, apice rotundatis et distinctè punctato-striatis: pedibus, antennis, palpisque piceo-ferrugineis aut piceis.* (Long. corp.  $1\frac{1}{8}$ — $1\frac{1}{4}$  lin.)

Hyd. riparia. *Kugellan. Schmeid. Mag. 578.*

In this and the three following species, the eyes are but slightly prominent, and the head is rather elongate, with the sides nearly parallel; the body is also very linear.

I have taken several specimens of this species in the river Wandle, Wandsworth. Hebden-bridge; Mr. Gibson.

Sp. 2. Hyd. pulchella. *Præcedentibus (nigrita et gracilis) minor: caput triangulare antice obtusum, nigrum, nitidum, punctulatum: antennis palpisque rufis: thorax latitudine paullò brevior, lateribus rotundatus, posticè paullò magis angustatus, basi apiceque truncatus, supra punctatus, disco subtilius; obsoleto canaliculatus, sulcoque utrinque longitudinali versus latera impresso: color niger, nitidulus margine antico posticoque dilute latiora, oblongo-ovata, convexa, punctato-striata, picea: corpus subtus nigrum, pedibus rufis.*<sup>b</sup>

Hyd. pulchella. *Müll. Germar. Ins. Spe. Vol. I. p. 94. Curtis's Brit. Ent. p. 308.*

Not having a specimen of this species, which is introduced in Mr. Curtis's "British Entomology," I have given Germar's description.

Sp. 3. Hyd. concolor. *Pallidè testacea; capite inter oculos punctato: thorace lato, lateribus dilatatis, densè punctato: elytris elongatis, linearibus, manifestè punctato-striatis.* (Long corp.  $1\frac{1}{4}$  lin.)

Allied to *H. riparia*, but at once known by its pale colour: the head is rather smaller in proportion, the thorax is broader, and

<sup>b</sup> Is not the word *elytra* omitted? the description does not seem quite intelligible.—Ed.

not so thickly punctured. This species is often confounded with *H. testacea*, but it is much larger, its form is more linear, the head is of a different form, the sides being nearly parallel, and the eyes scarcely prominent: the thorax is much larger and broader in proportion, not so coarsely punctured: the striæ of the elytra are wider apart, and likewise not so coarsely punctured. In some specimens the head is of a pale pitchy-testaceous, but it is generally concolorous with the body, in which respect it also differs from *H. testacea*, which always has a black head.

Taken at Hebden-bridge, by Mr. Gibson and A. H. Davis, Esq.

Sp. 4. Hyd. nigropicea. *Piceo-nigra; capite densè punctato, oculis prominentibus: thorace breviorè, densè punctato, foveis quatuor leviter impressis: elytris oblongo-oratis, sub-truncatis, punctato-striatis, striis sub-confluentibus: antennis, pedibus, palpisque rufo-testaceis.* (Long corp. 1 lin.)

About the size of *H. riparia*: the eyes are more prominent, the thorax is shorter, the elytra are ovate and subtruncate, whereas in *riparia* they are linear, and rounded at the apex.

I have once met with this species near London. Epping; E. Doubleday, Esq. I have also seen several specimens from Hebden-bridge.

Sp. 5. Hyd. melanocephala. *Testacea; capite nigro-piceo, profundè punctato, oculis magnis, prominentibus: thorace brevi, lateribus dilatatis, densè punctatis, foveis quatuor leviter impressis: elytris latioribus, oratis, vix truncatis, leviter punctato-striatis: antennis, pedibusque pallidè testaceis, palpis testaceis, apicibus nigris.* (Long. corp. 1 lin.)

Allied to the foregoing, but known by its pale colour, it is altogether broader and shorter in proportion: very distinct from *H. testacea*, which it resembles in colour; it is much larger and broader, the thorax is considerably dilated at the sides, and very short; it is also more delicately sculptured throughout. Netley, Salop; Rev. F. W. Hope.

Sp. 6. Hyd. testacea. *Pallidè piceo-testacea: capite nigro, densè punctato, oculis prominentibus: thorace angustiorè, lateribus vix dilatatis, profundè punctato, ad*



*angulos depresso : clytris elongato-oratis, ad apicem rotundatis, profundè punctato-striatis : antennis pedibusque pallidè testaceis : palpis pallidè testaceis, apice nigris, gracillimis et elongatis.* (Long. corp.  $\frac{7}{8}$  lin.)

*Hydræna testacea.* Curt. B. E. p. 307.

This species may readily be distinguished from its pale congeners by the coarse sculpture, and by the form of the thorax, which is scarcely dilated at the sides.

I have taken this species tolerably plentiful in the ditches in Battersea-fields. Epping: E. Doubleday, Esq. Halifax: A. H. Davis, Esq.

Sp. 7. *Hyd. nigrita.* *Atra; capite densè punctulato, oculis prominentibus: thorace breviorè, densè punctato, sulco utrinque longitudinali versus latera impresso: clytris brevibus, ovatis, lævissimè punctato-striatis, striis subconfluentibus: antennis, pedibus palpisque rufo-testaceis.* (Long. corp.  $\frac{3}{4}$  lin.)

*Hydræna nigrita.* Müller Germ. Ins. Spe. p. 93.  
*pusilla.* Stephens.

The short ovate form and dark colour distinguish this species from all the foregoing.

I have taken three specimens of this species in the neighbourhood of London.

Sp. 8. *Hyd. pygmæa.* *Piceo-brunnea; capite nigro, fronte punctato, oculis prominentibus; thorace anticè lato, postice attenuato, foreis quatuor impressis, duobusque leviter impressis discoidalibus, punctato; clytris brevibus, ovatis, densè punctatis: pedibus robustioribus, piceo-ferrugineis, palpis brevioribus et robustioribus, rufo-ferrugineis.* (Long. corp.  $\frac{5}{8}$  lin.)

Distinguished from all the foregoing by the want of regular striæ on the elytra: about the size of *H. pusilla*: the thorax is longer and broader in front, less deeply punctured, but the foveæ are more deeply impressed: elytra shorter and not so ample; legs and palpi thicker.

The only specimens I have seen of this curious little species, were taken at Hebden-bridge by Mr. Gibson.



Sp. 9. Hyd. minutissima. *Piceo-brunnea: capite nigro, lato, posticè dense, anticè vix punctato; oculis prominulis: thorace lateribus rotundatis, anticè latissimo, dense punctato, ad angulos depresso: elytris elongatis, obtusè ad apicem rotundatis, distinctè punctato-striatis: pedibus, antennis palpisque rufo-testaceis.* (Long. corp.  $\frac{5}{8}$  lin.)

Hydræna minutissima. *Stephens.*

This species may be known from all the foregoing by its minute size and the proportionately large head and thorax.

I have taken one specimen of this species in the neighbourhood of London, but forget the exact locality. Newcastle-upon-Tyne; C. Hewitson, Esq.

Sp. 10. Hyd. gracilis. *Nigra, nitida: capite inter oculos punctato: thorace longiore, lateribus dilatatis, punctato, sulcis duobus longitudinalibus impresso: elytris nigropiceis aut nigris, angustatis, punctato-striatis, suturâ paullò elevatâ; antennis, palpisque rufo-piceis: pedibus nigris, geniculis tarsisque rufis.* (Long. corp.  $1\frac{1}{4}$  lin.)

Hydræna gracilis. *Müller. Germar. Ins. Spe. p. 94.*  
elongata. *Curtis.*

Closely allied to *H. riparia*, but may be distinguished by its more elongate narrow form, and black legs; the eyes are also rather more prominent.

I have one specimen of this insect, but do not recollect its locality.

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ART. XXXIII.—*On the Existence of "Natural Genera."*  
By ALEXANDER WILLIAM GRIESBACH, Esq. B.A. of Trinity  
College, Cambridge.

"Ne mea dona, tibi studio disposta fidei,  
Intellecta prius quam sint, contemta relinquant."

OF all the qualities of the human mind, there is none more enviable, and none which has been the cause of greater good to mankind generally, than an acute perception of the beauty

of nature. It is this perception which has alike inspired the philosopher, the painter, and the poet; and it would be difficult to point out an art or a science which has not been, directly or indirectly, benefited by it.

But how useful soever the results of this keen relish for nature and natural things may be, the study of them is no less amiable for its own sake; and perhaps no purer happiness can be enjoyed on earth than that which arises from it. If it be true that "a main article of human happiness is the exercise of our faculties, either of body or mind, in the pursuit of some engaging end,"—surely no end can be proposed more engaging than the perusal of the great book of the creation, whose every page is full of interest and beauty.

There are but few, however, whose avocations will allow to take more than a cursory view of the general scheme of nature; and we usually find that naturalists have chosen some particular branch, upon which to bestow the greater portion of their labours and investigation. And here, as a lover of entomology, I cannot refrain from expressing the pleasure with which I have observed the increasing attention paid to this wonderful and delightful study.

Entomology is indeed a study which will well repay those who may bestow their attention upon it; yet, whether from the comparative difficulty of pursuing it, or in consequence of the sneers of the vulgar-minded, it has never been, and probably never will be, extremely popular. Those, however, who are the best acquainted with it, consider it as, perhaps, the most wonderful branch of the creation, and as affording some most valuable auxiliary evidences of the existence of a Supreme Being; and whilst those individuals of the animal kingdom, which are most remarkable for their gigantic bulk, more particularly excite the attention of the many, the entomologist sees in those atom-like beings, which others pass by absolutely without notice, organs as perfect, and as beautifully adapted to their particular functions, as any which are to be found in the whale or the elephant.

Interesting, therefore, as even a vague acquaintance with entomology is, we shall be still more interested when we observe how beautifully and gradually its almost endless varieties of forms are blended, and flow into each other. Indeed so nicely, and almost imperceptibly, does this blending

take place, as to have led to the supposition that nature knows no division of *kinds* or "*genera*," but that *specific* distinction is all that can be proved to exist.

Now as this supposition is what I have proposed as the subject of inquiry in the present paper, it may be as well, before entering upon the inquiry, to give a definition of a "*genus*;" and in so doing, I must observe that, supposing the existence of generic groups in nature, the characters by which we separate such groups must necessarily be, in some measure, *arbitrary*, since we cannot know *of a certainty* where one group terminates, and another begins. I define a "*genus*" to be—

A group of specifically distinct individuals, similar to each other, more or less, in habits and economy, which have at least one character in common, and this a character either not found in other groups, or not found in other groups with a like combination of characters.

The aphorism, "*Natura non facit saltus*," is generally acknowledged to be true, and of its truth I am fully convinced; for so gradual is the transition from one form to another, not only in entomology, but in every form of matter throughout nature, at least where we have most knowledge, that it is but reasonable to suppose, when we observe any insulated form, it is only so insulated because the links which would make it harmonize with the whole are unknown to us. But admitting this, I contend that groups do exist in nature, of which the individuals of each respectively agree, more or less, in general characters, one with another, but do not so agree with the individuals of any other group.

As it is to be supposed that "*genera*" exist *throughout* nature, if at all, it signifies but little from which part of nature we reason. Let us, therefore, for the sake of illustration, take the horse, the zebra, and the ass, and place them in a group together. The first thing that strikes us is, that they have a great general resemblance to each other: the outline of their respective forms is much the same; their various members are similar, their habits are nearly alike: in these points the three individuals agree one with another. But, following up the comparison, we find that, although a *general* resemblance obtains between them, they differ from each other in certain *particulars*, which, as the position is all we want, may be

taken for granted. Let us now take the lion, the tiger, and the leopard, and examine them in the same manner. We arrive at the same conclusion. They have a general resemblance to each other, but differ "*inter se*" in particulars. Now the resemblance they bear to each other constitutes the *genus*, the difference between them the *species*.

A comparison of these two groups, one with the other, will show that hardly a single character is there in common between them. The individuals of the first feed upon grass and herbs; those of the second upon the flesh of other animals: according to their different habits their organs are formed; and surely no two groups can be more dissimilar. All that they resemble each other in is, that the individuals of both are viviparous, and suckle their young, characters hitherto thought no more than sufficient to class them equally as "mammalia." This difference of groups exists as strongly in insects; and it is a difference, I think, as clearly pointed out by nature as the difference of one species from another.

The principal argument of the unbelievers in genera is, "that although it may be extremely easy to form two groups apparently unlike each other in every respect, yet a series of insects may be formed which shall so gradually connect any two such groups, that it shall be impossible to say where the one terminates and the other begins;" hence they deduce that genera do not exist.

Now if this reasoning is good for any thing, it ought to be of universal application; but will it lead us to doubt that animals and vegetables are separated from each other by nature, because the line of separation is not clearly discernible? for so great is the difficulty naturalists have experienced in drawing this line, that the only characters of distinction hitherto given, are not wholly free from objection. Will it lead us to conclude that *matter* is either all organic, or all inorganic, because "the line of demarcation between the mineral kingdom and organized matter is allowed to be indistinct?"

But if the gradual merging of one genus, so called, into another, be sufficient to show that genera exist not in nature, it will follow that neither do "orders" exist; for it cannot be doubted that insects exist which will link every order together.

I have seen an Algerine insect, in Mr. Waterhouse's possession, which closely connects the Orthoptera and Hemiptera, resembling both the *Blattidæ* and *Cimicidæ*: and in the cabinet of Mr. Stephens is another insect, which partakes of the characters of the Coleoptera and Strepsiptera. Granting therefore all insects to be linked together in most easy gradation, which in fact they are, would it be the language of nature to say, "This butterfly is a distinct species of beetle;" and *vice versâ*? It may be answered, "No;" but it would be correct to say, "This butterfly and this beetle are distinct species of insects." But it unluckily happens, that if such stress be laid upon "*links*," even "*insects*" can no longer be considered a distinct group; the transition from them to the Arachnoïda, &c. being easy, and equally so from one group to another, throughout animated nature. And what is worse, the difficulty does not end here—for animal and vegetable nature are as closely linked to each other as animals are; so that, by way of being correct, we must speak of every palpable being, merely as a form of matter, unless indeed we follow Bishop Berkeley in his theory, that *matter does not exist*.

But to return to the objection. It is said that in entomology, "so gradual a connecting series may be formed from one group to another, that it shall be *impossible* to draw the line between them." This *impossibility*, however, I am disposed to deny; and in the definition I have indicated that, if no where else, this line can be drawn where individuals, in such a series, cease to have a single character in common with those which precede them.

Mr. Newman is of opinion, "that a genus should be established for every species whose primary characters differ from those of its congeners," and probably these would be true natural genera; for if the transitions from the great groups to each other be so gradual, we may suppose those from the smaller groups to each other to be still less abrupt, and the genera indicated by these types may contain many species with which we are at present unacquainted.

But it was not my purpose here, to show how genera may be *distinguished*, but if possible to prove their *existence*, which I trust I have in some measure accomplished. If what I have written should prove the means of exciting enquiry and discussion, by which not only the existence of genera

shall be ascertained, but a clue to their formation discovered, I shall be satisfied to have written not uselessly, if not well.

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ART. XXXIV.—*Notice of Entomological Works.*

1. *British Entomology*, by J. Curtis, F.L.S., Nos. 105—110. —No. 105 contains, 1. *Oxyporus maxillosus*. This is a beautiful figure; the species from which it is drawn is very rare as British, existing only in the cabinets of the British Museum and Mr. Kirby; its congener *rufus* is comparatively common, being taken at Birchwood and other localities near London, in an *agaricus*, which grows on the stumps of fir-trees which have been felled. 2. *Nomada Dalii*, with a list of thirty-seven British species: the economy of this tribe of bees is at present unknown, although some of the species are among our commonest insects. 3. *Cerostoma annulatella*. This elegant little moth is remarkable for holding its antennæ, when at rest, porrected in a right line from its head, and touching each other, in the manner of *Phryganææ*. 4. *Hippobosca equina*. This insect is much too highly coloured; we have often possessed them when alive and active; they are nearly unicolorous. The *Hippoboscæ* are pupiparous, and, with the *Notostomata* of Dr. Leach, probably form an osculant group, which connect the Diptera in *Insecta* with some of the parasitical *Acaridea*. The tenacity of life in these horse-flies is truly remarkable; we have deprived them of their heads, and allowed them to run again on our horse, which they do backwards, forwards, and sideways, with precisely the same apparent ease as before: although they do not bite, the irritation they occasion appears to be intense, and renders horses that are unaccustomed to them perfectly unmanageable.—No. 106 contains, 1. *Arcopagus puncticollis*. This curious little insect had been previously very correctly figured by Mr. Denny, in his excellent monograph on the *Pselaphidæ*, and we rather regret Mr. Curtis did not wait for a new species before he figured the genus. 2. *Fænus assectator*. 3. The beautiful and rare moth, *Psodos equestrata*. 4. *Xylota bifasciata*, one of the *Syrphidæ*.



The generic name, *Xylota*, we could have wished restricted to the species *pipiens*, which appears to us typical; and a new name might have been given to the remaining species. The *Xylotæ* have a remarkable analogical resemblance to the *Ichneumones*, running with great activity about the leaves and stems of plants, in the sunshine, with their wings closely folded on their backs.—No. 107 contains, 1. The very common *Cychnus rostratus*, so remarkable for its hissing noise, very much resembling that made by a water-beetle, *Pælobius Hermannii*: this noise has often attracted our attention when we have captured it. The *Cychni* usually conceal themselves at the roots of long grass, or under stones, in the day-time; and in the night, or sometimes in moist showery weather, even in the day, they ascend shrubs, in search of larvæ and perfect insects, on which, like the *Calosomæ*, they feed. 2. *Phagonia smaragdina*. This is a beautiful and interesting little Hymenopterous parasite. The genus appears identical with *Pachylarthrus* (Westw.) characterized in the Philosophical Magazine for August, 1832; and, much as we deprecate the publication of the characters of disconnected genera, for the paltry fame of attaching a name to them, it is our duty, and it ever shall be our endeavour, to give precedence to priority, however obtained, as it seems our only sound mode of deciding nomenclature: one species, that named *Insignis* by Mr. Westwood, seems to have been described by Dalman in the Stockholm Transactions, under the name *Diplolepis patellana*. Mr. Curtis has made a mistake in referring this little insect to the family *Cynipidæ*, to which it has no affinity. 3. *Nola monachalis*, a pretty little moth, and elegantly figured. Mr. Curtis wishes to make this genus something like a stepping-stone from the *Pyrallides* to the *Torticides*; we do not see the weight of his arguments on this subject. 4. *Helophilus Ruddii*. This is a beautiful and interesting plate: the fly was taken by L. Rudd, Esq. near Yarmouth, in Norfolk: it has the head and antennæ of a *Criorhina*, and the abdomen of a *Tabanus*; the thorax is longitudinally striped, like that of *Helophilus*, to which genus, however, it does not appear to us to be at all nearly related.—No. 108 contains, 1. *Hypoplæus bicolor*. 2. *Trachea atriplicis*, with a larva copied from Hubner, in which we fear there is some mistake, as Roësel (see Mr. Curtis's text), Fabricius, Haworth, Stephens, &c. agree in describing it



as red, with a brown dorsal line: we have never seen the larva ourselves. 3. *Eristalis nubilipennis*. 4. *Halictophagus Curtisii*. A new insect, of the singular family *Stylopidæ* (making the fourth), discovered by that eminently successful and ardent entomologist, Mr. Dale.—Nos. 109 and 110 are published together: they contain, 1. *Eudromis versicolor*. ♂. ♀. and larva; the latter does not convey to us an idea of the insect. 2. *Cardiapus Mathewsii*. (*Haltica olim*.) 3. *Emphytus fasciatus*. 4. *Phora abdominalis*. 5. *Tasgius rufipes*. 6. *Acrydium subulatum*. 7. *Leptogramma irrorara*. 8. *Oxycera Morrisii*. In the characters of *Acrydium*, Mr. Curtis seems to have made some mistake: he says, “*Thorax* forming a narrow band, with a keel down the centre.” We do not know to what part the term *thorax* is here given. “*Scutellum* sometimes much longer than the body,” &c. The elongated part is the *prothorax*; the part known as *scutellum* is completely concealed. Mr. Curtis henceforth intends publishing his works every alternate month, each number to contain eight plates.

2. *The Book of Butterflies and Moths*.—This is a work of two volumes, “with numerous coloured engravings on wood,” to each of which the cunning designer has, with very great judgment, applied a name, although in this nomenclature, from the author’s presumptuous attempt to dip a little into entomology, he falls into singular mistakes now and then. The book *will* open at one place, which, though we have seen it twenty times, still excites a smile: it is a representation of something like a striped bolster, and above it a ninepin; the author facetiously calls this pair, “the *larva* and *caterpillar* of the pink under-wing moth;” which is which we have not yet made out. A few pages further, we are told that “the *moth* assumes the *imago* state in May;”—and many other such wonders we find scattered up and down. The truth is, that *Captain Brown* seems to derive his information from *Professor Rennie’s* works; and “when the blind lead the blind,” the consequence may be inferred. Let us not, however, deny the book its merits; it is a cheap pennyworth; and if the plates are not representations of *particular* butterflies and moths, yet they are pretty, and would be likely to inspire a wish to know more about these things; and if the science of the work

is not deep, there will yet be found some extracts from other authors, which will not only prove interesting, but instructive.

3. *Annales de la Société Entomologique de France: trimestre 1, 2, et 3.*—We hail with delight the establishment of an Entomological Society in Paris, and sincerely hope that the example may shortly be followed in this country, where the taste for the study seems to be every day increasing. Three numbers of their Transactions have already been published, which we most cordially recommend to the notice of our countrymen. Amongst the contents we observe, “Opening Discourse, by M. Latreille;” “Observations on the mode of writing Papers on Natural History, particularly Monographs, by M. Godet;” “Memoir on Gorytes, by M. Pelletier de Saint-Fargeau;” “Notice of a new Genus of Homoptera, by M. Laporte;” “Monograph of a new Genus of Curculionidæ, by M. Chevolet;” “A new Classification of the Family Longicornes, by M. Audinet-Serville;” “Observations on Bombyx Pitiocampa, by M. de Villiers;” “Monographs of two new Genera of Curculionidæ, by M. Chevraut;” “Description of a new Tetralobus, by M. Gory;” “Memoir of some new Genera of Homoptera, by M. Laporte,” &c. &c.

4. *Revue Méthodique des Insectes de l'Ordre des Orthoptères, par J. G. Audinet-Serville.*—This clever little essay has been previously published piece-meal in the “Annales des Sciences Naturelles,” but now for the first time appears as a whole. The *Orthoptera* are divided into seven families, *Forficulaires*, *Blattaires*, *Mantides*, *Spectres*, *Grylloniens*, *Locustaires* and *Acridites*: we may observe that *Mantides* and *Spectres* seem to us scarcely to constitute two separate groups, being in every respect so nearly allied; we also feel at a loss how to account for the omission of the genus *Thrips*, which appears to us decidedly Orthopterous.

5. *Centurie de Lépidoptères de l'Île de Cuba, par M. Poey.*—The figures in this work are well engraved, but it strikes us, rather indifferently coloured. The most remarkable insect figured, is *Mastigophorus Parva*, one of the family *Pyralidæ*, with palpi which are considerably longer than the whole length

of the insect exclusively; it appears nearly related to our genus *Polypogon*.

6. *Magasin de Zoologie, par M. Guerin*.—We have again been highly gratified by our inspection of this beautiful work; the figure of *Hipocephalus armatus* of Desmarest, is well worthy of notice; and M. Laporte's "Essay on the Systematic Classification of the Heteropterous *Hemiptera*," should be studied attentively by all who purpose paying attention to this section of insects; it is succinct, clear, and exceedingly clever. M. Laporte divides the Heteropterous *Hemiptera* into two tribes and fourteen families. We cannot too highly recommend this Magazine to the notice of British naturalists, and sincerely wish to see a taste for the scientific researches of our neighbours more cultivated in this country than it is at present.

7. *Annales des Sciences Naturelles, par M. Audouin*.—This work is continued with spirit and talent; in the number before us we find a paper on the same minute tribe (the *Chalcides*), which our highly valued contributor, Mr. Walker, is now for the first time bringing into notice in this country. To an entomologist, above all men, diminutive size should be no objection. In another number (the last) we find some excellent observations on the anatomy of the flea, by M. Dugés.

8. *Magazine of Natural History*.—This useful and highly entertaining Magazine is continued with its usual spirit: lately we have observed some excellent papers on Crustacea, &c. by Dr. Johnston, a most scientific and persevering naturalist; many interesting scraps on birds, insects, &c. by the Rev. Mr. Bree; a valuable paper, by Mr. Yarrell, on some new British Mammalia, &c. &c.: but the most delightful feature in the Magazine, is a series of letters by our correspondent, Rusticus, commencing in the September number. We do not know which of these most to admire, they are all so exactly to our taste, and we congratulate our contemporary on the acquisition of such a writer; we might envy him, but that Rusticus is doing the same for us, though on a somewhat different subject; and we content ourselves in the belief, that if "Something about Birds" be more beautiful, "Observations on Blight" will be more useful. The entomological papers in Mr. Loudon's

Magazine have been rather weak. In September we observed a very dry, and we think useless paper, by Mr. Huish, about bees. In the March number, our correspondent, Mr. Westwood, has a paper, giving Mr. MacLeay's, and Messrs. Kirby and Spence's calculations of the supposed number of insects: he continues the old error of supposing the *Coleoptera* so greatly superior to the other orders of insects in point of number. Mr. Westwood has appended some characters of Hymenoptera (we do not see the connexion between the subjects), in which, unwilling as we are to criticise, we must notice a few errors, lest it be thought by our friends that we have not observed them. *Agonioneurus*, W. is *Aphelinus*, Dalman; the wing and antennæ appear to be copied from that author; the name, moreover, is inappropriate, as in the wing of this insect the stigmal *does* form an angle, though a slight one, with the subcostal nervure. *Choreia nigro-cænea* is probably the female of *Encyrtus hemipterus*; the abbreviated subcoriarius *wings* of this insect, Mr. Westwood describes, as the sides of the mesothoracic *scutellum*, which part, he says, is *quadrate*, whereas it is really *triangular*, with the apex acuminate. *Hemiptarsenus fulvicollis*, W. is an excessively common little insect, and has two remarkable characters: first, the variation of the colour of the thorax, two being seldom found alike (bright green is perhaps the prevailing colour, which, by the by, makes *fulvicollis* a bad name); and, secondly, the beautiful snow-white tips to its antennæ: neither of these characters are noticed.

9. *Monographie der Carabiden Von Zimmermann. Erstes. Stück. 8vo. Berlin et Halle, 1831.*—The *Carabidæ* have been more attended to by entomologists than any other family of insects; an immense number of new genera and species have been published within the last two or three years, by Dejean and others; indeed, the genera and species of all insects, especially of *Coleoptera*, have been rapidly increasing lately, while their general arrangement has been comparatively neglected. It would tend much to simplify and perfect the system, if *natural orders*, on the plan of Jussieu's excellent arrangement of plants, were adopted. This work is written in German, with a very short Latin notice of each genus and species. The *Zabroides*, the subjects of the present essay,

are divided into five genera; viz. *Eutroctes*, *Zabrus*, *Pelor*, *Polysitus*, and *Acorius*; and though the author only describes twenty-six species, the work extends to seventy-six pages. It would have been more generally useful if he had written it entirely in Latin, and had given the names of the authors on the same subject, and the synonyms. His second essay will be on the *Amaroides*.

10. *Versuch einer genauen beschreibung der in Schlesien einheimischen Arten der Familie der ruderwanzen Ploteres.* Latr. Von T. E. Schummel. Mit. 4. Kupfertafeln. Breslau, 1832.—An excellent monograph on the genera *Hydrometra*, *Velia*, and *Gerris*, constituting the family *Ploteres*, Latr.; accompanied by numerous and accurate dissections and figures. Several new species of *Gerris* are described, and their variations are well exhibited in the last plate. The author gives complete synonyms of the genera and species.

11. *Versuch einer genauen beschreibung der in Schlesien einheimischen Arten der gattung Raphidia.* Linn. Von T. E. Schummel. Mit einer illuminirten Kupfertafeln. Breslau, 1832.—An essay much on the same plan as the preceding. The author describes four species (two of them new), the nervures of whose wings often vary in the same specimen. The species described are: 1. *Ophiopsis*, Linn. 2. *Crassicornis*, Hartlich. 3. *Notata*, Fabr. 4. *Xanthostigma*, Schum.; the two latter are common near London. The plate represents the wings, head, &c. of each species.

12. *Observationes de speciebus nonnullis generis Mycetophila vel novis, vel minus cognitis scripsit F. H. Stannius.* Med. et Chir. Dr. Accedit tabula ænea colorata. Vratislavia, 1831.—An interesting monograph on the genus *Mycetophila*, which the author appears to have thoroughly studied. This group belongs to the *Tipulariæ Fungicolæ*, in which he has also included *Leia*, *Sciophila*, *Sciara* or *Molobrus*, and *Cordyla*. He gives an account of their habits and economy, and observes that their larvæ are intimately allied to those of Lepidoptera, while they differ from other Dipterous larvæ, in having the stigmata placed together on the side of each segment, and in some other characters. He says that this formation

is common to all the above-mentioned genera, and that he has also observed lateral stigmata in the larva of *Cecidromyia*. Eight species are figured, and twenty-three described, fifteen of which are new.

13. *Die Arachniden-Getreu nach der Natur abgebildet und beschrieben Von Dr. Carl Wilhelm Hahn. Erster Band.*

14. *Die Wanzenartigen Insecten. Getreu nach der Natur abgebildet und beschrieben Von Dr. Carl Wilhelm Hahn. Erster Band. Mit sechs und dreissig fein ausgemalten. Tafeln Nürnberg, 1831.*—The first number of each of these works was published in 1831; of the second, we have just received a second number, and we understand they are to be continued. Each has six plates, with coloured figures. The first illustrates some of the genera and species of *Arachnida*; a few sketches of the positions of their eyes are also given. The second is very similar to a work published, by the same author, several years before, and contains figures of the genera and species of *Hemiptera*, with sketches of their heads, trophi, antennæ, and nervures of the wings, magnified. The figures, in all the three numbers, are accurately, though in some instances, rather coarsely executed.

15. *Handbuch der Entomologie Von Herrmann Burmeister. Erster Band. Allgemeine Entomologie. Mit 16 Steindruck- und erklärenden Text in Quart. Berlin, 1832.*—This volume, containing nearly seven hundred pages 8vo, is divided, by the author, into four sections. The first treats of the Terminology or Orismology; the second, of the Anatomy; the third, of the Physiology; and the fourth, of the Taxonomy, or system of insects. Our limits will only allow us to give a short list of the contents of the book. His first section contains three chapters; in the first, he speaks of the basis of Orismology; the second chapter is devoted to general, and the third to partial Orismology. Observations on the organs of growth, and on the animal organs, occupy the second section. The third, containing above three hundred pages, is divided into three parts, the first describing the physiology of the body, which he calls "*Somatische Physiologie*;" the second, that of the soul, or instinct ("*Psychische Physiologie*"); and the third, the geography, &c. of insects. The fourth



section is upon systems: those of Aristotle, Gesner, Ray, Lister, Linnæus, De Geer, Geoffroy, Fabricius, Illiger, Clairville, Cuvier, Latreille, Lamarck, Dumeril, Leach, Kirby, Oken, MacLeay, &c. are described; and he gives a short account of a system of his own. He concludes with a few pages on nomenclature, and a table containing lists of the different thoracic parts, according to his views, and those of Knoch, Kirby, Chabrier, Andouin, MacLeay, and Straüs-Durckheim. This work is accompanied by an atlas, containing sixteen anatomical plates, copied from other authors, some of them coloured. We recommend this book to the attention of all who wish to extend their information beyond the mere descriptions of genera and species, which is too often the *ne plus ultra* of the researches of British Entomologists.

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ART. XXXV. — *Varieties.*

(Continued from p. 216.)

24. *Inquiry respecting the Genus Castnia*, (Vid. ante, p. 44.)—SIR, Permit me to request, from the anonymous reviewer of "*Sphinx vespiformis*," some information on the natural history of the genus *Castnia*, which he intimates he has seen in its native country, "sitting with its wings deflexed, as we have ourselves observed," (p. 46.) This fact was published many years ago, (*Zool. Ill.* 3 Pl. 149); but it has never been confirmed, until now, by the observations of others. Your correspondent must, of course, be a traveller in equinoctial America, where only this genus is found; and can probably communicate something more on this singular group than I have published. Allow me to express the pleasure I have derived from your first number, and my hope that it will be effectually supported. The first article deserves the highest commendation.

I am Sir, your very obedient Servant,

WILLIAM SWAINSON.

*St. Albans, Nov. 25, 1832.*

[We are sorry that we are unable to afford Mr. Swainson any further information on this interesting subject.—ED.]



25. *Singular mode of capturing Noctuæ*.—I would recommend to your readers a plan, by means of which I have captured many good Lepidoptera, as will be seen by the list I send herewith. It is simply to lay a sugar-hogshead, which has just been emptied, and to which of course some small quantity of sugar will still adhere, in an open space near a garden or field. In the course of a night or two it will be visited by numbers of Noctuæ, amongst which will not unfrequently be found some of the rarer species. The Noctuæ continue to visit it, particularly on moist evenings, as long as it retains any saccharine matter.

Yours, &c.

E. DOUBLEDAY.

*Epping, Nov. 21, 1832.*

Callimorpha miniata	Orthosia macilentata	Apamea rava
Lithosia complana	upsilon	oculea
Triphæna orlona	Mythimna grisea	I-niger
pronuba	Segetia xanthographa	Miana Æthiops
innuba	Caradrina alsines	strigilis
fimbria	Sepii	humeralis
interjecta	cubicularis	Miselia oxyacanthæ
Janthina	glareosa	Polia advena
Cerigo texta	Glæa Vaccinii	seladonia
Lytæa umbrosa	polita	Acronycta Psi
Agrotis æqua	Amphipyra pyramidea	tridens
segetum	Pyrophila tetra	Bryophila perla
suffusa	Nænia typica	Bombycia viminalis
nigricans	Xylina putris	Cosmia diffinis
exclamationis	Xylophasia lithoxylea	trapetzina
Graphiphora augur	polyodon	Xanthia flavago
brunnea	rurea	Leucania impura
punicea	epomidion	pallens
C. Nigrum	Hadena plebeia	Phlogophora meticulosa
pecta	Mamestra oleracea	Abrostola urticæ
Semiophora gothica	Brassicæ	triplasia
Orthosia litura	aliena	Mormo Maura
pistacina	persicariæ	Catocala nupta

26. *Genus Amphimalla*. (*Vide ante*, p. 84.)—SIR, So far from suppressing my learned friend, M. Latreille's, genus *Amphimalla* (which may be termed a sub-genus), I have given the characters of it under my third division, Vol. IX. p. 406. On an inspection of the foreign species of *Melolonthidæ*, the antennæ will be found to vary so much, that if generic names be given where the antennæ differ, it must be done to a

very great extent; and it is as well to bear in mind, that it will be simplifying the science to form divisions, and not genera, when the groups are not unmanageable from their extent. It will be seen, from my characters of the other two divisions, that it might, on the same principle, be contended that *M. vulgaris* and *M. Fullo* should each have a generic name; but such a step would, I think, be actual folly. You will see, in the *errata* of Vol. IX. published this day, that since *Melolontha* was illustrated by me, I have had a female of *M. solstitialis* sent me by a friend, by which means I learn that I was unacquainted with that sex before, and beg to sub-join the corrected definition of M. Latreille's genus.

AMPHIMALLA.—Antennæ 9-jointed, 3 terminal joints forming the club, which is very small in the female; the legs differ in the sexes as in the other species, being dentate or spined in the female.

There must be something different in the habits of the sexes, for I examined nearly twenty specimens, which had been retained from many scores, taken at different times and places, and, from their varying in size, I presumed I had both males and females; but it appears I had none of the latter sex. I think it is very probable that they were all taken on the wing, and if that were the case, it may be inferred that the females seldom fly, and that the swarms that we see of these insects in the evening are either flying about, or in search of their partners. I am, yours, &c.

JOHN CURTIS.

December, 1832.

27. *Singular Instinct in a Spider.*—In a walk, after breakfast, this morning, in our little garden at Kennington, I was much delighted by the contrivance of a small garden spider: she had formed her web over the middle of a gravel path, attaching the supporting threads to the paling, on one side, and to a sunflower on the other. The breeze was rather strong; and, to keep her web steady, she had drawn up a small gravel stone, though very nearly the size of her own body, which hung beautifully poised between two threads, about a foot above the path, and which answered the purpose she wished most admirably well; it swung backwards and

forwards with the motion of the wind, but still was heavy enough to keep her web distended and steady. I placed a sheet of paper underneath, to catch the stone when it fell, and have it now in my possession.

E. T. FOSTER.

*Dated August 27—received December 4, 1832.*

28. *Inquiry respecting the preservation of Crustacea.*—SIR, Will you have the goodness of informing me, through your magazine, what is the best mode of preserving shell-fish, as crabs, &c. I have excellent opportunities of collecting them, but they invariably become moist, and decay at the joints. Your obedient servant.

*December, 1832.*

DEVONIENSIS.

[We believe that the most effectual mode of preserving Crustacea is to clean the shells thoroughly, and then keep them steeped in fresh water, until the salt is completely extracted from them. Mr. Yarrell or Mr. Stephens could furnish much better information than ourselves on this subject. We should feel obliged by any communication from them on the subject.—ED.]

29. *Coccus of the Vine.*—I have found on the shoots of the vine an insect which adhered to them, in form and colour something like a flat insect I have frequently met with on the head of prawns. When I saw them first, they were very flat, and close to the branch, but they increased in bulk much more upwards than in circumference; and, after some time, I have picked them off, and found that they contained a white cottony substance, and a great many young red spiders. I never saw them in any other state than this. I have destroyed great numbers, considering them prejudicial to the vine, by injuring the sap. I never remember seeing any of the old ones, nor indeed any others than what were in the cottony substance, which I considered the nest. Any information on the subject will oblige  
G. N.

[The insect is the female of the *Coccus vitis*; the red spider-like insects are the young, which hatch from eggs, deposited on the stem of the vine, and thus protected from

harm by the body of the mother. We hope our correspondent Rusticus will include a history of this singular creature among his valuable "Observations on Blight."—ED.]

30. *Larva of Cræsus septentrionalis*.—I have more than once found this larva in abundance on the hazel, in the beginning of July and the end of August. It is gregarious, and remains most of the day at rest, on the margins of the leaves, in the attitude represented in the drawing by my friend Newman. Last July I observed some young hazels nearly stripped of their leaves by these larvæ, but apparently most of them had changed to the pupa state, as scarcely any were to be found on the few remaining leaves. Although the larva is abundant at times with us, yet I have rarely found the imago. The plate so well exhibits the form of this larva, that any description of it would be superfluous. (See pl. 1. fig. 5.)

EDWARD DOUBLEDAY.

31. *Metamorphosis of Aleyrodes*.—Since Reaumur, no entomologist seems to have met, in the larva or pupa state, with *Aleyrodes Proletella*; and the opinion that its metamorphosis resembles that of the *Lepidoptera* has been so general, that it is with much hesitation I venture a doubt of its correctness. Having recently reared it from the pupa which I found on cabbage-leaves, I am disposed to think that it more resembles the coarctate pupa of some *Diptera*; but as I had not the opportunity of paying sufficient attention at the time, I merely throw out this hint in the hope that some more able entomologist may take the pains to examine the larva and pupa of this remarkable insect, which I have no doubt will be found in abundance throughout the summer, under the leaves of the rough-leafed variety of the common cabbage.

EDWARD DOUBLEDAY.

Epping, December, 1832.

32. *Larva of Lyda sylvatica, &c.*—When my friend Davis was at Blackheath, last summer, he found a nest of the larvæ of *Lyda sylvatica* feeding in a web, on the leaves of a pear-tree; he kindly gave me specimens, one of which I have drawn: it is remarkable in being entirely without the abdominal legs (see pl. 1. fig. 4). Another yellow larva, with

fourteen abdominal legs, which I found in great abundance on poplar-trees, produced *Nematus dimidiatus* (see pl. 1. fig. 1). On the *Scrophularia aquatica*, in my garden, I obtained numbers of the larvæ of *Allantus scrophulariæ*: it is remarkable for its great change of colour in its last skin; from having been a clear blueish-white, with several rows of jet black spots, it becomes a dirty brown colour (see pl. 1. fig. 2 and 3). The green larva represented, is that of *Cræsus Septentrionalis*, a description of which you will receive from its captor. The accompanying plate is engraved by my friend, Mr. Ingall, and coloured by a gentleman who does not wish his name made public, and most exactly represents the insects above named.

EDWARD NEWMAN.

Deptford, December 20, 1832.

[We beg to express our best thanks to the gentlemen who have gratuitously furnished us with this elegant plate: generosity of this kind can only be returned by every exertion on our part to make our Magazine a worthy receptacle of such gifts.—ED.]

33. *Generic Names should be of Greek Derivation.*—I was much surprised at the admission into your last number of no less than *four* generic names, not derived from the Greek, as is now the universal practice, but being simple Latin nouns and adjectives. I do not think even Mr. Curtis's name of sufficient weight to authorize an innovation, which it was certainly the duty of an editor to have guarded against.

Δ

January 10, 1833.

[We certainly regret that these very unscientific appellations should have escaped Mr. Curtis's notice in the revision of the proofs; for our own part we feel a delicacy in making alterations, which might not, by our contributors, be deemed justifiable: our reader will perceive at once that our correspondent must refer to *Silo*, *Chlamydatus*, *Loricula*, and *Galeatus*. We select Delta's observation on this subject as the most temperate one of four, and because we are sure it is written with no unfriendly feeling either towards ourselves or Mr. Curtis. XYZ., who says that every genus, excepting *Paramecosoma*,

described in the article alluded to (XIX. p. 186), has been previously characterized, must supply us with references in proof of the assertion, otherwise his communication is what he is pleased to term Mr. Curtis's,—“waste paper.” We however caution our correspondents not to allow their zeal in making genera and species to overstep the real object of such labour,—the elucidation of the science. With the elegant epistle (on the article in question) which dared us to omit its publication, we lighted our cigar; we heartily wish all entomologists were as willing as ourself to smoke the calumet of peace.—ED.]

34. *Aphides produced in the winged state.*—Having paid much attention to the hop-fly during the last summer, I was not a little surprised at observing that the young of that insect are born *in the perfect state*, and that some of them are actually provided with wings.

J. B——, JUN.

Worcester, January 19, 1833.

[This fact, we believe, is new to entomology; we therefore beg to say we are personally acquainted with the writer, and cannot doubt his veracity.—ED.]

35. *Ignis fatuus.*—The insects which were found (see p. 216) in digging up the mud of an old pond, must have been the larvæ of some large *Libellula*. I am surprised you should think they were the mole-cricket; for though that insect frequents damp situations to a certain extent, I never heard of its burrowing in the mud of a pond. I forbear making any observation on that strange phenomenon, but I have long thought it to be the *Libellula*.

JAMES W. BOND.

[Mr. Bond furnishes us with many remarkable instances of tenacity of life in insects; the most remarkable of which is one of a moth (*Phlogophora meticulosa*) which appears to have been caught flying about without a head, and which lived in that state about thirty-six hours.—ED.]

36. *Motion of legs, &c. in Water-beetles.*—Having brought home, a short time since, a number of water-beetles alive, I put them into a large white bason, for the purpose of observing their actions: I found that all the carnivorous beetles



(natural order *Dytiscites*, including the well-known genera, *Dytiscus*, *Colymbetes*, *Acilius*, *Hydroporus*,) in swimming, moved both their hind legs simultaneously, striking out with great vigour, in the same way as a frog; whereas the herbivorous beetles (natural order, *Hydrophilites*; genera, *Hydrous*, *Hydrophilus*, *Helophorus*, &c.), in swimming, moved their hind legs alternately, thus making weaker strokes, and progressing in the water much more slowly. There is yet another difference between the groups, which, however, I believe, has been before observed; it is, that the *Dytiscites* porrect their antennæ in swimming, and conceal their palpi; the *Hydrophilites*, on the contrary, porrect their palpi, and conceal their antennæ.

EDWARD NEWMAN.

Deptford, Jan. 20, 1833.

37. *Inquiry as to the collecting Apparatus.*—Sir, It was with great pleasure I became a subscriber to the "Entomological Magazine," hoping to find in it some few instructions and hints to young entomologists; but meeting with disappointment in this, I have written this letter, humbly requesting you to devote one or two pages for the benefit of tyros in the science. I shall feel much obliged by your informing me where, in London, all apparatus necessary for collecting may be purchased, and what particular nets, &c. you recommend, with any hints you may think useful, either for collecting or preserving insects.

I remain, Sir, your respectful subscriber, J. D.

Dartmouth, Jan. 1833.

[We intended to do this, but our correspondent must observe how very little editorial matter we are able to publish, owing to the press of more important communications. We obtain our own nets, &c. of Mr. Bew, 19, Newgate Street; we are not aware of any other maker. J. D. will find ample directions for collecting in Messrs. Kirby and Spence's "Introduction to Entomology," to which we beg to refer him for the present.—ED.]

38. *Insects captured at Bridgend, Glamorganshire.*—Sir, I have to request that you will put my name down as a subscriber to your excellent and long wished for Magazine. At the same time I have embraced the opportunity of sending you



a list of insects collected in the vicinity of Bridgend, Glamorganshire, from last May to September. They were all captured in a circle of about three miles round that small town. Two parts consist of different species of limestone, one of coal-mines, and one of sand-hill or sea-coast. The larvæ of *Lasiocampa trifolii* I found in plenty at the end of May, in all stages of growth, on the sand-hills; their natural food is the *Lotus corniculatus*, or bird's-foot clover; although they eat freely, and thrive, still the moth is difficult to rear, as the larvæ mostly die in transforming to the pupa state. *Thecla Betulæ*, *Pieris Cratægi*, and *Melitæa Artemis*, were in profusion last year. I shall be happy to exchange any *Coleoptera*, *Diptera*, *Hymenoptera*, &c., for *Lepidoptera*, and am, Sir,

Your most obedient servant,

CHARLES BLOMER, Capt. — Regt.

LEPIDOPTERA :—	HYMENOPTERA :—	Clivina collaris
<i>Thecla Betulæ</i>	<i>Chrysis bidentata</i>	<i>Tachypus Andreae</i>
<i>Pieris Cratægi</i>	<i>ignita</i>	<i>Ocys rubens</i>
<i>Melitæa Artemis</i>	<i>cyanea</i>	<i>Nebria complanata</i>
<i>Lasiocampa Trifolii</i>	<i>Bombus Harrisellus</i>	<i>Pedinus maritimus</i>
<i>Bombycia viminalis</i>	<i>rupestris</i>	<i>Nitidula obscura</i>
<i>Caradrina trilinea</i>	<i>Osmia Tunensis</i>	<i>Haltica affinis</i>
<i>Cymatophora subtusa</i>	<i>maritima</i> *	<i>Ægialia globosa</i>
<i>Polia bicaudata</i> *	<i>parietina</i>	<i>Hister 4-striatus</i>
<i>herbida</i>	<i>bicolor</i>	<i>Opatrum tibiale</i>
<i>Actebia Præcox</i>	<i>Andrena aurata</i> *	<i>Hydroporus flavipes</i>
<i>Agrotis Cunigera</i>	<i>spinigera</i>	<i>12-pustulatus</i>
<i>Coclylis Baumanniana</i> *	<i>Eucera longicornis</i>	<i>Colymbetes vitreus</i>
<i>Pterophorus tetradactylus</i>	<i>Mellinus pratensis</i>	<i>paludosus</i>
<i>Sesia Bombiliformis</i>	<i>frontalis</i>	<i>oblongus</i>
<i>Scopula flavalis</i>	<i>Psen compressicornis</i>	<i>guttatus</i>
DIPTERA :—	COLEOPTERA :—	<i>Cassida nobilis</i>
<i>Tabanus vittatus</i> *	<i>Agonum emarginatum</i>	<i>Cistela nobilis</i> *
<i>Æstrus Ericetorum</i>	<i>punctatum</i> *	<i>Cicindela maritima</i>
<i>Tachina fera</i>	<i>Ophonus azureus</i>	<i>Ocypus brunnipes</i>
<i>Atherix Ibis</i>	<i>Omaseus angustior</i>	HEMIPTERA :—
<i>Henops gibbus</i>	<i>Elaphrus cupreus</i>	<i>Pentatoma bidens</i>
<i>Asilus germanicus</i>	<i>riparius</i>	<i>Cydnus Morio</i> .
<i>Ceria Conopsoides</i>		

[We have marked with an asterisk several insects with which we are wholly unacquainted, even by name.—ED.]

39. *Rather extraordinary*.—On Sunday, as Mr. William Ferris, of Pennywell Lane, was in his garden, about eleven o'clock in the

forenoon, millions of insects, of the caterpillar species, forming quite a cloud, which darkened the air, passed over him from west to east.—*Bristol Mercury*.—!!! ED.

40. *Stephens v. Rennie*.—This case happening to be the last on the list, at the Court of Exchequer, has been, we are sorry to say, put off till May. On the morning on which it was expected it would be heard, we took a stroll into Westminster Hall, and we think we may say we never saw so many fellows of the learned societies assembled on any occasion: we recognised Mr. Yarrell, Mr. Children, Mr. Haworth, Mr. Vigers, M.P., Mr. Gray, Mr. Samouelle, Rev. Mr. Hope, Rev. Mr. Rudd, Mr. Davis, Mr. Newman, Mr. E. Bennett, Mr. Westwood, Mr. Waterhouse, Mr. Griesbach, Mr. Hanson, Mr. E. Doubleday, &c. &c.; most of whom were, we understood, witnesses for the plaintiff, who, as a matter of course, was present. These gentlemen, after spending nearly the whole day walking up and down the hall, had the pleasure of being dismissed until again wanted. We certainly do not envy any man a law-suit: when the matter is decided, even in the plaintiff's favour, which we have no doubt will ultimately be the case, what damages can repay him the trouble and expense he has incurred? In the mean time, entomologists are inconvenienced by the discontinuing of Mr. Stephens's "Illustrations," which he, of course, suspends until the law has decided whether he has a copyright in them or not.—ED.

41. *Inquiry respecting Mr. Stephens's "Illustrations."*—Sir, can you give me any information as to the re-appearance of Mr. Stephens's valuable "Illustrations of British Entomology?" At this distance from London, I find it impossible to obtain any information through booksellers, &c. ?

*Edinburgh, 13th Feb. 1833.*

[We may positively state, on the authority of Mr. Stephens himself, that the only cause of delay is the law-suit above alluded to.—ED.]

42. *Flight of Insects*.—The propensity which insects evince to fly in one direction, is truly remarkable; in the roads through the woods of Kent, I have found that the readiest way to take *Leucophasia Sinapis*, the little "Wood White" butterfly, is to

stand quietly and allow them to come to me ; they are slow and very easily captured ; and after having observed the direction in which one is proceeding, I could always make sure of many more following in the same track : when I have attempted to turn them back, it has been of no avail, they have passed on one side, or over me, and quietly pursued their course : these roads are cut through the woods in every direction of the compass, and I found the way of the wind had little or nothing to do with the matter, as in some instances their flight was with the wind, and in others directly against it. *Saturnia Carpini*, the Emperor Moth, and *Endromis versicolor*, the Kentish Glory, invariably fly against the wind. During the past spring, I had an excellent opportunity of remarking the habit of the latter beautiful and rare moth ; it was about the middle of April, the weather cloudy, and the wind eastward. Being on the heathy common, on the south side of Birchwood, at two o'clock P.M., I observed one of these moths coming directly from the west, with a zig-zag flight, and at a most amazingly rapid rate it passed over my head, and was soon out of sight ; for about an hour and a quarter others continued to follow, one at a time, in nearly the same line, all coming like the first, directly from the west, and flying towards the east. I was not fortunate enough to secure a single one, although I learned that several were captured on the same day ; probably, one motive for these insects flying in this way, is to detect the females, which are generally dull sluggish animals, and scarcely fly at all. In the autumn, when the ants are assuming the winged state, I have seen myriads of both sexes, crossing the River Thames in the direction of the wind, and moving in a somewhat oblique manner, so as to cause thousands of them to fall in the water, the surface of which was completely sprinkled with their floating bodies : the swarm continued to pass in nearly equal profusion, six hours afterwards, when I repassed the spot, and had probably continued to do so during the interval. In windy weather, *Megachile Willoughbiella*, the leaf-cutter bee, invariably goes to windward of its nest to procure leaves, and returns loaded, with the wind, thus converting a high wind into an assistance, instead of permitting it to be, as one would very reasonably have supposed, a preventative to its proceedings.

Your's, &c.

EDWARD NEWMAN.

ART. XXXVI.—*On the Death of Latreille.*

A VOICE of sorrow floats upon the gale,  
 'Tis science weeps, she weeps for thee, LATREILLE !  
 At length thy bright career is o'er,  
 Thy honoured voice shall teach no more ;  
 And we, who doatingly have hung  
 Upon the wisdom of thy tongue,  
 All eager lest a single word  
 Should chance to pass thy lips unheard,  
 That, as a father's to his child,  
 Instruction poured in accents mild,  
 Not only to bright science true,  
 But advocating virtue too—  
 Now, drop upon thy hallowed bier,  
 The honest tribute of a tear.

Oh Frenchman ! dost thou wonder ? wouldst thou know  
 Whence comes this lay, and whose this strain of woe ?  
 And deem'st thou that no honest hand  
 Can hold the pen in foreign land,  
 And thus with grief unfeign'd bewail  
 Thy own, thy loved, thy lost LATREILLE,  
 Nor seek to hide his sterling worth,  
 Because thy country gave him birth ?—  
 Oh ! learn that our impartial eye  
 Finds merit under any sky ;  
 Our pearls of knowledge have been strung  
 From every land, in every tongue ;  
 And shall we ill for good return,  
 Nor let the palm where won be worn ?—  
 No ! when our FIRE-FLY spreads her wings,  
 An equal light on all she flings ;  
 A guardian banner is unfurled  
 For merit over all the world !

And, Briton, as thou readest, put to rest  
 All envious feeling, if such haunt thy breast.  
 The mighty has resign'd his trust,  
 The teacher mingles with the dust ;  
 And surely we shall seek in vain  
 To find on earth his like again.  
 O, let not then thy niggard frown  
 Attempt to dim his radiant crown ;  
 But keep his matchless worth in view,  
 And honour give where honour's due :  
 Boughs of the weeping-willow bear—  
 Wreaths of the gloomy cypress wear ;  
 And with us pay thy tribute here—  
 One heartfelt sigh, one parting tear.

ENTOMOLOGIAE · HODIERNAE · FVNDATOR

**PETRVS · ANDREAS · LATREILLE**

DIEI · VI · FEBRVARII · OBIIT

A · D · MDCCCXXXIII

THE  
ENTOMOLOGICAL MAGAZINE.

JULY, 1833.

ART. XXXVII.—*Colloquia Entomologica.*

(The second and last of the series.)

Γνωθι σεαυτον.

SCENE—*The Parlour at the Bull Inn, Birch-wood-corner.*

*Enter ERRO from nothing; he takes off a bull's-eye lanthorn, and sits, folding his arms.—An expiring fire in the grate.*

ERRO.—

Where rose the mountains, there to him were friends;  
Where rolled the ocean, thereon was his home;  
Where a blue sky and glowing clime extends,  
He had the passion and the power to roam.  
The desert, forest, cavern, breaker's foam  
Were unto him companionship; they spake  
A mutual language, clearer than the tone  
Of his land's tongue, which he would oft forsake  
For nature's pages, glassed by sunbeams on the lake.

(*A long pause.*)

Like the Chaldæan, he could watch the stars  
Till he had peopled them with beings bright  
As their own beams; and earth, and earth-born jars,  
And human frailties, were forgotten quite.  
Could I have kept my spirit to that flight  
I had been happy; but this clay will sink  
Its part immortal, envying it the light  
To which it mounts as if to break the link  
That keeps us from yon heaven, that lures us to its brink.

But in man's dwelling I'm become a thing,  
 Restless and worn, and stern, and wearisome,  
 Droop as a wild-born falcon with clipt wing,  
 To whom the boundless air alone were home;  
 'Then comes my fit again, which to o'ercome,  
 As eagerly the barr'd-up bird will beat  
 His breast and beak against his wiry dome,  
 Till the blood tinge his plumage; so the heat  
 Of my *impeded* soul does through this bosom eat. (A pause.)

Poor captive nightingales, how have I watched your oft repeated efforts for liberty, when nature has told you it was time to go! how deeply have I shared in your disappointment! (A long pause.)

*Enter ENTOMOPHILUS (from nothing).*

ENTOMOPHILUS. What, moping again! for ever on the dolorous (*sits*), migratory, I suppose—wrapt in fancy—sighing for ideal good, like the infant stretching out her little hand towards the moon—so—and whimpering and squalling because her nurse can't get it for her.—All the Jewell family a-bed? Are we going to have any supper?

ERRO. Yes, go I *will*—sooner or later; Humboldt was disappointed a dozen times, yet what did he not accomplish at last?

ENT. Shall I summon him?

ERRO. You have not forgotten that hallucination, then; but I am glad to hear you allude to it jokingly.

ENT. Jokingly!—I never was more serious, (*rises and places a chair between them*) say who it shall be.

ERRO. Poor fellow! every man is mad on some point. (*musingly.*)

ENT. A truism, no doubt—your crack induces migratory dreams; but before fixing a crack in my pate, have the goodness to give me a hearing; mention but a name past or present, dead or living—who shall it be?—Stephens?—MacLeay?—Aristotle?—Waterton?—Humboldt?—Dr. ———?

ERRO. Well, call the doctor, then; come, begin the incantation—

Being or spirit,  
 Whatever thou art,  
 Who still dost inherit  
 A whole or a part;  
 Of the form of thy birth,  
 Of the mould of thy——

ENT. Nonsense—now mind, if you notice him, or speak to him, before he joins the conversation of his own accord, the spell is broken, and we lose him (*he speaks a few words in a low voice, and RUSTICUS instantly occupies the chair placed for him*). So you are still migratory, not satisfied with old England yet.

ERRO. I have little reason to be satisfied; condemned to kneel before a man whom I despise from the bottom of my soul, because I was bold enough to tell the truth of him. I know every body must hate me for it; but I had my reasons.

RUSTICUS. I feel shivery, all needles and pins, and for all the world as though I had been run away with by the steam-horse that bolted on Ashton Moss the other day, or shot out of an air-gun—shall I stir your fire?

ENT. What country are you particularly thinking of?

ERRO. Any where that truth may be spoken, and the sky is clear.

RUS.—

Kennst tu das land wo die citronen blühn.

ERRO. 'Tis the land of the east, but the land of the west is my aim; Humboldt and Waterton have determined me on that: think of laying stretched at full length in the shade of a group of coucourite palms, covered with scarlet and blue aras; think of the magnificent arborescent *gramineæ* gracefully waving in the breeze; think of clusters of shrubs, whose flowers are almost too brilliant to gaze upon, and each fanned by the tiny wings of a humming-bird, whose ruby crest and emerald bosom seem to emit rather than reflect the luxurious light; while around and above sail majestically the morphos and the swallow-tails; the gay *Hesperidæ* flit, or rather skip from flower to flower, and the long-winged Heliconians flutter, owl-like, on their way: all nature is on a lavish scale; each rough stem glows with the blooms of parasitic *Orchideæ*, or bends with the weight of luxuriant purple passion-flowers, and scarlet *Bignoniæ*, while the graceful heavily-waving leaves of the cocoas, or the still more beautiful palms of the Oronoco, mingle with the light pinnated foliage of *mimosæ*, and giant tree-ferns, undulating beneath a sun which, for weeks and weeks, has not been hidden by a cloud. O, that I could transport myself to some such lovely spot—



Where a leaf never dies on the still blooming bowers,  
And the bee banquets on through a whole year of flowers ;

where I might always be learning something new ; something calculated to place the omnipotence of our Creator still more forcibly before me ; something to make me feel, still more strongly, my own nothingness :—even now, when disappointed hope, when misfortune, nay disgrace, arising from my too thoughtless disposition ; when sorrow for the death of those who were my friends in the happy days of my childhood, who played, and who studied with me ; even now, broken down by trouble, the hope that I may live to pass a few years in the majestic solitudes of the Andes, chains me to a life, to me almost as irksome as it is valueless to others.

ENT. 'Tis a glowing picture ; but is there no alloy, no drawback ?

ERRO. Yes, there is ; and I have often shuddered at the thought. What think you that it is ?—the poisonous rattlesnake basking in the sun ?—the deadly *Bothrops*, lurking under a large stone when I turned it over for a Carab ?—the great Boa, swinging like a pendulum by his tail from a tree ; or the forest all a-howl with jaguars ? No, none of these ; but, that I should have to see such beings as *Nestor* and *Eurylochus*, and *Menelaus*, a constant prey to a fly-catcher, as brilliant as themselves, which, taking his station on a dead twig, darted off, and seized them as they approached——

RUS. Then, returning again to the very same twig, with that glorious *Menelaus* in his bill, sever those four resplendent wings, and drop them, gently hovering, and often flickering upward a moment in the eddy of a tropical air-current, as if again endowed with life ; wavering and shifting colour ; now black, and now a blaze of blue ; at last, sinking to the earth, which henceforward they must adorn no more.

ERRO. O, Doctor, don't dwell on it ; there is something to me so mournful in the idea of any thing so lovely perishing ; but it is the fate of all that is beautiful.

Καὶ τὸ ῥόδον καλὸν ἐστὶ καὶ ὁ χρόνος αὐτὸ μαραίνει·  
Καὶ τὸ ἴον καλὸν ἐστὶν ἐν εἴαρι καὶ ταχὺ γηρά·  
Λευκὸν τὸ κρίνον ἐστὶ μαραίνεται ἀνίκα πίπτῃ·  
'Α εὐὲ χιῶν λευκὰ, καὶ τάκεται ἀνίκα παχθῆ.

ENT. There's gibberish! The unknown tongue, no doubt.

RUS. (*musingly.*)

The crimson rose, the bulbul's bride,  
 The purple violet in the shade,  
 The lily white, the maiden's pride,  
 Alike are bright, alike must fade.  
 The beauteous flake of purest snow  
 Its very being must forego.

ERRO. Yes, Doctor, that's it; and seeing any thing perishing makes me melancholy; it tells me that I too am perishing; that youth, though pleasing, is soon gone; it seems to make me feel how little hold we have of this world; and that, short as is our time here, our pleasures must be shorter still;—and beyond this world, what are my prospects? If now I look back with regret at the past, what would be my feelings in a future state of existence!—for there *is* a future. I have done nothing—not one *good* action, that is for the *general good* of mankind!—and that, Doctor, is the only true source of pleasure, and should be our aim in every thing.

ENT. Erro, you extract poison from the most delicious flowers; you gorge yourself with vapourings and musings, which, though pleasing, from your love of melancholy, vitiate your taste for the wholesome exercise of your powers. Awake, man, awake! Arouse yourself! Up—up; constant mental occupation is the surest, the safest source of earthly happiness.

RUS. Yes; and if your soul longs to hold communion with Nature, go into the fields and the forests of England; she has not deserted them; fret not for ideal regions.

ERRO. Ideal! There is an intensity of truth in all I think or say of them. Then would the publication of my discoveries do no good?

RUS. You might do as much here: it has been my aim also to do good after my own measure; little is expected from him who little has: from my infancy I have delighted to be alone with Nature; there is a sound of sweet music in her voice; and the pleasure that she gives me I have tried to impart to others;—but what can the pen do, when the heart is overflowing? O, could I find words to describe all that I have seen and noted, there should be no end of the letters of

Rusticus!—but it is impossible. Every moment of a fine spring morning is a chapter in the book of nature; every act of nature is a homily. The little lark, which long before the blush of morning tinges the sunward edges of the fleecy clouds—shakes the dew-drops from his spotted and guileless breast; and, with a voice, at first inward and low—rises on hovering wing, up, up into the heavens; and, as he mounts higher and higher, swells his notes, singing and soaring,—sing-ing and soar-ing, quiver, quiver, quiver, qua-ver—till lost to sight in the dusky twilight, his voice falls like enchantment on the ear, so melodious, so clear, so distinct is every—even its slightest modulation. Does not, I ask, that sweet bird, thus pouring forth——

ENT. —his earliest hymn, his morning soul, his first joyous warbling to his Maker,—Does not, I ask, that sweet bird offer a lesson to the man who can read it?—Does not he pass a sentence of bitter, bitter condemnation—the more bitter, because unintentional, on the man who will not read it; on all who refuse to listen to him, and to those who tell of him—and refusing, harden their hearts against the voice of Nature, and the voice of Nature's God?

RUS. Not unbeautiful; but what right have you to hoist me out of my say in that way?—you should have let me come to an anchor out of common politeness.

ENT. It was unintentional, I assure you, Doctor; it escaped me unawares.

RUS. You are for all the world like the young cuckow, that balances the featherless and blind eggling of the hedge-sparrow on his shoulders, and, clambering up the side of the nest, chucks him off by a jerk, out of his own warm, snug, cozy, comfortable habitation, and keeps it for himself.

ERRO. No, no; rather like the milk-tree of Venezuela, so full of riches, that at the least excitement, at a mere scratch, it overflows.

ENT. No, no, neither; it was unintentional; I hardly knew I spoke;—so will a stragglng and unbidden thought now and then escape from its most secret sanctuary, and, wandering to the cheek of beauty, reveal itself in a blush; I pray you, pardon me.

RUS. We are metaphorical;—metaphors thrown in with judgment are ornamental; and the writer or speaker who

manages them, will enlighten his subject as the spring brightens the face of Nature, by strewing the earth with flowers.

ERRO. Or as Nature herself adorns her favourite regions, the tropics, with her radiant birds, her gorgeous flowers, and her glorious insects.

ENT. Or as Juno, in her stately queenlike walk through heaven, showered her track with inextinguishable stars.

RUS. *Via lactea*, a thing I never look on without a recurrence to that beautiful fable; but of all heavenly sights, the *aurora borealis* is to me the most beautiful; here it does not exist; but in Sweden, and the north of Russia, the frozen face of the snow is lighted up by it with inconceivable splendour. It begins soon after sun-down, and rising in the north, at first somewhat like sheet-lightning afar off in the horizon, spreads fan-like to the zenith, and at last wraps all the heaven in a shooting, shifting, flashing, varying, all-coloured light, and tinges the earth with the reflection of its hue.

ERRO. Russia and her ice-palaces have no temptation for me.

ENT. Think of the bears'-paws for breakfast, Roey.

RUS. And think of the bear-hunts. I have speared the tusky pig in his native Hartz; I have chased the bounding chamois on his native Alps; I have fought hand to hand with the majestic desert-king on his native Zaara; and here I have not scorned the insipid inanity of pursuing the stag, the fox, the otter, and even the gentle hare; but a bear-hunt, with all its pomp and circumstance, is the hunt for me.

ERRO. I feel no great desire to witness one. I suppose half-a-crown would purchase the sight any day in London.

ENT. Thanks to Joseph Pease, those disgusting, disgraceful, inhuman, brutal exhibitions are put an end to.

RUS. To his honour be it spoken; but what resemblance has the worrying with curs a mangy bear, closely chained against a cellar wall, to the pursuit of the same animal in his native forests?

ENT. Where for a century he has stalked sidling along, undisputed master—none.

RUS. I had been six months at St. Petersburg without seeing a bear-hunt, when the Emperor announced it to be his pleasure, that preparations should be made for one; and, much to my satisfaction, an express invitation was sent me

to join the cavalcade, which I was not backward in accepting, as you may suppose.

ENT. Tell us all about it.

RUS. The first thing is the finding of the bears, and this is managed by fellows that go out two or three days beforehand, or else the Emperor and all his cavalcade might be frozen to blocks of ice before they would see the shaggy hide of a single bruin. These finders, six or eight in number, are mounted and armed; and no sooner had I heard about their office than I fixed to be one of the company. The Emperor heard of my valiant resolution, and most courteously sent his messenger to examine my equipments and garniture. The messenger made his observations, took notes, bowed, and departed, as I thought, quite satisfied that my appointments were perfect. I was mistaken: in about two hours he returned with a peasant leading a horse, and carrying a whole tout of paraphernalia. The horse was a perfect picture, bigger than our Shelties and rather less than our stocky Welsh breed, and much stiffer than either; the hair all over his body was at least six inches long, rough, and slightly curly, in fact he was as much like a bear as a horse, and I have no doubt the natural orders *Ursites* and *Equites*, meet each other in the natural system; the animal in question, *Ursoides Cossacus*, Lin., being osculant between them.

ERRO. Moffy, you keep on fidgetting the poker and tongs with your toe,—don't make that noise, the Doctor's very interesting.

RUS. I am fond of philosophizing a little.

ENT. It's nothing to me: it's MacLeay that talks about osculants.

ERRO. To be sure, and natural orders, *Ursites*.

ENT. Well, Doctor, what was there besides the horse?

RUS. *Ursites*, *Equites*, *Porcites*, *Vaccites*, *Ovites*, *Canites*, with *Simiites* central, among which in the heart's core, *Homo*.

ERRO. Is not the Doctor pleasant, Moffy?

ENT. The Doctor is not the only one to deride and criticise a system which—

RUS. Don't stop, man, don't stop,—*which they have not brains enough to understand*,—out with it. Well, to proceed, there was a light rifle slung on a leathern thong to go over the

shoulder; a lance at least eight feet long, with a diamond-shaped steel head; a cutlass and belt; a wallet, stored with provender for man and beast; a bear-skin cap; a ditto jacket, or spencer, if you please; a ditto inexpressibles, and a ditto saddle. I retired and made my toilet in a moment, and re-appeared in costume to the great delight of the messenger and slave of the Emperor of all the Russias. I mounted the charger, slung on the rifle, adjusted the wallet to the saddle, buckled on the belt, and laid the spear in rest,—a boar's hide rest, nicely fastened on the right thigh of the inex, and I declare to you the spear stuck out far enough to run through a half a dozen bears before the charger could come up to one of them. I could not resist the temptation of charging on a young pig, which was mumbling a frozen turnip in my landlady's farm-yard, so I rode furiously at him, the pony's feet ringing on the frozen snow—

ERRO.—

Quadrupedante putrem sonitu quatit ungula campum.

Rus. The little half-starved *Porcites*, supposing I was in earnest, bolted through a double window into the kitchen, which did immense mischief, for I afterwards heard that the whole winter's stock of eggs and small beer was frozen solid while the cook was hunting about for something to stuff in the hole. But to the tale. I started with five other hairy centaur-looking fellows, as beautiful as myself, and as the day was clear, the snow solid, the beasts fresh, and I possessed enough Russ to hold sweet converse with my companions, the ride was far from unpleasant. Before night we reached a square building, of considerable size, built expressly for these occasions, and consisting of four bare walls, with a few narrow slits for windows, and a hole in the roof; into this hut we turned, horses and all, lighted a fire in the middle, fed our horses and ourselves, spread our furs, and prepared for rest, having first carefully fastened the immense door. *Salvator Rosa* or *Rembrandt* would have immortalized us had they had the opportunity. My companions were most or all asleep, when a wild shriek of horror or fright burst from all the horses at once,—it seemed to crack one's ear-drums, and mine even now tingle with the recollection. The Cossacks sprung on their feet: then came the clicking of the rifle-cocks, and then



a howl without as the unanimous voice of a thousand furies. The slits were manned, and the rifles cracked one after another, and at each report a new howl arose. I was not backward at the sport when I understood it. The moon had risen and made it as light as day; the wolves were dancing and jumping about I should think by hundreds, and so close, that it was impossible to miss them. After every crack, whilst the howl of anguish or rage died away, the puff of smoke sailed off with the wind among the trees of the forest, compact as a balloon, but unimpeded by the boughs. Two hours passed in this way until all had fallen or fled; and what is remarkable, when one of them fell, two or three of these famished and ravenous wretches instantly began to gorge on him,—these became victims in their turn,—and many died with the flesh of their half-living companions still in their mouths!

ERRO. Horrible!

RUS. As we resumed our journey the next morning, I was glad to get away and lose sight of the bloody snow; the long tracks which some poor creatures had made, as they vainly attempted to fly from the death they carried with them, made me feel some compunction for the deed.

ENT. They would have felt but little for you, I imagine, had they laid hold of you.

RUS. I reasoned so, and satisfied myself.

ENT. Mr. Grey tells me they are a positive pest, nightly prowling about the farm-yards and courts, even in the environs of St. Petersburg.

RUS. The bears live through the winter entirely in their dens, never coming out at all or eating any thing, but subsisting entirely by sucking their paws. The old father and mother bear, and often five or six young ones of different sizes and ages, live together in one den, which is always under the largest tree they can find; as the snow falls, the hole of their dens very often gets blocked up, and then they set to work and clear it out again, always keeping it open as a breathing hole, so the breath of all of them must come out through it; and as it mounts up among the branches of the trees it freezes and makes little icicles; these in time grow larger and longer, till they all join into one which reaches down to the surface of the snow, on which it rests and forms a huge upright pillar, which is pointed at top, and, as the breath continues to



curl up, grows in size as well as in height, sometimes reaching sixty feet, and being visible at a distance of two or three miles. In the course of a few hours after we started the second day we found two of these pillars; the finders then marked the stems of fir-trees as we passed along, so as to insure the finding of them again without any trouble, and we got back before night to the hut of the wolf slaughterer.

ERRO. And did they visit you again?

RUS. Which? the *manes* of the departed pack, or their companions that escaped? Ay! (*Erro smiled blandly.*) We heard them howling at a distance, but saw none; I had, however, the good luck to bring down an enormous elk, as he was gamboling by at a three-quarter gallop, and in the morning, when we turned out, he was devoured all except the horns and a part of the skull, which I brought home as a trophy.

ERRO. What do they measure?

RUS. Seven feet one inch and an eighth from tip to tip.

ENT. Less than the extinct Irish elk: *that* spans eleven feet and three-eighths of an inch.

RUS. What giants there must have been on the earth in those days! Mammoths big as houses; crocodiles as long as the monument, and flying, fiery, scaly dragons, horrible enough to make one shudder: think of their toothed bills!

ERRO. *Pterodactylus.*

RUS. The same: geology has disclosed wonders.

ERRO. It has, indeed; I used to underrate it, but I have read Charles Lyell's book now, and I have altered my opinion;—but we are losing sight of the bear-hunt.

RUS. O the rest is not worth telling; the pomp of the court, and parade of wealth and splendour, of gold, and green, and ermine, and all manner of furs, you may imagine;—then the old father bear issues from his den and stands upright on his hind legs like a human bear; then the firing of rifles, often twenty or thirty before he drops on all-fours; then the spattering of his blood, glistening in the languid sunshine, as it drops on the snow; then his bounding like a calf up to the imperial retinue; then his rearing up again for the attack; then the cleaving of his head by a peasant with an axe; then his exit from the strife, interspersed with an account of his invincible courage, his stoical endurance of pain without a whisper of repining, and the excellence of his hams, scientifically cured;

and all this, repeated, with slight variation, about fourteen times, would furnish you with a very tolerable idea of an imperial bear-hunt.

ENT. What sort of a man is the Emperor?

RUS. A prince; all the people love him; he goes out every where without guards or servants, often with the Empress and his children, and the people just take off their caps when they see him, and sometimes the peasants hurra him. He is a good-looking man, has a fine open countenance, a commanding forehead, and wears large moustaches. He always dresses in the usual green coat and epaulettes of an officer in the army, without any particular distinguishing mark, and—*(the clock strikes the first stroke of twelve, and Rusticus vanishes.)*

ERRO. He is gone.

ENT. And for ever.

ERRO——

As the dew on the mountain,  
As the foam on the river,  
As the bubble on the fountain.

ENT. And what say you now; are you convinced?

ERRO. It is passing strange!

ENT. These are things, Erro, which, like the cloud shadow transversing the mountain side, pass over us and are forgotten, or seen through an avenue of years, are but dimly remembered.

ERRO. O never, whilst memory retains her seat, can time dim the impression of such a scene as that which we have witnessed.

ENT. A wonder ceases by becoming constant.

ERRO. I felt not the full force of this until it had past.

*(Exeunt.)*



ART. XXXVIII.—*Essay on the Classification of Parasitic Hymenoptera, &c.* By A. H. HALIDAY, ESQ. M. A.

(Continued from p. 276.)

FAM.—CHALCIDES.

Trib. 2<sup>da</sup>.—SPALANGIÆ.

*Tarsi pentameri. Palpi maxillares bi-articulati. Caput nutans longius quam latius. Antennæ prope os insertæ.*

GEN. I.—SPALANGIA. Latr.

*Caput ovatum, anticè attenuatum margine bisinuato, fronte depressa. Oculi villosi. Antennæ capitis margini antico insertæ, remotæ, 10-articulatæ, — maris filiformes articulo 3<sup>to</sup>. elongato; — feminæ sensim incrassatæ articulis 3<sup>o</sup>.—9<sup>m</sup>. brevibus, ultimo longiore obtuso. Collare anticè attenuatum. Abdomen ovatum petiolatum.*

Caput fere rostratum, margine antico bisinuato s. trilobo os obtegente. Frons latè depressa, plagâ oblongâ planiusculâ in fundo discretâ : ocelli tres in triangulum positi, postici occipitales : oculi mediocres ovati villosi : antennæ—*feminæ* longitudine thoracis, scapo lineari plusquam trientem antennæ longitudinem attingente, pedicello clavato longiore quam articulo 3<sup>o</sup>. flagelli articulis longitudine decrescentibus et latitudine crescentibus, ultimo præcedentibus 2 simul sumtis longiore, oblongo apice rotundato ; (antennæ reverâ 12-articulatæ sunt sed tres apices arcuatis connatis unice speciem faciliè exhibent)—*maris* thorace longiores, scapo quadrantem longitudinem æquante, pedicello parvo, articulo 3<sup>o</sup>. elongato lineari, sequentibus 6 ovatis aut oblongis pedicelli longitudine, ultimo rursus longiore : mandibulæ oblongo-trigonæ apice emarginatæ : mentum obconicum subcompressum, labium breve obtusum integrum — palpi biarticulati articulo 1<sup>mo</sup>. clavato, 2<sup>do</sup>. ovato : maxilla scapo gracili arcuato, lobo lato subovato—palpi labialibus dimidio longiores articulo 1<sup>mo</sup>. clavato, 2<sup>do</sup>. longiore et graciliore : thorax capite duplo longior et in medio latior, antice constrictus, postice truncatus : collare angustius crateriforme antice attenuatum : mesothoracis scutum anticè globoso prominens collari insertum, lobi humerales discreti globoso prominuli : paraptera lata trigona in medio dorsi conniventia : scutellum planum basi angulatum apice arcuatum, lineâ transversâ profunde punctatâ bipartitum et pari modo a scuto metathoracis discretum : metathorax subquadratus angulis posticis obtusè dentatis : scutello

declivi, undique marginato, cordiformi, longitudinaliter canaliculato: petiolus descendens cylindricus striatus, *mari* longior: abdomen ovatum convexum, thorace fere brevibus et vix angustius, apice obtusum; aculeo brevi valido, parum compresso, desuper exerto: segmenta 2 anteriora longitudine subæqualia, primum basi fossulatum carinulis lateralibus antrorsum productis, 3<sup>um</sup>. maximum, reliqua brevissima linearia: coxæ magnæ compressæ: femora utrinque attenuata: tarsi tibiis breviores, articulis intermediis minutissimis, metatarsis antico dilatato, posterioribus elongatis: alæ anticæ nervo subcostali<sup>a</sup> dimidiato (*sc.* humerali a margine parum remoto et ulnari longitudine subequalibus) cubito brevissimo perparum dilatato, radio mox abrupto vix illo longiore: posticæ nervo subcostali tenui ultra medium costæ abrupto.

This genus has a slight resemblance in habit to *Megaspilus* as the following to *Microps*.

Sp. 1. Sp. hirta. *Capite thoraceque fere totis punctato reticulatis confertim villosis.* ♀ (Long. corp. .14; alarum .2).

Caput obscure æneum antice magis attenuatum quam in sequente, totum confertim crassè punctatum et villosum, plagâ intermediâ frontis tantum lævissimâ glabrâ: antennæ nigræ quam in illâ longiores et minus incrassatæ, articulo 3<sup>io</sup>. parum brevior quam 2<sup>do</sup>: thorax obscurè æneus: collare, mesothoracis scutum et humeri confertim punctati, scuti tantum margine antico levigato: paraptera et scutellum vagè punctata, hoc apice parciùs: metathoracis latera rugoso-punctata, scutellum lævissimum marginibus et canaliculâ mediâ crenatis: squamulæ fusco-ferrugineæ: alæ dilute ferrugineæ nervis fuscis: abdomen et pedes ut in sequente.

Taken in England; I forget the particular spot.

Sp. 2. Sp. nigra. *Capite punctulato (fronte lævissimâ), et thorace anticè suturisque punctato, sparsim pubescentibus.* ♂ ♀ (Long. .1±; alar. .15±.)

*Spalangia nigra.* *Latr., Spin., Dalm., &c.*

Caput et thorax nigra nitida viridi s. æneo micantia: caput vage punctulatum pubescens, fronte latè depressâ lævissimâ glabrâ:

<sup>a</sup> As the variations of the subcostal nervure afford some useful divisional characters, I have employed the following terms to distinguish its parts:—

1. The interior portion distinct from the rib I call Humeral.
2. The costal portion before the fork . . . . . Ulnar.
3. The costal portion beyond it . . . . . Radial.
4. The descending branch of the fork . . . . . Cubital.

antennæ nigræ ♀ articulo 2<sup>do</sup>. fere duplo longiore quam 3<sup>uo</sup>.: collare, scuti mesothoracici apex et metathoracis latera vage punctata pubescentia, reliqua fere lævia suturis punctatis s. crenatis: abdomen nigrum nitidissimum chalybeo micans, apice pubescens: pedes nigri nitidi, tarsis flavo-ferrugineis apice fuscis: alæ hyalinæ s. lutescentes nervis fusco-ferrugineis.

Tolerably abundant throughout both islands, in pastures and marshes.<sup>b</sup> Varies much in size, more frequently falling short of the dimensions given, (especially the males), the smaller individuals are also blacker and smoother.

GEN. II.—LÆSTHIA. *Haliday.*

*Caput oblongo quadratum, margine orali utrinque et fronte anticè mucronatis. Oculi minuti glabri. Antennæ infra mediam faciem insertæ remotæ, — feminæ 9-articulatæ clavatæ, — maris 10-articulatæ ante apicem incrassatæ. Collare anticè attenuatum. Alæ fere nullæ. Abdomen subsessile ovatum depressum.*

Caput magnum anticè haud attenuatum, ore prominulo, margine supra mandibulas utrinque mucronato: frons leviter depressa carinulâ media elevatâ, inter antennas mucronatâ: ocelli 3 in triangulum positi, postici occipitales minutissimi, in ♀ inconspicui: antennæ — *feminæ* longitudine thoracis, scapo trientem longitudinem adequante, pedicello clavato longiore quam articulo 3<sup>uo</sup>. sequentibus subglobosis sensim crassioribus ultimo longè maximo ovato-acuminato; — *maris* paulo longiores pedicello minore, flagello sensim incrassato, articulis 9<sup>mo</sup>. 10<sup>mo</sup>. rursus angustioribus arcetè connatis, 10<sup>mo</sup>. longiore apice attenuato: mandibulæ breves subquadratæ apice inæqualiter denticulatæ: labrum et maxillæ fere quales *Spalangia*: palpi labiales biarticulati, articulo 1<sup>mo</sup>. clavato, 2<sup>do</sup>. utrinque attenuato—maxillares longiores conformes: thorax oblongus capite longior et angustior: collare crateriforme antice attenuatum: mesothorax quadratus, scuto transverso humeris minutissimis, scutello transverso subquadrato, parapteris minutissimis valde remotis: alæ scutello haud longiores decumbentes coriaceæ: metathorax brevis constrictus: abdomen thorace longius et latius, (præsertim in ♀,) ovatum subdepressum, aculeo exerto brevi subconico parum compresso: pedes quam in *Spalangia* breviores (haud saltatorii?); coxæ et femora

<sup>b</sup> "In excrementis humanis."—*Spinola.*

lata compressa : tarsi tibiis vix breviores articulis 1<sup>mo</sup>.—4<sup>um</sup>. longitudine decrescentibus, metatarso antico haud dilatato.

The wings being reduced to rudiments, the parts of the thorax connected with these organs are very minute in this genus. It is nearly allied to *Spalangia*, and with it may be considered as forming a typical group,<sup>c</sup> from which *Pirene* recedes by its peculiar trophi and compressed aculeus.

Sp. 1. *L. vespertina*. *Luteo testacea dorso æneo micans oculis et antennis apice fuscis*. ♀ ♂ (Long. ♀ .1.)

*Spalangia vespertina*.—*Curt. G.*

Vertex atque mesothoracis et abdominis dorsum obscuriora et æneomicantia : pedes pallidiores.

On midsummer evenings I have twice taken females of this singular little insect, wandering over the leaves of a book which I was reading. Another time I found one lurking among the florets of *Taraxacum*, as if for shelter from the mid-day sun. The only male I have met with was drowned in a basin of water.

### GEN. III. PIRENE.—*Haliday*.

*Caput ovatum, ore prominulo, fronte canaliculatú. Oculi magni. Antennæ versus os insertæ, breves, 10-articulatæ, clava magna ovata 3-annulata. Collare transversum. Abdomen sessile compressum.*

Ocelli tres, in triangulum positi, postici occipitales minuti : oculi magni ovati pubescentes : frontis canalicula profunda in verticem fere elongata, antrorsum bifurca : antennæ capite longiores, scapo elongato lineari aut dilatato, pedicello crasso clavato, articulis flagelli inferioribus brevissimis, ultimis 3 clavam latam ovatam constituentibus : labrum membranaceum, transversum rotundatum, subtiliter ciliatum : mandibulæ oblongæ apice latæ acutè 4-dentatæ : mentum obconicum, labium elongato-conicum tenue—palpi minutissimi punctiformes, fere obsoleti : maxilla lata compressa, lobo trigono attenuato, dorso incrassato indistinctè

<sup>c</sup> Though I have not seen the genus *Theocolax* (Westwood), I have little doubt that it is to be referred to this tribe, and very near the present. The club of the antennæ, in that 3-jointed, is here solid ; but from analogy and a comparison of the male it must be considered to represent three joints, which might perhaps be separated by maceration. The face in that genus is described as unarmed ; in this there are three sharp points.



articulato—: palpi lobo longiores articulo secundo longiore et graciliore :<sup>d</sup> thorax latitudine capitis et fere duplo longior, ovatus subdepressus : collare transversum : mesothoracis paraptera remota minuta humeris arcetè annexa : scutellum ovatum basi truncatum, lineolâ transversâ (ordinariâ) subtilissimâ bipartitum, cum scuto metathoracis continuum : metathorax brevis declivis scuto lineari arcuato, scutello lævi : abdomen sessile compressum, thorace angustius ;—*maris* dorso elevatum carinatum, apice truncatum ;—*feminae* dorso nonnihil deplanatum aculeo compresso exerto : pedes quam in *Spalangia* breviores : tarsi tibiis parum breviores articulis a 1<sup>mo</sup>. in 4<sup>m</sup>. longitudine decrescentibus, metatarso antico haud dilatato : alæ anticæ apice valde rotundatæ, cubito brevissimo, radio ad ejus basin statim evanescente : posticæ angustiores quam in *Spalangia*.

This genus has less of the peculiar habit of its tribe than the others. On a cursory view it might be referred to the *Eulophi*, with which it agrees tolerably well in the wings and thorax ; but a closer examination will shew its near accordance with *Spalangia*. A few of the *Pteromali* approach it by a compressed abdomen and the low insertion of the antennæ ; such is *Macroglenes* (Westwood), and still more an unpublished subgenus in my cabinet. The males of *P. varicornis* so much resemble certain *Eulophi* with similar antennæ, (Genus *Ceranisus*, Walker) that they might, without examination, be confounded in one group.

Sp. 1. *P. varicornis*. *Antennarum articulis* 3<sup>o</sup>.—7<sup>m</sup>. *brevissimis latitudine sensim crescentibus, maris scapo dilatato ; feminae aculeo brevi.* (Long. corp. et aculei .08 ; alar. .12).

*Pirene varicornis.* *Curtis G.*

Nigra nitida : capite thoraceque viridi- abdomine chalybeo-micantibus : mandibulæ ferruginæ : antennæ feminae scapo lineari, clavâ magnâ ovatâ abruptâ ;—*maris* scapo dilatato ovato, articulis flagelli inferioribus crassioribus et clavâ oblongâ minore quam in illa : abdomen *feminae* lanceolatum, capite cum thorace longius, aculeo fere quadrantem longitudinem abdominis æquante : genua et tarsi fusco-pallidi, hi apice obscuriores, (tibiæ anticæ nonnuncquam totæ posteriores basi et apice pallidæ,) alæ obscure hyalinae, angustiores quam in reliquis, ulnâ longiore, cubiti apice vix dilatato.

<sup>d</sup> Sp. examined—*P. varicornis*.



The female is commonly to be found on the flowering panicles of *Anthoxanthum*; the male is very rare.

Sp. 2. *P. chalybea*. *Antennarum articulis* 3<sup>o</sup>.—6<sup>um</sup>. *sensim crescentibus* .7<sup>mo</sup>. *abrupte majore*; *feminæ aculeo brevi*. (Long. corp. et acul. .08; alar. .13.)

*Pirene chalybea*. *Curtis, G.*

Præcedenti concolor, fronte ænea: statura hujus vero crassior: antennæ nonnihil longiores, scapo in utroque sexu lineari, articulis 3<sup>o</sup>.—6<sup>um</sup>. transversis, in ♀ brevioribus, sensim crescentibus, 7<sup>mo</sup>. illis majore sed 8<sup>um</sup> haud adequante: abdomen *maris* ut in præcedente; —*feminæ* brevius, oblongum dorso magis deplanatum, aculeo crasso vix sextantem abdominis longitudinem attingente: pedes paulo crassiores: alæ candido-hyalinæ, cubiti apice in punctum dilatato.

Not uncommon upon the boughs of larch trees and the flowers of *Senecio Jacobea*, late in the summer.

Sp. 3. *P. eximia*. *Antennarum articulis* 3<sup>o</sup>.—6<sup>m</sup>. *sensim crescentibus*, 7<sup>mo</sup>. *abrupte majore aculeo elongato*. ♀ (Long. corp. et acul. .1; alar. .12.)

*Feminæ* præcedenti simillima: antennæ nonnihil longiores: abdomen etiam longius, aculeo graciliore ejus dimidiam longitudinem superante.

Sp. 4. *P. graminea*. *Antennarum articulis* 3<sup>o</sup>.—6<sup>m</sup>. *minutissimis*, 7<sup>mo</sup>. *maximo*; *aculeo brevissimo* *Femina*. (Long. .06; alar. .1.)

Præcedentibus minor brevior, nigra nitida chalybeo micans, tarsis fusco-pallidis: pedes quam in illis graciliores: antennæ breviores articulo 7<sup>mo</sup>. vix minore quam 8<sup>vo</sup>: abdomen *feminæ* vix thoracis longitudine, ovatum compressum, aculeo brevissimo: alæ hyalinæ nervis tenuissimis, cubiti apice dilatato.

On grass in summer; but rare.

### *Trib. 3<sup>ia</sup>.—EULOPHI.*

#### *Tarsi tetrameri. Palpi biarticulati subconici.*

Or the genus *Entedon* of Dalman, excluding *Aphelinus*; but his generic character is too exclusive, as the aculeus is exerted in several, and the number of joints in the antennæ varies up to eleven.

Subgen.—*OMPHALE*. *Haliday*.

*Antennæ 7-articulatæ, flagello*—*maris elongato lineari, verticillato-piloso, articulis æqualibus*;—*feminæ filiformi articulis apicis longitudine decrenentibus ultimo minuto acuminato. Alæ anticæ cubito brevissimo radio statim abrupto. Abdomen sessile maris oblongum*;—*feminæ acuminatum rimâ ventrali in basin fere elongatâ, aculei apice exerto.*

Vertex linearis, frons latè impressa: antennæ *feminæ* scapo lineari, pedicello clavato, brevior quam articulo 3°. reliquis longitudine decrenentibus discretis ultimo minuto acuminato;—*maris* scapo dilatato, pedicello brevissimo, flagello elongato lineari compresso, articulis singulis apice attenuatis: trophi fere quales subgeneri *Eulopho* sc. mandibula lata trigona apice tridens: mentum subcompressum, labium plicatum apice attenuatum incisum: palpi articulis subequalibus, 2<sup>do</sup>. apice attenuato: maxilla lata compressa, lobo attenuato-trigono intus membranaceo dorso firmiore indistinctè articulado: palpi labialibus conformes parum longiores: thorax ovatus: collare brevissimum: mesothoracis paraptera remota minuta humeris arcè annexa, scutellum rotundatum leniter convexum, lincolâ transversâ subtilissimâ vel obsoletâ: metathorax brevis declivis: abdomen thorace angustius sessile segmenti primi puncto petiolari membranaceo incisum;—*maris* lineare obtusum thorace parum longius;—*feminæ* dimidio-triplo longius, lanceolatum dorso deplanatum, ventre carinatum, usque sub segmentum dorsale 2<sup>um</sup>. rimâ ventrali fissum: aculeus longus apice et valvulis breviter exertis: alæ anticæ ulnâ elongatâ, radio ultra basin cubiti brevissimi vix producto: posticæ ulnâ tenui duplicatâ: pedes graciles.

From *Eucercus* (*Walker*), which it somewhat resembles, it may be distinguished by the antennæ, being but 7-jointed, not clavate in the female, with the joints after the pedicel of equal length in the male; by the less convex scutellum without longitudinal lines, the shorter aculeus and the cubital nervure shorter and nearer the tip of the wing.

Sp. 1. *O. salicis*. *Viridi-aurea alis candido-hyalinis, antennarum scapo basi flavo, pedibus luteo fusque variis*  
♂ ♀ : *abdomine medio atro purpureo* ♂ : *ant. fasciis atro*

<sup>c</sup> Sp. examined—*O. salicis*.

*purpureis segmento ultimo longissimo* ♀. (Long. ♂ .8; ♀ .12; alar. .17.)

*Omphale salicis*.—*Curt. G.*

Abdomen feminae thorace triplo longius segmento ultimo trientem longitudinem occupante; punctum petiolare pallidum: pedes quam in reliquis longiores valde graciles; coxae virides, trochanteres, apex femorum, tibiae et tarsi lutei, illae medio hi apice obscuriores: alarum nervi dilute fusci.

This brilliant species is found on willows (*S. Helix* et *vitellina*); the females are fond of basking in umbelliferous flowers in strong sunshine. Among the remaining species none of the females have the last segment so conspicuously elongated as the present, which I regard as the type.

*Trib. 4<sup>a</sup>. — ?*

*Tarsi trimeri. — — ?*

GEN. I.—*CALLEPTILES. Haliday.*

*Antennae flagello lato compresso piloso haud distinctè clavato.*

*Alae anticae latissimae setulis microscopicis seriatim ordinatis, nervo subcostali brevi lato sigmoideo. — — ?*

Caput transversum, vertice lineari; oculis parvis rotundis distantibus: ocellis 3 in triangulum: fronte latâ impressâ: antennae infra mediam faciem insertae, longitudine thoracis, scapo oblongo, pedicello clavato, anello unico<sup>f</sup> minutissimo, flagello scapo paulo longiore, lato compresso pilosissimo articulis contiguis parum distinctis (7?), ultimis tribus arctius connatis: thorax breviter ovatus, convexus, collari brevissimo; mesothoracis humeris discretis, parapteris remotis subovatis, scutello brevi rotundato convexo; metathoracis scuto discreto lunato, scutello leviter canaliculato: abdomen longitudine thoracis, sessile obtusè-trigonum dorso deplanatum: pedes breviusculi, tarsi trimeris articulis subaequalibus: alae anticae extrorsum latissimae apice rotundatae; nervus subcostalis dilatatus bisinuatus sinu antico costam modo contingens, dehinc in discum inflexus, apice bifurcus, vix trientem alae longitudinem accedens; lineola setigera exinde fere trans alam ducta aream baseos glabram cingit; setulae reliquae alarum dispositae sunt in lineas ex hac areâ radiatim excurrentes in marginem

<sup>f</sup> The joints of the antennae following the pedicel are sometimes abruptly smaller than the rest, and commonly overlooked in the computation of the joints. It is to such that I apply the distinctive epithet *annelli*.

exteriorem subtiliter ciliatum : alæ posticæ lineares angustissimæ ciliatæ, nervo subcostali brevissimo tenui.

Sp. 1. *C. latipennis*. *Nitide fuscus alis hyalinis antennis ore pedibus abdominisque basi lutescentibus* ♂. (Long. .025; alar. .07.)

*Microma latipennis* . . . *Curt. G.*

[*Trichogramma evanescens*. *Westwood. Lond. & Edinb. Phil. Mag. Third Series. Vol. II. No. XII. p. 444?—ED.*]

Caput subtus et antennæ obscure lutescentes; abdomen antice pedesque pallidiores; vertex et thorax fusca nitida; oculi rubri: alæ hyalinæ radice obscuriores, nervo subcostali fusco.

Bred from subcutaneous larvæ in the leaves of *Aquilegia*: J. Curtis, to whom I owe the species.

The trimerous tarsi, and peculiar wings, so decidedly separate this insect from the preceding tribes, that I could not satisfy myself of its affinity to any one of them; and have therefore preferred the confession of ignorance, implied in the leaving it as an insulated species. Where there is such marked disparity of typical characters, I am inclined to distrust slighter resemblances, or I might have supposed a relation to the *Eulophi*. The trophi would probably determine the point, but I have not attempted their investigation, as Mr. Curtis possesses only one complete specimen besides the one he most liberally gave to me.

*Trib. 5<sup>ta</sup>.—MYMARES.<sup>6</sup>*

*Caput transversum areolatum. Antennæ supra mediam faciem insertæ, graciles elongatæ fractæ, feminis capitatæ. Os epalpatum. Alæ angustæ ciliatæ, nervo subcostali brevissimo, cubitali nullo.*

Areolarum capitis hæc est circumscriptio: vertex anticè et utrinque lineolis elevatis terminatur lateralibus posticè inflexis aut cum margine præciso occipitis coeuntibus: frons pari modo secernitur

<sup>6</sup> Or the genus *Mymar*, E. B.; the genera here distinguished being disposed under it as subgenera. For an arrangement founded on other details, see Mr. Walker's divisions given in E. B. I suppose Genus 189 (unnamed) of Stephens's Catalogue also to be equivalent to my tribe, and his *Platygaster ovulorum* not to be the species for which I have cited *Ichn. ovulorum*, L.—otherwise that indication is determined by its representative, *Ichn. punctum* (*Shaw*) to the subgenus *Anaphes*.

a regione oculorum, lineolâ aliâ insuper sub antennis arcuatim ductâ. Quo vero crassius caput est et vertex planior eo magis emicat hæc structura: nonnullis quorum caput brevissimum est (e.g. *Anagro*) vertex antrorsum declivis fere in lineæ speciem contractus et antennæ inferiùs insertæ videntur: antennarum radícula sæpe exserta tenuis, capitulum *feminarum* plerunque exannulatum, rarius biarticulatum (Eustocho): mandibulæ trigonæ apice denticulis 3: maxillæ unâ cum labio ovato-circumscriptæ: palpi desunt:<sup>h</sup> thoracis forma variat: mesothoracis lobi humerales discreti; paraptera minuta valde remota; scutellum subtiliter transversè bipartitum, plerisque cum scuto metathoracis continuum: alæ valde angustæ lineares vel anticæ obovatæ nunquam trigonæ: nervus subcostalis tenuis quadrantem alæ longitudinem vix attingit sæpius adhuc multo brevior, radio et cubito nullis, ulnâ lineari brevi, vel etiam in punctum contracta: alarum margo plerisque pulchrè ciliatus s. plumatus: abdomen sæpius ad instar Cynipedum tereti-compressum, segmentorum dorsalium marginibus inflexis ventrem obtegentibus: venter carinatus arcuatim ascendens: aculeus gracilis crimæ ventrali repositus: pedes elongati graciles saltatorii, tarsis pentameris aut tetrameris.

This tribe comprises the very atoms of the order Hymenoptera. Their hues are mostly black or yellowish, unadorned by metallic splendour: the plumed and iridescent wings of many are beautiful objects for the microscope. The males, by their very long and slender antennæ, (sometimes more than twice the length of the body,) resemble Ichneumons in miniature. The females oviposit in the eggs of other insects, from which the tiny parasite emerges only in the perfect state, a single butterfly's-egg often nourishing the transformation of many individuals. The species occur from the earliest spring upon the herbage of groves and meadows, walking and leaping; most copiously on warm still days of autumn, when a host of *Lepidoptera*, &c. are engaged in laying the latest brood of eggs to be hatched the following spring. With regard to their position in the system, both Stephens and Curtis refer them to the *Proctotrupidæ*; and such high authority makes me very diffident in proposing for them a position nearer to the *Chal-*

<sup>h</sup> Species examined,—*Ooetonus insignis*, *O. vulgatus*, *O. litoralis*, *Polynema ovulorum*. In a living specimen of *Polynema ovulorum*, I have seen at the back of the maxilla, in the ordinary place of the palpus, a minute shapeless tubercle, which becomes contracted, and disappears in dried specimens.

*cides*:<sup>i</sup> to which I have been determined principally by an examination of the parts of the thorax,<sup>k</sup> and the position of the petiole, which however presents a marked peculiarity.<sup>l</sup>

GEN. I.—OOCYTONUS. *Haliday.*

*Antennæ maris* 13-articulatæ, *femine* 11-articulatæ *capitulo exannulato. Tarsi pentameri.*

A. *Abdomine petiolato.*

His statura *Polynemæ* fere, sed brevior abdomine magis rotundato, pedibus brevioribus, alis breviter ciliatis, ulnâ brevi lineari: quoad reliqua, caput thorax abdomen alæque satis conveniunt: antennæ *femine* scapo elongato utrinque attenuato, pedicello lato compresso, articulis flagelli longitudine subæqualibus aut intermediis longioribus, exterioribus sensim incrassatis; undecimus major ovatus s. oblongus;—*maris* articulis flagelli linearibus subæqualibus.

<sup>i</sup> I do not mean to venture an opinion, that the aggregate group is co-ordinate with those which rank as families in the rest of this order. Till the contents of the *Pupivora* are more fully investigated, the value of its sections must remain exposed to doubt. When the natural groups shall have been recognized and examined in detail, we may hope that some systematist of comprehensive mind and adequate knowledge will assign them respectively to their proper grade, perhaps a higher than is yet conceded to them. The *Chalcides* and *Oxyuri* seem each to embrace more than one equivalent to such families as the *Ichneumones*, *Chrysidæ*, and *Gallicolæ*. As to the *Fænidae*, the chain is so interrupted from the small number of genera, that it might be rash to divide it. The family besides is, in its present form, far too convenient a receptacle for all stray articles to be lightly resigned. I am obliged to enrich it further at the expense of the *Ichneumones* with two genera—*Stephanus* and *Plancus*—which *Pelecinius* and *Fænus* seem respectively to reclaim; of the latter I am more doubtful; for the other I have the authority of Jurine and Spinola.

<sup>k</sup> Important as the structure of the aculeus is to the functions of these Hymenoptera, its variations are to be admitted with great caution into the characters of the higher groups, the more obvious differences often depending less on the typical composition than on its greater or less development in length. Parallel variations seem to be often reproduced in distinct families. Perhaps there is no one character which has been more generally fixed on to distinguish the *Gallicolæ* than the spiral aculeus, but in *Anacharis nitidula*, *Dalm.* there is nothing to claim such an epithet *κατ' ἐξοχήν*; the aculeus is simply subulate, shorter than the last ventral segment in which it is contained, and it would demand a sharp sight to single out any palpable difference in its form from the same organ of *Cinetus gracilis*.

<sup>l</sup> It may be added, that there are certain resemblances between species of this tribe and the genus *Evania*, but so partial that I have not ventured to entertain any conjecture as to their significance or tendency.



Sp. 1. *O. insignis*. *Niger alis obscurè hyalinis, antennis basi pedibus et petiolo flavis ♂ ♀; capitulo antennarum elliptico ♀.* (Long. .06; alar. .15.)

*Polynemæ ovulorum* valde similis: antennæ feminæ articulis a 3<sup>to</sup>. in 10<sup>m</sup>. longitudine subequalibus, exterioribus sensim paulo crassioribus, 11<sup>mo</sup>. magno fere oblongo.

Taken near London.

Sp. 2. *O. vulgatus*. *Niger alis obscurè hyalinis, antennis basi pedibus et petiolo flavis ♂ ♀; capitulo antennarum ovato ♀.* (Long. .04; alar. .1.)

Præcedenti similis at longè minor præsertim brevior; antennæ breviores basi obscuriùs flavescentes, ♀ flagello extus sensim incrassato, articulo 11<sup>mo</sup>. longe maximo ovato.

Very abundant on grass near trees.

Sp. 3. *O. hemipterus*. *Niger alis abbreviatis antennis basi pedibus et petiolo flavis capitulo antennarum ovato ♀.* (Long. .04.)

Præcedentis statura et magnitudo: antennæ paulo breviores et apice crassiores: alæ vix longitudine thoracis.

In the same places with the last, but rare.

#### B. *Abdomine subsessili.*

Discrepant hi ab *Oöctonis* sectionis 1<sup>ma</sup>. capite oblatiore, vertice fere lineari; collari brevior; abdomine haud petiolato, infrà præsertim basi valde compresso: antennis *maris* brevioribus crassiusculis, *feminæ* capitulo angustiore.

Sp. 4. *O. litoralis*. *Piceo niger alis ceruleo-hyalinis, antennis basi et abdomine antice sulphureis pedibus concoloribus plus minus infuscatis ♂ ♀.* (Long. .04; alar. .11.)

Antennarum scapus et pedicellus lutescentes: abdomen posticè nigricans: pedes anticè sulphurei femorum basi fuscâ, postici vel concolores, vel fuscî geniculis tantum luteis; etiam prothorax *maris* nonnunquam subtus lutescit.

Common on the sea-coast near Holywood.

Sp. 5. *O. pictus*. *Sulphureus alis subhyalinis, antennarum flagello capite thoracis maculis anoque nigricantibus ♀.* (Long. .033; alar. .09.)

Statura fere præcedentis: antennæ breviores crassiusculæ: collare, margo anticus scuti, punctum humerale utrinque et paraptera



fusca; scutellum fuscum lateribus flavum: metathorax cum postpectore nigro-fuscus: femora medio, tarsi apice obscuriores. Taken near London.

GEN. II.—LITUS. *Haliday.*

*Antennæ* feminae 9-articulatae capitulo exannulato. *Tarsi pentameri.*

Characteres fusiores petendi sub singulis speciebus.

Sp. 1. *L. cynipseus.* *Niger capite thoraceque opacis, alis fuscis longè ciliatis, pedibus ferrugineis* ♀. (Long. .02; alar. .08.)

Caput et thorax granulato-opaca: frons lata truncata: vertex planus: occiput excavatum: antennæ feminae radiculâ brevissima, scapo longiusculo arcuato utrinque attenuato, pedicello lato compresso, articulis flagelli 6 minutis, 3<sup>tio</sup>. brevior, exterioribus sensim incrassatis subglobosis, ultimo 3 præcedentibus simul sumtis longiore, ovato-acuminato: thorax brevis gibbus: collari brevissimo arcuato; metathorace truncato: abdomen breve sessile metathoraci adpressum, tereti-compressum, ventre carinatum, aculei apice subexerto, (forma fere ut in genere *Cynipede*): alæ lineares anticae paulo latiores undique longe ciliatae: pedes approximati solito crassiores, tibiis anticis clavatis.

Not uncommon on grass near trees.

Sp. 2. *L. dimidiatus.* *Piceus ano concolore, alis lutescenti-hyalinis, antennis basi abdomine pedibusque luteis.* ♀. (Long. .04; alar. .08.)

*Mymar dimidiatus.* *Curt. G.—E. B.*

Huic omnia fere ut in *Oöctonis* sectionis B. modo antennæ 9-articulatae et alæ angustiores sunt: caput oblatum vertice fere lineari, piceum ore lutescente: antennæ luteae apice fuscescentes, articulis flagelli oblongis extres latitudine crescentibus, ultimo oblongo ovato vix duplo majore quam præcedente: thorax piceus scutello rufescente: abdomen subsessile compressum, luteum apice fuscum: pedes graciles lutei: alæ anticae fere lineares breviter ciliatae posticae angustiores longius ciliatae.

This and the preceding may be considered as the probable types of distinct genera, which I have thought it premature to separate without having examined a greater number of species.

GEN. III.—ANAPHES. *Haliday.*

*Antennæ* maris 12-articulatæ, feminæ 9-articulatæ capitulo exannulato. *Tarsi* tetrameri. *Abdomen* subsessile ovoideum.

Caput oblatum vertice fere lineari: frons subimpressa: antennæ feminæ scapo compresso utrinque attenuato, pedecello lato compresso, articulo 3<sup>to</sup>. brevissimo, reliquis subæqualibus latitudine crescentibus, ultimo magno oblongo;—*maris* flagello filiformi articulis subequalibus: thorax breviter ovatus convexus collari brevissimo, scutello ovato, metathorace rotundato: abdomen breve ovoideum subsessile aculeo vix exerto; alæ anticæ latiores, posticæ lineares longius ciliatæ.

Sp. 1. *A. fuscipennis*. *Niger alis fuscis, antennis basi et pedibus pallidè piceis.* ♂ ♀ (Long. .025; alar. .06.)

Perpusillus; antennæ crassiusculæ præsertim *maris*: alæ tenuiter ciliatæ.

The species of this genus are numerous; mostly black, with pitchy or rust-coloured legs, and obscure or hyaline wings: *Ichneumon Punctum*, Shaw (Linn. Trans. IV. Pl. 18, fig. 1.), is to be referred to it. In this species the wings are fringed with longer hairs than ordinary.

GEN. IV.—ANAGRUS. *Haliday.*

*Antennæ* maris 13-articulatæ, feminæ 9-articulatæ capitulo exannulato. *Tarsi* tetrameri. *Abdomen* sessile conico-acuminatum.

Caput valde oblatum vertice lineari, fronte depressâ: antennæ feminæ articulo 3<sup>to</sup>. brevissimo, sequentibus subequalibus ultimo majore oblongo;—*maris* compressæ crassiusculæ articulis flagelli interioribus paulo brevioribus: thorax oblongus depressus, collari parvo attenuato, scutello brevi semiorbiculato; metathorace fere disjuncto, subitò depresso et dorso excavato: abdomen sessile metathoracis dorso incumbens, conicum elongatum, dorso deplanatum aut canaliculatum, ventre compressum carinatum, aculeo breviter exerto: pedes graciles: alæ lineares plumato-ciliatæ, anticæ apice nonnihil dilatatæ rotundatæ: cilia haud ex ipso margine oriuntur sed interiùs unde margo alæ pulcherrimè duplicatus s. striatus extat: nervus subcostalis tenuissimus.

Sp. 1. *A. atomus*. *Pallido fuscoque varius alis hyalinis*. ♀  
(Long. .02; alar. .05.)

*Ichneumon atomus*. *Lim.*

Caput, antennarum apex, prothorax et anus sæpius subfusca: alæ limpidae pulcherrimè ciliatæ.

Upon grass under trees, in autumn; common.

Sp. 2. *A. incarnatus*. *Ruber oculis nigris scutello pallido alis lutescenti hyalinis*. ♀ (Long. .03; alar. .07.)

Huic thorax minus elongatus quam præcedenti; alæ plumatæ quidem sed brevius: antennæ basi et pedes dilutiores, aculeus fuscus.

Not rare in similar places with the last.

Sp. 3. *A. ustulatus*. *Fuscus antennis thoracis disco pedibusque ferrugineis, alis hyalinis*. ♂ (Long. .03; alar. .08.)

Præcedentibus brevior, colore obscuriore; alæ ut in *A. atomo*.

There appear to be other species of this genus with similar mingled shades of pale and dusky.

#### GEN. V.—POLYNEMA. *Haliday*.

*Antennæ maris 13-articulatæ, feminae 9-articulatæ capitulo exannulato, utriusque scapo dilatato sinuato parum elongato. Tarsi tetrameri. Abdomen petiolatum.*

Caput crassiusculum subrotundatum, vertex latè planiusculus: frons subtruncata: antennarum scapus capite vix longior dilatatus sinuatus, pedicellus latus compressus, flagellum *maris* lineare articulis exterioribus longitudine decrescentibus;—*feminae* articulo 3<sup>to</sup>. brevior quam 4<sup>to</sup>. exterioribus sensim brevioribus et crassioribus, ultimo magno ovato: thorax ovatus convexus lævis collari conspicuo, scutello ovato, metathorace rotundato: abdomen petiolatum semicordatum aut fere lanceolatum ascendens, *feminae* apice deplanatum aculeo brevi vel elongato: petiolus ut etiam sequentibus filiformis descendens: pedes longi graciles: alæ anticæ angustè obovatæ ciliatæ, nervo subcostali brevissimo clavato (*sc. ulnâ* fere in punctum contractâ); posticæ lineares longius ciliatæ.

Sp. 1. *P. ovulorum*. *Piceo niger alis obscure hyalinis, antennis basi pedibus et petiolo flavis*. ♂ ♀ (Long. .07; alar. .16, vel minor.)

- Ichneumon ovulorum. *L. S. N.—Fua. S.—Schra. F. B. &c.*  
 Cryptus ovulorum. . *Fabr. S. P.*  
 Mymar ovulorum . *Curt. G.—E. B.*  
 Platygaster ovulorum. *Steph. Cat.? vix.*

Antennæ *feminæ* articulo 3<sup>tio</sup>. longitudine 2<sup>di</sup>.: alæ hyalinæ, fusco-pilosæ et margine longiùs ciliatæ: aculeus subexertus: petiolus coxis posticis longior.—Variat collari utrinque rufescente.

Abundant in summer, destroying the eggs of *Pontia Brassicæ*, &c. Linné and Schrank have each described two species under this.

Sp. 2. *P. pusillus. Nigro-piceus alis obscure hyalinis, antennis basi pedibus et petiolo flavis, antennarum articulo 3<sup>tio</sup>. brevissima ♀* (Long. .04; alar. .08.)

Præcedenti similis at minor et brevior antennis pedibus et petiolo multo brevioribus: alæ minores angustiores parciùs pubescentes et ciliatæ.

Sp. 3. *P. fuscipes. Ater alis hyalinis, antennarum pedicello pedibus et petiolo ferrugineis. ♂ ♀* (Long. .05+; alar. .14.)

Specie primâ robustior, petiolo et pedibus brevioribus; antennæ *feminæ* fere conformes, *maris* crassiores: femora basi, tarsi apice obscuriores; pedes posteriores sæpe fere toti fusci: alæ hyalinæ subtilissimè pubescentes, margine longius ciliatæ.

In similar situations less frequent.

Sp. 4. *P. atratus. Ater alis hyalinis, antennarum pedicello petiolo et pedibus ferrugineis, abdomine subgloboso ♀* (Long. .045; alar. .1.)

Præcedenti simillimus, antennis et pedibus brevioribus, alis angustioribus parè ciliatis; abdomine brevi subrotundato.

Sp. 5. *P. euchariformis. Ater alis hyalinis, pedibus piceis, antennarum pedicello et tarsis pallidis, aculeo elongato, ♀* (Long. .06; alar. .1.)

Abdomen valde angustum dorso lanceolatum, aculeo parum longius: alæ tenuiter ciliatæ: petiolus fusco-ferrugineus: tarsi apice fusci: antennarum articuli 2<sup>dus</sup>. et 3<sup>us</sup>. longitudine pares ut in præcedentibus.

Not rare in similar situations.

GEN. VI.—MYMAR. *Haliday.*

*Antennæ* maris 13-articulatæ; feminæ 9-articulatæ *capitulo exannulato, scapo utriusque elongato lineari. Tarsi tetrameri. Abdomen petiolatum.*

Caput oblato-globosum, vertice latè planiusculo subquadrato, fronte producta obliquè truncata: antennæ elongatæ, *feminæ* scapo longissimo lineari, pedicello lato compresso, articulis 3°. 5°. 6°. 7°. et 8°. brevibus, his sensim crassioribus, 4°. lineari vix brevior quam scapo, ultimo magno elliptico: *maris* adhuc multo longiores scapo lineari arcuato, flagelli articulis exterioribus parum brevioribus: thorax fere ut in *Polynemâ*, collari adhuc majore: abdomen petiolatum semicordatum ascendens aculeo brevi: pedes gracillimi eximiè elongati: alæ anticæ valde elongatæ capillares, apice summo explanatæ, margine longius plumato ciliatæ, lineolâ disci setigerâ longitudinali unicâ: posticæ brevissimæ setacæ nudæ.

Sp. 1. *M. pulchellus. Ochreus antennis apice oculisque fuscis, alis hyalinis apice nigris. ♂ ♀* (Long. 06; alar. .12.)

*Mymar pulchellus. Curtis, E. B.* 411.

Presented to me by Mr. Walker.

GEN. VII.—EUSTOCHUS. *Haliday.*

*Antennæ* feminæ 10-articulatæ *capitulo bi-articulato. Tarsi tetrameri. Abdomen petiolatum.*

Caput transversum, occiput truncatum; vertex latus planus undique definitus transverso quadratus angulis anticis mucronatis; frons truncata: antennæ margini summo frontis insertæ, scapo longiusculo fusiformi, pedicello clavato, articulis sequentibus linearibus, 3<sup>to</sup>. 4<sup>to</sup>. subequalibus, 6°. 7°. 8°. brevioribus incrassatis, 9<sup>mo</sup>. et 10<sup>mo</sup>. capitulum magnum lenticulari-ovatum efformantibus: thorax breviter ovatus valde convexus, collari inconspicuo; mesothoracis scutello et metathoracis scuto continuis, per dorsum longitudinaliter elevatis, lateribus præcis: abdomen petiolatum ascendens semicordatum teres apice acuminatum, aculeo elongato ascendente: alæ anticæ obovatæ longiùs ciliatæ, ulnâ quam in reliquis generibus magis elongatâ; posticæ lineares ciliatæ: (*plura videas sub specie unicâ.*)

Sp. 1. *E. atripennis. Niger capite thoraceque opacis, alis fuliginosis, antennis basi pedibus et petiolo ferrugincis. ♀* (Long. corp et acul. .07; alar. .11.)

*Mymar atripennis*. Curtis, E. B.

Caput thorax et coxæ posticæ granulatæ: abdomen lævissimum nitidum: aculeus abdomine longior: alæ pilosæ lineolâ ambiente crassiusculâ: lunula seu fascia ferruginea internè hylalino limbata sita est transversè prope basin alarum anticarum fere sub medio ulnæ, lineola tenuis subimpressa (s. nervus spurius) ibidem orta usque in marginem exteriorem pone apicem alæ excurrit, leni flexu a costâ discedens.

In autumn, among trees, but very rare.

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ADD.—Of the other genera indicated in this family, *Crantor* is *Choreia*, Westwood; I had considered *Encyrtus ineptus*, Dalman, as the type; *Choreia nigro-ænea*, Westw., seems to approach the genuine *Encyrti*; some of which have little more than rudiments of wings. The identity of *Agonioneurus*, Westwood, with *Aphelinus*, has been already pointed out, (antea page 306). I have deferred giving the characters of the genus *Cea*, (Curt. G. 587,) with the hope of having the opinion of a more competent judge than myself upon its affinities.

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ART. XXXIX.—*Observations on Ignis Fatuus*. By GEORGE WAILES, Esq.

I THINK the surmises of the writer in the Westminster Review, that this natural phenomenon is to be attributed to some luminous insect, are, so far as Britain and northern climes are concerned, without foundation. That any large insect, possessing the property of luminousness, should have hitherto escaped the pursuit of not only the Entomologists of this island, but our numerous and indefatigable brethren on the continent, is, to say the least, very improbable. Our only British *Annulosa* which have the power of hanging out their lights are the glow-worm (*Lampyrus noctiluca*, Linn.), and *Scolopendra electrica*, De Geer. Although Mr. Dilwynn, in his valuable Memoranda relating to Coleopterous insects found in the neighbourhood of Swansea, states, “Nor have I here observed the *small* light in the males,” of the glow-worm,

“ which is always sufficiently obvious near Dover,” no Entomologist requires to be reminded that neither the Apterous female of this beetle, nor the equally wingless *Scolopendra*, can by any possibility perform the vagaries so identified with the very name of “ Will-with-the-Wisp.” No doubt, the insect alluded to by the Reviewer as having been brought to light by the pond-side is meant for the mole cricket, but I do not think, after the vague descriptions and consequent wild-goose-chases with which every Entomologist has been more or less pestered by his non-entomological friends, we ought to allow the surmises of the “ Mudlark” to be entitled to much weight, nor yet the flying, fiery “ dragon-fly” of the “ subsequent examiner.” You ask for facts—the following you may depend upon. I had often heard my father mention an ignis fatuus which he and a friend, “ nunc inter beatos,” saw several years ago, and the notice in your last number caused me to ask for full particulars. They were riding along the road between Hexham and Alston, in the month of May, accompanied by a servant; and in crossing the wild moors, near the place where the counties of Northumberland and Cumberland join, about ten o’clock P.M., were surprised by the sudden appearance of a light within fifteen yards of the roadside. It was about the size of the hand, and its shape, which was oval, very well defined. The light is described to me as more like that of a bright white cloud than of a flame. The place where it appeared was very wet, and the peat moss had been dug out, leaving what are locally termed “ peat pots,” which soon fill with water, affording nourishment to numerous *confervæ* and the various species of *Sphagnum*, which in their turn are metamorphosed into peat. Doubtless these places, during the decomposition of the vegetable matter, give out large quantities of gaseous particles. The light was about three feet from the surface of the ground, and, hovering over the peat pots, moved for the distance of about fifty yards nearly parallel with the road, and then, probably on the failure of the supply of gas, suddenly went out. In order to obviate the question, Was not this the alighting of the insect, supposing it to have been one? I inquired whether the light approached the ground on going out, and find that it did not, but the manner of its disappearance was similar to that of a candle being blown out.

This is the only authentic account I ever had from an eye-



witness who had been so very near to an ignis fatuus ; but when at school, I recollect, from the bedrooms, we used frequently to observe lights at night in a very wet wood, distant about half a mile from the village. Sometimes two or three or even more were seen at one time, and they appeared to wander up and down about the marsh. It may be urged they probably were tallow *ignes fatui* ; but the wood, of nutting notoriety, was too well known to us from its swampy character to be at all inviting for a walk by candle-light, and, besides, the vagaries of the flames forbid our attributing them to human agency. So well known was the phenomenon, that it was no uncommon amusement to rise from our beds and watch the Will-with-the-Wisps. However as we were not permitted to go by night in search of " Jack-o'-lantern " adventures, these observations must necessarily be received with some degree of caution. In short, I think there can be no doubt but that the *moving* (if I may be allowed to use the term) *ignis fatuus* of this country always owes its origin to the spontaneous ignition of gaseous particles, arising, in most instances at least, from the decomposition of vegetable matter, and which, when ignited, is put in motion by any current of air ; whilst the *stationary* one may arise from the same cause or the presence of either the glow-worm or *Scolopendra*. I do not remember ever to have heard or read of any of these lights having been seen about the floating island which now and then shews itself in Derwentwater lake ; but I think it is more than probable that such things do occur, considering the immense quantity of gas which escapes, which I have myself witnessed when an oar or stick is thrust through the matted surface of vegetable matter forming the crust of the island.

The most detailed and satisfactory account of the *ignis fatuus* I have been able to meet with, is contained in a highly interesting paper in the number of Professor Jameson's Edinburgh New Philosophical Journal for January last, entitled, "*Observations on the Ignis Fatuus or Will-with-the-Wisp, Falling Stars, and Thunder Storms, by L. Blesson, Major of Engineers, Berlin,*" which I think sets the question quite at rest, and indubitably proves the gaseous origin of that appearance. As the book is perhaps not generally within the reach of your readers, I subjoin a copy of that portion of the paper relating to the *ignis fatuus* ; and though the subject is rather without

the pale of your Magazine,<sup>a</sup> I am quite certain that the whole, or any part you may think proper to reprint, will be read with pleasure by every true lover of nature, be he meteorologist or not.

GEORGE WAILES.

P.S. M. Blesson's account of a thunder-storm he encountered on a mountain near Teschen, is the most extraordinary I ever read.

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*Observations on the Ignis Fatuus, or Will-with-the-Wisp, Falling Stars, and Thunder Storms.* By L. BLESSON, Major of Engineers, Berlin.

THE first time I saw the Ignis Fatuus, or Will-with-the-Wisp, was in a valley in the Forest of Gorbitz, in the Neumark. This valley cuts deeply in compact loam, and is marshy on its lower part. The water of the marsh is ferruginous, and covered with an iridescent crust. During the day bubbles of air were seen rising from it, and in the night blue flames were observed shooting from and playing over its surface. As I suspected that there was some connexion between these flames and the bubbles of air, I marked during the day-time the place where the latter rose up most abundantly, and repaired thither during the night; to my great joy I actually observed bluish-purple flames, and did not hesitate to approach them. On reaching the spot they retired, and I pursued them in vain; all attempts to examine them closely were ineffectual. Some days of very rainy weather prevented further investigation, but afforded leisure for reflecting on their nature. I conjectured that the motion of the air, on my approaching the spot, forced forward the burning gas; and remarked, that the flame burned darker, when it was blown aside; hence I concluded that a continuous thin stream of inflammable air was formed by these bubbles, which, once inflamed, continued to burn—but which, owing to the paleness of the light of the flame, could not be observed during the day.

On another day, in the twilight, I went again to the place, where I awaited the approach of night: the flames became gradually visible, but redder than formerly, thus shewing that they burnt also during the day: I approached nearer, and they retired. Convinced that they would return again to the place of their origin, when

<sup>a</sup> Whilst a doubt exists on this interesting subject it is certainly a very appropriate one for our pages, and we confess that doubt does still exist in our own mind.—ED.

the agitation of the air ceased, I remained stationary and motionless, and observed them again gradually approach. As I could easily reach them, it occurred to me to attempt to light paper by means of them, but for some time I did not succeed in this experiment, which I found was owing to my breathing. I therefore held my face from the flame, and also interposed a piece of cloth as a screen; on doing which I was able to singe paper, which became brown-coloured, and covered with viscous moisture. I next used a narrow slip of paper, and enjoyed the pleasure of seeing it take fire. The gas was evidently inflammable, and not a phosphorescent luminous one, as some have maintained. But how do these lights originate? After some reflection I resolved to make the experiment of extinguishing them. I followed the flame; I brought it so far from the marsh, that probably the thread of connexion, if I may so express myself, was broken, and it was extinguished. But scarcely a few minutes had elapsed, when it was again renewed at its source (over the air-bubbles), without my being able to observe any transition from the neighbouring flames, many of which were burning in the valley. I repeated the experiment frequently, and always with success. The dawn approached, and the flames, which to me appeared to approach nearer to the earth, gradually disappeared.

On the following evening I went to the spot, and kindled a fire on the side of the valley, in order to have an opportunity of trying to inflame the gas. As on the evening before, I first extinguished the flame, and then hastened with a torch to the spot from whence the gas bubbled up, when instantaneously a kind of explosion was heard, and a red light was seen over eight or nine square feet of the surface of the marsh, which diminished to a small blue flame, from two and a half to three feet in height, that continued to burn with an unsteady motion. It was, therefore, no longer doubtful that this ignis fatuus was caused by the evolution of inflammable gas from the marsh.

In the year 1811, I was at Malapane, in Upper Silesia, and passed several nights in the forest, because ignes fatui were observed there. I succeeded in extinguishing and inflaming the gas, but could not inflame paper or thin shavings of wood with it. In the course of the same year I repeated my experiments in the Kouski in Poland. The flame was darker coloured than usual, but I was not able to inflame either paper or wood-shavings with it; on the contrary, their surface became speedily covered with a viscous moisture.

In the year 1812, I spent half a night in the Rubenzahl Garden, on the ridge of the Riesengebirge, close on the Schneekoppe, which

constantly exhibits the Will-with-the-Wisp, but having a very pale colour. The flame appeared and disappeared, but was so mobile that I could never approach sufficiently near to enable me to set fire to any thing with it.

In the course of the same year I visited a place at Walkenried, in the Hartz, where these lights are said always to occur; they were very much like those of the Neumark, and I collected some of the gas in a flask. On the day after, I found by experiment that it occasioned cloudiness in lime-water, a proof of its containing carbonic acid.

I observed accidentally another phenomenon allied to this, at the Porta Westphalica, near Minden. On the 3d August, 1814, we played off a fire-work from the summit, to which we had ascended during the dark, and where no ignis fatuus was visible. But scarcely had we fired off the first rocket, when a number of small red flames were observed around us, below the summit, which, however, speedily extinguished—to be succeeded by others on the firing of the next rocket.

These facts induced me to separate the ignes fatui from the luminous meteors, and to free them from all connexion with electricity. They are of a chemical nature, and become inflamed on coming in contact with the atmosphere, owing to the nature of their constitution.

I think it highly probable that the fires that sometimes break out in forests are caused by these lights.

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ART. XL.—*Observations on the Influence of Locality, Time of Appearance, &c. on Species and Varieties of Butterflies.*  
By. J. C. DALE, Esq. M.A. F.L.S., &c.

*Papilio Muchaon*, though an abundant insect in some places, varies but little except in size; it has not been seen at Glanville's Wootton since the year 1818.

*Colias Hyale* has occasionally a white female, and also a variety with the black border broader. *C. Edusa* varies very much in size and colour, the variety of the female which

Haworth has called *Helice* being white; and there are two or three intermediate varieties in the British Museum, some very small, the *Chrysotheme* of Stephens.

*Pontia Daplidice* is much more brilliant in colour towards the south of France than in England or Sweden: climate has certainly an influence on this insect. *P. Cardamines* varies in size greatly, and in the black spot on the upper wings; it sometimes has a black spot on the second wings: Mr. Haworth has a specimen of this insect apparently hermaphrodite. *P. Brassicæ* varies in size and markings according to the broods; the *P. Chariclea* of Stephens is a mere variety; a variety of *P. Rapæ* is in like manner the *P. Metra* of Stephens, but in this species there are more broods, and consequently more varieties. *P. Napi* varies still more, and if *P. napææ* and *P. sabellicæ* of Stephens are distinct, there are at least two more distinct species.

*Hipparchia Janira* is sometimes entirely cream-coloured, and I have a specimen spotted with that colour. *P. Tithonus* has occasionally an extra spot or two. *P. Hyperanthus* has sometimes very large ocelli, sometimes only white specks, and is sometimes immaculate. *P. Davus* occurs sometimes with very large ocelli, and I have taken one at Manchester with very small ones. *P. Polydama* occurs at Lake Bala. There is a variety of *P. Typhon* quite immaculate, it is called *Laidion*; and I have a specimen from Keswick with ocelli as large as any *Davus*. *Davus*, *Polydama*, and *Typhon*, are all exceedingly subject to vary, and I have no doubt that they will all prove to be but a single species. I have two specimens of *P. Pamphilus* quite immaculate on the upper side.

*Vanessa Antiopa* varies in the colour of the margins of its wings according to locality, being sometimes white and sometimes yellow. *V. C. Album* was formerly very common here. In the specimens of the June brood, the under surface of the wings is yellow; in those of the autumnal brood, brown; they seem to me very distinct, and yet they remain undivided.

*Argynnis Paphia*. I took a female nearly all black on the upper side; it is in the British Museum. Of *Ar. Aglaia* I have taken the variety called *Charlotta*, and the one figured by Mr. Curtis. *A. Adippe* I have found in larva in the New Forest. *A. Lathonia* has two broods. I have not observed that they vary.

*Melitæa Euphrosyne*. Of this insect the spring brood varies very much in markings, I have one specimen nearly white; the September brood varies in colour, it is much yellower. *M. Selene* varies in the same manner. The Rev. Mr. Bird has a specimen nearly black. *M. Cinxia* varies but little in colour; in markings only and size; sometimes the ocelli want the pupil. A variety of *M. Artemis* has been taken at Enbourne and in Wales: this insect was not seen at Glanville's Wootton from 1815 to 1822, and then it reappeared in great abundance. *M. Athalia* is very variable: *Eos*, *cunigera*, *tessellata*, &c. are varieties of this species.

*Thecla quercus* sometimes wants the black spot in the red anal spot. *T. W. album* varies more or less in the red anal spot. *T. rubi* has sometimes a row of white spots on the green side, and is sometimes entirely without them.

Of *Lycæna Phlæas* there are two or three broods; some of the varieties have blue spots on the lower wings; others vary in having the border of the upper wings narrow or broad, and some have the under wings totally black. In the fine autumn of 1826, I took one with the red border in the second wings quite interrupted. *L. dispar* varies only in the size and form, and the intensity of colour.

*Polyommatus Arion* varies in having the black spots large or small; the latter variety is called *Alcon*. The female of *P. Corydon* is sometimes nearly as blue as the male, and sometimes the ocelli on the under side are very nearly obliterated; sometimes they are large and elongated. *P. Adonis* varies in a similar manner: it has two broods. *P. Dorylas*, *Icarius*, *Alexis*, and *Eros*, are but a single species, varying amazingly in colour, markings, &c. I took a very fine female, allied to *Burrelii* of Haworth, being white underneath, and wanting the elongate spot. The female of *P. Argus* varies in being more or less blue, and sometimes very much larger, and has elongate spots on the underside. *P. Salmacis* or *Titus*? is intermediate between *Agestis* and *Artaxerxes*; in Scotland none of the *Agestis* are to be found, they are all *Artaxerxes*; in the south none of the *Artaxerxes* are to be found, they are all *Agestis*. At Newcastle they appear to be mules or hybrids, between the two species, partaking in some degree of the characters of both; some of the varieties have a black spot inside the white one, on the upper surface of the first wings.



*Hesperia Alveolus* and *H. Lataveræ* vary in having more or less white on the upper surface of the first wings. *H. Lataveræ* has the most.

#### ADDITIONAL NOTES ON BUTTERFLIES.

*Papilio Podalirius*. I have a specimen of this insect, which I consider undoubtedly British; I received it with Dr. Abbot's collection; it was taken near Bedford. I certainly saw another specimen in Cambridgeshire.

*Doritis Apollo*. I have reason to expect that I shall obtain British specimens of this insect next season.

*Pontia Daplidice*. I received one from Dr. Abbott.

*Vanessa Huntera*. The Welsh specimen of this insect is much smaller than the American ones, and I rather doubt whether they are exactly the same species.

*Apatura Iris* and *Limenitis Camilla* have been found near Cranbourne.

*Argynnis Niobe*. Dr. Abbott considered *Niobe* to be nothing more than a variety of *Ar. Adippe*; in his MSS. he observes that the silver spots have sometimes yellow spots in them, and Stewart mentions the reverse of *A. Niobe*.

*Melitæa Dia*. I think that the specimens taken at Sutton Park, by Mr. Weaver, of Birmingham, are most probably this species.

*Melitæa*. I found the young larvæ of a *Melitæa* at Lulworth in August. I think they were most probably those of *M. Cinxia*.

*Lycæna Chryseis*. I received one from Dr. Abbott.

*Thecla Betulæ* is mostly bred from the larva by Captain Blomer now; I used to take it in great plenty, but have not seen it for years.

*Colias Europome*. I have male and female from Russia; it is very distinct from *Philodice*, which I had from Dr. Abbott's cabinet, marked *Hyale*; and I also received it from Mr. Latham.



ART. XLI.—*On the Structure of the Antennæ in the Order APHANIPTERA*<sup>a</sup> of Kirby, with reference to the Propriety of the Establishment of Genera upon the Variations of those Organs. By J. O. WESTWOOD, Esq., F.L.S. &c.

ON looking at the head of the flea, for the purpose of discovering its antennæ, two organs are observed placed in the ordinary situation of those members, and composed of four joints, which, from their general appearance, situation, structure, and usage, have been regarded by most naturalists as the true antennæ.

Latreille, however, from the philosophical manner in which he had studied the organization of the whole of the annulose subkingdom, had very early acquired a knowledge of the fact, that in different groups the same organ is often employed in a totally different manner, supplying the place, as well as the use, of another organ which is either entirely obsolete, or which has itself undergone an equally extensive modification: hence, by tracing these supposed antennæ to their place of insertion, he was induced to consider them rather as palpi.

Where, then, were the analogues of the true antennæ?—Behind the eye, on each side of the back of the head, a small oval-oblong impression is perceived, which incloses a minute organ, which in the living insect is kept in constant motion. Respecting this apparatus, Latreille observes, in his *Histoire Naturelle et Générale*, &c.: “*Est-ce un organe servant à la respiration? Seroit-ce une antenne? Je ne puis prononcer.*”

Mr. Curtis, in illustrating the genus *Pulex*, (Brit. Ent. 114, April, 1826,) stated the *Pulex irritans* to be the *type* of the genus, figured the *P. Talpæ* as an example, and gave an admirable series of dissections of the mouth of *P. Canis*, with

<sup>a</sup> I adopt Mr. Kirby's term, (Dugès having proved its appropriateness,) in preference to *Suctoria*, used by De Geer and Latreille, that name not being in accordance with the other names of orders; to *Aptera*, as restricted to the flea by Lamarck and MacLeay, considering it improper to apply to one group a term intended originally to designate many very distinct groups, and which has been employed by various naturalists in so many different ways; and to *Siphonaptera*, proposed by Latreille (as being preferable “*à celles trop vagues ou trop générales de suceurs et d'aptères*,” and adopted by Curtis and Dugès,) Mr. Kirby's name having the priority.

the observation: "The cavity behind the eye, which appears to be partly closed by a small lobe that may be distinctly seen to rise and fall, I am disposed to believe is an organ of respiration rather than the analogue of the antennæ, as suspected by my friend, Mons. Latreille; and the absence of spiraculæ down the sides of the abdomen strengthens my opinion. Little as we know of the uses of the antennæ beyond the sense of touch, it is impossible to say that the maxillary palpi may not perform in this order the office of antennæ, and that the orifice behind the eye may not be also adapted to hearing."

Subsequently, however, Mr. Curtis obtained specimens of *P. Hirundinis*, in which the antennæ "are as long as the head, placed above the eyes, and received when at rest into a deep groove, and when erected look like the ears of a rabbit. They are four-jointed, and the basal joint has a few long bristles."

In the summer of 1831, I had occasion to investigate the structure of this order, and gave much attention to this portion of the subject; and, after considerable trouble, succeeded in extracting the antennæ of several specimens of *P. Canis* from their cavity behind the eyes. In this species these organs are broad and four-jointed; the first joint is short; the second larger, and somewhat cup-shaped, and produced on the outside with numerous rigid setæ at the external angle, forming a defence to the terminal joint, which is large, ovate, or rounded, and subdepressed with numerous denticulations on the outer edge; the third joint is short and narrow, forming the base of the fourth joint.

In the 417th plate of Mr. Curtis's British Entomology for August 1832, another species of flea was illustrated under the name of *Ceratophyllus elongatus*, with the observations, that, from repeated examinations, that gentleman had found it necessary to divide the *Pulices* into two genera; that the *P. Talpæ*, previously figured as an example of the genus *Pulex*, belonged in fact to the new genus; and that the discovery of the antennæ of *P. canis*, by Mr. Haliday, rendered it necessary to erase the paragraph in the 114th folio, quoted above. A copy of Mr. Haliday's figure of the antennæ of the latter species (which is considered as a true *Pulex*) is introduced into Mr. Curtis's plate of *Ceratophyllus*; but it is not quite correct, being described as only two-jointed, the basal joint having only a single

bristle near its internal apex. The dissections of *Ceratophyllus* are taken from the *Pulex hirundinis*, which is considered as the type, and of which the antennæ are described as slightly attenuated and four-jointed, although one of them is represented in the plate as five-jointed. Of the species figured as the example of the genus, *Cer. elongatus*, the antennæ are not described; but in fig. 16 they are represented as eight-jointed, the basal joint being pear-shaped, the second subcyathiform, and the remainder transverse, forming a thick oval mass. In the coloured figure of this insect, these organs are however represented of the same attenuated form as in *Cer. hirundinis*, and apparently having only six joints. And in the *Pulex talpæ*, which is expressly stated to belong to *Ceratophyllus*, the antennæ are described and figured as ten-jointed, the basal joint being ovate-truncate, and the nine remaining annulose, and forming a rather elongate-ovate mass. M. Duges, in his admirable "*Recherches sur les Caractères Zoologiques du Genre Pulex*," has described and figured the antennæ of various species of fleas. In the *P. irritans* they are described as three-jointed:<sup>b</sup> "*Le premier article est court, le deuxième long et épais, armé d'une grosse apophyse et d'un bouquet de poils, le troisième est plat, élargi en palette, et divisé en lanieres ou digitations de plus en plus courtes d'avant en arriere.*" The antenna of *P. canis* is described as "*peu différente de celle de l'espèce précédente, un peu plus grosse et plus courte.*" In the *P. musculi*, Dug. (*Cerat. muris?* Curt.) the antenna "*présente cette particularité, que le premier article est long et le deuxième court, le troisième peu large est strié en travers, et dentelé sur un de ses bords;*" and in the *P. vespertilionis*, this organ is "*presque toute semblable à celle du P. musculi.*"

Such are the various formations stated to exist in the antennæ of different species of fleas. Now on comparing the characters given by Mr. Curtis of his genus *Ceratophyllus*, with those of *Pulex*, it will be seen that, with the exception of the formation of the antennæ, scarcely the slightest difference

<sup>b</sup> Either M. Duges has overlooked the articulation which I noticed between the second and terminal joints, or I have mistaken the contracted base of the latter for a distinct articulation. From the numerous sketches, however, which I made of the antennæ of *P. canis* in various positions, I think myself warranted in considering the former to be the case.

is to be found between them. If, however, the antennæ are to be regarded as affording the characters of genera in this order, it must be evident, even from Mr. Curtis's plate of *Ceratophyllus* alone, that there ought to be a much greater number of genera established according to the variations in the structure of those organs.

I should however be inclined to consider, from analogy, that the antennæ of *P. canis* have the same number of joints as the *P. hirundinis*; and indeed I have but little doubt that all the other species are formed upon the same type, the supposed numerous articulations, represented by Mr. Curtis in some of the species appearing to me to be merely deeper impressions of the marginal denticulations of the terminal joint: indeed, according to M. Duges, the antennæ, both of the *Pulices* and *Ceratophylli*, are three-jointed, the only material difference consisting in the variation in the length of the first and second joints.

Hence it can scarcely be considered that the genus *Ceratophyllus* is well founded. The species, however, figured by Mr. Curtis, *Cer. elongatus*, as well as the *Cer. vespertilionis*, and probably *Cer. bifasciatus*, and *Pulex musculi*, Dug.; together with a Chinese species, which has been kindly presented to me by the Rev. Leonard Jenyns, exhibit a general form so different to that of the other fleas, that I cannot help thinking them, on that account, entitled to form a distinct group; for which (as the name *Ceratophyllus* must likewise be rejected in consequence of having been previously employed in botany) the generic name of *Ichnopsyllus* may not be deemed inapplicable, the characters of which I propose to detail in a memoir, upon which I am at present occupied, upon Bat Parasites.

In conclusion, I may be allowed to observe, without however venturing to offer any decided opinion upon so difficult a question, that no group of insects appears to afford so striking an instance in support of the opinion, that the antennæ are organs of hearing, as those of the order under consideration. Such, it will be seen from the passage quoted above, was the doubtful opinion of Mr. Curtis; and when we notice the peculiar form of the aperture in which these organs are placed, and its situation at the back of the head on each side behind the eyes, such an opinion seems to have some reasonable

foundation. I offer this observation to those who deem attempts to stifle inquiry into such abstruse points, by the aid of ridicule, to be as unphilosophical as it is to give, without hesitation, to an organ whose uses are, and probably ever will remain unknown, the name of another organ whose uses are perfectly understood; thereby equally tending to stifle inquiry by instilling the idea that the uses of the organ thus inappropriately named, had been clearly ascertained. To such persons I would also point out the admirable remarks of M. Straus-Durckheim upon the antennæ of the cockchaffer, which are also in favour of the opinion that they are instruments of hearing.

*The Grove, Hammersmith. May 1, 1833.*

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ART. XLII. *Observations on Blight.* By RUSTICUS,  
*of Godalming.*

THE hop-fly is an animal whose injury to man is perhaps not quite of an unmixed kind, for its depredations serve to keep up the price of hops so as to afford a tolerable profit to the grower; whereas, were there to be no fly, the crop would be larger than the consumption, and the price consequently not a remunerating one. I well recollect, that after the immense crop of 1826, the price did not repay the grower his rent, taxes, and labour; and the farmers, a set of men, I am sorry to say it, with less forethought generally than any other class of tradesmen, most improvidently went to work and were silly enough to grub up their hop-yards and sow wheat. This took place in several instances in the district between Farnham and Alton, and at the same time both in Kent and Herefordshire; and afterwards, when the price recovered, some of the finest pasture land in the world was ploughed up to make hop-yards which have not yet paid even the tithe; there is, however, a blight whose ravages are without any proportionate good, or any good at all that I am aware of: a thief that robs our sheep and our cows of their winter food, and often compels their owners to starve them to skin and bone, thereby causing murrain and all manner of disease to the kine, empty pockets to himself, and a host of accompanying evils; and this thief is a little glossy, tiny, skipping, hopping, merry-andrew kind of

a beetle, in common parlance known by a name the very mention of which elongates a farmer's countenance at least an inch and a half—the *turnip-fly*.

The turnip-fly<sup>a</sup> is not always of one kind, but the difference between them is not important, they only alter in their paint, their build is always alike: the most common is painted bottle-green; but in some fields all are painted black, with a white line from stem to stern on each side down the deck; they are so active, that the only way I could ever obtain them in the newly-sown fields was by sweeping the surface with a gauze net on an iron-hoop at the end of a strongish stick; they jump like fleas directly they see you. This insect, or rather its grub, commences its attack on the turnip directly it is up, devouring the two cotyledons and the little heart, and sometimes, in a few days, leaving the field as brown as the day it was sowed.

Schemes out of number have been tried to get rid of or kill this little pest wherever it has appeared, the particulars of which, if I were to relate, with the accompaniment which I must add, that they have all turned out to be failures, would not, I fancy, be of much use; but I one day was cogitating on the matter, and argued to myself thus:—it would be a difficult task to catch and kill twenty thousand fleas if shut up in a room with them; but it might not be quite so difficult to prevent twenty thousand fleas coming into a room where there were none previously; and the wisest way seemed to me to find out how they could come there. Now, as all straightforward inquiries of this kind are laughed at, and at once yclept theories, I kept all my operations to myself, and now, for the first time, offer them to the public. I am sorry to say they are yet incomplete, but still they will be found of some use to those who are disposed to pursue the subject.

I had always observed that there was the greatest quantity of grubs on very young plants, and that they were very various in size, and that it was not till the plants were a fortnight or three weeks old that the beetles appeared in any quantities;

<sup>a</sup> Our contemporary, Mr. Loudon, wishes us to show off our learning by "supplying the systematic names to the insects" of which Rusticus treats, or, as our correspondent would probably term it, interlard his observations with crack-jaw. The turnip-fly is an *Altica*; the one with white lines down the back is *A. Nemorum*.—ED.



yet there were some beetles from the very first coming up of the plant: now I knew from experience, that the turnip-beetle fed on wild mustard and several other hedge plants, and therefore it was not at all an improbable thing, that when they smelt the fragrance of the fresh bursting cotyledons of their favourite food that they should skip down from their spring habitations, the hedges, and commence the attack. This would account for the few beetles observable from the first, but not for the numberless grubs which covered the cotyledons, riddling them with holes, and devouring the succulent stems, even that part which was covered by the ground. These must have sprung from eggs either left in the ground last year or have been laid on the turnip-seed itself and harvested with it in the autumn.

I first sowed some seed in a flower-pot with earth out of my garden; it produced the animal in abundance. Secondly, I inclosed the pot with pasteboard and canvas with the same success; but there was still a possibility of the enemy getting in, as I had not made the cover sufficiently close. Thirdly, I made a light frame, about eight inches square, covering it with very fine silk gauze, and carefully stopping the crevices of the door with pasted paper, and round the pot, where the cover was fastened on to it with putty, so that there was now no possibility of any thing coming to it from without; yet this experiment was attended with the same success: however, one point, that is, a negative point, was now proved, namely, that the fly did not come to the turnip from other plants; this was a point gained. Fourthly, I baked the earth in a cast-iron pot over the fire, and used no water to water the seed but such as I had boiled myself, applying it at the bottom of the pot in a common feeder, then I used the same care and took the same precautions as before—I did not take off the cover till the plants were of a considerable size, and I found them all a-hop with beetles. I had now made another step; that the beetle did not come from other plants, I had found before; but now it was clear that it was not in the earth nor in the water. Fifthly, with a lens I examined the seed, and found on it a number of white flattish substances, some seeds were without any, but there were generally one, two, three, four, and in one instance five, on a single seed; these I concluded to be eggs, and thought the only way now left me was to attack them; it would



have been easy enough to have poked them off with a needle, but I could not see how I was to employ a needle and a magnifying glass on a sack of turnip-seed; I recollected, however, that I had found that some salt and water into which I had once unintentionally dropped a paper of silkworms' eggs had killed them to an egg; it was therefore worth while trying in this case: I accordingly made some pretty strong brine, and soaked the seed in it for twenty-four hours, then dried it thoroughly, and with all the precautions I have mentioned above I sowed it again, and with a kind of success—there was not a single fly, but neither was there a turnip. Nothing discouraged at this, I tried again and again, and I found that, without weakening the brine, if the seed was only kept in it three hours, there were no beetles, but yet the seed came up as well as ever. I now practise this with turnip-seed, cabbage-seed, and, in fact, with the seed of all the cruciform flowering plants in common cultivation, (all of them being equally infested by the beetle,) and with very satisfactory success. I cannot say that I never find beetles on the young plants, but I never have a crop destroyed, or even seriously injured by them. The whole of the experiments mentioned above were made on the Swede turnip, which I find is generally more infested by these beetles than any of our older sorts. The experiments were all made prior to the year 1823, and have been waiting for a suitable opportunity of publication; the liberal mode of conducting your magazine affords that opportunity; and allow me to express the pleasure which a writer feels in seeing his own handywork appear in print. If an article is to have a slice cut out here and another there, in the obsequious endeavour to oblige some literary impostor, whose fame is to be kept up by the suppression of public opinion, then good-by to editorial independence.

A word more in support of the idea that the beetle lays eggs on the seed of the turnip. First, Self-sown turnip-seed is more infested than when sown in the usual way; Secondly, when turnip-seed is harvested over-ripe, as in very hot dry seasons, the produce has much more fly than when harvested unripe, or in wet and cold seasons; in these instances it is certain, from the exposure of the seed, both in ripening and falling, that the beetles must have much better opportunities for depositing their eggs on it; Thirdly, on shaking the

flowers of turnips which have been sowed for seed, a great many of the identical fellows will be found skipping about the cloths over which you shake them; I do not mean the little beetles, which are dark green, about the same size, and fly very easily, but the real turnip-beetle. (I send you specimens of both.) The flying-beetle is very common in all flowers that produce a good deal of pollen; I have seen fifty or sixty in a dandy-lion.<sup>b</sup> The real turnip-beetles do not eat pollen.

If you can stick in this note at the end of my turnip-fly epistle pray do so.—Lord F——'s beetle is a weevil; he has nothing to fear from it; if it strip the leaves off his beech-trees one year it will not do so the next. I well recollect, some years ago, seeing the fine beech-woods about Gloucester completely stripped by it in the middle of June; the next year the woods were as healthy and luxuriant as ever. The weevil appears and disappears without any known cause, like all other insect pests, and these irregular visitors are always difficult to deal with; I shall try, notwithstanding, to trace its habits, and shall feel much obliged for any further information his lordship may transmit through you.

I am, yours, &c. RUSTICUS.

Godalming, 1833.

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ART. XLIII.—*Monographia Chalcidum*. By FRANCIS WALKER, ESQ. F. L. S.  
(Continued from page 142.)

GENUS CRATOMUS, *Dalman*.

Caput transversum, maximum: oculi magni, laterales: ocelli in triangulum dispositi: mandibulæ arcuatæ, una tridentata, altera quadridentata: maxillæ elongatæ, externè in lobum productæ: palpi maxillares articulis 4, 1<sup>us</sup>. 2<sup>o</sup>. duplo longior, 3<sup>us</sup>. 2<sup>o</sup>. æqualis, 4<sup>us</sup>. subfusiformis 1<sup>o</sup>. æqualis: mentum elongatum, posticè conicum: labium fissum: palpi labiales triarticulatæ, 1<sup>us</sup>. linearis, 2<sup>us</sup>. brevior, 3<sup>us</sup>. latior: antennæ clavatæ, 13-articulatæ; 1<sup>us</sup>. elongatus, subarcuatus, versus medium crassior; 2<sup>us</sup>. elongato-cyathiformis; 3<sup>us</sup>. parvus, cyathiformis; 4<sup>us</sup>. et sequentes ad 10<sup>um</sup>. brevissimi, approximati, cyathiformes; clava triarticulata, ovata: thorax convexus, ovatus; prothoracis scutellum breve; mesothoracis scutum gibbum; scutellum magnum, obtusum; metathoracis scutellum benè determinatum, canaliculatum: abdomen subpetiolatum, convexum, breve, latum, contractum: pedes subæquales; coxæ magnæ; femora subclavata; tibiæ apice

<sup>b</sup> *Meligethes*, of several species, and *Altica Nemorum*.—Ed.

spinis duabus armatae; tarsi articulis 5, 1<sup>us</sup>. elongatus, sequentes longitudine decrescentes, 5<sup>us</sup>. præcedenti crassior et longior: alæ anticæ nervus solitus ramulum stigmaticalem emittens elongatum, arcuatum.

Cratomus may be distinguished from Perilampus (to which it is closely allied); and from the other Torymidæ, by the long and curved stigmal branch of the nervure of the wing: the only Pentamera which resemble it in this character, are the Cleonymidæ and some of the Eupelmidæ.

Sp. 1. Cra. megacephalus. Mas. *Cyaneo-niger, antennis pedibusque fuscis, tibiis 4 anticis tarsisque flavis, alis anticis fusco maculatis.*

Cynips megacephala. . . . . *Fabr. Ent. Syst. 2. 103. 17.*

Diplolepis megacephala. . . . . *Fabr. Syst. Piezat. 149. 21. 2.*

Perilampus (Cratomus) megacephalus. *Dalman, Kongl. Vetén. Acad. Handl. 1820.*

Caratomus megacephalus. . . . . *Dalman, Kongl. Vetén. Acad. Handl. 1822.*

Caput thorace latius, punctatum, anticè profundè excavatum, utrinque bituberculatum: oculi ocellique nigri: antennæ breves, fuscæ, versus medium obscuriores: thorax et petiolus punctati: abdomen nitidum, glabrum: coxæ nigro-fuscæ; trochanteres flavi; femora fusca; tarsi flavi, articulus 1<sup>us</sup>. subtus productus, 5<sup>us</sup>. fuscus: alæ hyalinæ; anticæ prope medium fuscescentes; nervi pallidè fusci; stigma parvum, concolor. (Alarum longitudo, 2 lin.)

Taken at Ripley, July 1827, and in Epping Forest, by J. F. Stephens, Esq.

July; on palings; near London.

Fabricius says that it inhabits decayed wood.

Sp. 2. "Cratomus nigripes. *Ater, pedibus toto nigris, alis hyalinis.*"

"Taken in my own garden, at the Hermitage, South Lambeth. J. F. Stephens."

The description and name of this new species were obligingly sent to me by Mr. Stephens.

#### GENUS EPIMACRUS,<sup>a</sup> Walker.

Fem.—Caput sat magnum, thorace latius: oculi mediocres, laterales: ocelli supra verticem in triangulo dispositi: antennæ fronte infe-

<sup>a</sup> 'Επί ἀντὲ, μακρὸς longus.

riore insertæ, 11-articulatæ?<sup>b</sup>, clavatæ, pubescentes; articulus 1<sup>us</sup>. elongatus, versus apicem crassior; 2<sup>us</sup>. et 3<sup>us</sup>. elongato-cyathiformes; 4<sup>us</sup>. et sequentes longitudine decrescentes, ferè rotundi; clava triarticulata, ovata: thorax elongato-ovatus: prothoracis scutum angustum; scutellum maximum, anticè angustius: mesothoracis scutum minimum; parapsides convexi, optimè determinati; scutellum parvum, ferè rotundum, depressum; paraptera et epimera parva: metathoracis scutellum magnum: abdomen elongatum, petiolatum, supra depressum, subtus carinatum, apice elevatum et compressum; segmentum 2<sup>um</sup>. magnum, supra medio retractum; 3<sup>um</sup>. breve; 4<sup>um</sup>. longius; sequentia parva: oviductus exsertus: pedes subæquales; coxæ magnæ; femora, præsertim postica, clavata; tibiæ rectæ, apice crassiores et spinis armatæ; tarsi articulis 5, 1<sup>us</sup>. longus, sequentes longitudine decrescentes, 5<sup>us</sup>. præcedenti longior et crassior: alæ superiores anticè et apice ciliatæ; nervus solitus ramulum emittens brevem, et mox abruptus.

I have placed this singular genus between Decatoma and Megastigmus, though it differs from both in many particulars. Like the Spalangiidæ, the antennæ are inserted in the lower part of the face, but the head is transverse, and not depressed. It has the prothorax developed like the Cleonymidæ; and like them also, the angle, formed by the stigmal branch with the continuation of the principal nervure of the superior wing, is more acute than in most of this tribe. The structure of the trophi will probably determine its natural situation.

Sp. 1. Epim. rufus. Fem. *Rufus, thorace et abdomine posticè nigris, antennis fuscis, alis hyalinis, fusco maculatis.*

Caput rufum, nitidum; vertex niger: oculi nigro-fusci: ocelli rufi: antennæ fuscæ, basi et subtus rufæ; clava articulis 2-præcedentibus longior et latior: thorax nitidus, subtus omninò rufus, prothorax rufus, posticè supra fuscus: mesothoracis scutum nigrum, anticè fuscum; parapsides prope scutum fuscescentes; squamulæ rufæ; scutellum nigrum, apice rufum: metathoracis scutellum scabrum, obscurum, nigrum: petiolus brevissimus, crassus, obscurus, scaber, rufus: abdomen nitidum, glabrum, cyaneo-nigrum, subtus fuscum, apice setosum; segmentum 2<sup>um</sup>. rufum, basi fuscum; 3<sup>um</sup>. rufum, supra nigrum: oviductus abdominis segmento ultimo paullo longior, fuscus, basi rufus: pedes

<sup>b</sup> The two ring-shaped joints of the antennæ apparent in most of the Pentamerous Chalcides are almost, if not entirely, obsolete in this genus.

rufi, supra pallidè fusci; tarsi flavi; ungues et pulvilli fusci: alæ hyalinæ; anticæ, ubi nervus solitus costam attingit fusco maculatæ, ubi ramulum emittit latè fusco-fasciatæ; nervus fuscus, ubi costam attingit incrassatus, ater; ramulus ater. (Alarum longitudo,  $1\frac{1}{2}$  lin.; corporis 1 lin.)

Taken near Stockton-upon-Tees, by the Rev. G. T. Rudd.

The Pentamerous Chalcides will form two divisions: of the first, the remaining families may be placed in the following order:

Ramulus stigmatalis rectus.		Abdomen petiolatum . . . . .	FAM. IV. MISCOGASTERIDÆ.
		Antennæ moniliformes . . . . .	FAM. V. ORMOCERIDÆ.
Ramulus stigmatalis incurvus		Abdomen sessile.	Antennæ filiformes fusiformes aut clavatæ . . . . .
			FAM. VI. PTEROMALIDÆ. FAM. VII. CLEONYMIDÆ.

The second division includes the Eupelmidæ, Encyrtidæ, and a few genera, composed of very minute species, which connect the Encyrtidæ with the Tetramera. The only one yet described is *Aphelinus*, *Dalman*.

#### *Family IV.*—MISCOGASTERIDÆ.

Caput transversum: oculi laterales: ocelli in triangulum dispositi: *maris* antennæ filiformes, fusiformes aut clavatæ, 12—, 13-aut 14-articulatæ: *feminæ* antennæ filiformes aut clavatæ, 12-aut 13-articulatæ: mandibulæ 4-dentatæ, arcuatæ aut rectæ; nonnunquam una arcuata, altera recta: maxillæ elongatæ: palpi maxillares 4-articulati: mentum elongatum aut ovatum: labium integrum, anticè latum: palpi labiales articulis 3, 2°. brevi: thorax convexus, elongatus aut ferè rotundus: prothoracis scutellum anticè angustatum, aut subquadratum: mesothoracis scuti inter parapsides et scutum proprium suturæ duæ laterales benè vel minimè determinatæ; scutellum ovatum aut rotundum: paraptera et epimera triangula: metathoracis scutellum parvum aut magnum, plus minusve canaliculatum aut carinatum: abdomen petiolatum: oviductus plerumque absconditus: coxæ mediocres: femora gracilia aut subclavata: tibiæ rectæ, in nonnullis clavatæ aut subarcuatæ, apice spinis duabus armatæ: tarsi articulis 5; 1<sup>us</sup>. longus; sequentes longitudine decrescentes; 5<sup>us</sup>. præcedenti longior, crassior: alæ anticæ nervus solitus ramulum stigmatalis emittens elongatum, rectum, simplicem.

Chrysolampus, Sphegigaster, Stilbula, Eucharis, and some species of Halticoptera belong to this family.

Characteres Generum.

subquadratus	Mas. et fem. Antennæ clavatæ . . . . .	SYNTOMOPUS.
	Mas. Antennæ filiformes . . . . .	DIPARA.
Prothorax	brevis, Petiolus   elongatus . . . . .	PSILOCERA. PROODES. MERISMUS.
	elongatus, Petiolus   brevis, non clavata. Tibie inter-Abdomen   medice	TOXEUMA. CORUNA.
	varium non compressum   pressum nec clavatum. Antennæ fem.	incrassatus . . . . .
	mediocris. Nervus solitus cum per- tam per- currit	<i>maris</i> fusiformes, <i>fem.</i> clavata. Abdomen convexum . . . . .
	13-articulata. Articululus 5 <sup>us</sup> .	<i>fem.</i> clavata. <i>Fem.</i> abdomen supra depressum . . . . .
		<i>maris</i> filiformes, <i>fem.</i> filiformes aut extrosum cras- siores. <i>Maris</i> palpi maxillares
		articulo ultimo dilatato. <i>Fem.</i> Abdomen supra de- pressum . . . . .
		simplices. <i>Fem.</i> abdomen convexum . . . . .
		MICROMELUS.
		12-articulata . . . . .
		clavatæ . . . . .



GENUS I. SYNTOMOPUS,<sup>c</sup> *Walker.*

Caput magnum, thorace latius: oculi mediocres: antennæ clavatæ, 13-articulatæ; 1<sup>us</sup>. elongatus; 2<sup>us</sup>. cyathiformis; 3<sup>us</sup>. et 4<sup>us</sup>. minimi; 5<sup>us</sup>. et sequentes ad 10<sup>um</sup>. in *mare* lineares, longitudine decrescentes, in *feminâ* æquales, subcyathiformes; clava triarticulata, ovata, articulis 2 præcedentibus paullò longior: thorax elongatus: prothoracis scutellum magnum, subquadratum: mesothoracis scutum conspicuum, suturæ distinctæ; scutellum magnum, latum, convexum: metathoracis scutellum benè determinatum, canaliculatum: petiolus linearis, sat elongatus: abdomen *maris* breve, ferè trigonum, depressum, apice latum, segmento 2<sup>o</sup>. maximo, sequentibus vix conspicuis; *fem.* elongato-ovatum, apice acuminatum, supra depressum, infra carinatum, segmento 2<sup>o</sup>. elongato, sequentibus brevioribus: oviductus subexsertus: pedes breves; coxæ magnæ; femora subclavata; tibiæ subarcuatæ; tarsi breves: alæ breves.

Sp. 1. Syn. thoracicus. Mas. *Viridis, antennis nigris, tibiis fuscis, tarsis stramineis, alis hyalinis.*

Caput punctatum: oculi rufo-fusci: ocelli rufi; antennæ nigræ; articuli 1<sup>us</sup>. et 2<sup>us</sup>. virides: thorax punctatus, obscurè viridis; metathoracis latera obscurè viridi-nitentia: petiolus crassus, punctatus: abdomen nitidum, glabrum, æneo-nitens: pedes virides; trochanteres fusci; genua flava; tibiæ fuscae, apice basique flavæ; tarsi antici fulvi, 4 postici straminei, apice fusci: alæ hyalinæ: nervi pallidè fusci: stigma parvum, fuscum. (Alarum longitudo, 1 $\frac{1}{4}$  lin.)

September; Isle of Wight.

Sp. 2. Syn. incurvus. Fem. *Nigro-cyaneus, abdomine viridi-æneo, antennis nigris, tibiis fuscis, tarsis stramineis, alis hyalinis.*

Caput punctatum: oculi fusci: ocelli rufo-nigri: antennæ breves, nigræ: thorax punctatus, obscurus; metathoracis latera basi viridi nitentia: petiolus gracilis, punctatus, nigro-cyaneus, obscurus: abdomen nitidum, glabrum, viride, apice cyaneo-viride, segmentis posticè æneis: pedes virides; genua straminea; tibiæ fuscae, apice basique flavæ, anticæ pallidiores; tarsi antici fulvi, apice fusci; 4 postici straminei, apice nigri: alæ hyalinæ: nervi

<sup>c</sup> Σύντομος brevis, ποῦς pes.



pallidè fuscì: stigma parvum, fuscum. (Alarum longitudo,  $1\frac{1}{4}$  lin.)

Taken by Mr. Davis; the end of August; on Blackheath.

## GENUS II. DIPARA,<sup>d</sup> Walker.

*Mas.*—Caput magnum, thorace latius: oculi mediocres: antennæ filiformes, corpore longiores, 12-articulatæ; 1<sup>us</sup>. subfusiformis; 2<sup>us</sup>. cyathiformis; sequentes moniliformes, elongato-ovati, remoti, pilosi: thorax elongato-ovatus: prothoracis scutellum magnum, subquadratum: mesothoracis scutum conspicuum, suturæ valdè distinctæ; scutellum ovatum, convexum: metathoracis scutellum benè determinatum, canaliculatum: petiolus elongatus, abdomine vix brevior: abdomen convexum, ferè rotundum, segmento 2<sup>o</sup>. maximo, sequentibus supra vix conspicuis: pedes graciles, elongati; tibiæ rectæ: alæ angustæ.

Sp. 1. Dip. petiolata. Mas. *Atra, antennis fuscis, petiolo pedibusque flavis, alis hyalinis.*

Caput punctatum, subnitidum: oculi nigro-fuscì: ocelli rufo-nigrì: antennæ fusæ, articulus 1<sup>us</sup>. flavus: thorax minutè punctatus, subnitidus; metathorax obscurus, scaber: petiolus minutè punctatus: abdomen nitidum, glabrum: pedes flavi; tibiæ 4 posticæ pallidè fusæ: alæ hyalinæ pubescentes, apice ciliatæ; costa pilosa; nervi fulvi; stigma parvum, concolor. (Alarum longitudo, 1 lin.)

July; on grass; near London.

## GENUS III.—PSILOCERA.<sup>e</sup> Walker.

*Mas.*—Caput magnum, thorace latius; oculi mediocres: antennæ moniliformes, verticillato-pilosæ, corpore longiores, 13-articulatæ; 1<sup>us</sup>. elongatus; 2<sup>us</sup>. cyathiformis; 3<sup>us</sup>. minimus; 4<sup>us</sup>. et sequentes ad 10<sup>um</sup>. remoti; clava triarticulata, elongato-ovata, angusta, articulis 2 præcentibus brevior: thorax latus, ferè rotundus: prothoracis scutellum brevissimum: mesothoracis scutum breve, suturæ vix conspicuæ; scutellum convexum, breve, ovatum; paraptera et epimera benè determinata: metathoracis scutellum magnum, canaliculatum: petiolus brevissimus: abdomen ovatum, depressum; segmentum 2<sup>um</sup>. trientem occupans; 3<sup>um</sup>. vix brevius; sequentes brevissimi: pedes graciles; coxæ mediocres; tibiæ rectæ: alæ anticæ latæ.

<sup>d</sup> Δὶς bis, πρὸς juxtâ.

<sup>e</sup> Psilus genus Insectorum, κέρασ cornu.

*Fem.*?—Antennæ extrorsum crassiores, 13-articulatæ; 1<sup>us</sup>. elongatus; 2<sup>us</sup>. cyathiformis; 3<sup>us</sup>. et 4<sup>us</sup>. minimi; 5<sup>us</sup>. et sequentes ad 10<sup>um</sup>. subæquales; clava triarticulata, elongata, apice acuminata, articulis 2 præcedentibus paullo longior; abdomen ovatum, supra depressum, infra carinatum, apice acuminatum; segmentum 2<sup>um</sup>. magnum; sequentes brevissimi.

Sp. 1. Psil. obscura. Mas. *Atra, antennis nigris, pedibus fuscis, tarsis flavis, alis fuscis.* Fem.? *Nigro-viridis, abdomine æneo-viridi, antennis nigro-fuscis, pedibus flavis, alis subfuscis.*

*Mas.*—Caput punctatum: oculi nigro-fusci: ocelli rufo-nigri: antennæ albo-hirtæ: thorax punctatus; latera læviora, nitidiora: metathorax minute punctatus: petiolus punctatus, obscurus: abdomen nitidum, glabrum; segmenta 2<sup>um</sup>. et 3<sup>um</sup>. nigro-ænea: pedes flavi; coxæ nigræ; femora fusca, apice basique flava; tibiæ concolores; tarsi postici apice fusci; 4 antici fusci, articulis 1<sup>o</sup>. et 2<sup>o</sup>. flavis; ungues et pulvilli fusci: alæ anticæ fuscae, posticæ subfuscae; nervi fusci; stigma parvum, concolor.

*Var. β.*—*Mar.* abdominis segmentum 2<sup>um</sup>. basi nigrum: tibiæ pallidè fuscae, anticæ flavæ; tarsi fusci, basi flavi.

*Fem.*?—Oculi ocellique rufo-fusci: antennæ nigro-fuscae; articulus 1<sup>us</sup>. flavus: alarum nervi flavi; stigma parvum, concolor. (Alarum longitudo, 1 $\frac{1}{4}$ —1 $\frac{1}{2}$  lin.)

July; on laurels, amongst grass in fields; near London.

#### GENUS IV.—PROSODES, <sup>f</sup> Walker.

*Mas.*—Caput magnum, thorace latius: oculi mediocres: antennæ clavatæ, 13-articulatæ, corporis dimidio longitudine æquales; articulus 1<sup>us</sup>. elongatus; 2<sup>us</sup>. cyathiformis; 3<sup>us</sup>. et 4<sup>us</sup>. brevissimi; 5<sup>us</sup>. et sequentes ad 10<sup>um</sup>. longitudine decrescentes; clava triarticulata, conica, articulis 2 præcedentibus longior: thorax latus, ferè rotundus: prothoracis scutellum brevissimum: mesothoracis scutum breve, suturæ vix conspicuæ; scutellum convexum, breve, ovatum; paraptera et epimera conspicua: metathoracis scutellum magnum, canaliculatum: petiolus abdominis triente longior: abdomen breve; segmentum 2<sup>um</sup>. maximum, sequentia obtegens, apice truncatum, basi excavatum: pedes graciles, femoribus tibiisque rectis.

<sup>f</sup> Προσώδης inflatus.

In this, and in many other Hymenopterous genera, the petiole appears divided; but as the terms of the abdominal segments are not yet well defined, I have called both divisions the petiole. — See *Latreille, Cours d'Entomologie*, Tom. I. p. 231.

Sp. 1. Pro. ater. Mas. *Ater, antennis fuscis, pedibus flavis, alis hyalinis.*

Caput punctatum, obscurum: oculi nigro-fusci: ocelli rufo-fusci: thorax obscurus, punctatus; latera læviora, nitidiora: mesothoracis paraptera nigro-ænea: metathorax et petiolus minimè punctati: abdomen nitidum, glabrum: antennæ pallidè fuscae; articulus 1<sup>us</sup>. flavus: femora posticæ fusco maculata; tarsi apice fusci, 4 postici straminei: alæ hyalinæ; nervi flavi; stigma parvum, concolor. (Alarum longitudo, 1½ lin.)

June; on a window; near London.

GENUS. V.—MERISMUS,<sup>g</sup> *Walker.*

Caput magnum, thorace paullò latius: mandibulæ rectæ, dentibus 4 parvis armatæ: maxillæ elongatæ, apicem versus internè in lobum productæ: palpi maxillares 4-articulati; 1<sup>us</sup>. et 2<sup>us</sup>. æquales; 3<sup>us</sup>. longior; 4<sup>us</sup>. elongatus, acuminatus: mentum elongatum, posticè conicum: labium elongatum, anticè rotundatum: petiolus elongatus: abdomen *fem.* ovatum, supra convexum, apice abruptè elevatum et acuminatum: pedes graciles; tibiæ rectæ.

The trophi are described from *M. aculeatus*.

DIVISIO I.

Thorax ovatus, posticè latior: prothoracis scutellum mediocre: mesothoracis scutum mediocre, suturæ vix conspicuæ; scutellum latum, convexum; epimera et paraptera distincta: metathoracis scutellum magnum: petiolus posticè angustior: *maris* abdomen ovatum, gibbum, apice subtruncatum; segmentum 2<sup>um</sup>. magnum; 3<sup>um</sup>. maximum; sequentia brevissima: *fem.* abdomen elongato ovatum: antennæ *maris* extrorsum crassiores, *fem.* sub-clavatæ, 13-articulatæ; 1<sup>us</sup>. elongatus; 2<sup>us</sup>. cyathiformis; 3<sup>us</sup>. et 4<sup>us</sup>. brevissimi; 5<sup>us</sup>. et sequentes ad 10<sup>um</sup>. æquales; clava triarticulata, elongato ovata, articulis 2 præcedentibus æqualis.

Sp. 1. Mer. aculeatus. Mas et fem. *Viridis, antennis, nigris, pedibus flavis, alis hyalinis.*

Caput punctatum: oculi rufo-fusci: ocelli rufi: antennæ nigræ; articulus 1<sup>us</sup>. viridis, basi fuscus; 2<sup>us</sup>. æneus: thorax punctatus:

<sup>g</sup> Μερισμὸς divisio.

petiolus abdomine vix brevior: abdomen nitidum, glabrum; latera nonnunquam æneo-nitentia: coxæ virides; trochanteres fusci; femora postica viridi-fusca, 4 antica basi fusca; tarsi apice fusci, antichi fulvi, 4 postici straminei: alarum nervi pallidè fusci; stigma parvum, concolor. (Alarum longitudo, 1—1½ lin.)

*Var. β.*—*Mas.* femora flava, postica basi viridi-fusca.

*Var. γ.*—*Fem.* tarsi fusci, 4 postici basi straminei.

*Var. δ.*—*Fem.* thorax æneo-viridis: abdominis segmentum 2<sup>um</sup>. cupreo micans.

May; Southampton. September; Isle of Wight, and near London.

## DIVISIO II.

*Fem.*—Caput thorace multo latius: prothoracis scutellum mediocre: mesothoracis scutum magnum, suturæ sat conspicuæ; scutellum ovatum, convexum, mediocre: metathoracis scutellum magnum, carinatum: petiolus linearis: abdomen elongato-ovatum, apice abrupte acuminatum et elevatum, subtus valdè carinatum; segmentum 2<sup>um</sup>. maximum; sequentia brevissima: antennæ clavatae; articulus 5<sup>us</sup>. et sequentes ad 10<sup>um</sup>. longitudine æquales; clava ovata, articulis 2 præcedentibus longior.

*Sp. 2.* Mer. fronto. *Fem.* *Viridis, antennis nigris, pedibus flavis, alis hyalinis.*

Caput punctatum: oculi rufo-fusci: ocelli rufi: antennæ nigræ; articulus 1<sup>us</sup>. viridis: thorax punctatus: petiolus linearis: abdomen nitidum, glabrum; segmenta 2<sup>um</sup>. 3<sup>um</sup>. et 4<sup>um</sup>. apice obscure ænea: femora subtus fusco maculata; tarsi antichi fulvi, 4 postici straminei, omnes apice fusci: alarum nervi pallidè fusci; stigma parvum, concolor. (Alarum longitudo, 1¼ lin.)

August; on grass in fields; near London.

## DIVISIO III.

*Mas.*—Prothoracis scutellum minimum: mesothoracis scutum breve, suturæ vix conspicuæ; scutellum convexum, ovatum; paraptera et epimera mediocria: metathoracis scutellum magnum, elongatum, carinatum: petiolus linearis: abdomen ovatum, gibbum, abbreviatum; segmentum 2<sup>um</sup>. magnum; 3<sup>um</sup>. maximum; sequentia brevissima: antennæ extrorsum crassiores; articulus 5<sup>us</sup>. et sequentes ad 10<sup>um</sup>. longitudine decrescentes; clava elongato-ovata, articulis 2 præcedentibus æqualis.

Sp. 3. Mer. flavicornis. Mas. *Viridis, antennis pedibusque flavis, alis hyalinis.*

Caput punctatum: oculi ocellique rufo-fusci: antennæ flavæ; articulus 1<sup>us</sup>. apice fuscus: thorax et petiolus punctati: abdomen nitidum, glabrum: coxæ virides; femora crocea; tarsi 4 postici straminei, apice pallidè fusci: alarum nervi pallidè fusci; stigma parvum, concolor. (Alarum longitudo,  $\frac{3}{4}$ —1 lin.)

July; on grass in fields; near London. September; Isle of Wight.

#### DIVISIO IV.

Thorax elongatus: prothoracis scutellum parvum: mesothoracis scutum magnum, suturæ optimè determinatæ; scutellum magnum, convexum, elongato-ovatum; epimera et paraptera magna: metathorax magnus; scutellum carinatum: antennæ *maris* filiformes, *fem.* extrorsum crassiores; articulus 5<sup>us</sup>. et sequentes ad 10<sup>um</sup>. elongati, longitudine decrescentes; clava valdè elongata, apice acuminata, articulis 2 præcedentibus æqualis *mar.* aut longior et latior *fem.*: petiolus linearis: *maris* abdomen ovatum, convexum; segmentum 2<sup>um</sup>. maximum basi canaliculatum; 3<sup>um</sup>. magnum; sequentia brevissima: *fem.* abdomen elongato-ovatum, subtus carinatum, apice elevatum.

Sp. 4. Mer. megapterus. Mas. et Fem. *Viridis, antennis fuscis, pedibus flavis, alis hyalinis.*

Caput punctatum: oculi ocellique rufo-fusci: antennæ fuscæ; articulus 1<sup>us</sup>. flavus: coxæ virides; *maris* tibiæ intermediae pallidè fuscæ; tarsi pallidè flavi: oviductus subexsertus: alarum nervi pallidè fusci; stigma parvum, concolor. (Alarum longitudo, 1—1 $\frac{2}{3}$  lin.)

*Var. β.*—*Mar.* pedes crocei; tarsi flavi.

*Var. γ.*—*Fem.* tarsi straminei; apice fusci.

July; on grass in fields; near London.

Sp. 5. Mer. clavicornis. Fem. *Viridis, antennis nigro-fuscis, pedibus rufo-flavis, alis subhyalinis.*

Præcedenti similis; antennæ crassiores; caput minus; thorax et alæ angustiores: caput punctatum: oculi ocellique nigro-fusci: antennæ nigro-fuscæ; articulus 1<sup>us</sup>. flavus, apice fuscus: tarsi 4 postici flavi, apice fusci: alarum nervi fusci; stigma parvum, concolor. (Alarum longitudo, 1 $\frac{1}{4}$  lin.)

New Lanark, Scotland.

## DIVISIO V.

Prothoracis scutellum parvum: mesothoracis scutum mediocre, suturæ sat conspicuæ; scutellum mediocre, ovatum, convexum: metathoracis scutellum magnum, carinatum: abdomen ovatum, convexum, subtus carinatum, apice abruptè elevatum; segmentum 2<sup>um</sup>. maximum, sequentia brevissima: petiolus quàm præcedentium brevior: antennæ subclavatæ; clava elongato-ovata, apice acuminata, articulis 2-præcedentibus longior et latior.

Sp. 6. Mer. rufipes. Fem. *Viridis, antennis nigris, pedibus pallidè rufis, alis subhyalinis.*

Caput punctatum, cyaneo-viride: oculi ocellique nigro-fusci: antennæ nigræ; articulis 1<sup>us</sup>. basi flavus: coxæ virides; tarsi antichi fusci; 4 postici straminei, apice fusci: nervi pallidè fusci; stigma parvum, concolor. (Alarum longitudo, 1 lin.)

September; Isle of Wight.

GENUS VI. TOXEUMA,<sup>h</sup> Walker.

Fem.—Caput mediocre, thorace vix latius; antennæ subclavatæ, 13-articulatæ; 1<sup>us</sup>. elongatus; 2<sup>us</sup>. elongato-cyathiformis, 3<sup>us</sup>. et 4<sup>us</sup>. minimi; 5<sup>us</sup>. et sequentes ad 10<sup>um</sup>. æquales; clava triarticulata, apice acuminata, articulis 2 præcedentibus longitudine æqualis: mandibulæ 4-dentatæ, arcuatæ; dens interna obtusa: maxillæ elongatæ, externè ciliatæ; palpi maxillares 4-articulati; 1<sup>us</sup>. brevis; 2<sup>us</sup>. et 3<sup>us</sup>. paullò longiores, subæquales; 4<sup>us</sup>. elongatus, acuminatus: mentum elongato-ovatum: labium latum, anticè rotundatum: palpi labiales breves; articulus 2<sup>us</sup>. brevissimus: prothoracis scutellum breve: mesothoracis scutum mediocre; suturæ optimè determinatæ; scutellum magnum, convexum, ovatum; paraptera et epimera distincta: metathoracis scutellum magnum, carinatum: petiolus brevissimus: abdomen elongatum, plus minusve compressum, subtus carinatum, apice elevatum et acuminatum; segmentum 2<sup>um</sup>. elongatum; sequentia breviora: oviductus exsertus, brevis: pedes graciles; tibiæ rectæ.

Sp. 1. Tox. fuscicornis. Fem. *Viridis, antennis fuscis, pedibus cingulatis, alis hyalinis.*

Caput punctatum: oculi ocellique, rufo-fusci: antennæ fusæ; articulis 1<sup>us</sup>. viridis; 2<sup>us</sup>. nigro-æneus: thorax et petiolus punctati: abdomen nitidum, glabrum, æneo-micans: pedes rufi; coxæ

<sup>h</sup> Τοξεύμα sagitta.



virides; trochanteres nigri: femora intermedia basi nigra; postica nigra, apice rufa; tibiæ 4 posticæ versus medium pallidè fuscæ; tarsi antici pallidè fusci; 4 postici rufi, apice nigro-fusci: alarum nervi fusci; stigma parvum, concolor. (Alarum longitudo,  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.)

Var.  $\beta$ .—Tibiæ intermediæ omninò rufæ.

July; on grass in fields; near London.

Sp. 2. Tox. Ericæ. Fem. *Viridis, antennis nigris, pedibus cingulatis, alis hyalinis.*

Antennæ nigrae; articulus 1<sup>us</sup>. viridis: abdomen pubescens, apicem versus setosum, basi subtus purpureo, cupreo, cyaneoque micans: pedes nigri; coxæ virides; femora apice rufa; tibiæ 4 posticæ nigro-fuscæ; anticæ pallidè fuscæ; tarsi antici pallidè fusci; 4 postici rufi, apice nigro-fusci: alarum nervi fusci; stigma parvum, concolor. (Alarum longitudo, 1— $1\frac{1}{2}$  lin.)

Var.  $\beta$ .—Abdomen cyaneo-viride.

July; on heath; near London.

## GENUS VII. CORUNA,<sup>i</sup> Walker.

Caput magnum, thorace latius: oculi magni: antennæ 13-articulatæ, maris filiformes, fem. extrorsum crassiores et paulò breviores; articulus 1<sup>us</sup>. elongatus; 2<sup>us</sup>. cyathiformis; 3<sup>us</sup>. et 4<sup>us</sup>. minimi; 5<sup>us</sup>. et sequentes ad 10<sup>um</sup>. æquales, elongati; clava triarticulata, elongata, acuminata, articulis 9° et 10°. paulò longior: mandibulæ valde arcuatæ, dentibus 4 acuminatis armatæ: maxillæ elongatæ, apicem versus internè in lobum productæ: palpi maxillares 4-articulatæ; 1<sup>us</sup>. et 2<sup>us</sup>. æquales; 3<sup>us</sup>. brevior; 4<sup>us</sup>. acuminatus, 2 præcedentibus longitudine æqualis: mentum ovatum: labium anticè sinuatum: palpi labiales triarticulati; 2<sup>us</sup>. brevis: thorax gibbus, ovatus, posticè angustior: prothoracis scutellum parvum: mesothoracis scutum magnum; suturæ laterales optimè determinatæ; paraptera et epimera magna; scutellum magnum, ovatum: metathoracis scutellum conspicuum, canaliculatum: petiolus brevis: abdomen convexum, clavatum, basi angustum, fem. subtus carinatum et apice elevatum; segmentum 2<sup>um</sup>. elongatum, 3<sup>um</sup>. supra obtegens; 4<sup>um</sup>. mediocre; 5<sup>um</sup>. elongatum; 6<sup>um</sup>. et 7<sup>um</sup>. abbreviata: pedes graciles; tibiæ rectæ: alæ anticæ nervus solitus qua cum costâ concurrat incrassatus.

<sup>i</sup> Κορύνη clava.



Sp. 1. Cor. clavata. Mas et Fem. *Æneo-viridis, antennis fuscis, pedibus flavis aut fusco-flavis, alis hyalinis.*

Oculi ocellique rufo-fusci: antennæ fuscae; articulus 1<sup>us</sup>. flavus; 2<sup>us</sup>. ater: pedes flavi; tarsi 4 postici straminei; ungues et pulvilli fusci: alæ hyalinæ; nervi fusci; stigma mediocre, concolor. (Alarum longitudo,  $\frac{3}{4}$ —1½ lin.)

Var. β.—*Mar.* viridis; abdomen æneum, apice viride.

Var. γ.—*Mar.* omninò viridis.

Var. δ.—*Mar.* femora omnia basi fusca; tibiæ posticæ et nonnunquam omnes basi pallidè fuscae.

Var. ε.—*Fem.* antennæ nigro-fuscae; articulus 1<sup>us</sup>. flavus, apice fuscus: alæ subhyalinæ.

Var. ζ.—*Fem.* femora postica pallidè fusca.

June to September; grass in fields, lime-trees, &c.; near London. September; Isle of Wight. New Lanark, Scotland.

#### GENUS VIII. PACHYNEURON,<sup>k</sup> Walker.

Caput magnum, thorace latius: oculi mediocres: *maris* antennæ filiformes, 13-articulatæ; 1<sup>us</sup>. elongatus; 2<sup>us</sup>. cyathiformis, subarcuatus; 3<sup>us</sup>. et 4<sup>us</sup>. minimi; 5<sup>us</sup>. et sequentes ad 10<sup>um</sup>. æquales, lineares; clava elongata, acuminata, articulis 9<sup>o</sup>. et 10<sup>o</sup>. longitudine æqualis: *fem.* antennæ subclavatæ, corporis dimidio longitudine æquales; articuli post 5<sup>um</sup>. longitudine decrescentes; clava elongato-ovata; mandibulæ arcuatæ, dentibus 4 acuminatis armatæ; dentes 2 interni minuti, approximati: maxillæ elongatæ, externè ciliatæ: palpi maxillares filiformes; articuli 1<sup>us</sup>. et 2<sup>us</sup>. æquales; 3<sup>us</sup>. paullò longior; 4<sup>us</sup>. elongatus, acuminatus: mentum elongatum, angustum: labium latum, transversè lineatum, anticè rotundatum: palpi labiales articulis subæqualibus 3<sup>o</sup>. acuminato: prothoracis scutellum brevissimum: mesothoracis scutum breve; suturæ laterales vix conspicuæ; paraptera et epimera majuscula; scutellum latum, convexum: metathoracis scutellum sat magnum, carinatum: petiolus brevissimus: *maris* abdomen elongato-ovatum, depressum; segmentum 2<sup>um</sup>. elongatum; sequentia breviora: *fem.* abdomen ferè rotundum, supra depressum, subtus convexum: pedes graciles; tibiæ rectæ: alæ anticæ nervus solitus qua cum costâ concurrat incrassatus.

Sp. 1. Pach. formosum. Mas. *Viride, antennis fuscis, pedibus flavis, alis hyalinis.* Fem. *Æneo-viride, antennis nigris, pedibus flavo-fuscis.*

<sup>k</sup> Παχὺς crassus, νεῦρον nervus.

*Mas.*—Lætè viridis: oculi ocellique rufo-fusci: antennæ pallidè fuscae; articulus 1<sup>us</sup>. flavus, apice supra fuscus: mesothoracis scutellum æneo-viride: abdomen anticè cupreum: pedes lætè flavi; coxæ virides; tarsi apice, ungues et pulvilli fusci: alarum nervi fusci; stigma concolor parvum.

*Fem.*—Obscurè æneo-viridis: caput viride: oculi ocellique fusci: antennæ nigrae; articulus 1<sup>us</sup>. pallidè rufus, apice fuscus: mesothoracis scutellum æneum: abdomen nitens, viride, medio cupreum: pedes flavo-fusci, subtus pallidiores; coxæ virides; tarsi apice fusci. (Alarum longitudo, 1—1½ lin.)

*Var. β.*—*Mas.* thorax æneo-viridis.

*Var. γ.*—*Fem.* pedes rufi; tarsi flavi, apice fusci.

*Var. δ.*—*Fem.* nigro-viridis: abdomen viride: pedes flavi, femoribus basi tarsisque apice fuscis.

July; on windows, lime-trees, &c.; near London. September; Isle of Wight.

## GENUS IX. CYRTOGASTER,<sup>1</sup> Walker.

Caput mediocre: oculi majusculi: *maris* antennæ 14-articulatae, fusiformes; articulus 1<sup>us</sup>. elongatus; 2<sup>us</sup>. elongato-cyathiformis; 3<sup>us</sup>. et 4<sup>us</sup>. minimi; 5<sup>us</sup>. et sequentes ad 11<sup>um</sup>. longitudine decrescentes; clava triarticulata, elongata, compressa, apice acuminata, articulis 2 præcedentibus longior: *fem.* antennæ 13-articulatae, clavatae; articulus 1<sup>us</sup>. antennæ longitudine ferè triens; 5<sup>us</sup>. et sequentes subæquales; clava elongata, apice conica, articulis 9<sup>o</sup>. et 10<sup>o</sup>. longior: mandibulæ arcuatae, æquales, 4-dentatae: maxillares filiformes; articuli 1<sup>us</sup>. 2<sup>us</sup>. et 3<sup>us</sup>. breves, æquales; 4<sup>us</sup>. angustus, apice acuminatus, 3 præcedentibus vix brevior: mentum elongato-ovatum, basi conicum: labium anticè dilatatum et rotundatum: palpi labiales articulo 1<sup>o</sup>. mediocri; 2<sup>o</sup>. brevi; 3<sup>o</sup>. elongato, apice acuminato: thorax ovatus: prothorax parvus: mesothoracis scutum mediocre; suturæ laterales distinctæ; paraptera conspicua, triangula; scutellum magnum, convexum, ovatum: metathorax optimè determinatus; scutellum magnum: petiolus, mediocris, crassus: *maris* abdomen ovatum, convexum; segmentum 2<sup>um</sup>. maximum; 3<sup>um</sup>. majusculum; reliqua minima, sæpissime invisæ: *fem.* abdomen subtus carinatum; segmenta versus basin retracta; 2<sup>um</sup>. maximum, 3<sup>i</sup>. latera amplectens; 3<sup>um</sup>. maximum; sequentia parva: oviductus in carinula ventrali

<sup>1</sup> Κυρτός curvus, γαστήρ venter.

receptus, segmenti 3<sup>l</sup>. apicem versus manifestus, trans abdomen vix exsertus: pedes graciles, subæquales, tibiis rectis, *maris* tibiis tarsisque intermediis latis: alæ breves.

Sp. 1. Cyr. vulgaris. Mas. *Viridis, antennis fuscis, pedibus fusco-flavis, alis hyalinis*. Fem. *Æneo-viridis, antennis nigris, pedibus fuscis, alis subhyalinis aut subfuscis*.

*Mas.*—Caput punctatum: oculi ocellique rufo-fusci: antennæ fuscae; articulus 1<sup>us</sup>. apice 2<sup>usque</sup>. omninò nigri: thorax punctatus: petiolus æneo-viridis: abdomen æneo-viride, nitidum, glabrum, pedes fusco-flavi; coxæ virides; tibiæ intermediæ nigræ; tarsi fusci, intermedii nigri: alæ hyalinæ; nervi pallidè fusci; stigma parvum, concolor.

*Fem.*—Obscurè æneo-viridis: antennæ nigræ: abdomen medio nigro-cupreum: pedes fusci, tibiis tarsisque 4 posticis nigro-fuscis: alæ subhyalinæ. (Alarum longitudo,  $\frac{2}{3}$ — $1\frac{1}{4}$  lin.)

*Var. β.*—*Mar.* femora antica et postica flava; tibiæ flavæ; intermediæ nigræ, basi fuscae.

*Var. γ.*—*Mar.* mesothoracis scutellum viridi-æneum: abdomen apice nigro-cupreum.

*Var. δ.*—*Mar.* antennæ flavæ; articulus 1<sup>us</sup>. fuscus, apice niger; 2<sup>us</sup>. omninò niger: abdomen æneum, apice nigro-cupreum: pedes fusci.

*Var. ε.*—*Mar.* tibiæ posticæ fuscae.

*Var. ζ.*—*Mar.* abdomen viride, apice cupreum.

*Var. η.*—*Mar.* pedes antici et postici omninò flavi.

*Var. θ.*—*Fem.* abdomen nigro-cupreum, apice æneum: tibiæ tarsisque omnes nigro-fuscescentes.

*Var. ι.*—*Fem.* caput viride; thorax concolor; mesothoracis scutellum æneo-viride.

*Var. κ.*—*Fem.* thorax æneus: alæ subfuscae.

Near London. September; Isle of Wight. New Lanark, Scotland.

It is common throughout the year, and is sometimes wingless: it inhabits moss in winter.

Sp. 2. Cyr. scotica. Fem. *Ænea, abdomine nigro-cupreo, antennis nigris, pedibus fuscis, alis subfuscis*.

Obscurè ænea, præcedenti angustior: antennæ graciliores, nigræ: caput posticè æneo-viride: oculi ocellique rufo-fusci: abdomen nigro-cupreum, basi lateribusque æneis: pedes fusci, tibiis apice

tarsisque nigris : alæ subfuscae ; nervi pallidè fuscis ; stigma parvum, concolor. (Alarum longitudo,  $\frac{3}{4}$ —1 lin.)

New Lanark, Scotland.

Sp. 3. Cyr. thoracica. Fem. *Nigro-ænea*, *antennis nigris*, *pedibus fuscis*, *alis fuscis*.

Oculi ocellique rufo-fusci : pedes-fusci ; tibiæ nigro-fuscae ; tarsi nigri : alæ fuscae ; nervi fuscis ; stigma parvum, concolor. (Alarum longitudo, 1 lin.)

New Lanark, Scotland.

Sp. 4. Cyr. pusilla. Fem. *Ænea*, *antennis nigris*, *pedibus nigro-fuscis*, *tarsis flavis*, *alis fuscis*.

Oculi ocellique nigro-fusci : abdomen nigro-æneum : pedes nigro-fusci ; coxæ æneæ ; trochanteres fuscis ; genua flava ; tarsi flavi, apice fuscis : alæ fuscae ; nervi pallidè fuscis ; stigma parvum, concolor. (Alarum longitudo,  $\frac{3}{4}$  lin.)

Obs.—A *C. vulgari* antennis gracilioribus, alis longioribus differt.

July ; grass in fields ; near London.

Sp. 5. Cyr. clavicornis. Fem. *Nigro-ænea*, *antennis nigris*, *pedibus rufo-fuscis*, *alis subhyalinis*.

Oculi ocellique rufo-fusci : antennæ nigræ : elava magna, lata : abdomen æneum, basi viride : pedes rufo-fusci ; coxæ æneæ ; femora basi genuaque rufa ; tarsi rufi, apice fuscis : alæ subhyalinæ ; nervi fuscis ; stigma parvum, concolor. (Alarum longitudo,  $\frac{3}{4}$  lin.)

July ; grass in fields ; near London.

Sp. 6. Cyr. obscura. Fem. *Nigro-ænea*, *antennis nigris*, *pedibus nigro-fuscis*, *alis fuscis*.

Oculi ocellique nigro-fusci : abdomen apice æneum : pedes nigro-fuscae ; genua fusca ; tarsi concolores : alæ fuscae ; nervi fuscis ; stigma parvum, concolor. (Alarum longitudo,  $1\frac{1}{4}$  lin.)

July ; grass in fields ; near London.

Obs.—Hæc species et præcedens a reliquis hujus generis alis longioribus et latioribus differunt.

Sp. 7. Cyr. rufipes. Mas. *Æneo-viridis*, *antennis pedibusque pallidè rufis*, *alis hyalinis*. Fem. *Viridi-ænea*, *antennis nigris*, *pedibus rufis*, *alis subhyalinis*.

*Mas.*—Lætè æneo-viridis: oculi ocellique rufo-fusci: antennæ pallidè rufæ: petiolus æneus: abdomen basi cyaneo-viride, apice nigro-cupreum: pedes pallidè rufi: tibiis apice tarsisque intermediis nigris, tarsis posticis apice fuscis; ungues et pulvilli fusci: alæ hyalinæ; nervi pallidè fusci; stigma parvum, concolor.

*Fem.*—Caput posticè viride: antennæ nigræ; articulus 1<sup>us</sup>. pallidè rufus, apice niger: mesothoracis scutellum æneum: petiolus viridi-æneus: abdomen nigrum, nitidum, ventre, lateribus apiceque æneis: pedes rufi; coxæ æneæ; tarsi pallidè rufi, apice fusci: alæ subhyalinæ; nervi pallidè fusci; stigma parvum, concolor. (Alarum longitudo,  $\frac{2}{3}$ —1 $\frac{1}{4}$  lin.)

*Var. β.*—*Mar.* antennæ articulo 2<sup>o</sup>. fusco.

*Var. γ.*—*Mar.* abdomen viridi-æneum, apice cupreo-æneum.

*Var. δ.*—*Fem.* abdomen supra nigro-viride.

*Var. ε.*—*Fem.* abdomen omninò viride.

*Var. ζ.*—*Fem.* abdomen nigro-cupreum, basi viride, apice lateribusque æneis.

*Var. η.*—*Fem.* antennæ fuscæ: alæ hyalinæ.

*Var. θ.*—*Fem.* caput viride; thorax concolor; mesothoracis scutellum æneo-viride.

Common near London during the greater part of the year; sometimes wingless like *C. vulgaris*. New Lanark, Scotland.

Sp. 8. *Cyr. tenuis*. *Fem. Viridis, abdomine nigro-æneo, antennis quàm C. rufi pedis gracilioribus, pedibus obscure rufis, alis subfuscis.*

Oculi ocellique rufo-fusci: antennæ nigræ; articulus 1<sup>us</sup>. fuscus: abdomen nigro-æneum: pedes obscure rufi; tarsi rufi, apice fusci: alæ subfuscæ; nervi pallidè fusci; stigma parvum, concolor. (Alarum longitudo,  $\frac{2}{3}$  lin.)

July; grass in fields; near London.

Sp. 9. *Cyr. cingulipes*. *Fem. Viridi-ænea, abdomine nigro-cupreo, antennis nigris, pedibus rufis, intermediis fusco-cingulatis, alis subhyalinis.*

Oculi ocellique rufo-fusci: antennæ nigræ; articulus 1<sup>us</sup>. nigro-fuscus: mesothoracis scutellum æneum: abdomen nigro-cupreum, margine ventrequè viridi-æneis; pedes pallidè rufi, femoribus tibiisque intermediis fusco-cingulatis, tarsis apice fuscis: alæ subhyalinæ; nervi pallidè fusci; stigma parvum, concolor. (Alarum longitudo,  $\frac{2}{3}$  lin.)

July; grass in fields; near London.

ART. XLIV.—*Notes on the Habits of Insects.*—By DELTA.

“*Agrestem tenui meditabor arundine musam.*”

SIR,—I have ventured to send you a few rough notes on a department of entomology which has been but little attended to in this country by real naturalists, having been left almost entirely to the care of literary hacks, hired by booksellers at a regular stipend per sheet to compile volumes, in which truth is to be sacrificed in order that the book may be *popular*; that is to say, may contain something wonderful, and calculated to catch the notice of the multitude. Should you consider these notes worth publication, I may perhaps send you a few more occasionally. I leave it to your judgment to publish these as a separate paper or amongst your “*Varieties.*”

*Chelostoma florissomme* has always been a great favourite with me. Though not adorned with brilliant colours, or a pleasing external form, the male seems to me almost a faery being, a little Ariel, now sporting in the sunbeams, now reposing, not certainly “in the cowslip’s bell,” but in the corolla of that far fairer flower.

— “dout Vénus compose ses bouquets,  
Le Printemps sa guirlande, et l’Amour ses bosquets;  
Qu’Anacréon chanta! qui formoit avec grâce,  
Dans les jours de festins la couronne d’Horace.”

But though the male is a perfect Sybarite, a mere voluptuary, the female is the very model of maternal industry, her whole life being spent in providing for her family.

Often, when amusing myself with guiding the young shoots of *Atragene Austriaca* or *Glycine Sinensis* along a trellis in my garden, have I observed the female anxiously examining the posts which support the trellis, especially on the sunny side. Having found one which is quite dry and a little going to decay, she commences by piercing a hole nearly horizontally, about an inch deep, then changing the direction, she proceeds as nearly in a perpendicular line as circumstances will allow. Her strong mandibles, bidentate at the apex, are the sole instruments with which nature has furnished her for this difficult task; but with these she contrives to gnaw the wood to a sort of sawdust, which she kicks out of the hole, passing it from one



pair of feet to the next. Occasionally she comes to the mouth of her hole, it may be to rest herself, or to look round and see that no enemies are near. This cylindrical hole, which is generally about ten or twelve inches long, is to be divided into nearly twenty cells, which are to be filled with food for her "*parvos Quirites*," one of which will occupy each cell.

Let us suppose a sufficient length of the post to be excavated, there remains a great difficulty to be got over. The egg which is first deposited will, of course, be the first to hatch, the earliest larva will, therefore, first become a pupa, and also will undergo the final change sooner than the younger part of the brood above. To guard against the confusion which must necessarily arise from this, she continues the hole, changing the direction of it until it assumes a horizontal course, and at length arrives again at the outside, thus leaving an easy escape for the first of the brood without disturbing those above, which will not appear for from two to five days later. In this, as in much else, the habits of this bee resemble those of *Xylocopa violacea*, as detailed by Réaumur, Tom. VI. p. 40, *et seq.*

She now closes the hole just above the lower bend with a partition, consisting of fine sand firmly glued together by means of a viscid saliva, with which she is copiously furnished.

What now remains for her to do is light and pleasing compared to her former labours—

"Illa continuo saltus silvasque peragrat,  
Purpureosque metit flores et flumina libit  
Summa leves. Hinc nescio quâ dulcedine læta  
Progeniem nidumque fovet."

Having stored a sufficient quantity of food, which consists of pollen from the anthers and honey from the nectaries of flowers, for the support of one larva, she deposits an egg, and then closes the cell in the same manner as she formed the bottom of it. She now begins to store up more food, deposits another egg, and closes that cell, proceeding thus until she has quite filled the perpendicular part of the hole.

Her task now draws to a conclusion, she has only to close the two apertures; the lower one being intended for the outlet is merely closed in the same way as the cells, with very fine sand, but as the upper one is much more exposed to danger



from rain, which might penetrate it, and getting into the nest destroy the young larvæ, she first closes it in the same manner as the first, and then adds a layer of much larger grains of sand. Alighting on the gravel-path, she selects a grain suited to her purpose; she carries it to her nest, holding it in her mandibles, turns it about to find where it will fit best, then, guiding it with her maxillæ, and covering it with saliva from her tongue, she presses it down into its place, and flies off for another.

Μάστακα δ' οἷα τέκνοισιν ὑπωροφίοισι χελιδῶν  
 "Αψορρόν ταχινὰ πέτεται βίον ἄλλον ἀγέριεν.

Another and another are fetched until, the aperture being securely closed, her labour is done; she has provided for the continuance of her race, and with her maternal care ends also her life.

But after all her toil, it often happens that the whole of the brood is destroyed; and instead of our observing next spring the appearance of bees descended from the one whose labours we have observed, we see come forth a small Hymenopterous insect, having, like most dandies, nothing but a gaudy dress to recommend him.

Thus also does it sometimes happen, when some giant in science has been toiling day after day and night after night, bearing in mind the words of Moore, who is an Irishman—

" And the best of all ways  
 To lengthen our *days*  
 Is to steal a few hours from the *night*"—

when, after much toil and trouble, both of body and mind, he thinks to immortalize his name amongst scientific men, in steps some upstart, whose knowledge is mere outside show, and having clandestinely gained some little acquaintance with the object and result of his researches, endeavours, by a paltry appearance of priority, to defraud him of his just reward.

The intruder, in the case of our little insect, is *Chrysis cyanea*, which, during the absence of the mother, has deposited her eggs in the cells; the larvæ produced from these feed on the larvæ of the *Chelostoma*, and undergo their metamorphosis in cells prepared for these last.

*Osmia bicornis* also nidificates in the posts of the same *charmille*, which moreover affords food and dwelling-places to

innumerable *Tipulidæ* and many *Coleoptera*, as *Mycetæa fumata*, several *Anobia* and *Ptini*, *Sphæriestes 4-pustulatus*, &c., whose history, had I time, I might perhaps detail.

“Verum hæc ipse equidem, spatiis exclusus iniquis,  
Prætereo, atque aliis post commemoranda relinquo.”

I am not quite sure that this bee does not bore holes into posts, &c., but it mostly chooses an old bolt-hole, a hollow in a wall where the mortar has fallen out, or, where bees are kept, the space between the hive and the pan usually placed as covering on the top.

The appearance of the male is generally synchronous with that of *Anthophora retusa* and the flowering of the bulbous fumitory. The female is rather later, and is not generally out before the flowering of the plum, or even apple, in the blossoms of which she seems to take great delight. The weather at this time is often stormy, and then we frequently see her alight on the ground, pick up two or three grains of coarse sand and fly off with them. Virgil probably mistook this insect for a hive-bee, no doubt from seeing it fly to his hives, the construction of which would just suit our insect. He says—

“————— et sæpe lapillos  
Ut cymbæ instabiles fluctu jactante saburram  
Tollunt : his sese per inania nubila librant.”

I have read somewhere of a very learned friar, I forget his name, who was so thin and light in his body (a *rara avis* truly he must have been), that he always in windy weather filled his pockets with pebbles lest he should be blown away, but I much doubt whether any bee ever carried stones for the same purpose.

The real object of her carrying them is the formation of her nidus, which is composed of a number of separate oval cells, consisting entirely of clay and sand, glued together with her saliva, and disposed irregularly according as she best can find room to place them. However close they may be to each other, she never makes the side of one cell serve also for another; each cell, though mostly touching, is quite distinct from its neighbours,—a waste of materials we do not often observe in nature. When all the cells (which are about twenty or thirty in number) are completed, she covers the whole of the exposed parts with a coating of the same materials as she

employed in their formation. The larvæ when full grown spin a rather thick, brown, silky cocoon, in which they undergo their metamorphosis. The imago is perfectly developed in autumn, but does not quit the cells till spring.

*Trochilium tipuliforme*, as is well known, is very injurious to the common currant, its larva feeding on the pith of the younger branches; but there is another insect, whose ravages do not appear to have attracted so much notice, perhaps from its being more local, or it may be that the mischief it occasions has been attributed to the more generally known destroyer. Here, although *T. tipuliforme* is very common, the injuries it occasions are not one-tenth so great as that of a little moth, *Lampronia capitella*.

It is nothing uncommon in the spring to see a large and flourishing currant-bush just putting forth its leaves, and then in a few days wither away; just so—"si magna licet componere parvis"—does he whom misfortune has overtaken in his youth wither away beneath the blighting influence of the sorrow which preys upon his heart.

If we examine the young shoots, we find within them a small reddish caterpillar, with something in its external form, which, combined with its colour, forcibly reminds us of that of *Cossus ligniperda*. Apparently, this larva enters the shoot about an inch up it, and penetrates downwards quite to the bottom of the shoot, eating the pith of this part of the shoot. It then proceeds to a second, and even a third; and when full fed undergoes its metamorphosis at the bottom of the shoot. In about five weeks the imago appears—"maculis insignis et auro"—and may be seen flying in swarms around the currant-bushes.

Should any one be disposed to consider the above notes as trifling and useless, I beg leave to say, that in all the cares, troubles, and disappointments in life which I have met with, and these are not few, I have found nothing so useful in driving away despondency, in reviving hope, as the study of nature. Truly has La Lepède said, that all that has been spoken by philosophers of learning in general can be said with far greater emphasis of the study of natural history. To use his own words, "Elle enchante nos jeunes anneés, elle plaît à l'âge mûr, elle pare la vieillesse de fleurs, dissipant les chagrins, calmant les douleurs, écartant les ennuis, allégeant le

fardeau du pouvoir, soulageant du souci des affaires pénibles, faisant oublier jusques à la misère, consolant du malheur d'une trop grande renommée,—quelle adversité ne diminue-t-elle pas ?”

I am, yours most truly,

Δ.

Colchester, May, 1833.

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ART. XLV.—*Establishment of the Entomological Society of London.*

NOTHING more clearly demonstrates the increasing taste for a particular science than the establishment of a separate and distinct society for the accommodation of its advocates. It was thought a very unnecessary step when the Linnæan Society first associated itself as distinct from the Royal; again the Geological and Zoological Societies had many wise heads shaken at them, many opinions passed on their probably ephemeral existence; yet all these societies, notwithstanding manifold evil predictions, exist and flourish: why then should we not have an Entomological Society? The objects of the Royal Society are too multifarious, of the Linnæan too phyto-logical, of the Geological too inanimate, and of the Zoological too vertebrate, for an entomologist to attend either with the slightest hope of meeting with his congeners. Under these circumstances it was deemed expedient to propose an Entomological Society, the objects of which should be the holding of periodical meetings for the reception and reading of papers connected with the subject; the publication from time to time of such papers as the Society or its council may consider worthy of publication; the forming a library and collection for the use of the members; and the general promotion of the science of entomology in all its branches;—objects in every respect so praiseworthy, that we feel the most lively satisfaction in giving the Society all the publicity and assistance in our power, and in heartily recommending our friends at once to enrol their names as members,—a recommendation they will be the more willing to attend to when they see the names of

the gentlemen appointed to manage the affairs of the Society. If there be a name endeared to every British entomologist; if there be a name respected both at home and abroad; if there be a name before which all party and illiberal feeling would hide its face, and turn abashed and trembling away, it is the name of him whom the Society has, with an accordant voice, placed at its head as honorary president. The acting president and the council are too well known to our readers, either as authors or zealous collectors, or in many instances as valued personal friends, to need any commendation of ours.

Agreeably to an invitation sent to his entomological friends, a party met at Mr. Children's, and, after due deliberation, agreed that it was expedient to establish a Society to be called the Entomological Society of London; that periodical meetings should be held to receive communications; that collections and a library should be formed; that communications of sufficient interest should be published; that all persons signifying to the secretary their wish to join the Society before the 1st of November should be original members, that all after that day should be elected by ballot; that the annual subscription should be one guinea; that original members should pay on entrance one guinea; elected members two guineas; and that the first general meeting should be held at the Thatched House, St. James's-street, on the 22d of May.

A copy of these resolutions was sent round to all the entomologists whose addresses could be obtained, and a meeting was accordingly held, at which Mr. Stephens was called to the chair.

The minutes of the previous meeting were read and signed.

Letters were read from Messrs. Griesbach, Wood, Babington, Davis, Broome, E. Doubleday, and Raddon, requesting that their names might be entered as original members; Messrs. Bowerbank, W. Christy, jun., J. F. Christy, Hanson, Newman, and Walton, who were present, signified in writing their wish to become original members; the names of Messrs. Wailes and Hoyer were handed in for the same purpose; a letter was read from the Rev. Mr. Kirby, declining to take an active part in the management of the Society.

The CHAIRMAN said it would be the next business of the meeting to appoint a council to manage the affairs of the Society, out of which council the higher officers must be

chosen. A paper was then handed round the table, on which it was competent to each member to write the name of any gentleman whom he considered worthy the honour of being placed on the council. When the paper again reached the chair it contained the following names, to none of which any objection being made they were declared duly elected.

CHILDREN, J. G. Esq., <i>Sec. Roy. Soc. &amp;c.</i>	NEWMAN, E. Esq., F.L.S., &c.
DAVIS, A. H. Esq., F.L.S., &c.	STEPHENS, J. F. Esq., F.L.S., &c.
GRAY, I. E. Esq., F.R.S., &c.	SYKES, LIEUT.-COL., F.L.S., &c.
GRAY, G. R. Esq.	VIGORS, N. A. Esq., M.P., M. A., F. R. S., &c.
GRIESBACH, A. W. Esq., B.A.	WATERHOUSE, G. R. Esq.
HOPE, REV. F. W., M.A., F.L.S., &c.	YARRELL, W. Esq., F.L.S., &c.
HORSFIELD, T. Esq., M.D., F.R.S., &c.	

The CHAIRMAN said the next business before the meeting was the appointment of a President.

MR. CHILDREN said there was a gentleman whose entomological labours had for a long series of years been an honour to this country, and to whom he was sure every entomologist must look up with feelings of the warmest esteem and most profound respect; and although, from the fear probably of not being able to bestow that time and attention on the affairs of the Society which he thought it might claim, he had in the letter just read declined taking any active part in it; yet he (Mr. Children) questioned whether the Society would be altogether testifying its feelings towards the individual to whom he alluded unless it conferred on him the highest honour it had in its power to bestow; many gentlemen would be aware that the Entomological Society of France had conferred on the learned and now lamented Latreille a title which did not oblige him to take any more active part in the affairs of that Society than his own inclination might induce or his leisure permit. The title he alluded to was that of *honorary* president, and with the permission of the chair he would move—

That the Rev. W. Kirby be appointed Honorary President of this Society.

COLONEL SYKES seconded the motion, which was then put from the chair, and carried unanimously.

MR. NEWMAN then moved, and the REV. MR. HOPE seconded—

That J. G. Children, Esq. be President of this Society.



MR. YARRELL moved, and the REV. MR. HOPE seconded—  
That N. A. Vigors, Esq. be one of the Vice-Presidents of this Society.

COLONEL SYKES moved, and MR. CHILDREN seconded—  
That J. F. Stephens, Esq. be one of the Vice-Presidents of this Society.

MR. GRAY moved, and MR. WESTWOOD seconded—  
That Dr. Horsfield be one of the Vice-Presidents of this Society.

COLONEL SYKES moved, and MR. YARRELL seconded—  
That the Rev. F. W. Hope be Treasurer and Vice-President of this Society.

REV. MR. HOPE moved, and MR. CHILDREN seconded—  
That G. R. Gray, Esq. be Secretary of this Society.

MR. WESTWOOD moved, and the REV. MR. HOPE seconded—  
That G. R. Waterhouse, Esq. be Curator of the Collections and Librarian of this Society.

MR. YARRELL moved, and MR. CHILDREN seconded—  
That, in consequence of the advanced state of the present season, no further meeting of the Society is expedient till November next, on a day to be fixed by the Council, who will in the interim be engaged in deciding on a place of meeting, of which due notice will be given : that the Council frame laws to be then submitted for approval ; that it is not considered necessary that any payment should be made till the meeting in November, which will be considered the anniversary, and on which the annual subscription will be due.

MR. NEWMAN moved, and MR. CHILDREN seconded—  
That the Thanks of this Meeting be given to MR. STEPHENS for his very able and obliging conduct in the chair.

The whole of these resolutions were carried unanimously, and without the slightest difference of opinion being expressed on any of them ; and the meeting altogether passed off with that perfect good humour, cordiality, and good feeling which we hail as an earnest of its future prosperity,—for in concord there is strength.

We conceive the main objects of the Entomological Society to be—1st, The formation of a *well-named* collection ; and for this purpose we most earnestly and respectfully solicit for the Society donations of specimens, particularly of those genera and species which are newly-named and described ; if these be labelled by the first describer, and thus openly exhibited to



all inquirers, much of the present confusion and misunderstanding about priority might be avoided, and moreover a very essential service rendered to beginners. 2dly, The formation of a library; and to assist in this we think that every author should make the Society a present of his own works, or copies of papers published in periodical works. 3dly, The reception of scientific papers: we would venture to suggest that these should be read by their authors, that during the reading silence should be maintained, and that each paper should become the subject of discussion, during which only one member should be allowed to speak at a time, and that until the chair had been vacated no general conversation should take place. We merely throw out these hints; if the council do not consider them worth attending to we shall be perfectly satisfied without making any attempt to enforce them; but it is easier to avoid the acquisition of bad habits than to escape from them when acquired; and the constant conversation during the reading of papers at learned societies in general we really must consider somewhat indecorous.

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ART. XLVI.—*Osteology, or External Anatomy of Insects.*  
By EDWARD NEWMAN, ESQ., F.L.S.

“I find it impossible to give, according to the present state of science in England, any satisfactory description of insects without making some previous observations on their anatomical nomenclature.”  
MACLEAY.

“Ce que personne n'avait encore tenté j'ai osé l'entreprendre.”  
SAVIGNY.

LETTER I.—ON THE PRIMARY PARTS OF INSECTS.

SIR,—It is with a full consciousness of my inability to render it justice, that I undertake a subject from which all our entomologists seem to have shrunk, viz. the substitution of a natural nomenclature of the parts of insects for the artificial one proposed by Linnæus, which is still in universal use; but I have always considered that it is more commendable to do our best, however short of perfection that best may be, than to procrastinate the little service we may render to others, in the vain and selfish hope that we may hereafter render our labours so complete as to be an object of general praise. The more

closely and attentively I regard the structure of that portion of animals to which my present observations will be exclusively confined, the more thoroughly am I convinced that this branch of science is yet in its very infancy. I may perhaps be reminded that Lyonnet, Leon Dufour, Chabrier, Herold, and Sträus-Durckheim, have, by their unconquerable industry and surpassing skill, accomplished wonders;—I may be told that Savigny, Andouin, and MacLeay, have, by the vigour and comprehensiveness of their minds, and their extraordinary talent in the application of observations, arrived at great and important results;—and I am willing to admit all this;—but, though great the researches in this science, and apposite their application, the same objection may be taken to them all, that they tend to illustrate a theory in itself evidently false, rather than to find out and establish plain and solid truths. It appears to me somewhat singular, that entomological writers, who have so boldly and unceremoniously attacked and altered the disposition and nomenclature of the groups proposed by Linnæus, should without exception have religiously adhered to that erroneous and artificial disposition and nomenclature of external parts, from which his principal faults in grouping and systematic arrangement have arisen. All nomenclature of parts, which have only ideal limits, I would contend that common sense commands us to discontinue, believing that no name for any portion of an animal, the limits of which portion are unsettled or optional with the describer, and have no existence in nature, can be suitably retained or philosophically employed. In the comparative anatomy of higher animals we trace the same part through an almost infinite variety of modifications, yet apply to it the same name, and assign as characters its variations, as the variations of a single part; in the comparative anatomy of insects we can with ease detect the presence of the principal parts in every individual, yet have hitherto assigned such parts no common name, but name them variously according to their variations.<sup>a</sup> In examining a particular portion of an insect,

<sup>a</sup> Even this is more than we always accomplish. In turning over for the purpose twenty consecutive pages of two of the most highly esteemed British works on entomology, I find the most important segment of an insect is described or alluded to under the following names:—*manitruncus*; *collare*; *collum*; *thorax*;

I have considered it invariably with a strict attention to its relative value; that is, *first*, as to its relation to neighbouring parts in the same insect; *secondly*, as to its relation to the same part in other insects. I have endeavoured to avoid bringing into notice extravagant or monstrous appearances in particular genera or species, as exemplifications of any proposition, believing that these bear no higher value, in a general system, than a deformed individual does in a species; that they are not plans of nature, but departures from her plans; not rules of nature, but exceptions to her rules: for the entomologist cannot but observe, that these strange conformations are not necessary developments of muscle for the support of increased action in organs of locomotion, &c.; for where the increased use of either pair of locomotive organs is observable, the segment bearing those organs is increased in volume through whole orders, or even classes; and is never, as far as I have yet observed, limited in its increase to a genus or family. I fear, that in thus generalizing, I shall by some be charged with being superficial; but it is my firm impression, that we have been too prone to insulate facts; too eager to notice and comment on wonders, which would probably cease to be such were the range of our meditations allowed a wider field.

On the subject of system it may be thought that I have elsewhere indulged somewhat too freely,—a point which time must settle: I have merely made such allusions to it here as the subject of the present essay renders compulsory; for instance, in tracing the progressive development of particular parts, I have adhered to the position of the seven classes which I formerly proposed; and in doing this I furnish the reader with a test by which the worth of any system may be

*prothorax; mesothorax; scutellum; manitrunk; collar; ring; neck; behind the head; anterior margin of thorax; anterior portion of thorax; anterior part of thorax; segment of thorax; first segment of thorax; anterior segment of thorax; first portion of the trunk; first segment of the trunk; second segment of thorax; second segment in an insect.* Inferior writers have added to this list, as have also the writers above alluded to in other parts of their works. The names now in use in this country alone for this one segment, considered as a whole, are thirty-nine. The fore-wings of insects are called *elytra, hemelytra, pseudelytra, tegmina, coriaria, alæ, alæ anticæ, alæ primæ, alæ primores, alæ primariae, alæ anteriores, &c. &c.*, besides English names.

tried; and it will be quite impossible for myself, or any systematist, to explain away obvious relationships dependent on essential similarity of structure, if indeed the grouping together of intrinsically similar conformations be, as I suppose, the basis of natural arrangement.

Animals are formed on a number of perfectly distinct plans: the organs which answer the purposes of perpetuating the kind, of sustaining life, and of moving from place to place, are present in all; but the mode of their appearance affords those characters which serve best to separate the kingdoms of animals from each other.

Many animals are merely an homogeneous jelly, inhabiting the water, and adhering to earthy or vegetable substances, or protected by an earthy tube secreted by their own bodies; of these, the history, *i. e.* the reproduction and mode of existence, seems to foil inquiry, and to throw every impediment in the way of those who would draw the line between the animated and vegetable portions of the universe; but, as we rise in the scale of animated beings, we find they acquire the power of locomotion, and either fly in the air, walk on the earth, or swim in the water, moving at will from object to object, as the great incentives to action, love and hunger, destined wisely for the increase and sustenance of animal life, may induce them. In these we find the body consists of two principal portions besides the organs immediately connected with the continuance of life: these portions are commonly known as bone and muscle; the bone is solid, hard, and capable of fracture, and serves for the attachment and support of the muscular parts, which are softer, generally incapable of fracture, and yield before the slightest pressure, by the motion of their composite particles *inter se*. The disposition of bone and muscle varies in the groups in which these parts are distinct; the bone is sometimes an articulated frame-work to which the muscle adheres externally, clothing it as with a garment; animals formed on this plan are called *Vertebrata*: sometimes the bone is composed of little nodules, not articulated with each other, but strung together like beads by means of cartilaginous tendons; these are termed *Radiata*: sometimes the whole of the bone is united into one or two large pieces, which are throughout the greater part of their surface entirely unconnected with the animal, but constitute a

domicile within which it retires for protection; these are *Mollusca*. Lastly, in some animals the bone completely envelopes the muscle, as with a case, which is articulated externally and vertically, thus dividing the animal into a number of portions, segments, or *annuli*; whence the name *Annulata*.

An Insect, then, is an annulate animal; and its characters are these:—the bones are external, or perhaps, more correctly speaking, the skin in which the animal is inclosed has become solid, compact, and bony; and, like the bones of vertebrate animals, serves for the attachment and support of the softer and muscular parts, around which it forms a complete case or covering, which, owing to its liability to injury, consequent on its constant risk and exposure from its own activity, is absolutely necessary to protect it from that loss of life which must otherwise very speedily annihilate the kind. This case is vertically divided into thirteen segments; and each of these segments is sometimes<sup>b</sup> subdivided, both vertically and horizontally, into four; thus giving sixteen osseous plates or bones to every segment, or two hundred and eight to the whole trunk.<sup>c</sup> From the first of these segments arise the organs of manducation, vision, and two *antennæ*, which are the principal organs of touch; from the second, two legs; from the third, two wings and two legs; and from the fourth, two wings and two legs; these ten being the organs of locomotion: these organs are for the most part covered with the same osseous case as the trunk, and are articulated in a similar manner. In the sutures of the trunk, and also in those of the organs of locomotion, the connecting skin is membranous and pliable, affording freedom of motion when required; but there are exceptions to this.

The bony plates being always so formed as to meet accurately at their margin, and to play easily, and without injury

<sup>b</sup> I should suppose this may be invariably the case.

<sup>c</sup> Mr. MacLeay asserts that fifty-two segments is the *maximum* number in the *Chilognatha*. (Anatomy of the Thorax of Winged Insects, Zool. Jour. XVIII. p. 153.) In many of these, each segment very evidently consists of a dorsal, a ventral, and two lateral plates or bones, which would produce the number, two hundred and eight, as proposed above, and afford a striking fact in support of Andouin's excellent observation, that *the case of all Annulata is formed of a fixed number of parts, which may be distinct or united, but which exist in all.*

to the animal, by means of the connecting membranes, it becomes obvious that particular segments, from the active or peculiar use of the organs which they bear, must occasionally require a greater degree of freedom than others whose organs have no such active or peculiar use; and when strength, rather than activity in the articulation, is desirable, then a less degree of freedom will be best adapted to the purpose. In the human frame articulations are of three very obvious kinds: these are called, first, *diarthrosis*, in which the motion permitted is perfectly free, as that of the bones of our arms and legs; secondly, *synarthrosis*, in which no motion is permitted, as in the sutures of the bones of the skull; and, thirdly, *amphiarthrosis*, which partakes in some degree of both of the others, being a very limited motion, yet plainly distinguishable,—such is the articulation of the vertebral column. These three kinds of articulation, I believe, have been denominated familiarly, *moveable*, *immoveable*, and *mixed* articulation; terms so easy to be remembered, that I shall not hesitate in adopting them. Besides these, another anatomical term, *symphysis*, requires an introduction into entomology, or we must have recourse to an English analogue; by *symphysis*, in anatomy, is meant the natural union of bones, which in the *fœtus*, or even in early life, have been for a while distinct; thus, the under-jaw, which in man is one solid and compact bone, has originally been two, which have united in the front. A fifth anatomical term, also applicable to entomology, is *anchylosis*; it is employed when the synovial glands are wanting, and the customary articulation becomes ossified: it may generally be contrasted with *symphysis* by the observation, that *symphysis* naturally takes place as an approach to strength and perfection; *anchylosis*, more frequently as a consequence of accident, or disease. The application, however, of both these terms is very extensive, and often made, even by skilful anatomists, to widely different effects. Now, on the mode of articulation, together with the situation of the locomotive organs above detailed, much will be found to depend.

In Insecta, the first articulation is *moveable*; the second is *moveable*; the third *immoveable*; the fourth *varies*; the fifth *varies*; the sixth, and all the others, are *mixed*.<sup>d</sup>

<sup>d</sup> Subject, however, to exceptions hereafter to be detailed: the variations of articulation generally observable in insects will also be more fully explained.



Although every insect is composed of thirteen segments, all of these are not constantly observable; the existence of all, however, may be generally ascertained, though some of them under great variation in appearance; a segment occasionally almost disappearing, and on the contrary sometimes nearly hiding all the others by its magnitude;<sup>e</sup> being occasionally closely united to an adjoining segment;<sup>f</sup> and again, sometimes bearing on its surface an indentation<sup>g</sup> or fold,<sup>h</sup> giving to it the appearance of two: a segment, moreover, will frequently give rise to processes; these are of two kinds,—*apophyses*, which are merely bony excrescences, and evidently an intrinsic part of the segments;<sup>i</sup> and *epiphyses*, which are distinct appendages, with a moveable articulation;<sup>k</sup> great care is therefore required to avoid mistaking a mere process for a segment, and also to insure against overlooking segments which really exist.

For the thirteen segments observable in true insects, I would propose the following names:<sup>l</sup>

- No. 1. (A. B.) CAPUT, bearing the organs manducation, vision, &c.
2. (C. D.) PROTHORAX, bearing the PROPEDES, or *fore-legs*. (a)
3. (E. F.) MESOTHORAX, bearing the PROALÆ, or *fore-wings* (e), and the MESOPEDES, or *middle legs*. (i)
4. (G. H.) METATHORAX, bearing the METALÆ, or *hind-wings* (o), and METAPEDES, or *hind-legs*. (u)
5. (I. J.) PROPODEON.
6. (K. L.) PODEON.
7. (M. N.) METAPODEON.
8. (O. P.) OCTOON.
9. (Q. R.) ENNATON.
10. (S. T.) DECATON.
11. (U. V.) PROTELUM.

<sup>e</sup> The prothorax, for instance, is scarcely discernible in *Musca*, while *Centrotus* appears all prothorax.

<sup>f</sup> As the *metathorax* and *propodeon* in *Melolontha*.

<sup>g</sup> As in *Pulex*.

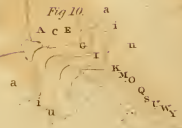
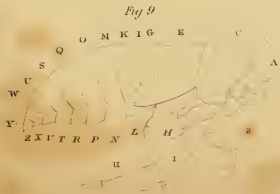
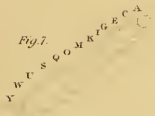
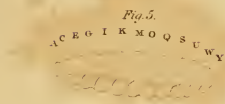
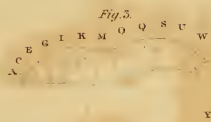
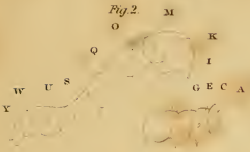
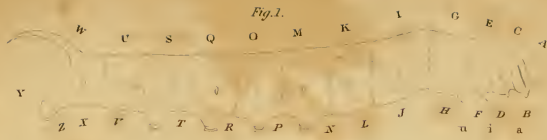
<sup>h</sup> As in some *Locustæ*.

<sup>i</sup> As in the *prothorax* of *Dynastes*, *Typhæus*, &c.; yet these apophysal appendages appear to have been not unfrequently described, named, and figured as primary parts; thus introducing into our nomenclature a mass of parts, the common existence of which it were vain to attempt to trace.

<sup>k</sup> As the appendages to the *telum* in *Phasma*, *Libellula*, &c.

<sup>l</sup> See Plate III. The letters between parentheses in this table apply to all the figures in this and succeeding plates on this subject.







12. (W. X.) PARATELUM.

13. (Y. Z.) TELUM, bearing the organs of reproduction,<sup>m</sup> or sometimes being confined to those organs<sup>n</sup> or weapons of defence.<sup>o</sup>

I will now state what has previously been done in this way.

Linnæus divided an insect into *head*, *thorax*, and *abdomen*; a division, the propriety of which being universally acknowledged, has been employed by all writers<sup>p</sup> from his day to the present; yet a division diametrically at variance with nature: in fact, the limits of the parts were ideal; or, in other words; it has always been perfectly optional with a describer to limit the thorax to the second segment, or include in it any number, not exceeding the four following segments; and in this entomological writers have not been influenced by any philosophical rules, but have been guided solely by the relative size of the segments: the same has been the case with the abdomen, which may comprise seven, eight, nine, ten, or eleven of the segments; and it so happens, that the segments, which are thus either thorax or abdomen, bear the wings; so that the wings are either thoracical or abdominal appendages, as an entomologist pleases. In a beetle, they are generally considered abdominal; in a bee, thoracical. Chabrier and Andouin, in their excellent observations on the anatomy of insects, have applied to the wing-bearing segments the names which I have retained, and have treated the subject with great skill; the former renouncing the term *thorax* as applicable to a series of parts, but unaccountably leaving the reader to determine whether he shall consider the four wings as arising from one segment or two; for he expressly terms the site of these organs "*segment alifere*," and yet divides it into *mesothorax* and *metathorax*. Andouin, though a most accomplished writer and able reasoner, retrogrades a step, by again uniting the *prothorax* with Chabrier's "*segment alifere*," under the original name *thorax*. Kirby somewhat fancifully alters the term *prothorax* into *manitruncus*, and calls Chabrier's "*segment alifere*" *alitruncus*; giving to the two united the name of *truncus*. Knoch called the *prothorax* "*collum*," and the

<sup>m</sup> Except in the order *Libellulites*.

<sup>n</sup> *Ichneumonites*, &c.

<sup>o</sup> *Apites*.

<sup>p</sup> Sträus-Durckheim has four parts—*head*, *corslet* (prothorax), *thorax* (meso and metathorax), and *abdomen*.

*meso-* and *metathorax*, "*pectus*." Sträus-Durckheim calls the *prothorax*, "*corselet*," and the other two segments the *thorax*. Lastly, MacLeay and Burmeister, following Andouin, consider the three segments perfectly distinct, and adopt for them the same names; yet these writers still seem to suppose some connexion between these segments, which essentially insulates them from the rest, and therefore apply to the three united the name of *thorax*. Beyond the nomenclature of these four segments, reckoning the head as one, nothing has been done yet in description; we find the second, third, fourth, &c. segment of the abdomen, constantly spoken of and described, without the slightest hint being given to us from which segment we are to commence counting.

Before entering more minutely into those variations of the thirteen segments on which subdivision will be found to depend, permit me to make a few observations on the preparatory and highly important state of *larva*. Every true insect must pass through this state previously to arriving at perfection; and as its habits are more sluggish, and its occupation (that of eating) more uniform, and as its life is usually confined to a single medium, and its movements to a single mode of progression, it seems evident that no one segment need be particularly enlarged or strengthened at the expense of the others: we find this not only theoretically, but positively the case; and, consequently, each of the thirteen segments is regularly and uniformly developed; and from this circumstance, and the splendid discoveries of insect anatomists, who have detected every part of the *imago* in the *larva*, in the very position, or nearly so, which it is destined eventually to occupy, it may, I think, without incurring a charge of theorizing, be taken for granted, that every segment of the *larva* still exists in the *imago*, although its presence, owing to the development of a neighbouring segment, may be in some instances somewhat difficult to detect. It would be a delightful task to trace each segment in its increase or decrease as it passed through the intermediate state of *pupa*, but this will scarcely be accomplished by a single individual, as the number of specimens to be examined, and the difficulty of obtaining sufficient specimens of all the classes, in each of the stages, would render the undertaking rather a laborious one. In order to show the uniformity of structure in *larvæ*, I have drawn a few outlines of those whose *imagines*

present the greatest differences; and, owing to the accurate and elegant manner in which my friend Mr. Ingall has engraved them, the reader will not fail to observe how beautifully simple and unvarying is the foundation on which nature builds structures so wonderfully and elegantly diversified; it seems as though a certain portion of matter were allotted, out of which she has to mould every variety of form.<sup>9</sup>

In naming the segments I have found two difficulties to contend with; *first*, the fear of introducing a new name where an old one had been pretty well established; *secondly*, the adoption of any name the meaning of which conveyed a false impression; these, however, I have not been altogether able to avoid without causing unnecessary inconvenience and confusion; your readers will therefore be kind enough to recollect that the six segments following the head are not named with any view to convey a sound and universally applicable meaning in their names, but to avoid any clashing with previous nomenclature: the remaining six, on the contrary, convey a meaning which I have endeavoured to render as simple as possible: the similarity in the meaning of the name given to the eleventh and twelfth segments will perhaps be pardoned when it is shewn that each in turn becomes the penultimate segment. In perusing these remarks, however, I could wish your readers to abstain from attempting to apply meanings, and to consider the whole as unmeaning words, the numerical situation being the only circumstance tending to illustrate the subject.<sup>7</sup>

The first segment of all insects is the CAPUT, or head, the hinder part of which generally forms a considerable portion of a sphere; the fore part is variously formed. On each side, immoveably fixed in it, and sometimes occupying the

<sup>9</sup> See Plate III. As the whole of the segments, in the perfect state, must be figured in the illustration of their parts, I thought it would be unnecessary to give figures of them here. "One of the most beautiful facts that the study of comparative anatomy presents us with, is the delight nature appears to take in working as it were with a given quantity of material, while she, nevertheless, produces an infinite variety of forms."—MACLEAY, *Zool. Journ.* XVIII., p. 157.

<sup>7</sup> If in any instance I have introduced a new name where a previous name could possibly, I will not say properly, be retained, it has been entirely through negligence, and I shall be most willing to withdraw it when pointed out; for (in common I hope with all naturalists) I consider that the alteration of names once given is, of all scientific labours, the one most conducive to confusion and error, and one which no lover of science would intentionally commit.

greater portion of its lateral superficies, is an eye,<sup>s</sup> composed of an immense number of highly convex lenses; between these, which are termed *oculi*, and nearly on the crown of the head, are three simple eyes, called *ocelli*,<sup>t</sup> very minute, and each consisting of a single lens; these are generally placed in a triangle, and, like true eyes, are firmly fixed in the surface of the head. In front of the *ocelli*, between the *oculi*, and attached by a moveable articulation to the head, are the *antennæ*, or principal feelers. These are exceedingly various in size and form, which depend almost wholly either on the habits of the animals or on the development or situation of the eyes. In nocturnal insects, and those diurnal ones which have either small or very lateral eyes, the *antennæ* are always of great size, and in walking insects are carefully stretched forwards and used to touch and ascertain the surface before every step.<sup>u</sup> Those insects, on the contrary, which only fly in the brightest light, and which continue on the wing for a great length of time without alighting, have enormous eyes but very small *antennæ*.<sup>x</sup> Even in instances where the female in nocturnal insects is sedentary and less active than the male, the *antennæ* of the latter are so much the more developed that little similarity can be traced between them.<sup>y</sup> The mouth of insects at first sight appears rather complicated; it is composed of seven pieces, which may be readily understood by an analogical reference to the mouth of vertebrated animals—for instance, man himself—bearing in mind that the parts of the mouth in insects are to be considered and treated of as *bones*, the soft and fleshy parts being internal. Suppose the upper and under maxillary bones in man to be divided vertically down the centre, leaving the lips entire, then suppose additional muscles given to these jaws, so that they might move horizontally instead of

<sup>s</sup> Not always present, as in the instance of the *flea*, which has only simple eyes, or *ocelli*, a circumstance which renders its situation in a natural system very difficult to ascertain. As far as I recollect, this very obvious and highly important character has not been noticed by any of our writers on this singular animal.

<sup>t</sup> Not always present, nor uniform in number.

<sup>u</sup> Examples—*Phryganea*, *Carabus*, *Cerambyx*, *Formica*.

<sup>x</sup> Examples—*Syrphus*, *Libellula*.

<sup>y</sup> Examples—The Apterous females of *Bombyces*, and the slothful females of *Melolonthæ*; while the closely allied genera *Trichius* and *Cetonia*, both sexes of which fly by day, have small and similar *antennæ*.



vertically, we should then have an *upper lip*, a pair of *upper jaws*, a *tongue*, a pair of *lower jaws*, and an *under lip*, or, in entomological language, a *labrum*, two *mandibulæ*, a *lingua*, two *maxillæ*, and a *labium*, which parts are always present in the principal forms of every class, and in no insect yet discovered has any new or additional primary part been detected; nevertheless, there are epiphysal appendages, or secondary parts, called *palpi*, these are four or six in number,<sup>2</sup> and are articulated on the *maxillæ* and *labium*. The variations in the form of these constituent parts of the mouth have been used by Fabricius as the exclusive characters on which to found his classes, and perhaps are more sound and unobjectionable than any others taken singly.

In the first class, *Lepidoptera*, the *labrum* is scarcely distinguishable, the *labium* is distinct but short; it gives rise to two large, conspicuous, erect, or porrected *palpi*, between which are situated the *maxillæ*, which are in this class two long tubes, rolled up spirally when at rest, in the manner of the main-spring of a watch, but capable of being unrolled at will for the purpose of being inserted into the *corollæ* of flowers to extract their honey: the *lingua* and *mandibulæ* are nearly obsolete, and take no part in the functions of manducation. This mouth is termed *antliate* by Kirby. In the second class, *Diptera*, the *labrum* and *labium* combine in forming a stiff hollow cylinder, in which are contained the *mandibulæ*, *maxillæ*, and *lingua*; these are excessively sharp-pointed, and are thrust by the animal into substances (as leaves, fruit, flesh, &c.) for the purpose of making an incision, through which the fluid portion (as sap, juice, blood, &c.) may flow into the cylinder, formed by the united lips, which, by the creation of a vacuum on the plan of a syphon, conveys the juice through the *œsophagus* into the stomach. This mouth is termed *proboscitate* by Kirby. In the third class, *Hymenoptera*, the *labrum*, *mandibulæ*, *maxillæ*, *lingua*, and *labium*, are all fully developed; the office and appearance of the *mandibulæ* and *maxillæ* are now changed, acting neither as suckers nor lancets, but being hard, strong, horny jaws, eminently adapted to gnawing and detrition of hard and solid substances, of which office, in the preceding classes, they are

<sup>2</sup> Epiphysal parts vary in number, constituent primary parts never.

incapable; the *lingua* is tubular, and particularly developed,<sup>a</sup> and, like the *maxillæ* in the first, and the *lips* in the second, serve for the imbibition of liquids. Kirby calls this mouth, in common with those of the fourth, fifth, and seventh classes, *perfect*. In the fourth class, *Coleoptera*, the *labrum*, *mandibulæ*, *maxillæ*, and *labium* are distinct and osseous, the *lingua* is generally small, often nearly obsolete; it frequently appears to be inserted in the *labium*, but I am inclined to believe it invariably originates farther back within the mouth, and, owing to its tenuity, needs this point of attachment. The *Coleoptera* both gnaw and swallow solid substances. In the fifth class, *Orthoptera*, the constituent parts of the mouth are all fully developed and osseous, as in the last class, excepting the *lingua*, which is larger, more fleshy, and, in one of the orders, somewhat tubular. In the sixth class, *Hemiptera*, the *labrum*, *mandibulæ*, *maxillæ*, and *labium* are again attenuated and elongated, and, with the exception of the *labrum*, which is free, united and formed into a jointed sucker, of which the *lingua* occupies (as far as I have been able to ascertain) the centre, and is thence darted out in the manner of a lancet into any substance the juices of which the insect wishes to extract. The insects of this class live entirely by suction. Kirby calls this mouth *Promuscidate*. Here you will observe I have arrived at a kind of mouth very nearly resembling that with which I commenced. The seventh class, *Neuroptera*, has no uniform structure of parts, but varies as its contents resemble those of the other classes, consequently, neither to the constituent parts of the mouth nor the variations of the segments of the trunk can be assigned any common character.

The second segment of an insect is the PROTHORAX; it is the most important segment, for its variations, combined with those of the mouth above given, will at once determine to what class an insect belongs; and here allow me to observe, that the variations in the development of this and the adjoining segments is closely dependent on the functions which the

<sup>a</sup> In some of the orders, as the bees, the *mandibulæ* are free and corneous, while the *maxillæ* are pliable, and unite with the *lingua* in extracting the nectar of flowers. The mouth in Hymenoptera is so various, that the above definition is of but little value, except as subject to further definition and qualification.

organs arising from them have to perform, and this not always directly, but relatively, as the functions of the organs which one segment may bear, frequently influence the next segment on either side in a greater degree than the segment more immediately concerned. The segment in question supports the *caput*, or head, and joins at its opposite margin the *mesothorax*, being articulated to both by a perfectly free joint, moveable in any direction: it bears also the *propedes*, or fore-legs, which are articulated to it with perfectly free joints, and which have generally a tendency to stretch forward. In *Lepidoptera*, the *prothorax* is a narrow ring, or circular collar, on which the scales are generally more erect than on the *mesothorax*, a circumstance which renders it easy to be seen externally, and without removing the scales; in the *Pterophori*, however, it is scarcely to be detected. In the *Diptera*, all external appearance of the prothorax (at least from above) has ceased,<sup>b</sup> the *caput* and *mesothorax* seem to be articulated together, and the fore-legs to spring from the joint which unites them; directly we leave the *Diptera* you will observe the *prothorax* reappearing among the bees, more prominent in the *Spheces*, and a very important segment in the genera *Sirex* and (particularly) *Cephus*:<sup>c</sup> these genera probably lead to the *Coleoptera*, in which the *prothorax* is remarkably conspicuous; but it is not until the next class, *Orthoptera*, that it attains its fullest development, where, especially among the *Grylli Bullæ* of Linnæus, it seems to have reached its maximum, being frequently of greater magnitude than all the remainder of the insect; in *Hemiptera* also we find the *prothorax* occasionally of prodigious relative magnitude, but it gradually decreases until, in *Cicada*, it has become a mere collar, and finally merges in the Lepidopterous form with which I commenced.<sup>d</sup>

<sup>b</sup> With some few exceptions.

<sup>c</sup> Also in the *Chalcides*, and above all in *Agaon*.

<sup>d</sup> If among your readers there should be some who wish to learn—which I fear there scarcely will be, as it is the infallible consequence of publishing in such a channel, to be read by those who know more on these subjects than oneself—if, I say, there be those who wish to learn, I will offer for their use a few very simple observations: I have already stated that the *prothorax* produces the fore-legs, the *mesothorax* the fore-wings and middle-legs, and the *metathorax* the hind-wings and hind-legs; if, therefore, an insect be accurately dissected, these parts will adhere to the segment to which they naturally belong. In order to try

The third segment is the *MESOTHORAX*: it is that prominent part in *Lepidoptera*, *Diptera*, and *Hymenoptera*, through which the entomologist usually passes the pin in specimens for his cabinet; it bears the fore-wings, and varies in development in accordance with the functions of those organs. In *Lepidoptera*, the fore-wings are large and powerful, and are the principal organs of flight; consequently, the *mesothorax* is robust, and in fact the most conspicuous segment of the thirteen. The *prothorax*, as we have seen, is small and unimportant, ruled by the mathematical law, that out of a given quantity of matter divided into portions, if one portion have more than its share, another must have less; and in insects, the increased segment or segments invariably diminish those immediately adjoining. In *Diptera* the fore-wings are the only organs of flight, the development of the muscles by which they are moved, and the space required for them, must consequently be great; accordingly we find the *mesothorax* at its maximum, and the *pro-* and *metathorax* at their minimum. In *Hymenoptera*, the hind-wing again becomes an organ of flight; consequently the equilibrium of parts begins to be restored, the *prothorax* reappears, and the *mesothorax* decreases in magnitude; it is still, however, the principal segment: as we approach the *Coleoptera*, the genera *Cephus* and *Sirex* present a smaller *mesothorax*, but as I have already pointed out, a larger *prothorax*. In *Coleoptera*, the fore-wings are not organs of flight, but merely osseous plates or shields to protect the organs of flight, which are the hind-wings only; accordingly its volume is very much reduced; its

this, and at the same time to gain a much more thorough knowledge of the subject than definitions or drawings can possibly give, let me recommend the inquirer to obtain some of the larger species of the principal orders in each class; for instance, *Papilio*, *Sphinx*, *Tipula*, *Tabanus*, *Bombus*, *Tenthredo*, *Sphex*, *Ichneumon*, *Meloë*, *Buprestis*, *Scarabæus*, *Silpha*, *Forficula*, *Gryllus*, *Acridium*, *Pentatoma*, *Notonecta*, *Cicada*, &c., and having thoroughly relaxed them by steeping in hot water, and afterwards dried them on blotting-paper, proceed to the task of carefully dividing each of them as far as practicable into their thirteen elementary parts; nature will point out the divisions, but it may require a little care to adhere closely to her guidings. The genus and class of each insect should be written down, and any observation that may occur noted at the time. The learned may smile at the idea of a beginner, like myself, attempting to instruct or offer advice on such points as these; let him however recollect that advice of this kind may be acceptable to some, and on the score of its possible utility, however limited, let him pardon the writer his presumption.

external appearance being confined to a small triangular plate which has its base situated against the hinder margin of the *prothorax*, and its sides against the osseous *proalæ*: in all descriptions of *Coleoptera* the *mesothorax* is termed *scutellum*. In *Orthoptera*, with the exception of the *Mantites*, the *mesothorax* has no external development when the wings are closed: it is here at its *minimum*. In *Hemiptera* it reappears as a triangular plate, similar to that called *scutellum* in *Coleoptera*; as we proceed through the class we find it increases in volume until, in *Cicada*, it has reached a magnitude and prominence closely resembling its appearance in *Lepidoptera*.

The fourth segment is the METATHORAX; it bears the *metalæ*, or hind-wings. In *Lepidoptera* the expansion of the hind-wings is considerable; and accordingly this segment is also very apparent. In *Diptera* the hind wings do not answer the purpose of flight, but have dwindled to mere pedunculated knobs, called *halteres*, or poisers; the *metathorax*, consequently, is very much diminished, and scarcely visible, being nearly concealed, especially in the *Muscæ*, by the enlargement of a portion of the *mesothorax*. In *Hymenoptera* it reappears conspicuously, and increases in volume as the hind-wings increase in expansion. In a small natural order of insects which are parasitical on bees (Genus *Stylops*), the *metathorax* is said to be very fully developed; but I have never yet possessed the means of examining one of these insects under a sufficiently high power to obtain any correct idea of its structure. From the elegant illustrations of *Elenchus Walkeri*, (Curtis,) and *Halictophagus Curtisii*, (Curtis,) it would appear that the epiphysal appendages which have been supposed analogous to the *proalæ* of *Coleoptera*, arise from the *prothorax* close to the insertion of the *propedes*; the same may be inferred from Kirby's definition, "Pseudelytera twisted attached to the fore-leg." Now, if this be the case, these appendages are not analogous to the *proalæ*, but are *processes* of the *prothorax*.<sup>e</sup> We see in the *Coleoptera* the cause of *metathoracic* development, viz. the bearing of the sole organs of flight; but in *Stylops*, &c. we find the wings on the next segment to that which

<sup>e</sup> "J'ai considéré ces organes comme des pièces analogues aux ptérygodes des Lepidoptères."—Latreille. *Cours d'Entomologie*. Tom. I. p. 242.

bears the *propedes*, consequently on the *mesothorax*; and its four divisions will then be the *præscutum*, *scutum*, *scutellum*, and *postscutellum* of the *mesothorax*, according to *Andouin's* nomenclature; the *metathorax* will probably be concealed, as in the *Muscæ*; and the nine posterior segments are found of uniform development, as in the *Tipulæ*. These conclusions would place *Stylops* very near the *Diptera*, a locality which a certain similarity of its head to that of *Myopa*, *Conops*, &c. would rather favour. So much from figures; as the greatest accuracy and care is required to avoid the destruction of such minute creatures in dissecting, errors may possibly have crept in; my motive for introducing a passing notice of *Stylops* in this place is, that should the part in question prove to be the *metathorax*, as has been hinted, then its natural station is the one which *MacLeay* has assigned it between *Hymenoptera* and *Coleoptera*; and, consequently, in passing from one of the classes to the other, it becomes compulsory to mention it. In *Coleoptera* the *metathorax* has reached a still greater development, and is nearly of equal dimensions with the *prothorax*; it is however entirely hidden under the *proalæ* when these are closed. In *Orthoptera*, particularly in some *Phasmæ*, the *metathorax* has reached its *maximum*. In *Hemiptera* it has much decreased, although still the principal organs of flight arise from it; at least this is the case in the *Cimicites*; but in the *Cicadites* the *proalæ* have resumed the full functions of flight; and, as I have already observed, the *mesothorax* is enlarged at the expense of the *pro-* and *metathorax*. The articulation of the *mesothorax* and *metathorax* is fixed.

The fifth segment is the PROPODEON, and is, of the whole thirteen, the most difficult to determine, because in orders of the same class it appears in different modes: in *Lepidoptera*, generally, I believe its external appearance is that of a narrow ring slightly incrassated in the middle, and assuming, when viewed from above, a somewhat bow-shaped figure. In *Cossus* it appears to me to be the part which *Kirby* calls the *metathorax*,<sup>f</sup> which I think it cannot be; as the *metalæ* are decidedly not attached to it. In *Pterophorus* it is very distinct, and varies scarcely at all from the following segment;

<sup>f</sup> Int. to Ent. Pl. IX. Fig. 1.



the same may be said of its appearance in the *Tipulæ*; but in *Musca* it is so completely anchylosed with the *metathorax* as scarcely to admit the possibility of drawing the boundaries of either. In *Hymenoptera* it also varies in the bees, wasps, *Spheces*, &c. It forms the anterior portion of what is commonly called the peduncle, and has been noticed by Latreille in some of the Hymenopterous parasites, the peduncle of which he considers as composed of two segments; and in MacLeay's figure of *Polistes*, I believe, the *postscutellum* (and perhaps *scutellum*) of the *metathorax*, are referable to it. In *Sirex* it is distinct and free. In *Coleoptera* it is always anchylosed to the *metathorax*. In *Orthoptera* it is always distinct. In most *Hemiptera* it is anchylosed to the *metathorax*, though distinct and free in *Cicada*; its articulation, however, to the *metathorax*, whether anchylosed or distinct, is always, as far as I have observed, perfectly immoveable.<sup>§</sup>

The PODEON, or peduncle, is the sixth segment. In *Lepidoptera* and *Tipula* it is rather of less circumference than the adjoining segments; its articulation with the neighbouring segment on each side is of the mixed kind. In the *Muscæ*, and the majority of the *Hymenoptera*, it is a mere tube connecting the incrassated parts of the insect, and its articulation to the *propodeon* is perfectly free and moveable. In the *Tenthredinites*, *Sirex*, and the *Coleoptera*, neither its articulation nor development differ from those of the following segments. The same may be said of its appearance in *Orthoptera* and *Hemiptera*, except that in the *Cimicites*, in common with the other segments, its articulation is almost or quite immoveable.

The seventh segment, METAPODEON, presents no remarkable character except in those *Diptera* and *Hymenoptera* in which the *podon* is so remarkably restricted: in these its circumference anteriorly is not more than one-eighth of its circumference posteriorly.

The eighth segment, OCTOON, is remarkable for its immense development in the pedunculated insects above spoken of; the common hornet or wasp are good illustrations of this.

The ninth, tenth, and eleventh segments present but trifling variations, and these by no means confined to the classes.

<sup>§</sup> Great uncertainty exists on this subject, but the position of the spiracle is in favour of the supposition.



The twelfth segment, *PARATELUM*, becomes the terminal one in the females of all pedunculated, and some few other orders of insects.

The thirteenth segment, *TELUM*, is remarkable for its various apophysal and epiphysal appendages, for its containing the organs of generation and reproduction, and for its total absence, or perhaps conversion into some essential organs, in the females of pedunculated insects.

The principal variations will perhaps be more readily understood by a glance at the following table :

Maximum of <i>CAPUT</i> . <sup>h</sup>	IV. Coleoptera.	
2d Degree.	III. Hymenoptera.	V. Orthoptera.
3rd Degree.	II. Diptera.	VI. Hemiptera.
Minimum.	I. Lepidoptera.	
Maximum of <i>PROTHORAX</i> .	V. Orthoptera.	
2d Degree.	IV. Coleoptera.	VI. Hemiptera.
3rd Degree.	III. Hymenoptera.	I. Lepidoptera.
Minimum.	II. Diptera.	
Maximum of <i>MESOTHORAX</i> .	II. Diptera.	
2d Degree.	I. Lepidoptera.	III. Hymenoptera.
3rd Degree.	VI. Hemiptera.	IV. Coleoptera.
Minimum.	V. Orthoptera.	
Maximum of <i>METATHORAX</i> .	V. Orthoptera.	
2d Degree.	IV. Coleoptera.	VI. Hemiptera.
3rd Degree.	III. Hymenoptera.	I. Lepidoptera.
Minimum.	II. Diptera.	

And here it is necessary that I conclude this letter, which has already extended to an unreasonable length ; although, in the desire of intruding as little as possible on the pages of a magazine occupied by writers in every respect so much more worthy of them than myself, I have studiously suppressed

<sup>h</sup> By "*Maximum of Caput*" I mean more particularly to imply the full, perfect, and osseous development of the seven organs of manducation. By "*Minimum of Caput*" the entire absence of masticatory organs.

Fig 1.

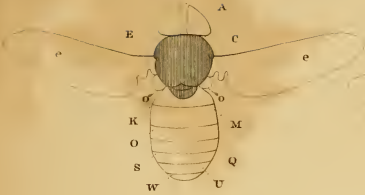


Fig 6.

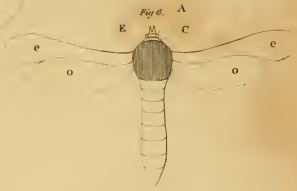


Fig 2.



Fig 5.

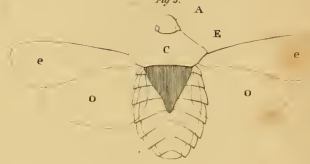


Fig 3.



Fig 6.





that mass of illustrations and collateral remarks, which seem completely to overwhelm one, when engaged on a subject like the present; and I have thus rendered my communication as bare and unadorned a detail as I could possibly accomplish consistent with clearness; but, as a repetition of the contents of this letter must be given in detail, as each segment comes to be reviewed separately, I feel the less regret at leaving it in its present very superficial and unfinished state, entreating your scientific readers to make every allowance for one who has had but little experience in these matters, and but little leisure to render that experience available.

The next letter will relate solely to the first segment or head of insects.

I am, &c.

EDWARD NEWMAN.

Deptford, March 1, 1833.

ART. XLVII.—*Entomological Notes*. By EDWARD NEWMAN, Esq., F.L.S.

(Continued from page 288.)

CLASS.—LEPIDOPTERA.

NATURAL ORDER.—GEOMETRITES, *ined.*

GENUS.—NYSSIA. *Godart.*

Nyss. Tauaria. *Fusco-grisea*; *metathoracis margine anteriori, lineaque centrali longitudinali nigris.* ♂

General colour brown-gray; mesothorax with its anterior margin and a longitudinal central line forming together the letter T, black: fore-wings tawny-gray transversely and irregularly waved with dark brown; exterior margin with a wide irregular band of pale brown: ciliæ of the same colour, having a row of black dots internally: hind-wings pale brown with a black spot at the anal angle. (Length  $\frac{6}{10}$  inch.; breadth  $1\frac{1}{2}$  inch.)

Although the above description may probably suffice to distinguish this insect from its congeners, *N. hispidaria* and *N. pilosaria*, I will call the reader's attention to its superiority in size to the former of these, to the T on the mesothorax,

formed by the transverse and longitudinal black lines, to the broad pale margins of the fore-wings, and lastly to the time of its appearance, so different to that of either of the other species, it having been taken by my father at Leominster, in June, 1832, in a perfectly recent state, and had apparently never flown.

CLASS.—HYMENOPTERA.

NATURAL ORDER.—SIRECITES, *ined.*

GENUS.—SIREX.

Hujus quandoquidem generis descriptionem vix aptam invenies ; integram, secundum partium nomenclaturam novam attentavi ; inde petens præterea eandem explicare. Sirecis, *maris* caput fere trigonum, anticè rotundatum, postice paulò convexum est ; antennis multi-articulatis, capite ad apicem pedetentim attenuantibus ; oculis parvis vix prominentibus ; ocellis tribus in triangulo, cujus apex anticus, dispositis ; labro elongato lateribus medio, convexis apice rotundato ; mandibulis corneis, rigidis, tridentatis ; lingua tenui vix conspicua ; maxillis linguiformibus haud corneis, palpos duos minutos integros, ferentibus ; labio fere trigono, angulis rotundatis, palpos duos triarticulatos, articulo ultimo longiore, ferente. Prothorax capite latior, anticè paullo ad capitem recipiendum, posticè valdè ad mesothoracem recipiendum, concavum, lateribus rectis ; hinc medio valdè attenuato, lateribus latioribus. Mesothorax pyriformis, apice minori retrospiciente. Metathorax mesothorace minor, medio tenuissimo lateribus dilatatis. Propodeon, segmentaque sequentia usque ad telum clarè pariterque patefacta. Telum minutum, fere trigonum, apice acutissimo. Pedes mediocres ; femoribus brevissimis, angulatis ; protibiis, mesotibiisque curvatis, brevissimis ; metatibiis longioribus, angulatis, dilatatis ; tarsis quinque-articulatis, articulo primo longissimo, quarto brevissimo, quinto mediocre ungues duos, arcuatos, bidentatos ferente. Hujus generis neque proalæ, neque metalæ, neque articulorum antennarum numerus, characteres ad distinctionem pertinentes, sic mihi videtur, præbent ; præterea distinctionis gratia segmentorum redundant figurationes.

*Sirex nigricornis*. Mas. *Antennæ* (20-articulatæ) *caput, prothorax, mesothorax, metathorax, propodeon, podeon, metapodeonis margo anterior, mediusque disci chalybeo-nigra : metapodeonis margo posterior lateribusque, octoon, ennaton, decaton, protelum, paratelumque ferruginea : telum chalybeo-ferrugineum : coxæ, trochanteresque nigra :*

*femora ferruginea: protibiæ ferruginæ: mesotibiæ ferrugineæ, extus macula magna nigra: metatibiæ nigra: protarsi ferrugini: mesotarsorum articuli 1<sup>us</sup>. 2<sup>us</sup>. 3<sup>usque</sup>. nigri, ferrugineo contaminati; 4<sup>us</sup>. 5<sup>usque</sup>. ferruginei; metatarsorum articuli 1<sup>us</sup>. 2<sup>us</sup>. 3<sup>usque</sup>. nigri; 4<sup>us</sup>. 5<sup>usque</sup>. ferruginei: proalæ, metalæque croceo inquinatæ, marginibus fuscis.*  
(Long. corp. 1½ unc.; Alar. dilat. 2 unc.)

*Sirex nigricornis.* *Fab. Ent. Syst.* Tom. II. p. 126.

In order to save trouble and avoid repetition, I have given the whole of the generic and specific characters in Latin, and each under a single head. A single specimen of the splendid insect described has been taken in Essex on the blossom of a Dahlia, and transmitted to me by my friend Christy: the colour of the twelfth segment and of the femora, besides three additional joints in the antennæ, distinguish it from *S. Juvencus*.

CLASS.—NEUROPTERA.

NATURAL ORDER.—PERLITES, *ined.*

GENUS.—ISOGENUS.<sup>a</sup> *Newman.*

Sexuum amborum alis pariter repandis, pariterque abdominem tegentibus; telo setis duabus instructo. Eâ descriptione *Perla*, hæc e *Nemoura* distinguebis: mox fusiorem conatus.

*Perla* . . . *Geoffroy Latreille.*

*Phryganea* . *Linnaeus.*

*Iso. nubecula.* *Proalæ sordidæ hyalinæ, nubeculâ costali ultra medium fuscâ.*

Body dark brown; head and prothorax with a longitudinal ochreous line; fore-wings hyaline, slightly tinged with brown and having a little oval cloud of a darker brown colour on the costal margin situated about one-third of the distance from the tip towards the body: hind-wings beautifully hyaline, legs pale brown. (Length  $\frac{6}{10}$  inch.; breadth 1½ inch.)

This insect is abundant in the neighbourhood of running waters in Herefordshire, Worcestershire, Nottinghamshire, &c. and is the favourite food of trout and grayling. I cannot find that any author has described or named it.

<sup>a</sup> *Ἴσος* par, γένος sexus.



NATURAL ORDER.—LIBELLULITES, *ined.*

GENUS.—LIBELLULA. *Linnaeus.*

Libel. prænubila. *Alæ omnes hyalinæ, nebulis duabus costam attingentibus; metalæ præterea prope basin, labe magnâ, fusco-nigrâ, ornata.*

Head brown with two yellow spots behind the eyes; body brown with five or six yellow spots more or less distinct on the sides, the hinder segments much broader and less pilose than in *L. 4-maculata*: to the stigma of the fore-wings is attached a rich brown cloud which frequently extends across the wing to the opposite margin; near the centre of the costal margin is another cloud of the same colour surrounding the spot which it possesses in common with *L. 4-maculata*; this cloud, however, does not extend across the wing to the lower margin: from this central cloud to the body the wing is beautifully stained with saffron colour: in these particulars the hind-wings perfectly agree, but have besides a large triangular dark brown blotch at their base as in *L. 4-maculata*: the legs are black and spiny. (Length 2 inch.; breadth 3 inch.)

Taken by my friends H. and E. Doubleday at Epping; it appears in abundance about a fortnight before *L. 4-maculata*, from which it differs in habit, flying over fields and about hedges, and never frequents water except for the purpose of laying its eggs, whereas *L. 4-maculata* confines its flight to the vicinity of ponds and waters. It has been considered as a variety by Vanderlinden and other authors, but the want of pilosity is a constant character; and this, together with the different habit, and beautiful though varied markings of the wings, I must consider entitles it to rank as a distinct species, more particularly as the difference between it and *L. 4-maculata* is most decided in specimens which have recently been transformed, and cannot therefore be the effect of age or detrition.

(*To be continued.*)

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ART. XLVIII.—*Notice of Entomological Works.*

1. *Entomologisches Archiv. Herausgegeben von Dr. Theodor Thon. Erster und Zweiter Band. Mit Kupfertafeln. Jena, 1827—1830.*—These archives have but little original matter: they are principally useful in giving reviews of, and copious extracts from, other entomological works. In one number there is an interesting Monograph of the genus *Simulia*, with figures. Our limits will not permit us to enter into any details.

2. *E. F. Germar. Fauna Insectorum Europæ. Halæ sumtibus C. A. Rummelii.*

3. *Deutschlands Insecten heransgegeben von Dr. G. W. F. Panzer—fortgesetzt von Dr. G. A. W. Herrich Schaeffer, &c.*—Both these works are continuations of Panzer. The first, which was formerly directed by Ahrens, contains twenty-five plates in each fascicle; of the second, there are about six numbers published, each containing twenty-four plates,—in the execution of the figures it is inferior to the first.

4. *Die Wanzenartigen Insecten. Erster Band. Drittes Heft. Viertes Heft. 1832—1833.*

5. *Die Arachniden. Erster Band. Zweites Heft. Drittes Heft. 1832. Getrell nach der Natur abgebildet und beschrieben von D. Carl. Willh. Hahn. Mit sechs fein ausgemalten Tafeln. Nürnberg.*—The latter numbers of these two useful little works are quite equal to the former in point of execution and interest. In the third number of the Hemiptera are figured: 1. *Myrmus miriformis*, *Coreus miriformis* of Fallen. In the same plate is figured an insect which is considered only a variety of the preceding; it appears to be quite a distinct species, and to be identical with *Lygæus micropterus*, Burrell. 2. Two species of *Ophthalmicus*; the type of the genus is *Cimex grylloides* of Linnæus. 3. and 4. *Arma* and *Jalla*, two genera separated from *Pentatoma*; the types of which are *Cimex bidens* and *C. dumosa* of Linnæus. 5. *Rhynarius*, a genus very abundant both in number and species; we are surprised to see no more figured; its type is *Cimex sylvestris*, Linn. 6. Two new genera, *Halticus* and

*Attus*; their types, *Cicada aptera*, Linn., and *Lygæus pulicarius*, Fallen. Both these names are ill-chosen, too much resembling *Altica* and *Atta*; besides *Attus* is employed by some authors for a genus of spiders. In the fourth number are figured species of *Ælia*, *Capsus*, *Berytus*, *Pachymerus*, *Lopus*, and *Lygus*. The second number of the Arachniden contains figures of one species of *Mygale*, two of *Eresus*, and twelve of *Thomisus*; amongst them, *T. citreus*, one of the most beautiful of the British spiders. In the third number, two species of *Thomisus*, and seventeen of *Salticus*, are figured; most of them are inhabitants of Great Britain.

6. *Iconographie, &c. des Coléoptères d'Europe; par M. Le Comte Dejean, et M. Docteur J. A. Boisduval. Tome troisième. 3<sup>me</sup>. et 4<sup>me</sup>. Livraisons.*—We have just received two numbers of this work, containing figures of fifty-two species of the extensive group *Feronia*, which has been divided into many natural genera.

7. *Iconographie du Règne Animal de M. le B<sup>m</sup>. Cuvier, par M. F. E. Guérin. 29<sup>me</sup>. Livraison.*—This admirable work proceeds with unabated spirit. The present number has only two plates belonging to our department of Zoology; one of Crustacea, representing the genera *Nephrops*, *Astacus*, *Eryon*, and *Callianassa*; the other of Coleoptera, *Curculionidæ*, with figures of *Bruchus*, *Rhæbus*, *Anthribus*, *Attelabus*, *Rhinotia*, *Eurhinus*, *Brentus*, *Ceocephalus*, *Ulocerus*, and *Cylas*.

8. *Monographie des Cétoines, et Genres voisins, formant, dans les Familles Naturelles de Latreille, la division des Scarabées Méliophiles; par M. H. Gory, et M. A. Percheron. 1<sup>re</sup>. Livraison, 1833.*—This, which we think ought rather to have been called a digraph, promises to be a useful work. It has been considerably delayed by the late events in France. We wish that all authors would show as much modesty as these do, in declining to publish new species named after them. In the Introduction there is a short account of the history and anatomy of the family; we then have a synoptic table of the genera. They are divided into three sections, which are called: 1. *Trichides*; 2. *Cétonides*;

3. *Gymnétides*. The new genera established are, *Strepsipher*, *Diplognatha*, *Amphitoros*, *Dicheros*, *Ichnestoma*, *Tetragonos*, and *Lomaptera*. We are glad to see that the authors give the derivations of these genera, a custom but seldom followed in this country. There is, besides, a diagnostic table of the species, giving a short description (comprising generally from one to two lines) of each species. We think this an excellent plan, as it often enables collectors to identify their species without wasting their time in wading through several volumes. We observe, that the lately-commenced practice of writing the names of persons to whom the species are dedicated, in the nominative case, is followed here. We thus have species named *Drummond*, *Brou*, *Hardwick*, *Hope*, *Germar*, *Brown*, *Cunningham*, *Desmarest*, *Dalman*, *Swainson*, *Macquart*, *Children*, *Petit*, *Barthélemy*, *Klug*, &c. &c. Of this we do not approve; it is decidedly at variance with all established laws of science.

This number is accompanied with seven plates, uncoloured, delineating all the genera, and the anatomy of *Cetonia*.

9. *The Nomenclature of British Insects*, by James Francis Stephens, F. L. and Z. S. Second Edition.—It is with much pleasure we find there has been a sufficient sale of this work to require the publication of a second edition. It is our duty rather to point out in what particulars this impression differs from the first than to notice it as an original work. The first remarkable difference is the numbering of the genera and species after Mr. Curtis's plan; and this is of great importance; but in our opinion the numbers ought to have corresponded exactly with those of the author's Systematic Catalogue, and new genera should have retained the number of the genus which immediately preceded each, and a letter might have been affixed to distinguish such genera. This is not an imaginary evil; for instance, we have often marked on little round pieces of writing-paper the numbers of the genus and species in Mr. Stephens's Systematic Catalogue, thus: S. 531. 1. a number which may now either mean *Euplectus Kirbii* or *Anax Imperator*; and, as we happen to have many insects marked in this way, much inconvenience will result. The second alteration is in the introduction of synonymes; this is a great improvement. The third alteration is the introduction

of a number of foreign *Ichneumones*; of this we entirely disapprove. The fourth alteration is in the printing of the genera in capital letters; this is too obvious an improvement for us to comment on. The present work only extends as far as the *Ichneumones*; the remainder is to be published in the autumn.

10. *Index Entomologicus, &c.*, by *W. Wood, F. R. S., &c.*, No. I.—This is a pretty work, though any thing but what its name implies; disheartening, however, though the title certainly is, the work will be found a delightful one by all who take pleasure in the accuracy of pictorial design. The first number contains coloured figures of all the British butterflies; some of them, particularly *Lathonia*, *Atalanta*, *Cardui*, *Galathea*, and *Semele*, are to the life; all the others are good. The accuracy of the figures is the sole merit of the work; the arrangement is confused and jumbled in a strange manner; the names mis-spelt, as *Gompetyrx* for *Gonepteryx*, *Asis* for *Acis*, *Acteon* for *Actæon*, &c. &c.; and the letter-press so like Miss Jermyn's, that, did not Mr. Wood omit to notice that lady's work *in toto*, we should have almost been inclined to suppose he had borrowed a hint or two from it. For instance:

## MISS JERMYN.

- Napi. Green-veined White. Gardens, Woods, and Thickets; middle of May; beginning of June.
- Cardamines. Orange tip. Woods and Lanes, Helmington, Suffolk; Dartmoor, Devonshire; end of May.
- Atalanta. Red Admiral. Woods, Hedges and Gardens, neighbourhood of Dartmoor, Devonshire; Spring; middle of July; beginning of August.
- Hyperanthus. Ringlet. Woods, neighbourhood of Dartmoor, Devonshire; end of June.

## MR. WOOD.

- Napi. Green-veined White. Gardens, Woods, and Thickets; May to July.
- Cardamines. Orange tip. Woods and Lanes; Suffolk and Devonshire; end of May.
- Atalanta. Red Admiral. Woods, &c.; Devonshire; June and July.
- Hyperanthus. Ringlet. Woods; Devonshire; end of June.

Now Mr. Wood could not have taken a shilling ride out of London, in any direction, without seeing all these butterflies; and it is very singular he should have hit on the only *habitat* and time which Miss Jermyn gives,—particularly as Miss Jermyn's times of appearance, as well as localities, happen frequently to be very far from correct. Mr. Wood's known science protects him from the charge of plagiarism!

ART. XLIX. — *Varieties.*

43. *Preservation of Crustacea*, (Vid. ante, p. 312)—  
 SIR, I with pleasure attend to the request made in the last number of the Entomological Magazine, and send you a brief account of the mode I have hitherto practised in preserving *Crustacea*; but without presuming that it is better than other methods which are described in Taxidermy, or the several manuals on preserving generally which have been published by Mr. Bullock, Mr. Swainson, Mr. Samouelle, or Captain Brown. When collecting *Crustacea* I provide myself with a wide-mouthed bottle, or small jar, half filled with a mixture of equal quantities of spirit of wine and water; into this mixture the living specimens are plunged; and when the vessel is full and corked down the whole contents will bear carriage without injury. To dry specimens for the cabinet, when at home, it is only necessary with those of small size to fix them on the setting-board, separating and pinning out the parts of the tail, legs, antennæ, &c., and exposing them to a current of air. With larger specimens, of the size of prawns or crawfish, the body should be separated from the tail, and the soft parts from the inside of each half picked out from the orifice. Roll up a small piece of writing paper to a size rather less than that of the body of the specimen, and about half its whole length; spread a thin coat of gum dissolved in water over one-half of this cylinder of paper, and pass it into the body, the paper tube unfolds sufficiently to bring it in contact with the shell all round; gum the outer half, and upon that slide the tail, putting a small portion of gum on the outer circular edge of the tail to fix it in its natural situation inside the edge of the body. Fix the whole to the corked board by a pin through the body, setting out the tail, &c., and in a few days it may be removed to the cabinet without danger of separation or fracture. Crabs of two inches diameter and upwards should have the lower portion carefully detached from the upper shell, and all the soft parts removed from the inside of both, replacing and refixing the two parts by gum at all the points of contact. The advantages of the previous soaking in the spirit mixture



appear to be various. The specimens are more portable in bottles or jars, and are less liable to fracture than when dried on the coast. When required for the cabinet, no moisture or other inconvenience arises from saline matter. The soft parts left within the shell being saturated with spirit dry up with little unpleasant smell and no decomposition. The membranous parts are preserved and rendered tough.

Very small and delicate specimens may be conveniently preserved and examined in the long narrow test-tubes used by chemists, a small quantity of the spirit mixture before mentioned being added to each, and separating the specimens by a small slice of a phial cork. Five or six examples may be thus packed in a tube of as many inches. By wrapping up each specimen in a small piece of linen cloth, and tying it round with thread before placing it in the bottle or jar, the most delicate fish may be conveyed any distance without injury to the scales or fins. The same precaution would insure additional security with rare specimens of *Crustacea*.

I am, Sir, yours, &c.

WILLIAM YARRELL.

*Ryder Street, St. James's.*

44. *Habit of Microsetia ruficapitella*. — SIR, It has no doubt been observed by many, that in autumn the leaves of the rose-tree, on their upper surfaces, are very often marked in various directions with broad brown lines, having a narrow black one running down the middle. This curious appearance is caused by the small caterpillar of a minute moth (*Microsetia*, Steph.) which feeds inside the leaf. When full grown, the caterpillar is nearly two lines long, of a yellow orange colour, with a brown mark down the back, the head very flat, and sharp, and light chocolate. In this little caterpillar, the pectoral legs, instead of being pointed and corneous, as in other Lepidopterous larvæ, are soft and fleshy, gradually narrowing from the base to the apex, which is truncate and broad. It has likewise the power of drawing them entirely within itself, which it invariably does every time it raises the fore part of its body, drawing them in and pushing them out in regular succession, beginning with the third pair, or those farthest from the head. Their peculiar conformation, also, enables it



to support itself, and walk on these alone, with the rest of its body elevated perpendicularly. The caterpillar is very plump, and this formation of the legs enables it to take up less room in the leaf; for, notwithstanding its size, it eats only half the thickness of the pulp, and, until it is full grown, they are never entirely pushed out; for, when taken from its mine before this time, they cannot at first be distinguished.

The brown mark on the leaf is caused by the epidermis drying, from the insect having eaten the parenchyma, or substance of the leaf beneath; — the black one by its egesta, which, during its young state, entirely stop up the mine. I first observed this insect in our garden the beginning of last October, when it was very abundant, particularly on a large standard tree, which had almost every leaf mined by one or more of these caterpillars; for several often mine in one leaf, frequently crossing their own paths and those of others. When full grown, which is about the 24th October, it eats out of the leaf, and crawls down the branches and stem, until it has found a convenient place to fix its cocoon. This is the only time when it finds it necessary to make use of its legs, which seldom exceeds an hour, sometimes less. After having found a suitable place, which is generally about the spines and offsets of the branches, it begins to form its cocoon, by stretching out its body and attaching a thread to the branch; it then crosses its body to the other side, and there fastens it. By proceeding thus on all sides, keeping the hinder part of the body fixed, it forms the upper part of the cocoon, or that exposed to the weather, which is convex, and generally circular; the under part is oblong, shaped to hold the pupa, and much smaller than the upper, which projects considerably beyond it on all sides. At one end the threads are not interwoven, and leave a space through which the pupa can force a passage. This remarkable cocoon is very flat, and at first of a pure white, which is changed by the first shower of rain to light orange; it afterwards becomes of a deep brown, so nearly resembling the bark of the rose-tree as only to be distinguished by a practised eye. This change takes place very rapidly. When kept dry, the cocoon remained perfectly white, and produced the moth at the usual time, as well as one which had been immersed in water for twenty-four hours. The pupa is light brown, of an oval shape, about a line long, and half that

in breadth. Those kept during the winter, at the temperature of 60° Fahrenheit, produced perfect insects on the 20th April, those in the open air about three weeks later. The moth is the Red-headed Pigmy, *Tinea ruficapitella* of Haworth.<sup>a</sup> The upper wings are gold-coloured, with the apex purple; the head ferruginous: the expansion of the wings  $2\frac{3}{4}$  lines.

I am, Sir, yours, &c.

EVAN WEBSTER LEWIS.

20, Queen Street, King's Road, Chelsea,  
30th May, 1833.

45. *Defence of Mr. Westwood's Conduct*, (Vid. ante, p. 260.)—SIR, I am sorry my last communication should have been so negligently expressed as to have drawn from you observations creditable to your liberal feeling, but I apprehend less than fair towards a fellow-labourer. I did not contemplate the covert allusion you have supposed, having no reason to attribute to Mr. Westwood a knowledge of the intimated identity of the doubly-named groups; indeed, I consider that gentleman's zeal in the cultivation of science a guarantee against his knowingly encumbering our already teeming nomenclature with discarded names. Individually I was interested in few of the cases alluded to, and entertained no idea of property in mere indications. It is unfortunate that in the present state of system the introduction of such is unavoidable in a general classified catalogue, as those of Curtis and Stephens: in these instances, however, the resulting inconvenience may be obviated (to the entomologists of the metropolis) by a direct reference to collections which the liberality of their possessors has made almost public. In other cases the publication of detached indications is a fertile source of confusion; it so often happens they are suffered by their sponsors to remain barely such, whether from indolence, alien occupation, or the want of an appropriate channel for descriptive essays. This last difficulty being now happily removed by the liberal management of your magazine (*esto perpetua!*), it is to be hoped that all such pledges will in future be speedily redeemed.

Yours, &c.

A. H. HALIDAY.

Dublin, May 6th.

<sup>a</sup> Lep. Brit. p. 586.

THE  
ENTOMOLOGICAL MAGAZINE.

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OCTOBER, 1833.

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ART. L. *Observations on Blight.* By RUSTICUS,  
*of Godalming.*

[Epistle V. and last.]

WHO has not noticed the white-thorn hedges stripped of their leaves, and the twigs matted together with a web? and who has not heard the appearance attributed to east-wind and to blight? The blight is nothing more than the caterpillar of a small moth, which lays its eggs on the twigs the year before. When these eggs first burst the shell, the little caterpillars, which come out of them, spin themselves a nice silken house, taking care to enclose two or three leaves; as soon as these leaves are devoured, for which purpose they are inclosed, the house is enlarged, and made to include other leaves; these, in turn, are devoured, and others inclosed, till a mass of web is formed as big as one's hand. These masses are often so abundant as to touch one another; and the whole hedge looks as though it were dead, not a leaf being visible. The caterpillar is a little blue-black fellow, with a row of jet-black spots down each side; and when you hunt him out of his web, he wriggles away backwards and drops, spinning a thread as he falls, by which he hangs with all the ease of a spider; but there is this difference, the caterpillar spins his thread from his mouth, the spider from his tail. When full fed, the caterpillars fasten themselves by their hind legs to a part of their web, and, hanging with the head downwards, turn into chrysalises, —I have often found dozens hanging together in a line like rabbits on a pole. At the end of June the moth appears: it is a pretty little creature, having wings of a leaden ground-

colour, with jet-black spots, but varies, some specimens having a pure white ground.<sup>a</sup> Last year our hedges about Farncomb were swarming with them.

A larger moth, with a yellow tail and snow-white body and wings, is also very destructive to white-thorn hedges; but its proceedings have already been so accurately told, that I will not repeat them. This moth is appropriately called the "yellow-tail."<sup>b</sup> A kind very similar in its ways to the little ermine-moth inhabits the oaks, and sometimes in such swarms as to consume every leaf, and encase all the twigs in a continuous web for hundreds of acres: I have noticed this in Surrey and Sussex on three occasions, and once in part of Shropshire and Herefordshire. In the July of 1831 the oak-woods about Downton, the residence of Mr. Knight, the celebrated horticulturist, were as completely bare as on Christmas-day, and had a most unnatural appearance; the season was rather late, and the moth was then in the chrysalis, as I ascertained by climbing up some of the trees and shaking down whole showers of them. Early in the year the caterpillars may be seen, when the sun is warm, hanging by their little threads from all parts of almost every oak-tree, swinging to and fro with the least breath of air, like a lot of pendulums, each varying in time according to the length of its thread, which acts as the rod, and each occasionally giving itself a twirl like a slack-rope dancer, in the overflowing joy and happiness of its little heart. Each turns to a black chrysalis; and in ten days afterwards to a beautiful—yes, exceedingly beautiful, pea-green, bell-shaped little moth,<sup>c</sup> but too common to be valued for its beauty. When the moth is on the wing the oaks again clothe themselves with all the fresh green of spring, and the woods once more throw off their wintry looks.

The Lackey-moth,<sup>d</sup> another web-maker, is a great nuisance in our gardens, though but little known in our woods and forests. Our apple and pear-trees in this neighbourhood are webbed by it every year; the eggs are glued together into a ring round a twig, and if the twig be cut off, and the eggs killed by steeping in strong brine, may be kept for years without injury; in a natural state they hatch in May, and begin

<sup>a</sup> *Yponomeuta padella*.—ED.

<sup>c</sup> *Tortrix viridana*.—ED.

<sup>b</sup> *Porthesia chrysorrhœa*.—ED.

<sup>d</sup> *Clisiocampa neustria*.—ED.

spinning their web at once; in this they live till their second change of skin; after which they wander from each other, straggling all over the tree;—they now no longer spin, but each plies away at a separate leaf as hard as he can. The caterpillar, when full fed, is very beautiful, being striped lengthwise down the back with blue, red, black, and white. It spins a loose, oblong cocoon, about three-quarters of an inch long, which is covered inside and out with a golden dust, just like the pollen of flowers. These cocoons may be found every July, stuck against palings, walls, trunks of trees, on leaves, &c., in the most conspicuous situations; and the greater part of the chrysalises which they contain becomes the prey of the sparrow and the tom-tit.

In all these cases it is very difficult to suggest any remedy; but Nature has means of her own; the effects of which we may witness every day, though we must ever remain in ignorance of the acting causes; thus, after a year in which either of these insects may have abounded in hosts like locusts, so as almost to strip from Earth's face her beauteous veil of green, the following year not one of the kind has been seen, and the breed is barely continued by some pair of straggling individuals, to swarm again at the appointed time: but, though we cannot deal effectually and certainly with these insect-wasters, yet a good deal may be done by a little care, especially in gardens;—smoke, made by burning weeds at the time a moth is laying eggs, drives it away, and thus affords a local cure; the webs also, by a careful gardener, may be picked off and burnt when the caterpillars are young and clustered together; and thus, in gardens, the vegetation may be completely saved.

The jumping weevil,<sup>e</sup> which I alluded to in my last as infesting the beech-trees, is a very impotent enemy; it attacks the leaves just as they are preparing to open, and, whilst still unfolded, drills little holes through them, so that when fully open they look as though they had been shot at. The elm feeds another beetle of the same tribe, but of a brown colour, spotted with black; it is often called the elm-flea, from its being a most excellent leaper. These leaf-eating beetles are scarcely worth notice, as an injury; but there are other beetles, scarcely bigger than these, whose visit to a tree is death,—

<sup>e</sup> *Orchestes Fagi*.—ED.

certain and inevitable death;—and I have been sorry to observe, whilst staying a few days in London, that its increase, particularly among elm-trees, is so rapid, that in thirty years' time, if its devastations continue, there will not be an elm left standing any where round the metropolis. In Kensington Gardens, Hyde Park, and St. James's Park, the elms are beginning to feel its power, but to the south of the city its ravages are frightful. In Greenwich Park the noblest trees are dying every year, and Camberwell Grove has nearly ceased to be a grove. The beetle<sup>f</sup> is brownish black, and in shape something like the great dung-chafer,<sup>g</sup> but is not more than an eighth of an inch in length; the females may be seen flying round the stems of the finest elm-trees in the sun-shine, like little bees. Where this is once seen the tree may as well be cut down, and the timber saved, for in two years the tree will be dead, and the timber good for little or nothing. Each female beetle bores a hole through the bark directly to the solid wood, and there deposits a cluster of from twenty to forty eggs; these hatch, and become little white maggots, which, by common consent, diverge like rays from the centre of a circle, and feed on the bark just where it touches the solid wood; guided by a singular instinct, they never cross each other's tracks, but go straight forward, without turning right or left; thus all connexion between the bark and the wood of the tree is destroyed, and their mutual offices lost to each;—the death of the tree is the sure and natural consequence. When each maggot has gnawed himself a gully about three inches long, he stops, turns to a chrysalis, then to a beetle, then gnaws a straight hole through the bark, comes out, and flies away in quest of a partner. The fir has a beetle very similar, peculiar to itself; it is quite black, rather longer, and much narrower.<sup>h</sup>

Now, as these little rogues breed by millions in a tree which they have once attacked, and much prefer them to fresh vigorous trees, I would recommend all owners of such property to cut down any tree directly he perceives, by the round shot-holes in the bark, that the attack has been commenced; convert the timber and burn the bark: this done in winter, when all are quietly housed in the bark, and no stragglers are

<sup>f</sup> *Scolytus destructor*.—ED.

<sup>g</sup> *Geotrupes stercorarius*.—ED.

<sup>h</sup> *Hylurgus piniperda*.—ED.



flying about for their recreation, would so thoroughly check their increase, that in a few years the insect would scarcely be known; and this might be effected without the destruction of a single tree, but those on which the beetles had already past their irrevocable sentence of death.

Here end my Observations on Blight; and now a word or two on things in general. I have more than once seen posted on a placard, at a shop window, "No connexion with the concern next door." I am compelled to take a hint from these worthies, and stick up, as a notice, "No connexion with the Rusticus of the Colloquia." I don't know that that Rusticus, or rather that adumbration of Rusticus, is made to say one word that is not strictly true; but this I know, that I cannot relate such things as an eye-witness, because I have never set foot on the soil of Africa, Switzerland, Germany, or Russia; and the Rusticus of the Colloquia appears perfectly familiar with all those countries. You will see I attach some importance to this matter, because on the veracity of my communications their sole value must depend; and were I once detected launching my pen into the sea of romance, that veracity might justly be called in question; after this explanation, your readers will be kind enough to draw a line between what Rusticus says for himself and what others say for him; and, with this understanding, I assure you no one will read the Colloquia with more pleasure than myself.

In the second place, a correspondent of yours, at p. 363, has, I perceive, given me a hint about what I said at p. 220, touching the antennæ of insects, for which I thank your correspondent, for it gives me an opportunity of requesting you to correct a printer's error; for *compilations* read *compilation*—you will see by the text *one compilation* only is referred to—pray put this in your *blunderata*. After thus duly thanking your correspondent for the kind and tender interest he seems to take in my writings, I should be acting rather unfairly towards your correspondent, if I were not to do a little in the same way for him; one good turn, you know, deserves another; and, as I suppose we are on a level in the matter of nomenclology, each having adopted a rural designation, we can the more freely discuss these little matters, each sheltering himself from the amicable weapons of the other under his own temporary shield. I will, therefore, in a brotherly manner, recom-



mend your correspondent, before he puts pen to paper, to consider whether he has anything to write about or not; and should he find that he is only writing for the sake of seeing his assumed name in print, I would advise him to wait till he has a worthier object; perhaps it is my excessive dulness, but for the life of me I can't make out what he means, it is for all the world like a young walnut—all bitter husk; yet his reader is always buoyed up by reference or promise; he

“ Never is, but always to be blest.”

Your correspondent has no present tense; the burden of his song is ever the same, of the *all* he has done, or the *all* he is going to do. Now I don't say that your correspondent makes too much of his labours; the *all* he has done I dare say is stupendous! folios and quartos innumerable! the *all* he is going to do, incredible! there must be quite a stir in the manufactories of paper, steel-pens, and ink, in consequence of his announcements. I do not pretend to say your correspondent overrates his labours, but I wish to remind him that this crabbed ill-natured world never takes a man at his own valuation; 'tis very perplexing, sour, ill-judged, and stupid of the world, I own; but in reply to all our boastings, the old lady sticks her arms a-kimbo, and laughs in our faces, allowing us to trumpet away as much as we please, and delight ourselves with sounds of our own making. I know your correspondent will take my remarks in good part, as I do his. “ Nous devons de la reconnaissance à tous ceux que nous disent nos vérités.”

Thirdly. I have observed that Mr. Loudon, Vol. VI. p. 261, has given you a most friendly jog of the elbow about the line which is left blank between each of your “ Varieties :” —“ *widely enough detached as to typography,*” says Mr. Loudon, thereby implying,—oh, the facetious fellow!—that we, your readers, are entitled to have letter-press instead of a blank space: he is very right in thus insisting on a reader's having as much as possible for his money, and I recommend you forthwith to adopt the course he points out of printing close. Mr. Loudon's remark, at first reading, perhaps appears a little too pungent; but editors are sad hands at screwing their readers out of a little bit wherever they can; even Mr. Loudon himself has slipped, quite unintentionally, no doubt,

into a little error of the same kind: his first number of the Magazine of Natural History contains 44 pages of small type, equal to 66 pages of large, and 41 wood cuts; the number of pages of small type have decreased to *none at all*, and of wood cuts to 13, which makes a difference to the subscriber of about 22 pages of letter-press and 28 wood cuts in each number. Every body must see at once that this has happened merely from some oversight, for Mr. Loudon has been so overwhelmed with communications that he has seriously considered of the necessity of publishing the Magazine monthly. This little alteration in Mr. Loudon's plan makes no difference whatever in his excessive kindness in pointing out your little peccadilloes, a kindness which I hope you will allow me the use of your pages thus to return; my age entitles me to act as a kind of Mentor to both of you; and you well know that "plus les instituteurs aiment leurs élèves, plus ils sont attentifs à les reprendre de leur fautes."

You will think that I have become very talkative, but the truth is I do love a bit of gossip, and it will be a long time before I have another opportunity: your Fire-fly will ever have my best wishes; in the words of your worthy and classical correspondent, Mr. Haliday, *Esto perpetua!* I don't know how it is, but the farewell seems to stick in my throat, or rather on my pen,—I have contracted a kind of friendship for your readers which makes it hard to say—farewell; so I'll skip it. Inclosed is a packet of memoranda on all manner of subjects—the other end of the trip to the Isle of Wight that Loudon published part of—something about wire-worms, and crane-flies, and summer-birds, and tortoises, and bees, and ants,—a rare medley; you may pick out what you like and put in the Fire-fly, when crack-jaw runs short with you; there are also a good many pen-and-ink sketches illustrative of the subjects.

Towards the end of 1834, Rusticus may be again in England; and, if his name has not passed from the memory of your readers, he may perhaps once more address you; but that time is too far a-head of us to make much calculation about it now.

Interia classem velis aptare jubebat  
Anchises, fieret vento mora ne qua ferenti.

Yours, &c. RUSTICUS.

London, 2d July, 1833.

ART. LI.—*Entomological Sapphics.* By RUSTICUS,  
of Godalming.

[*Note.*—The MS. alluded to by our correspondent in the preceding article is headed “Log, 13th May, 1801.” We intended on receiving the “Log” to have published it as it stood, making such few alterations as might appear absolutely necessary; but we find it will be more convenient to arrange the matter a little, and *delete* some occasional detail which might not be thought altogether adapted to our pages; we must therefore give editorial headings and notes occasionally, and omit those of the author: such editorial additions will be enclosed in brackets. The dates of the following *Sapphics* are very various, extending from 1812 to 1832.—ED.]

[No. I.—THE BUTTERFLY. *Translated from the Persian.*]

Late as I wandered o'er a verdant meadow,  
Hairy and loathsome creatures were devouring  
Every leaf that tempted with its greenness,  
Or by its fragrance.

Great was their toiling, earnest their contention,  
Piercing their hunger, savage their dissension,  
Selfish their striving, hideous their bearing,  
Noisome their figure.

Next day<sup>a</sup> I wandered to the verdant meadow,  
Each worm was spinning for himself a mantle,  
It was his grave-shroud, and I watched him closely  
Wrap it around him.

Once more I wandered by the verdant meadow,  
Each worm was bursting from his long confinement,  
Each one was spreading to the sun's bright beaming  
Quivering pinions.

Hued like a rainbow, sparkling as a dew-drop,  
Glitt'ring as gold, and lively as a swallow,  
Each left his grave-shroud, and in rapture winged him  
Up to the heavens.

Oh then shall man, on earth condemned to trouble,  
Toilsome existence, warfare with his kindred,  
Build for himself his last cold habitation,  
Doomed to remain there?

<sup>a</sup> “On the morrow” in the Persian,—it would not Sapphicise.

No! like these creatures, trouble, toil, and prison,  
 Chequer his pathway to a bright hereafter,  
 When he shall mount him to the happy regions,  
   Made to receive him.

[No. II.—THE FIREFLY. *Translated from the Arabic.*]

After the sun has sunk into the ocean  
 Thou dost awaken from thy daylight slumber ;  
 Night is the season for thy lamp to glisten,  
   It is thy day-time.

So will I leave to those who love his scorching,  
 Day's ardent ruler, and when night approaches,  
 Offer my homage to the moon's pale glances,  
   And the sea perfume.<sup>b</sup>

[No. III.—THE CICADA. *Translated from the Greek of Anacreon.*]

Happy Cicada, perched on lofty branches  
 Deep in the forest, cheerful as a monarch,  
 Tasting the dew-drops, making all the mountains  
   Echo thy chirping—

Thine is each treasure that the earth produces ;  
 Thine is the freshness of each field and forest ;  
 Thine are the fruits, and thine are all the flowers  
   Balmy spring scatters.

Husbandmen fondly doat upon thy friendship,  
 Knowing thee guiltless of a thought to harm them ;  
 Thee mortals honour, sweet and tuneful songster,  
   Prophet of summer.

Thee, all the muses hail a kindred being ;  
 Thee, great Apollo owns a dear companion ;  
 Oh, it was he who gave that note of gladness,  
   Wearisome, never.

Song-skilful, earth-born, mirth and music-loving,  
 Fairy-like being, free from age and suff'ring,  
 Passionless, and pure from this earth's defilement,  
   Almost a spirit.

[No. IV.—THE CICADA. *Translated from the Greek.*]

Drunk with the dew-drop, perched on twig so lofty,  
 Noisy Cicada, o'er the wild waste sounding,  
 Saw-like the feet which to thy side thou pressest,  
   Drawing sweet music.

<sup>b</sup> The breeze from the Red Sea blows nightly inland, and is loaded with the scent of musk, roses, and a variety of spices.—ED.

Try then, my beauty, tune another measure,  
 Pan shall return thy labours with an echo ;  
 Here, 'neath the plane-tree, all my love forgetting,  
 Woo me to slumber.

[No. V.—THE CICADA. *Translated from the Greek.*]

Wandering once, I saw a spider weaving  
 Lithesome <sup>c</sup> his meshes, and a poor Cicada,  
 Struggling captive in the filmy network,  
 Chirped for his freedom.

Quickly I hastened to the child, song-loving ;  
 Quickly I loosed him from the fearful durance ;  
 " Fly, then," said I, " with liberty I pay thee  
 " For thy sweet music."

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ART. LII.—*Exposure of the Fallacy of the Septenary System in Natural History.*

SIR,—Little did I imagine that I should ever again enter the field of disputation in matters of physical relation ; but extraordinary circumstances demand extraordinary exertions ; and unwilling as I feel to appear again before the public—unaccustomed as I am now to wield the pen, a voice seems to summon me from my retirement, and to demand of me one final effort before that pen has sunk for ever into disuse and its master into oblivion. It has been my object, during a longer period than most writers can boast of enjoying the public ear, to expose error, to promote truth, and to drive from natural science fiction and theory. How great has been my joy to observe the decline and the dying struggles of the Quinary system, and at length to have witnessed its existence becoming a matter of history, and being merely remembered as a joke against those who had the shallowness and credulity to listen to it ; but how great has been my sorrow to see another apparition, more potent than the first, arise Phoenix-like from its ashes, and blaze with a brightness that almost made truth itself look dim.

That such should be the case in this country, I am not at

<sup>c</sup> " With pliant feet" in the Greek, which would make too many feet of it.

all surprised, when I reflect (and how melancholy is that reflection!) that whilst on the continent naturalists are engaged in a constant search after, and a careful examination of, facts, whilst they are diligently adding to our knowledge of animals, both as relates to their structure and economy, nothing attracts attention in this country but theory; and wild indeed must be that theory which does not obtain numerous followers amongst our would-be philosophers.

I doubt not but that this will be disagreeable to most of your contributors, for I find amongst all of them, from the leading ones who write purely original papers, to the minor fry who only venture to criticise or to abridge, the same cant about natural genera, although the artificial nature of such combinations has been fully pointed out by Dr. Fleming, in his admirable *Philosophy of Zoology*, Vol. II. p. 140, where he proves that natural genera, as they are called, are in reality artificial combinations, which is proved by the genus *Lepus* being reckoned a most natural genus, whilst the two last known species, the hare and the rabbit, are, as he clearly points out, more nearly allied, the former to the horse, the latter to the fox, than they are to one another.

The mention of Dr. Fleming's name naturally calls to our mind the Dichotomous system, the only one that can be considered to be at all conclusive and of any service to the lover of nature. The ridicule that has been attempted to be thrown on this system, and the approving nod that Mr. Newman has given to that attack, induce me here just to shew that the Dichotomous system is founded on nature, and that it is free from all the inconvenience and confusion which even the staunchest advocates of the Quinarian, Trinarian, or Septenary systems allow to exist in their favourites.

If we take a considerable number of species and carefully examine them, we shall find that one portion of them has some character in common which is wanting in the rest; thus affording us a positive and a negative character. Thus in insects we have the *Mandibulata* and *Haustellata*, in *Crustacea*, the *Gymnobranches* and *Cryptobranches* of Lamarck (an author to whom I refer with regret, from the infidel tendency of his doctrines). A similar dichotomy is admitted by Lamarck in the *Arachnida*, namely, into *Arachnides palpistes*, *tubifères*, and *Arachnides palpistes* and *tenailles*, to say



nothing of his first division of his *Arachnides* into *antennistes* and *palpistes*. These divisions appear to me to be all of equal value, at least to those of *Haustellata* and *Mandibulata*, which MacLeay puts as two separate circles, whilst he places the *Crustacea* all in one. Proceeding lower down in the scale of divisions, we find excellent dichotomies in *Coleoptera* and *Dermaptera*, *Hemiptera* and *Homoptera*, *Trichoptera* and *Neuroptera*; but Mr. Newman, very conveniently for his theory, says that these six orders are but three. To descend still lower, let us take MacLeay's group *Adephaga*, and we find it will divide as follows:—

{	HYDRADEPHAGA . . . . .	Legs inserted in large pectoral plates.
	{ GYRINIDÆ . . . . .	Fore legs long, antennæ short.
	{ DYTISCIDÆ . . . . .	Fore legs not long, antennæ not short.
GEODEPHAGA.		
{	_____ . . . . .	Fore legs not notched.
	{ CICINDELADÆ . . . . .	Jaws, with the claw jointed.
{	{ CARABIDÆ . . . . .	Jaws, with the claw not jointed.
	_____ . . . . .	Fore legs notched.
{	{ SCARITESIDÆ . . . . .	Abdomen pedunculate.
	{ _____ . . . . .	Abdomen not pedunculate.
{	{ BRACHINIDÆ . . . . .	Elytra truncate.
	{ HARPALIDÆ . . . . .	Elytra not truncate.
<i>These last divided into</i>		
{	{ HARPALINI . . . . .	Palpi not pointed.
	{ BEMBIDIINA . . . . .	Palpi pointed.

If here is not enough to prove to any one the conclusive nature of the Dichotomous system, his intellects must be most obtuse or most strangely bewildered by some favourite theory. Let any one who with an unprejudiced mind has compared the long tedious characters of genera or families, given by the modern schools, with the clear, simple, and intelligible definitions resulting from the dichotomous method,—let such a person say how infinitely superior the latter method is. I defy Mr. Newman to point out any arrangement of the group which I have explained above, which equals, for clearness, truth, and utility, the one which I have given. As to circular systems, have we not already had three different numbers proposed by different writers, each of whom maintains the cause of his favourite number as the only true one? First stepped forward Mr. MacLeay (and I much regret that the first of these

wild theorists should be a Scotchman), maintaining that all groups in nature were resolvable into five smaller ones, or that if there appeared to be more or less than that number it arose from our ignorance of the true nature of that group.

Mr. Vigors next took it up, and attempted to apply quinarism to birds; but here he utterly failed, though I cannot join with Mr. Newman in considering that failure as a proof of the truth of *his* system, but, on the contrary, am induced to look upon Dr. Fleming's arrangement as the only perfect one. Soon after Mr. Newman proclaimed his number seven to be the only natural and scriptural one; but more of him hereafter. I must first say a few words to the champion of number three, Mr. Swainson, undoubtedly an excellent naturalist; but grievously led away by theory.

I wish to ask him in what way he would divide *Mammalia*, reptiles, fishes, or the annulose animals, each into three equal groups; how, in particular, he would divide insects; what his three main divisions in that group would consist of; and then the divisions into which each of these are resolvable.

Now, to return to Mr. Newman's book; notwithstanding the extensive circulation and great consideration into which it has risen, owing to the morbid propensity of our present race of naturalists to run after wild and vague theories and to desert truth, I firmly believe that it would have been better for the cause of true science that it should have been burnt by the hands of the common hangman.

After asserting that MacLeay is right as to the circular arrangement of groups, the author says that he is still in want of some number to allot them by, and then jumps at the conclusion that seven is the right and scriptural one; a main reason for thinking so, being, that Cuvier formerly divided animals into seven groups, but had subsequently renounced that number for four. Another reason is that he can find amongst *Mammalia*, *Aves*, or *Insects*, no possible way of making eight equal groups out of them; but here let me ask, are there no such orders, or, as he very properly wishes them to be called, classes, as *Dermaptera*, *Strepsiptera*, *Hymenoptera*? Again, are there but six groups of equal rank to *Vertebrata*, whilst he allows forty-nine of equal rank to *Mammalia*? Let the author answer these questions if he can.

The remarks Mr. Newman makes about the distinction

between *Haustellata* and *Mandibulata*, instead of proving the incorrectness of that division, merely serve to shew the author allows himself to be led away by an *ignis fatuus* of his brain, which blinds his perception of the true method of scientific arrangement so apparent in this dichotomy.

To make out his favourite number seven, this author (whose youth may, perhaps, be pleaded a little in excuse for his zeal for innovation) forces at one time two groups into one, at another he divides groups which even the leader of this school of innovations left untouched; witness, for an example of the first, his putting the *Homoptera* and *Hemiptera* into one group, and especially his reuniting the *Trichoptera* to the *Neuroptera*, the distinctions between which your correspondent, Clericus, has so well pointed out; for an example of the second, we need only refer to his separating the *Egeriadæ*, *Zygænadæ*, and *Glaucopisidæ* from the *Lepidoptera Crepuscularia*; thereby making the *Sphinxidæ*<sup>a</sup> a group of equal importance with the whole genus *Papilio* of Linnæus.

The erroneous nature of Mr. Newman's theory shews itself most plainly in these smaller groups; for instance, instead of two groups, as there are in fact in the *G. Papilio* of Linnæus, namely, *Papilionidæ* and *Hesperiadæ*, he must, in some way which he does not point out, make seven families; in the *Lep. Crepuscularia* ten, for out of the *Sphinxidæ* he will have to make seven; and though he has in the *Bombyxidæ* made out his full number, it is only by putting in two groups of insects, belonging one to the *Lep. Crepuscularia*, the other to the *Noctuadæ*. Thus are those who neglect the clear light of the Dichotomous system leading us into a labyrinth from which, if we proceed further, we shall be unable to extricate ourselves.

Although I have much to say on this subject, I shall not trouble you any further at present with observations on a system which I hope to see soon fall into oblivion; because, from the tone of all your correspondents, with one or two exceptions, I well know that such truths as mine will not be at all agreeable. I cannot, however, conclude without observing, that I consider this essay to be the production of a young man whose abilities, when ripened by age and experience, will shed

<sup>a</sup> I doubt not but that some of your readers may sneer at the terminations of the names of these groups; but, when I have Dr. Fleming for my guide, I fear not that I shall be found erring.

lustre on his country, and that the fame it has earned the author is, in a great degree, merited by the lucid and forcible manner in which he has exposed some of the absurdities of system-makers; but, alas! such fame is little worth, when it only lends to blind us to our own imperfections.

Yours, D. D.

ART. LIII.—*Notes on the Habits of Insects.*—By DELTA.

BEFORE leaving my garden, I will just point out to such of your readers as are fond of having long rows of species in their drawers, a method by which they may succeed in capturing many species not always to be found in cabinets; but unless they live in the country, have a garden and a hot-bed therein, all I am about to say will be but of little use to them. Nevertheless, for the benefit of those who may be in a similar situation to myself, allow me to say, that if they lay a flat piece of old board on the dung in front of the frame, first sprinkling a little water on the bed, if very dry, they will, on turning it over a few days after, when the sun is full on it, find many insects adhering to the under-side, amongst them some rather rare.

Besides *Scydmaenus tarsatus*, *S. hirticollis*, *S. collaris*, *S. pusillus*, *Euplectus Karstenii*, and *Reichenbachii*, which come to prey on the minute *Thysanoura*, which mostly swarm in such a situation, I have met with the following insects:

Sphæridium Daltoni,	Trich. minuta, and 2	Rhizophagus rufus,
Agathidium ferrugineum,	apparently new sp.	Monotoma picipes,
Clambus Armadillus,	Latridius carinatus,	pallida,
Orthoperus punctum,	elongatus,	angustata,
Trichopteryx atomaria,	Cryptophagus, several sp.	Abræus minutus;
minima,	Mycetæa fumata,	

and innumerable *Cercya* and *Brachelytra*, whose names I could not enumerate.

*Mycetæa fumata*, Mr. Stephens says, is very rare. I should rather say, that it is one of the commonest of insects, having been found in profusion in old posts, out-buildings, and in cellars, where it often attacks the corks of bottles.

The *Scydmaeni* are very carnivorous; they take a small

*Podura*, or one of the *Acari*, in their jaws, and walk about slowly, whilst devouring it: this, no doubt, is a harmony of nature, St. Pierre having long ago said, that what he meant by the harmony of nature was well illustrated by a wolf eating a lamb.

A better exemplification of this aristocratical kind of harmony is afforded us by the genus *Dioctria*, which preys on those ruthless destroyers, the *Ichneumonidæ*; at least, I have never found the common dark-winged species, *D. ælandica*, feeding on any but an *Ichneumonidæ*, (that, I am told, is the newest London phraseology) an *Apidæ*, a *Carabidæ*, &c., though I have seen dozens feeding on insects of this family.

About eighteen miles from us is the pleasant little village of Walton, which is fast becoming a fashionable place of resort for us North-Essexians;—a sweet spot it is, too, for any one who loves Nature,—for one who is willing to contemplate, in its cliffs, the remains of a former race of animals; for, when a high tide washes away parts of them, it often lays bare large bones, immense multitudes of fossil shells, &c. The botanist, too, may find many a rare plant on the shore, and in the marshes; amongst which I will only mention one, *Peucedanum officinale*, discovered here by my friend, J. Grubb. The ornithologist may find pleasure in listening to the plaintive note of the ring-plover, the harsh scream of the tern, or the hoarse croak of the cormorant;—he may watch the dunlins, the purple sandpipers, the sanderlings, coursing along the sands, or skimming lightly over the water; and if he does not, whilst walking along the shore on a calm summer's morn, when the sun is just rising above the sea, and when no sound is heard save the gentle murmuring of the waves and the notes of the sea-birds,—if in such an hour he does not feel the calmness of the scene—

“Steal to his heart, and make all summer there,”—

he is altogether unworthy to be called by the name of man.

But all this is quite away from my subject; but, I am given to wandering; and, Mr. Editor, if you do not check me, by leaving out, now and then, such parts of my letters as are not entomological, you will have me writing to you, not letters on the habits of insects, but letters *de omnibus rebus et quibusdam aliis*.

To return to entomology:—In the marshes a small black *Lciodes* is found on the ears of *Triticum repens*, wherever it is attacked by a disease similar to what in wheat is termed the smut. I have never had an opportunity of making out its habits and history fully, therefore I can only conjecture, that, like its near neighbour in systematic catalogues, *Phalacrus*, it feeds on the small fungilli which cause that disease. Under the weeds by the sides of the ditches, especially under the spreading branches of *Atriplex partulacoides*, innumerable *Coleoptera* shelter themselves; amongst which are *Ophonus pubescens* and *Pogonus chalceus* in profusion; *Ophonus obscurus*, &c.; *Amara atra*, *eurynota*, &c.; *Harpalus subcæruleus*, *dentatus*, *confinis*, &c.; *Curtonotus convexiusculus*, *Broscus cephalotes*, *Lopha nigra*, &c.; *Simplocaria semi-striata*, *Scymnus*, several species, amongst which I have two apparently nondescripts.

On the flowers, by the sides of the sea-walls, may be found *Pachyta livida*; and an *Eristalis*, of which I know not the trivial name, and which I do not remember to have seen in any London cabinet I have visited.

*Setina irrorella* is very common at a place called Stone Point, about four miles from the village. I have also found it at Mercey Island, and believe it to be common along all this part of the coast; but Stone Point is its head quarters. I have taken thirty or forty specimens, as fast as I could pin them; and my friend, J. Grubb, informs me, that about five years back he saw, literally, hundreds lying dead on the ground, or impaled on the blades of grass, and *Psamma maritima*; how they came into the latter situation, I cannot imagine; but there they were, by the dozen. They fly very early, from three to six in the morning, but may be found sitting on the blades of grass. The males appear a few days earlier than the females.

*Lasiocampa castrensis*, and *Agrotis cespitis*, have also been found here; the former, in the larva state, on *Artemisia maritima*.

I was much surprised to find, in Stephens's valuable work, so erroneous a description of the larva of *Nonagria Typhæ*, as the following: "Caterpillar green, spotted with black, with a palish lateral line." I had seen, perhaps, a hundred larvæ, and never one with the least shade of green. To be



certain of the fact, I went this year to a pond, where *Typha latifolia* abounds; it was the first week in June;—a few of the bulrushes had the inner leaves yellowish and faded. On opening these, I found the larvæ of a whitish colour, like those of *Agrotis*; they are long, slender, with a corneous brown plate on the *prothorax*,<sup>a</sup> and a paler dorsal and lateral line, of a somewhat transparent appearance. By the middle of July they had become thicker, and more of a brown hue. They evidently do not subsist each on one plant, but having devoured the pith of the flower-stalk, and the base of the youngest leaves, they quit that plant for another, eating, I believe, downwards. When full grown, they spin a web in the upper part of the stem, intermingling with the silk a large proportion of the fibres of the bulrush, which they have gnawed off, always undergoing their metamorphosis head downward. They remain about three or four weeks in the pupa; the imago may sometimes be found amongst the plants on which the larvæ have fed.

*Sparganium erectum* is attacked by a smaller moth,<sup>b</sup> of which I send you specimens in all the stages of larva, pupa, and imago. The larva above is of a lightish brown, with a paler dorsal line, beneath whitish; on the *prothorax* is a broad corneous plate; the *telum* is singularly flattened, with two or three stiffish hairs at the extremity. There are also a few scattered hairs on some of the other segments. The pupa is pale-brown, elongate, with a furcate horn above the eyes, and a small protuberance behind them. Around the middle of each of the lower segments, commencing with the *octoon*, is a row of small spines pointing downwards,—something resembling that in the xylophagous Lepidoptera. The whole appearance of the pupa reminds us of those of some *Tipulæ*.

In habit, this moth resembles *Non. Typhæ*; but the larva appears not to visit more than one plant. The pupa has the head upwards.

I am yours, most truly,

Δ.

<sup>a</sup> For the meaning of these terms, your reader will be kind enough to refer to Mr. Newman's highly useful paper on Osteology, at p. 394; before the publication of which it was next to an impossibility to give an intelligible description of a larva.—Δ.

<sup>b</sup> *Ortholænia nervosa*.—E.D.



ART. LIV.—*The Learned Fleas.*

Juvat imbribus actis

Progeniem parvam revisere—

VIRGIL.

Compelled to shelter from a shower,

We whiled away a pleasant hour,

Revisiting the learned fleas.

H. D.

COURTEOUS READER,—It is a pleasant thing to see human intellect soaring triumphantly over every obstacle and commanding applause. It is a pleasant thing to hear a philosopher lecturing of the motions of worlds, or the combinations of atoms, on the taming of elephants, or the breaking-in of fleas. Large and small are terms without a meaning. Size has no existence. Comparison is the only measure. Is our philosophy intelligible? are we understood? Yes; we know we are understood.

Fleas have lately obtained an unusual share of notice. M. Dugés supplied them with wings and antennæ; Mr. Newman denies their claim to eyes; and Messrs. Curtis and Westwood give them hard names: but greater honours than these were in store for them; and our friend in Regent-street,<sup>a</sup>—worthy man,—has taught them habits of civilized life, and shown them to be exceedingly docile, if not rational, creatures; we find, however, that their merits are still but little known to the world, and we hasten to record them.

In the exhibition-room is a large elevated table, covered with green cloth; on this are several small tables, say six or eight inches square, and these are covered with white paper, and are the stages on which the Messrs. Flea perform; and now, courteous reader, we will conclude this introduction of our subject, by introducing thee to the great master of the fleas, and allow him to explain the exhibition in his own way.

“ This, you see, ladies, is a mail-coach; it is made just like a mail coach in every part; take this glass and examine it; you will observe the wheels are perfect, and every part; there are four passengers inside; the horses are fleas, all harnessed with silk harness, and all buckled on its proper place; the coachman is a flea, with a whip, and the guard is also a flea, with a silver tin-horn, which he puts to his mouth every now

<sup>a</sup> No. 238, opposite Hanover-street.

and then and blows.—Use this glass, Sir.—Go on [to the fleas]—the coachman cracks his whip, and the guard blows his horn. You may see him put it to his mouth, but the sound is so small that you cannot hear it,—there, you see, he drives as straight as a mail-coachman.

“ This is a gig, with a lady and gentleman, drawn by a single flea,—go on. This is a figure of a elephant, with a castle on its back, and a good many men in it, drawn by a single flea; this is a very great weight for one flea—go on;—it shews what great strength it possess. There is Wellington,—go on, you are sulky,—Blucher, and Napoleon, the three heroes of Waterloo, mounted on fleas; the figures are of paper, and are all very like; the Duke of Wellington is perfect likeness.

“ There are two fleas settling a dispute of honour after the ancient method; each flea is covered with armour and provided with a lance—go on;—there, you see them spear one another—they do not hurt each other much. There is a flea with a blue petticoat on, he is drawing up a bucket of water out of a well; the chain and the bucket is gold; if you watch, you will see the bucket come up out of the well. This is a treadmill, in which the fleas are broke in, and cured of leaping; when the flea leaps, he knocks his head against the top, and he does not like that; there is one in now, when he moves—there! you see it go round.

“ This is a ball-room: it is the top of a musical snuff-box; this raised part is the orchestra; there are twenty-one fleas, musicians—seven violins, one violoncello, three French-horns, two bassoons, two key-bugles, four clarionets, one octave, and one harp—all the instruments of music are of gold; round the room are a great number of fleas, ladies and gentlemen, on chairs; there are two fleas, lady and a gentleman, flirting; and there is an old lady in spectacles reading the Times newspaper; in the middle are some ladies and gentlemen waiting for the music, to begin waltzing; directly the music begins, the musicians will all play their music, and the dancers begin dancing; there, now I will touch the key; there, you see,—take the glass, Miss, and look at the violin-players.” “ Oh, do look, ma! they're all fiddling” “ Yes, and the waltzers are twirling round and round. I have heard many young ladies say they wish they could waltz so well. Take the glass,

Mr. D. Now the tune is almost done, and they will all stop; they do not move one moment longer than the music lasts:—there, they are all stopped. In the other part of the room is something more to be seen.”

We accordingly went to the other end of the room, where were several perfect fleas, their larvæ, eggs, &c., under very tolerable glasses; the larvæ are long, apod, white worms, and struck us as being very like those so common in decaying cheese; some years back we should have added—*Musca putris*; but, alas! the insect has had so many names that we have no idea now which is the right one, we will therefore call it the cheese-fly. The figures of the larva of the flea, in Roesel, are very accurate.

The fleas, in this exhibition, certainly are made to perform a great proportion of the feats which their proprietor describes, but we must not send our readers to Regent-street with the impression that these operations are the result of docility and education entirely. In those fleas which draw the mail-coach, gig, &c., we observed, that the cause of their exertion was, an attempt to retreat from the light, and that they invariably travelled towards the dark side of the room, and were as invariably taken back to the light and performed the same journey over again: several of the other operations, we conceive, would be much more easily traced to the restless activity, than the sagacity, of the fleas; but, even after making due allowance for this, there will be found sufficient of the amusing in the exhibition to repay the visitor for the admittance-fee, particularly if, like ourself, he be overtaken by a hasty shower and have half an hour to spare. H. D.

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ART. LV.—*Transactions of the Linnæan Society, Vol. XVI.  
Part III.*

PAGE 471. *Notice of several recent Discoveries in the Structure and Economy of Spiders.* By John Blackwall, Esq., F.L.S.—This is a paper of much interest. The author, in the first place, details the mode in which *Clubiona atrox* constructs its web. The fabrication of a *flocculus*, or compound thread, is highly curious: on the abdominal side of the

first tarsal joint of the hind leg are two parallel rows of spines, moveable at the pleasure of the animal: the spines in the upper row are considerably curved, and taper to a point; those of the lower row are stronger, more closely set, and less curved; the spider presses its spinners against one of the glossy lines, which are the main-stays of its snare, and, emitting from them a small quantity of liquid gum, attaches to it several fine threads; the foot of one of the hind-legs is then applied to the upper part of the first tarsal joint of the other hind-leg, and the apparatus of spines is thus brought immediately beneath the spinners, at a right angle with the line of the abdomen; the apparatus of spines, by a slight motion of the leg, is forced backwards across the *mammulæ*, the diverging extremities of which it touches in its transit; the operation is rapidly repeated, and the lines of the *flocculus* are produced, the spider making room for them by raising and advancing its abdomen. Mr. Blackwall remarks that *Mygale avicularia*, *Drassus melanogaster*, and *Salticus scenicus*, have only two claws on each foot, and *Epeira apoclista* eight. Naturalists have generally supposed spiders invariably to have but three. He further observes, that the nets of geometicians are composed of *three* different kinds of silk; and that although nets lose their viscidty when exposed to the influence of sun and weather, yet, when artificially protected from the effects of these, they retain it almost unimpaired for many months. With regard to the *ecdysis* of spiders, Mr. Blackwall observes, that the thorax opens laterally, disuniting immediately above the insertion of the mandibles and legs, not from the centre, as Dr. Leach implies; this line of separation extends to the abdomen, which is next disengaged, the extrication of the legs being the last and most difficult operation, though facilitated, as Mr. Blackwall supposes, by the spines with which they are furnished: when the spider is quite free from the slough, it remains for a short period in a state of great exhaustion, suspended by a thread from the spinners, connected with the interior part of the cast skin; after being perfectly quiescent for some time, in order that the new skin may dry and consolidate in some degree, as well as, probably, for the sake of repose, it attaches itself to the suspensory line by its feet, and, climbing up, it returns to its retreat.

*Blackwall, Esq., F. L. S.*—The question of the structure of the pulvilli of flies, though often agitated, can hardly yet be considered satisfactorily settled. Mr. Blackwall, after enumerating various opinions published regarding it, has indeed clearly disproved the of late generally received one of Dr. Derham and Sir E. Home, that those parts act as suckers by atmospheric pressure;—for, on enclosing a house-fly in the exhausted receiver of an air-pump, he found, that so long as its vital powers were unimpaired, it was still able to traverse, not only the sides, but the dome of that vessel. In the sentiment, however, which he has himself adopted, or it may be in his explanation of it, he does not appear equally happy. Like Dr. Hooke, he sees the under surface of the *pulvilli* to be covered with closely-set minute hairs, directed downwards; and he considers that insects are enabled to take hold of the roughnesses, or irregularities of the surface of glass, by means of these hairs, their difficulty in doing so increasing with the goodness of the polish; but he remarks, that Hooke was in error in supposing the hairs to be pointed, for to him their extremities seem somewhat enlarged; and if we understand correctly Mr. Blackwall's reference to the preceding paper by himself, he takes this dilated appearance of the ends to be owing to each hair's being fringed by still finer hairs, which form at its extremity a brush on its under surface. The mode of adhesion he accounts to be strictly mechanical, not by the aid of a glutinous secretion, and to depend in great measure on the numerous points of contact presented;—their "influence being from the tarsi outwards." But the manner in which these points can operate in counteracting the force of gravity is left unexplained; and indeed we do not distinctly comprehend the idea here intended to be conveyed. Perhaps some light may be thrown on this obscure subject by introducing a notice of a few observations mostly made in 1825, and recently repeated.

The appearance, under moderate magnifying power, of the *pulvilli* of flies, is well known; their shape, and other particulars, differing according to the species, but maintaining a general resemblance throughout the family. Through a good achromatic microscope, each of the two similar parts, of which they consist, is seen to spread out into a thin flat membrane, more or less transparent, mostly furrowed on the upper

surface in delicate ridges, from the base to the margin, where they terminate in hairs; and these ridges are sometimes crossed by others. In some species, the marginal hairs might well be mistaken, with the less accurate instrument employed by Sir E. Home, for a serrature;—they in reality form the edge of that remarkable covering of the under surface which has so much puzzled observers.

This covering is composed of pellucid elastic hairs, arranged with beautiful regularity, which appear to have their insertion along the ridges just mentioned; all are inflected downwards, and slope a little outwards; and those near the sides of the *pulvillus* are inclined also towards the margin, or project beyond it;—each is nearly of an even thickness till near its extremity, where it is bent suddenly into a knobbed or flattened end. Hooke's comparison of them to the wire-teeth of a card for working wool, was not an inapt one, except that all their terminations, which he calls "tenters," are turned outwards from the *tarsus*.

The under side of the *pulvilli*, seen in a favourable light, when these terminations show as a multitude of bright spots, disposed at equal distances on a flat surface, is among the most striking of microscopic objects. The length and distance of the hairs is not always in proportion to the size of the fly:—in the broad *pulvillus*, for example, of *Sarcophagus carniarius*, they are as close as in that of the house-fly, (*Musca domestica*), but their number is vastly greater in the larger species. In *Scatophaga stercoraria*, the flat, transparent, and apparently glandular ends, are very distinct.

To obtain a just idea of this apparatus, it should be viewed in different positions, and by reflected, as well as by transmitted light;—the creature should be living, and the linear power employed from two hundred to five hundred.

Flies use their *pulvilli*, or their claws, according to the nature of the surface; and often, when walking horizontally, and on a soft substance, do not touch with either, but rest entirely on other articulations of the *tarsus*. When they adhere to polished glass, in a vertical position, they may be seen, from the other side, to apply to it the bent extremities of the hairs described. Those of nearly the whole *pulvilli* will be employed when the insect is full of vigour, but sometimes, when exhausted, it will be suspended by those of a



small portion only. The parts which touch commonly slide very gradually over the surface, in the direction in which the fly clings by them; and when the foot is detached, a distinct fluid trace will often be left by each individual hair. The spotted pattern, thus left on the glass, seems of an oily character; for, if breathed on, it remains after the condensed moisture is evaporated.

A slight dewiness from the breath, or an oily film on the glass, disables the fly from climbing it, if vertical, but not from traversing it when flat; and the insect ascends dry glass with ease immediately after having done so; but on watching one which seemed stationary on an upright piece, having just walked over a greased surface, it could be seen to be very slowly gliding down without any change in the relative position of its limbs. We have not found that the cleanness, or high polish of glass, causes any difficulty to flies in climbing.

The circumstances related imply, that it is not by the application of extremely small points to invisible irregularities on the surface of glass, that the pulvilli are attached, but by simple adhesion of the enlarged ends of the hairs, assisted by a fluid that is probably secreted there; and we are therefore induced to refer the effect to molecular attraction only—a power difficult to estimate, but evidently great in some cases, when an extremely thin flat surface is placed in contact with a smooth body;—and, in the present instance, the manner in which the bent expanded ends of the congeries of elastic hairs are applied, is particularly favourable for its exertion.

When a fly would increase the firmness of its hold, it contracts its leg so as to draw the *tarsi* to a direction more nearly parallel to the glass, thus bringing into contact the hairs of the whole *pulvillus*, and a larger portion of each hair. On the other hand, the foot is detached by an outward and upward impulse given to the *tarsus*; the tendency of which must be to draw off the ends of the hairs in rapid succession, beginning with those next it. This act is, as we suspect, assisted by a strong blunt bristle that projects from a tuft of hair between the *pulvilli*, and has a motion independent of them; and by the two claws that spring from one base, and branch over on each side, their ends touching the glass, and preserving the position of the foot as the insect clings. We have seen a blue-bottle fly, (*Musca vomitoria*), when so confined as not to be able to apply

his effort in the right direction, wriggle his leg about for some seconds before he could release an adhering portion of the *pulvillus*.

If we might suppose the supply of fluid at the end of each hair to vary according to occasion, it would furnish an additional explanation of the adhesion and disengagement of these extraordinary organs, as well as of their remarkable freedom from dust and impurities while the insect is healthy; but we must not proceed further with conjecture.

Page 607. *On the Paussidæ, a family of Coleopterous Insects.* By Mr. J. O. Westwood, F. L. S.—This is a most diffuse paper; it is extended over seventy quarto pages: had the essence of it been compressed into two or three pages of this Magazine, it would have been useful as describing a few new species, and in its place as being likely to be read by technical entomologists. Mr. Westwood writes at great length on the views of other authors, as to the affinities of *Paussus*, none of which he seems to approve, but forgets the necessity of adding something better or more definite of his own; indeed, he appears to have been misled by Donovan into the notion of connecting *Paussus* and *Cerapterus*; and his family, *Paussidæ*, in consequence, much resembles a “Refuge for the Destitute,” in which all manner of outlaws are collected together; the characters, “*antennæ articulis, 2—10,*” and “*Labrum magnum*” for the family, with “*Labrum minutum*” for one of its genera, will give the reader some idea of the limits to which Mr. Westwood’s family, *Paussidæ*, is restricted. We must say another word on this paper, a word applicable alike to all the writings by the same author, viz., that we disapprove of the language of dictation which Mr. Westwood employs: he never addresses his reader but as his “student,” and is continually referring his “student” to what he has said in other places: now, the paper in question will stand no chance of being read by any individual who is not a tolerable entomologist; and no man likes to be called a student: it is not at all inviting to the readers of scientific works. Modesty is a jewel of inestimable value, and one which almost invariably accompanies real merit. Let us refer to the writings of Newton; or, more recently, and more in our own way, to those of the late illustrious Latreille. What depth of research! what capacity, what strength of mind!

adorned with the purest, the sincerest, modesty. We have still amongst us examples equally brilliant; philosophers whose grey heads are as much loved for their meekness as respected for their knowledge. Is there not such an one in entomology? is there not one placed on an eminence so far above us that he might dictate to us all? but we see him willing to learn of all, to bear with all, to yield to all; the mildest, most humble, most unassuming of men, clothed as it were in a complete unconsciousness of his own superiority. The fact is, that a sip of the waters of science intoxicates—a deep draught sobers. The smatterer in learning wonders that he knows so much; the devoted student that he knows so little. It is only when we have made some progress in the paths of knowledge that we can form any just idea of their extent. Man is somewhat like a drum,—the sound is a symptom of its emptiness. When a man recounts his own deeds, it is a sign that no one else thinks them worth recounting: such a man's fame depends upon the length of his life; for after his tongue has ceased to move, and his hand to hold the pen, no one will take enough interest in the theme to renew it. These little observations may be trite, but they are nevertheless wholesome, and we hope their introduction here will not be taken amiss. Their application may be made by each of us without risk of injury; for who is there that can boast of sufficient knowledge to authorize his disregard of modesty.

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ART. LVI.—*British Entomology*. Nos. 111—116. By  
JOHN CURTIS, F. L. S.

WE never recollect addressing ourselves to a task which we so heartily wished to avoid, as that on which we are now about to enter; nothing but the call of imperative duty could induce us to undertake it. We have been angry, but we shall not commit ourselves; the first burst of indignation has passed away, and in sorrow, in deep sorrow, do we ascend the tribunal which we are compelled to occupy, and judge between the offender and the offended.

Most of our readers are already aware of the painful subject to which we allude; it is one of those unwarrantable attacks of one author on another which, for years past, have occasionally disgraced the paths of science, and, in this instance, it appears under the peculiarly aggravated circumstances of being unfounded in truth, and perpetrated at a time when misfortune had entitled the subject of the attack to universal sympathy.

Mr. Curtis has thought proper to publish, as an appendage to a description of *Cercopis*, merely, as he says, because "there is space for an observation or two," a charge against Mr. Stephens, that, in the second edition of the Nomenclature, he has "copied column after column from the Guide," "adopted the plan of the Guide," and made the Nomenclature "rather a second edition of the Guide than of the Nomenclature:" than the first and last of these charges, we never met with more gratuitous or untenable assertions: we pronounce this after having compared the two works word for word. With regard to the plan, *i. e.* in the addition of consecutive numbers to the genera and species, and the adoption of the mode of printing, Mr. Stephens has, we are aware, imitated; he could not have done otherwise; but in what manner this is an injury to Mr. Curtis, we defy human ingenuity to point out. Is it not the every-day custom to adopt any new mode or fashion in the getting up of a book? The only portions of the two works which bear any similarity are those in which the *Ichneumonidæ* occur, and the cause of the similarity here is, not that either has copied from the other, but that both have copied from another work, "Gravenhorst's *Ichneumonologia*," and this surely can be no just cause of complaint; the right of copying a foreign work cannot be confined to a single individual.

The cruel allusion to the affair with Rennie,—an affair which we consider reflects any thing but credit on the laws of this country, is the most unfeeling of all, and betrays a spirit of deep-rooted animosity and revenge which lowers our opinion of our kind. We presumed that the circumstances under which Mr. Stephens was placed had rendered him an object of kindly feeling with all scientific men; we imagined that self-respect would have prevented a Briton from striking another in distress; we supposed British honour would have

revolted from such a deed; we have, in fact, been deceiving ourselves,—we have been leaning on a reed.

How strenuously, how enthusiastically, have we laboured to eradicate the base and injurious party-spirit which has so long pervaded the paths of science;—and is this the fruit? is this the brotherly spirit we invoked? is this the endeavour, of which we urged the necessity, to forgive the past and to avoid offence for the future?

We see no termination to the mischief now a-foot: we see that a fresh question may now, in self-defence, be agitated: we see that Mr. Curtis's title to the copyright of this List may be examined; this attack is a fair challenge to the inquiry. We fear that Mr. Curtis will find that he had better, far better, have committed the whole copy of that tainted number to the flames, than have ventured to risk it on the excited wave of public opinion.

It is with pleasure we return from these observations to the beautiful work before us; for it is so much more gratifying to applaud than to condemn, that we would fain always applaud. In the present numbers, however, as a general observation, we would say, that Mr. Curtis is too much inclined to yield to the mania of the day for making genera and species, which the wheel of science, in its rotation, must inevitably fling from its circumference. Name-giving is one of the least important parts of a work like this; it were better to illustrate genera and species already described, than venture on the intricate task of making new ones.

The contents of the April number are, 1. *Hesperia Actæon*, a new butterfly, for which we are indebted to that indefatigable entomologist, Mr. Dale, whose important discoveries have enriched almost every column of our list. Mr. Curtis's character of the larva and pupa of the *Hesperidæ* is scarcely sufficient; we will improve it. "Larva elongate," attenuated gradually towards either end; "head large," porrected; "six pectoral, eight abdominal, and two anal, feet;"<sup>a</sup> "pupa" smooth, unangulated, head-case rounded, tail pointed, "enclosed in a" slight loose "web," through which it is visible, "or in leaves held together by threads," girted and attached by the tail. 2. *Callicerus Spencii*, one of the *Brachelytra*.

<sup>a</sup> The number and situation of feet is invariable in *Papilionidæ*.

3. *Molophilus brevipennis*, in its hairy body and wings, and in its *tarsi*, which are naturally more curved than represented in the plate, resembles some species of *Cecidomyia*; the *prothorax* in the figure is rather too elongate. We wonder Mr. Curtis does not allude to Dalman's genus, *Chionea*, which beautifully connects *Molophilus* with the *Cecidomyia*.  
 4. *Asiraca pulchella* is *Cicada crassicornis* of Creutzer.  
 5. *Carabus exasperatus* is *C. violaceus*, and totally distinct from *C. exasperatus*, Duft., as may be seen by a glance at Dejean's figure. 6. *Ephyra pictaria*, one of the *Geometridæ*.  
 7. *Lasioglossum tricingulum* is *Halictus Xanthopus*. 8. *Issus Coleopratus*, a beautiful variety; an Hemipterous insect.

The contents of the June number are:—1. *Aspidiphorus orbiculatus*, a minute Coleopterous insect. 2. *Cerapteryx hibernicus* is *Chareas graminis*. 3. *Volucella inflata*, a Dipterous insect. Mr. Curtis has omitted to mention the singular fact, that *V. bombylans* and *V. inflata*, although so different in appearance, are but a single species. 4. *Coranus subapterus*, a new genus of Hemiptera, allied to *Reduvius*. 5. *Drypta emarginata*, one of the genera connecting the Linnæan groups, *Cicindela* and *Carabus*. 6. *Aglossa Streatfeildii*, one of the *Pyralidæ*. 7. *Gryllotalpa vulgaris*, the mole-cricket. Of the note of this insect, a word from Dr. K——; not the Dr. Kidd to whom Mr. Curtis refers, but Dr. K—— the field and forest lover—the observer of living nature. Speaking of the fern-owl, he says:—

“I believe its very peculiar note is uttered sitting, and never on the wing. I have seen it on a stack of turf, with its throat nearly touching the turf, and its tail elevated; and have heard it in that situation utter its call, which resembles the birr of the mole-cricket, an insect very abundant in this neighbourhood. I have almost been induced to think this noise serves as a decoy to the male mole-cricket, this being occasionally found in the craw of these birds when shot. Those who may not be acquainted with the cry of the bird or the insect, may imagine the noise of an auger boring oak, or any hard wood, continued, and not broken off, as is the noise of the auger from the constant changing of hands.”<sup>b</sup>

8. *Cladius pilicornis*, one of the *Tenthredinidæ*. Is this distinct from *C. difformis*?

<sup>b</sup> Loudon's Mag. of Nat. Hist. Vol. V. p. 603.



The contents of the August number, are:—1. *Harpalus ruficeps*, an immature specimen of *H. Hottentota* of Sturm; to which species the *H. punctiger* of Stephens is also referable. 2. *Nonagria Vectis*, one of the *Noctuidæ*. A correspondent<sup>c</sup> has sent us *Nonagria Typhæ* in all its stages. The larva is a most singular one; it is very elongate and slender, of a dirty brown colour, longitudinally striped up the back and sides with darker lines;—it does not confine itself to an upright position, as Duponchel observes, and Mr. Curtis repeats, but enters the stem of the *Typha*, usually about eight inches above the water, and continues to devour the central portion to the water's-edge; it then comes out, and attacks another and another. 3. *Oryssus coronatus*. The description of this rare insect should have been much more explicit, as its relation to *Sirex*, in a natural arrangement, is a matter of great importance. Mr. Curtis has dismissed the description of those segments which would establish this, in the following words—"Thorax not larger than the head." 5. *Falagria thoracica*, one of the *Brachelytra*. 6. *Adela Frischella*. This is a bad plate; too much gilding and varnishing. 7. *Mesochorus sericans*, one of the *Ichneumonidæ*, and a beautiful figure. 8. *Pyrrhoceris apterus*, one of the *Cimicidæ*. The description of this insect is accompanied by some sensible observations on the probable causes of the occasional swarming of peculiar species of insects.

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ART. LVII.—*Monographia Chalcidum*. By FRANCIS WALKER, ESQ. F. L. S.

(Continued from page 384.)

GENUS X. DICYCLUS,<sup>a</sup> Walker.

Caput thorace latius: antennæ 13-articulatæ, clavatæ; articulus 1<sup>us</sup>. elongatus; 2<sup>us</sup>. elongato-cyathiformis; 3<sup>us</sup>. et 4<sup>us</sup>. minimi; 5<sup>us</sup>. et sequentes ad 10<sup>um</sup>. æquales, breves; clava elongata, articulis 9<sup>o</sup>. et 10<sup>o</sup>. æqualis: mandibulæ 4-dentatæ; una arcuata, dentibus acuminatis; altera recta, dentibus ferè obtusis: maxillæ elongatæ, apicem versus internè in lobum productæ: palpi maxillares filiformes; articulus 1<sup>us</sup>. mediocris; 2<sup>us</sup>. paulò longior; 3<sup>us</sup>. brevior;

<sup>c</sup> Δ.

<sup>a</sup> δὲς bis, κύκλος circulus.

4<sup>us</sup>. 2<sup>o</sup>. et 3<sup>o</sup>. æqualis, acuminatus: mentum elongato-ovatum: labium anticè latum, rotundatum: palpi labiales articulo 2<sup>o</sup>. minuto: thorax brevis: prothoracis scutellum parvum: mesothoracis scutum magnum; suturæ laterales vix conspicuæ; epimera et paraptera majuscula; scutellum ovatum, convexum, mediocre: metathoracis scutellum parvum, canaliculatum: petiolus brevis: abdomen elongato-ovatum aut ferè rotundum; segmentum 2<sup>um</sup>. maximum; sequentia parva: pedes graciles; tibiæ rectæ.

Sp. 1. Dic. æneus. Fem. *Viridi-æneus*, *antennis nigro-fuscis*, *pedibus rufis*, *alis hyalinis*. (Alarum longitudo, 1—1½ lin.)

August; grass in fields; near London. I have sometimes found it wingless.

Sp. 2. Dic. circulus. Fem. *Æneo-viridis*, *antennis nigro-fuscis*, *pedibus rufo-fuscis*, *alis subfuscis*. (Alarum longitudo, 1 lin.)

September; Isle of Wight.

Sp. 3. Dic. fuscicornis. Mas. et Fem. *Viridis* mas aut *æneo-viridis* fem., *antennis fuscis*, *pedibus rufis*, fem. *femoribus æneis*, *alis subfuscis* mas aut *fuscis* fem. (Alarum longitudo, ¾—1 lin.)

September; Isle of Wight.

Sp. 4. Dic. tristis. Fem. *Æneo-viridis*, *obscurus*, *abdomine nitido*, *antennis nigris*, *pedibus rufis*, *alis subhyalinis*. (Alarum longitudo, 1¼ lin.)

September; Isle of Wight.

Sp. 5. Dic. brevicornis. Fem. *Æneo-viridis*, *abdomine viridi*, *antennis nigris*, *pedibus rufis*, *alis fuscis*. (Alarum longitudo, 1 lin.)

August; grass in fields; near London.

#### GENUS XI. PACHYLARTHUS,<sup>b</sup> *Westwood*.

Caput magnum, thorace latius: oculi mediocres: antennæ 13-articulatæ, *maris* filiformes, *fem.* subclavatæ; articulus 1<sup>us</sup>. elongatus,

<sup>b</sup> Since I published the characters of *Cyrtogaster*, Mr. Westwood has kindly sent to me a description of the male of *Cyrtogaster rufipes*, under the name of *Pachylarthrus tibialis*. Having dissected the mouth of the female only, I was

longitudine ferè triens; 2<sup>us</sup>. elongato-cyathiformis; 3<sup>us</sup>. et 4<sup>us</sup>. minimi; 5<sup>us</sup>. et sequentes ad 10<sup>um</sup>. æquales, latiores; clava triarticulata, ovata, articulis 9<sup>o</sup>. et 10<sup>o</sup>. æqualis: mandibulæ 4-dentatæ, elongatæ, validæ, arcuatæ; dens basalis obtusa: maxillæ ovatæ, anticè in lobum elongatum productæ externè pilosum: palpi maxillares 4-articulati, graciles; articulus 1<sup>us</sup>. mediocris; 2<sup>us</sup>. longior; *maris* 3<sup>us</sup>. et 4<sup>us</sup>. dilatati; *fem.* 3<sup>us</sup>. 2<sup>o</sup>. brevior; 4<sup>us</sup>. 2<sup>o</sup>. æqualis, acuminatus: mentum ovatum: labium anticè dilatatum, rotundatum: palpi labiales filiformes; articulus 1<sup>us</sup>. elongatus; 2<sup>us</sup>. minutus; 3<sup>us</sup>. 1<sup>o</sup>. æqualis, apice acuminatus: prothorax parvus: mesothoracis scutum mediocre; suturæ non benè determinatæ; paraptera, epimera et scutellum magna: metathoracis scutellum magnum, medio carinatum: petiolus brevissimus: *maris* abdomen parvum, vix convexum, apice latum; segmenta subtus versus abdominis basin retracta; 2<sup>um</sup>. maximum, abdominis ferè dimidium occupans; sequentia minima: *fem.* abdomen ovatum, subtus carinatum, apice acuminatum; oviductus in carinula ventrali receptus, segmenti 3<sup>i</sup>. apicem versus apparens, non ultra abdomen exertus: pedes graciles; tibiæ rectæ.

Sp. 1. Pach. smaragdinus. Mas. *Cyaneo-viridis, antennis rufis, pedibus flavis, femoribus posticis fusco-maculatis, alis hyalinis.* (Alarum longitudo, 3 lin.)

Phagonia smaragdina.—Curtis, *Brit. Ent.* 427.

*Fem.*?—Cyanea, antennis nigris, femoribus cyaneis.

July; on a currant-bush; near London.

Sp. 2. Pach. flavicornis. Mas et Fem. *Lætè viridis, antennis maris rufis apice fuscis, fem. nigris, pedibus rufis, femoribus fem. viridibus, alis fuscis.* (Alarum longitudo, 1½—2 lin.)

not aware that the males of the above-mentioned genus have the tips of their maxillary palpi incrassated. This is Mr. Westwood's description:—

“*Viridis, palpis nigro-viridibus, tibiis tarsisque intermediis nigris.* ♂. (Long. corp. lin.  $\frac{2}{3}$ ; expans. alar. 1½.)

Habitat prope Londinum.—*In Mus. Lewis.*

Caput thorax et abdomen viridia, aureo vix tineta, illa punctatissima, hoc nitidum basi depressum, longius quam in *Pach. patellano*: mandibulæ ochrææ apice fuscæ: palpi maxillares nigri cæruleo-viridi nitentes; antennæ pedesque obscure fulvescentes, tarsis anticis et posticis apice fuscis, pedum intermedi-orum tibiis (nisi ad basin) tarsisque fusco-nigris: alæ albæ viridescens, nervis pallidis.”

It is requisite to add to my character of *Cyrtogaster*—*Maris* palpi maxillares apice incrassati.

*Phagonia flavicornis*. Haliday.—Curtis, *Brit. Ent.* 427.

June; on ferns; near London. Windsor. Hampshire.

Sp. 3. *Pach. patellanus*. Mas. *Lætè viridis, antennis rufis, pedibus flavis, alis hyalinis*. (Alarum longitudo,  $\frac{3}{4}$ — $1\frac{1}{2}$  lin.)

*Diplolepis patellana*. Dalman. *Stock. Trans.* 1822.

*Pachylarthrus insignis*. Westwood. *Lond. & Edinb. Phil. Mag. & Journ. of Science*. Third Series. No. II. p. 127.

August; grass in fields; near London. September; Isle of Wight.

## GENUS XII. MISCOGASTER,<sup>c</sup> Walker.

Caput mediocre: *maris* antennæ 14-articulatæ, filiformes, nonnunquam extrorsum crassiores, pubescentes; articulus 1<sup>us</sup>. elongatus; 2<sup>us</sup>. brevis, rotundus; 3<sup>us</sup>. et 4<sup>us</sup>. brevissimi; 5<sup>us</sup>. et 6 sequentes elongatæ, remotæ, lineares; clava triarticulata, apice acuminata, articulo 11°. multo longior: *fem.* antennæ 13-articulatæ, subclavatæ aut clavatæ; articulus 2<sup>us</sup>. brevis, cyathiformis; 5<sup>us</sup>. et 5 sequentes æquales, lineares; clava articulis 9°. et 10°. paullò brevior: mandibulæ 4-dentatæ, elongatæ, validæ, arcuatæ; dens basalis obtusa: maxillæ ovatæ, anticè in lobum elongatum productæ, externè pilosæ: palpi maxillares 4-articulati, filiformes; articulus 1<sup>us</sup>. brevis; 2<sup>us</sup>. longior; 3<sup>us</sup>. 2°. longior; 4<sup>us</sup>. 3°. æqualis, internè convexum et setosum: mentum breve, obconicum: labium elongatum, convexum, anticè paullò latius: palpi labiales articulis 3; 1<sup>us</sup>. apice latior; 2<sup>us</sup>. brevis; 3<sup>us</sup>. 1°. longitudine æqualis, angustior, apice setosus: prothorax non benè determinatus, anticè capite obtectus, medio angustior: mesothoracis scutum benè determinatum, suturæ optimè conspicuæ; paraptera trigona, maxima; scutellum benè determinatum, angustum; sternum magnum: metathoracis præscutum et scutum angusta; paraptera trigona, maxima; scutellum optimè determinatum, medio canaliculatum; postscutellum parvum: petiolus brevis, crassus, punctatus: *maris* abdomen thoraci longitudine æqualis, sublineare, depressum, medio vix concavum; segmentum 2<sup>um</sup>. maximum, abdominis triens; 3<sup>um</sup>. 4<sup>um</sup>. et 5<sup>um</sup>. parva; 6<sup>um</sup>. longius; 7<sup>um</sup>. breve; segmentis dorsalibus subtus basin versus retractis ventralia, apice excepto, omninò abscondita: *fem.* abdomen breve, contractum, ovatum, supra et subtus convexum; segmenta 3<sup>um</sup>. et sequentia ad 6<sup>um</sup>. subæqualia; 7<sup>um</sup>. minimum;

<sup>c</sup> *μίσχος* petiolus, *γαστήρ* venter.

segmenta ventralia nonnulla versus abdominis apicem conspicua; oviductus in carinula ventrali receptus, segmenti penultimi apicem versus apparens, non ultra abdomen exertus: pedes graciles, subæquales; tibiæ rectæ.

† *Stigma magnum*.<sup>d</sup>

Sp. 1. Misc. gibba. Fem. *Viridis, antennis nigris, clava graciliore, pedibus rufis, alis hyalinis*. (Alarum longitudo, 2 lin.)

June; grass beneath trees; near London.

Sp. 2. Misc. elegans. Mas et Fem. *Viridis, æneo variegata, antennis nigris, clava graciliore, pedibus rufis, alis subhyalinis*. (Alarum longitudo, 2—2½ lin.)

July; grass in fields; near London.

Sp. 3. Misc. rufipes. Mas et Fem. *Æneo-viridis, antennis nigris, fem. clava crassiore, pedibus rufo-fuscis, alis subfuscis*. (Alarum longitudo, 1¾—2 lin.)

August; grass in fields; near London. September; Isle of Wight.

Sp. 4. Misc. maculata. Mas et Fem. *Viridi-ænea, antennis nigris, fem. clava crassiore, pedibus rufo-fuscis, alis fuscis*. (Alarum longitudo, 1½—1¾ lin.)

June; grass in woods; near London. September; Isle of Wight. May; Southampton. New Lanark. Scotland.

Sp. 5. Misc. fuscipennis. Mas et Fem. *Ænea, antennis nigris, fem. extrorsum crassioribus, pedibus rufis, tarsis fuscis, alis fuscis, quàm M. maculatæ angustioribus*. (Alarum longitudo, 1 lin.)

June; grass in fields; near London.

Sp. 6. Misc. notata. Mas. *Viridis, præcedenti gracilior, abdomine æneo-viridi, antennis nigris, pedibus rufis, fusco cingulatis, alis subfuscis*. (Alarum longitudo, ¾—1 lin.)

August; grass in fields; near London.

Sp. 7. Misc. obscura. Mas et Fem. *Viridi-ænea, antennis nigris, fem. clava crassiore, pedibus rufis, femoribus viridi-*

<sup>d</sup> In the descriptions of the species of *Decatoma*, and of Var.  $\delta$ . of *Megastigmus dorsalis*, p. 26—29, and 117, for "stigma," read "macula," and for "productum," read "producta."

*æneis, alis obscure fuscis.* (Alarum longitudo,  $1\frac{2}{3}$ — $2\frac{1}{2}$  lin.)

July; grass beneath trees; near London. September; Westmoreland.

Sp. 8. Misc. fuscipes. Mas. *Æneo-viridis, antennis nigris, pedibus alisque fuscis.* (Alarum longitudo,  $1\frac{1}{2}$  lin.)

August; grass in fields; near London.

Sp. 9. Misc. obscuripennis. Mas et Fem. *Viridis aut æneo-viridis, M. fuscipede gracilior, antennis nigris, clava crassiore, pedibus alisque fuscis.* (Alarum longitudo,  $1\frac{1}{4}$ — $1\frac{1}{3}$  lin.)

August; grass in fields; near London. September; Isle of Wight.

Sp. 10. Misc. antennata. Fem. *Æneo-viridis, antennis nigris, clava gracilior, pedibus viridibus, alis subhyalinis.* (Alarum longitudo,  $1\frac{1}{2}$  lin.)

July; grass in fields; near London.

Sp. 11. Misc. maculipes. Fem. *Ænea, antennis nigris, clava crassiore, pedibus rufis, alis fuscis.* (Alarum longitudo,  $1\frac{1}{2}$  lin.)

September; Isle of Wight.

Sp. 12. Misc. hortensis. Mas et Fem. *Viridis, antennis nigris, fem. clava crassiore, pedibus rufis, tarsis fuscis, alis fuscis.* (Alarum longitudo,  $1$ — $1\frac{1}{2}$  lin.)

*Halticoptera hortensis.* *Curtis's Guide*, 118. 638. 7.

August; grass in fields; near London. September; Isle of Wight; Westmoreland.

Sp. 13. Misc. lucida. Mas. *Viridis aut cyaneo-viridis, abdomine viridi-æneo, antennis nigris, pedibus rufis, fusco cingulatis, alis hyalinis.* (Alarum longitudo,  $1\frac{1}{3}$ — $1\frac{1}{2}$  lin.)

August; grass in fields; near London. September; Isle of Wight.

Sp. 14. Misc. diffinis. Mas. *Viridi-ænea, abdomine subpetiolato, antennis nigris, clava crassiore, pedibus rufis, fusco cingulatis, alis hyalinis.* (Alarum longitudo,  $1\frac{1}{4}$ — $1\frac{1}{3}$  lin.)

August; grass in fields; near London. New Lanark, Scotland.



†† *Stigma mediocre aut minimum.*

Sp. 15. Misc. chrysochlora. Mas et Fem. *Viridis, æneo variegata, antennis nigris, fem. clava graciliore, pedibus rufis, alis hyalinis.* (Alarum longitudo,  $2\frac{1}{2}$ —3 lin.)

Halticoptera chrysochlora. *Haliday. Curtis, Guide, 118. 638. 1.*

August, September; on box-trees and thistles; near London. Westmoreland. Mr. Wailes has taken it near Newcastle.

Sp. 16. Misc. annularis. Mas et Fem. *Viridis, antennis nigris, fem. clava graciliore, pedibus rufis, tarsis posticis fuscis, alis subhyalinis.* (Alarum longitudo, 2 lin.)

Halticoptera annularis. *Curtis, Guide, 118. 638. 8.*

September; grass in fields; near London; Westmoreland.

Sp. 17. Misc. viridis. Mas et Fem. *Viridis, antennis nigris, fem. clava crassiore, pedibus rufis, fusco maculatis, alis hyalinis, stigmatе mediocri.* (Alarum longitudo,  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.)

August; grass in fields; near London. September; Isle of Wight.

Sp. 18. Misc. annulipes. Mas et Fem. *Æneo-viridis, antennis nigris, fem. clava crassiore, pedibus rufis, fusco cingulatis, alis subfuscis mas, aut fuscis fem.* (Alarum longitudo, 1 lin.)

August; grass in woods; near London. September; Isle of Wight.

Sp. 19. Misc. Scotica. Mas. *Viridis, antennis nigris, pedibus nigro-viridibus, alis fuscis.* (Alarum longitudo,  $\frac{3}{4}$  lin.)

New Lanark, Scotland.

Sp. 20. Misc. ænea. Mas. *Ænea, antennis fuscis, pedibus fusco-rufis, alis fuscis.* Fem. *Cuprea, antennis nigris, clava crassiore, abdomine æneo aut viridi, pedibus viridifuscis.* (Alarum longitudo,  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.)

June; grass beneath trees; near London.

Sp. 21. Misc. tarsalis. Mas et Fem. *Viridi-aut cupreo-ænea, antennis nigris, pedibus rufis, fusco-cingulatis, alis subhyalinis.* (Alarum longitudo,  $1\frac{1}{4}$ — $1\frac{2}{3}$  lin.)

August; grass in fields; near London. New Lanark, Scotland.

Sp. 22. Misc. nitidipes. Mas. *Viridi-ænea, thorace cupreo, antennis nigris, extrorsum crassioribus, pedibus flavis, femoribus viridibus, alis hyalinis.* (Alarum longitudo,  $1\frac{2}{3}$  lin.)

September; grass in fields; near London.

Sp. 23. Misc. breviventris. Mas. *Viridis, thorace cyaneo-  
viridi, antennis nigris, extrorsum crassioribus, pedibus  
flavis, fusco fasciatis, tarsis 4-posticis fuscis, alis hyalinis.*  
(Alarum longitudo,  $1\frac{2}{3}$  lin.)

August; grass in fields; near London.

Sp. 24. Misc. lugubris. Mas. *Viridis, abdomine æneo-cu-  
preo, antennis nigro-fuscis, pedibus flavis, tibiis interme-  
diis apice nigris, alis subhyalinis.* (Alarum longitudo,  
 $1\frac{1}{2}$  lin.)

August; grass in fields; near London.

Sp. 25. Misc. tenuicornis. Fem. *Viridis, antennis fuscis,  
pedibus rufis, 4 posticis fuscis, alis hyalinis.* (Alarum  
longitudo,  $1\frac{1}{2}$  lin.)

August; grass in fields; near London.

Sp. 26. Misc. ovata. Fem. *Viridis, thorace æneo-  
viridi, antennis nigris, pedibus rufis, alis subhyalinis.* (Alarum  
longitudo, 2 lin.)

July; grass in fields; near London.

Sp. 27. Misc. nitida. Mas et Fem. *Viridi-ænea, abdomine  
æneo-cupreo, antennis nigris, pedibus rufis, alis subhyalinis.*  
(Alarum longitudo,  $1\frac{2}{3}$ — $1\frac{3}{4}$  lin.)

July; grass in fields; near London.

Sp. 28. Misc. cinctipes. Fem. *Viridi-ænea, abdomine  
cyaneo-  
viridi, antennis nigris, pedibus fuscis, femoribus  
viridibus, alis subhyalinis.* (Alarum longitudo,  $1\frac{1}{2}$  lin.)

July; grass in fields; near London.

Sp. 29. Misc. nigro-ænea. Fem. *Ænea, abdomine nigro,  
antennis nigris, pedibus fuscis, alis subfuscis.* (Alarum  
longitudo,  $1\frac{1}{4}$  lin.)

September; Isle of Wight.

- Sp. 30. Misc. convexa. Mas. *Æneo-viridis, antennis nigris, quàm M. annulipedis gracilioribus, pedibus rufis, fusco cingulatis, alis subfuscis.* (Alarum longitudo,  $1\frac{1}{4}$  lin.)  
May; Southampton.
- Sp. 31. Misc. apicalis. Fem. *Cyaneo-viridis, abdomine æneo-viridi, antennis nigris, pedibus rufis, nigro et fusco cingulatis, alis subfuscis.* (Alarum longitudo, 1 lin.)  
August; grass in fields; near London.
- Sp. 32. Misc. tumida. Fem. *Æneo-viridis, antennis nigris, pedibus fuscis, alis subfuscis.* (Alarum longitudo,  $1\frac{1}{4}$  lin.)  
August; grass beneath trees; near London.
- Sp. 33. Misc. tristis. Fem. *Obscurè viridis, antennis nigris, pedibus rufis, fusco cingulatis, alis fuscis.* (Alarum longitudo,  $1\frac{1}{2}$  lin.)  
New Lanark, Scotland.
- Sp. 34. Misc. dissimilis. Mas et Fem. *Viridis mas, aut æneo-viridis fem., antennis fuscis, pedibus rufis, fusco cingulatis, alis subfuscis.* (Alarum longitudo, 1— $1\frac{1}{4}$  lin.)  
August; grass in fields; near London.
- Sp. 35. Misc. semiaurata. Mas et Fem. *Aureo-viridis, abdomine æneo-viridi, antennis fuscis, pedibus flavis, fusco cingulatis, alis pallidè flavescensibus.* (Alarum longitudo, 1— $1\frac{1}{4}$  lin.)  
August; grass in fields; near London. New Lanark, Scotland.
- Sp. 36. Misc. costalis. Mas. *Cyaneo-viridis, abdomine æneo-cyaneo, antennis fuscis, pedibus flavis, fusco-cingulatis, alis fuscis.* (Alarum longitudo, 1 lin.)  
July; grass in fields; near London.
- Sp. 37. Misc. philochortoides. Mas. *Æneo-viridis, capite inter oculos impresso, abdomine æneo, antennis fuscis, pedibus flavis, fusco cingulatis, alis subfuscis.* (Alarum longitudo,  $\frac{3}{4}$  lin.)  
September; grass in fields; near London.
- Sp. 38. Misc. cyanea. Mas. *Viridi-cyanea, abdomine nigro-cyaneo, antennis fuscis, pedibus flavis, fusco cingulatis,*

*alis subfuscis, quàm M. philoch. latioribus.* (Alarum longitudo,  $\frac{3}{4}$  lin.)

July; grass in fields; near London.

Sp. 39. Misc. brevis. Mas. *Præcedentibus brevior, viridis aut viridi-ænea, abdomine nigro aut cupreo-viridi, antennis fuscis, pedibus flavis, fusco cingulatis, alis subfuscis.* (Alarum longitudo,  $\frac{2}{3}$  lin.)

September; grass in fields; near London.

Sp. 40. Misc. contigua. Mas. *Viridis, abdomine æneo, antennis fuscis, pedibus flavis, fusco cingulatis, alis subhyalinis.* (Alarum longitudo, 1 lin.)

New Lanark, Scotland.

Sp. 41. Misc. linearis. Mas. *Cyaneo-viridis, antennis fuscis, pedibus flavis, fusco cingulatis, alis subfuscis.* (Alarum longitudo,  $\frac{3}{4}$  lin.)

*Obs.*—Præcedenti gracilia; antennæ breviores; alæ angustiores.

August; grass in fields; near London. New Lanark, Scotland.

Sp. 42. Misc. filicornis. Mas et Fem. *Viridi-cyanea mas, aut viridis fem., abdomine nonnunquam viridi-æneo, antennis fuscis, pedibus flavis, fusco-cingulatis, alis hyalinis.* (Alarum longitudo,  $\frac{3}{4}$ —1 lin.)

August; grass in fields; near London.

Sp. 43. Misc. femorata. Fem. *Viridis, antennis nigris, pedibus rufis, fusco-cingulatis, alis hyalinis, stigmatе minimo.* (Alarum longitudo, 1—1 $\frac{1}{8}$  lin.)

August; grass in fields; near London.

### GENUS XIII. MICROMELUS,<sup>e</sup> Walker.

Caput præsertim in *maribus* magnum, thorace latius: oculi mediocres: *maris* antennæ 13-articulatæ, extrorsum crassiores; articulus 1<sup>us</sup>. elongatus; 2<sup>us</sup>. elongato-cyathiformis; 3<sup>us</sup>. et 4<sup>us</sup>. minimi; 5<sup>us</sup>. minutus; 6<sup>us</sup>. et 4 sequentes æquales, lineares; clava triarticulata, elongato-ovata, apice conica, articulis 9<sup>o</sup>. et 10<sup>o</sup>. æqualis: *fem.* antennæ subclavatæ; articulus ultimus setiformis: mandibulæ arcuatæ; una tridentata; altera quadridentata: maxillæ elongatæ, angustæ: palpi maxillares triarticulati,

<sup>e</sup> μικρὸς parvus, μέλος membrum.

breves, filiformes; articulus 1<sup>us</sup>. brevis; 2<sup>us</sup>. longior; 3<sup>us</sup>. 2<sup>o</sup>. longior, acuminatus: mentum elongatum, angustum, posticè conicum: labium breve, anticè rotundatum: palpi labiales 2-articulati, breves: thorax ovatus: prothorax parvus: mesothoracis scutum breve, suturæ vix conspicuæ; scutellum magnum, latum; paraptera magna: metathoracis scutellum magnum: petiolus brevissimus: *maris* abdomen latum, ferè rotundum, supra minimè convexum, subtus planum; segmentum 2<sup>um</sup>. elongatum; 3<sup>um</sup>. brevius; sequentia brevissima: *fem.* abdomen ovatum, supra convexum, subtus carinatum; pedes graciles; tibiæ rectæ.

Sp. 1. Micr. rufo-maculatus. Mas et Fem. *Viridis aut viridi-æneus, abdominis disco rufo, antennis fuscis, pedibus rufis, alis subfuscis aut hyalinis.* (Alarum longitudo,  $\frac{2}{3}$ —1 lin.)

June; grass in fields; near London. New Lanark, Scotland.

Sp. 2. Micr. pyrrhogaster. Mas et Fem. *Viridis aut viridi-æneus, abdomine rufo, apice nigro, antennis fuscis, pedibus rufis, alis vix ullis.* (Corporis longitudo,  $\frac{1}{2}$ —1 lin.)

Pteromalus pyrrhogaster. *Haliday. Curtis' Guide.*

Grass in fields; throughout the year; near London. New Lanark, Scotland.

#### GENUS XIV. ISOCYRTUS,<sup>f</sup> *Walker.*

Caput magnum, thorace multò latius: oculi mediocres: antennæ 12-articulatæ, subclavatæ, thorace breviores; articulus 1<sup>us</sup>. vix elongatus; 2<sup>us</sup>. cyathiformis; 3<sup>us</sup>. et 4<sup>us</sup>. minimi; 5<sup>us</sup>. et sequentes ad 10<sup>um</sup>. æquales; clava triarticulata, elongata, apice conica, articulis 8<sup>o</sup>. et 9<sup>o</sup>. paullò longior: thorax elongatus: prothoracis scutellum mediocre: mesothoracis scutum magnum, suturæ laterales indistinctæ; paraptera et epimera benè determinata; scutellum magnum, convexum: metathoracis scutellum conspicuum, supra carinatum: petiolus brevis: abdomen elongato-ovatum, supra depressum, subtus carinatum, apice acuminatum; segmenta 2<sup>um</sup>. et 3<sup>um</sup>. magna; sequentia parva: pedes sub-æquales, graciles; tibiæ rectæ.

<sup>f</sup> ἴσος æqualis, κυρτὸς curvus.

Sp. 1. Isoc. lætus. Fem. *Viridis, abdomine purpureo, antennis nigro-fuscis, pedibus flavis, alis subhyalinis.* (Alarum longitudo,  $1\frac{3}{4}$  lin.)

August; grass in fields; near London.

GENUS XV. SPANIOPUS,<sup>5</sup> *Walker.*

Caput mediocre, thorace latius: oculi mediocres: antennæ 13-articulatæ, extrorsum crassiores; articulus 1<sup>us</sup>. elongatus; 2<sup>us</sup>. cyathiformis; 3<sup>us</sup>. et 4<sup>us</sup>. minimi; 5<sup>us</sup>. et sequentes ad 10<sup>um</sup>. subæquales; clava triarticulata, elongata, apice acuminata, articulis 9<sup>o</sup>. et 10<sup>o</sup>. longior: thorax elongato-ovatus: prothoracis scutellum parvum: mesothoracis scutum magnum; suturæ laterales satis conspicuæ; paraptera et epimera majuscula; scutellum convexum, ovatum: metathoracis scutellum magnum: petiolus brevissimus: abdomen breve, ovatum, supra depressum; segmentum 2<sup>um</sup>. magnum; 3<sup>um</sup>. mediocre; sequentia parva: pedes graciles; tibiæ rectæ, intermediæ apice incrassatæ.

Sp. 1. Span. dissimilis. Mas. *Aureo-iridis, antennis fuscis, pedibus stramineis, alis flavotinctis.* (Alarum longitudo, 1 lin.)

August; grass in fields; near London.

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ART. LVIII.—*Abstract of M. Straus-Dürckheim's "Considerations Générales sur l'Anatomie Comparée des Animaux Articulés."* By EDWARD DOUBLEDAY, ESQ.

(Continued from p. 283.)

"Quelle admirable structure, quelle sagesse, quelle toute-puissance dans le moindre objet sorti des mains du Créateur!"

PART. I.—TEGUMENTARY SYSTEM.

SECTION I.

IN all the *Annelida*, and in the greater part of the larvæ of insects, the skin still preserves that flexibility which it possesses in the *Vertebrata*; consequently, the skeleton being wanting, their bodies are soft and more or less cylindrical, and their motions confined to crawling or swimming; but Nature, wishing to introduce in the more perfect articulated animals many of the functions of the *Vertebrata*, has, by increasing the proportion of earthy substances in the skin, given it nearly the consistence of bone, whilst, by means of

<sup>5</sup> *σπάνιος* rarus, ποῦς pes.



articulations in different directions, it retains a sufficient degree of flexibility. This constitutes the chief difference between the teguments of vertebrate and articulated animals, although the armadillos in the former offer a similar example of an ossified skin.

In the *Annelida abbranchia*, especially in the genus *Hirudo*, the skin presents the same structure as in the *Vertebrata*, except that the papillary tissue is apparently wanting; the mucous matter,<sup>a</sup> which is very abundant and nearly fluid, is placed immediately beneath the corneous and nearly colourless *epidermis*; the *dermis* is a very thick membrane, of a close texture, formed of fibres irregularly transverse to the direction of the body; it appears to consist of but one layer.

In the genus *Limulus* the teguments consist of two *lamina*, easily separable; the first, corneous, brown, thick, analogous to the *epidermis*; the second, analogous to the *dermis*, still thicker, of a pale yellowish colour, corneous, but of a less compact structure than the first: beneath this is a copious black mucous matter.

In insects the teguments consist also of three layers, as in the *Annelida* and *Limulus*, but they present peculiar characters. The mucous, or more properly the colouring matter, is composed of two separate substances; the one soluble in alcohol, forming in many insects, especially the *Coleoptera*, the outer layer, giving those brilliant colours with which many are adorned; the other, not soluble in alcohol, generally of a brown or blackish hue, is mostly contained in the tissue of the *dermis* and *epidermis*. In *Coleoptera* the *epidermis* forms the second layer of the teguments; is thin, hard, brittle, friable, and without any trace of fibres; its colour is generally black or brown. The *dermis* consists of many distinct layers, easily separable, composed of fibres more distinct in proportion as the layers are more internal. The *dermis* is paler than the *epidermis*, being brownish or white.

The internal prolongations of the teguments appear to be formed by the *dermis*, intermixed with a small quantity of the colouring matter.

The colouring matter is found sometimes between the

<sup>a</sup> I use the term *mucous matter*, as employed by M. Straus, in preference to *rete mucosum*, because I conceive the latter term hardly applicable to an almost fluid substance as this is in insects.—D.

*epidermis* and *dermis*, sometimes beneath the last, and is sometimes external, as may be seen in the *Libellulidæ*. The *Arachnida* exhibits a similar structure.

In the *Onisci*, the teguments, from the large quantity of calcareous matter they contain, have become hard and brittle; the *epidermis* and *dermis* are not distinct, and present no trace of fibres; they are colourless, and only owe their appearance of being coloured to the mucous matter which is internal. The decapod *Crustacea* in general only differ from the *Onisci* in having the colouring matter external: in the articulations the colouring matter is wanting, and the *epidermis* and *dermis* are distinct.

At certain epochs, variable according to the species, the articulated animals change their skins, precisely as do the snakes. Those with soft teguments, as the *Annelida*, only renew the *epidermis*, whilst those whose teguments are solid renew also the *dermis*. The internal prolongations of the *dermis*, from their situation, cannot be renewed in this manner; the calcareous matter is, therefore, merely absorbed at the time of the change, and re-deposited after it.

The teguments of articulated animals differ much from those of the *Vertebrata* in their component parts; they even differ in the different families.

According to the analysis of M. Odier, the elytra of *Melolontha vulgaris* consists of *albumen*, an extractive matter, soluble in water; a brown animal substance, soluble in a solution of potass, but not in alcohol; a coloured oil, soluble in alcohol; a peculiar matter (chitine), forming one-fourth of their weight; sub-carbonate of potass; phosphate of lime; and phosphate of iron. Chitine is insoluble in potass, is soluble in hot sulphuric acid, does not turn yellow with nitric acid, burns without melting, and does not contain azote.

The teguments of the common crab (*Cancer pagurus*) are composed of

Chlorure of sodium and salts of soda . . .	1·6
Phosphate of lime . . . . .	6·0
Phosphate of magnesia . . . . .	1·0
Carbonate of lime . . . . .	62·8
Water and animal matter . . . . .	28·6
	100·0

In the lobster (*Astacus marinus*) the proportion of carbonate of lime is less, and of animal matter and water greater. The proportions of the other component parts do not differ much.

In the more perfect *Vertebrata*, the skin, being merely intended to protect the parts beneath from the immediate contact of external objects, presents merely a layer uniformly spread over the whole body; but, in the articulated animals, the teguments, having to perform the functions of the skeleton, exhibit many internal prolongations and articulations necessary for the new uses to which they are destined. In the fishes, the skin sends off internal prolongations at different distances, which serve for the attachment of the muscles of the trunk; these, in the genus *Ammocætes*, corresponding to faint transverse folds of the skin, cause the body to appear articulated. The *Annelida abbranchia* (*Cryptobranchia*) offer the same appearance; but in the other *Annelida*, the folds of the teguments are more distinct, and we find appendages serving as locomotive organs, furnished with muscles, and articulated. The *Myriapoda* have the teguments solid, the feet fully developed, furnished with numerous muscles, and internally the teguments are produced into many *apophyses* to which these muscles are attached.

Lastly, in *Insecta*, *Crustacea* and *Arachnida*, the teguments acquire all the development of which they are susceptible, and become as complicated as the skeleton of *Vertebrata*.

The *Annelida abbranchia* have the body composed of a greater or less number of segments, nearly similar, and without any distinct head; but in the others (*Gymnobranchia*) the first segment becomes a true head, bearing eyes more or less distinct, and *tentacula*. In some species the head is composed of many segments united, the first prelude of its more perfect organization in the following groups. The body of some *Annelida* is divided into two parts, one bearing *cirrho*, which might be considered as the trunk, the other without *cirrho*, representing the abdomen; but this distinction is very uncertain, as in some it is the posterior, in others the anterior segments which bear the *cirrho*. In the *Myriapoda* the body is composed of segments uniformly or alternately similar; the head is composed of several segments united. Insects have the body divided into eleven, twelve, or thirteen<sup>b</sup> segments,

<sup>b</sup> Evidently wrong; the true number being always thirteen, including the head.—D.

besides the head. In the *larvæ* they are, as in the *Myriapoda*, nearly similar; but they undergo great changes in the *metamorphosis*, becoming divided into four principal parts, namely, the head, the corselet (*prothorax*), the *thorax*, and the *abdomen*; the first and two last are also composed of more segments than one, united. It appears, from a comparison of the head of *Coleoptera* with that of the *Scolopendra morsitans*, that the head of insects is formed by a union of seven segments, represented by the *labrum*, *clypeus*, *epicranium*, and *mandibulæ*, *labium*, *prebasilar*, and the two last by the *basilar*, of which the appendages form the *maxillæ*. Perhaps the *labrum* or *clypeus* forms part of the segment to which the *labium* belongs, and the *epicranium* may also be part of the segment of which the *prebasilar* forms part; in this case the head consists but of five segments.<sup>c</sup>

The *Crustacea* present more numerous modifications in the form of the body, and less sudden transitions from one genus to another, than the *Myriapoda* and insects; and here, as well as in the *Arachnida*, the change of the feet to organs of mastication is so clear as to leave no room for doubt. Many genera of the *Isopoda* have the body similarly formed to the *Myriapoda*, except that the last segments undergo some modification on account of the change of the feet into respiratory organs. The head is distinct, and probably composed of several segments. In the *Amphipoda* the posterior segments diminish in bulk, marking out the distinction between the trunk and abdomen, which becomes complete in the *Decapoda*, where the segments of the trunk are intimately united, and where the anterior segments constitute a head confounded with the trunk, whilst the posterior remain moveable, diminishing gradually from genus to genus until they are reduced to mere rudiments in the *Brachyura*. Lastly, in *Limulus*, the head has disappeared, and the food is masticated solely by the feet. The body is divided into two segments, the trunk and abdomen; but the distinction of their respective segments is scarcely visible, except the last, which is styliferous. We now arrive at the *Arachnida*, the organization of which in general nearly resembles that of *Limulus*. The body is composed, according to the families, of two or three parts. In *Thelyphonus* the trunk bears the members and the mouth;

<sup>c</sup> Certainly not a correct view of the structure of the head.—D.

the abdomen has the segments distinct, and terminates in a tail, which, being articulated, appears to be the last rudiment of a series of segments in a state of atrophy. In *Phrynus* and *Galeodes* the body is formed of but two parts; in the last the segments are apparent, but they are not so in the rest of the *Arachnida*. In *Mygale* the *maxillæ*, with their *palpi*, differ only from the feet in size, but in the other genera the transformation is more complete. Nature, wishing to give insects the faculty of flying, as in birds, necessarily changed considerably the general form of the body from that of the *Myriapoda*, their nearest allies. This new function required that the thoracic segments should be shortened, but at the same time increased in width, and also that the motion of the aliferous segments should be very small or even none. There is a striking resemblance between these changes and those which we find in comparing the skeleton of birds and *Mammalia*.

We find, amongst the articulated animals, ten kinds of articulations of the teguments:—

1. The *suture*, which is always harmonic, is precisely the same as in the *Vertebrata*.

2. An articulation (to which M. Sträus gives the name of *adhérence*) formed by the close union of two parts by their faces.

3. *Symphysis*, which is only a suture in which there exists a slight movement.

4. An articulation, which may be termed *linear*, takes place between two parts usually flat, touching by a straight margin, and united by a ligament, which only allows a ginglymous movement.

5. An articulation, which may be termed *syndesmoidal*, only differing in the ligament being very wide, which permits a movement in every direction, but chiefly ginglymous.

6. We may give the name of *squamose* to syndesmoidal articulations, where one of the portions is so placed as partly to cover the other.

7. *Enarthrosis*, which resembles the same kind of articulation in the *Vertebrata*, except that the soft parts in the articulated animals being internal, the condyle is mostly perforated to allow of the passage of the nerves and vessels.

8. An articulation, only differing from the last in the fact that

the extremity of the one part is not received by a cavity of the other, being simply united by a circular dermoid membrane. (M. Straus terms this *Articulation à têtes disjointes*.)

9. *Ginglymus*, where there exists but a motion in one direction, as that of a hinge.

10. Two solid parts are sometimes separated by a space so thin as to permit a greater or less degree of motion to the two solid portions. This, which though equivalent to, cannot be considered as, a real articulation, may be termed, *movement by flexion*.

## SECTION II.

### *Structure of the Teguments in Melolontha vulgaris.*

In the last section I have endeavoured to give a much fuller and more regular abridgement of our author than it is my intention to do in the present one; but my friend, Newman, being now engaged in elucidating the external anatomy of insects, it would be occupying too much of your Magazine with one subject, were I to venture much on the same ground with him; and, moreover, some one, knowing how far more able he is than I am to undertake such a subject, might remind me of Boileau's lines:—

Un âne, pour le moins instruit par la Nature  
 A l'instinct qui le guide obéit sans murmure,  
 Ne va point follement de sa bizarre voix,  
 Défier aux chansons les oiseaux de la bois.

I shall, therefore, confine myself to pointing out M. Straus's terminology of the different parts, in as few words as possible, just noticing any of his remarks calculated to throw light on the subject of systematic arrangement. I had intended to give also Kirby's nomenclature of the different parts; but, on a re-examination of the third and fourth volumes of his Introduction to Entomology, I found so much confusion in the nomenclature, a certain indistinctness and unintelligibleness in the plates, that, fearful of misleading, I almost entirely gave up this idea. I trust, however, that this subject has now fallen into the hands of one who will not abandon it until he has furnished us with a clear and intelligible nomenclature; every one who has consulted works giving detailed characters, particularly Mr. Curtis's, in which the dissections are so beautiful and accurate,



must have been struck with the total want of uniformity and intelligibility in the nomenclature.

The head, according to M. Straus, may be considered to consist of several parts; one, all the parts of which are fixed, he calls the *cranium*; the others are the moveable parts; namely, the *antennæ*, and parts of the mouth.

The *cranium* is composed of four parts, which he terms, *epicrâne*, *chaperon*, *pièce basilaire*, *pièce prébasilaire*, and of the two *corneæ* of the eyes.

The *pièce prébasilaire* is that part immediately behind the *labium*; its form is an elongate trapezium: the *pièce basilaire* is placed immediately behind this, reaching from it to the *foramen occipitale*; internally, its anterior margin offers two *apophyses*, to which the *maxillæ* are articulated. The *chaperon* (*clypeus* of Fabricius) is the part immediately behind the *labrum*; the remainder of the *cranium* is the *epicrâne*, or *pièce epicrânienne* of our author. On its sides, near the anterior margin, are fixed the *corneæ* of the eyes; and immediately in front of these is a small opening, in which are articulated the *antennæ*. The *epicranium* is prolonged inwards, beneath the eyes, so as merely to leave an opening for the passage of the optic nerve. Near each antenna is a long internal *apophysis* connected with that of the *pièce basilaire*.

The *maxilla* he divides into four parts, besides the *palpus* and *galea*. The first piece is Kirby's *cardo*, which he calls *branche transverse*. The second is the *pièce dorsale*; to the internal margin of which is articulated the third, the *intermaxillaire*. The fourth, *pièce palpifère*, occupies the upper surface of the *maxilla*, contiguous to the mandible: it is nearly triangular, articulated by its external margin to the *pièce dorsale*. The *galea* is the part termed, by MacLeay, the outer lobe. There is little new in his description of the other parts of the mouth and of the *antennæ*.

Our author gives the name of *pièces jugulaires* to two consecutive plates contained in the inferior part of the skin of the neck, and uniting the head to the *prothorax*. The first, or *jugulaire antérieure*, is articulated by a small condyle at its extremity to a tubercle placed on the internal side of the hinder *apophysis* of the *pièce basilaire*. At its opposite extremity it is articulated to the second, or *jugulaire postérieure*; and this



last is articulated to the anterior *apophysis* of the *sternum* of the *prothorax*<sup>d</sup> (*corselet*).

These parts, which always are two in number on each side, in the *Coleoptera*, are the last remains of two segments, which have disappeared between the head and *prothorax* (*corselet*).

In *Forficula* they form two small rings surrounding the neck. They are also very distinct in *Blatta* and the *Orthoptera*.

M. Straus-Dürckheim, without assigning any reason for the change, has altered the names usually given to the three segments, included by Kirby under the general name of *truncus*; calling the *prothorax* the *corselet*, the two remaining ones, when taken together, the *thorax*; and, when separately, the *prothorax* and *metathorax*. But, in order to avoid confusion, I shall uniformly adhere to the received terms; because, I conceive, a name once given, ought only to be changed on the ground of its being inapplicable.<sup>e</sup>

The whole upper part of the *prothorax* is occupied by a large convex plate, (*le bouclier*), which curves laterally, and inwards, until it meets the *prosternum*. The anterior part of the lateral margin unites with the *alæ* of the *prosternum*; and, posteriorly, the same margin is prolonged into a strong *apophysis*, (*apophyse scuto-sternale*), which unites with the *prosternum*: between this *apophysis* and the *alæ* of the *prosternum* is a large opening, in which is placed the leg. The *prosternum* (*sternum antérieur*) occupies the lower part of the *prothorax*; it presents a central part and two pairs of lateral *apophyses*; one of which, the *alæ* of the *prosternum*, forms part of the external envelope of the *prothorax*, uniting the *prosternum* by its anterior part to the *bouclier*. From the union of these, and that of the scuto-sternal *apophyses* with the *prosternum*, arises the apertures mentioned above. The lateral margins of the *prosternum* are prolonged into these

<sup>d</sup> Not of M. Straus; his *prothorax* is what is commonly called the *mesothorax*. —ED.

<sup>e</sup> It is much to be regretted that so able an author should, by substituting new names for those previously given, without any reference to the former ones, have induced so much confusion that even that great entomologist, whose death we have lately had to deplore, was compelled to own that he could not unravel it. I trust that should I (who even amongst the least of your correspondents may be said merely *argutos inter strepere anser olores*) fail in making myself so clearly understood as I could wish, your readers will pardon me, or only blame my rashness, in attempting a task so far above my abilities.

apertures, so as partly to cover the internal side of the *coxæ*. From this prolongation arises, on each side, a stout, broad, but short *apophysis*, forming the second pair spoken of above. These may be named the “*anterior episternal apophyses*.” Two small pieces placed within the *thorax*, and articulated to the *coxæ*, are called the *rotulæ*. They are nearly triangular; very convex on the interior surface; the posterior margin is straight, and articulated with the corresponding margin of the opening of the *coxa*; the opposite side is nearly circular, with a small notch fitting a crescent-shape projection of the *bouclier*, upon which these parts move; whilst at the same time they fix indirectly the *coxa* to the *bouclier*. Two corneous rings, of an elongate-oval form, suspended in the membrane, which unites the *prothorax* to the *mesothorax*, near to the scuto-sternal *apophyses*, surround the *stigmata*, and are termed the “*cadres des stigmates*.”

The *prothorax* of *Coleoptera* varies much in different genera: that of *Forficula* is intermediate between that of *Coleoptera* on the one hand, and of the *Lepismæ* and *Scolopendræ* on the other; the upper part resembling the former—the lower, the latter. Though differing much from the *prothorax* of *Coleoptera*, it resembles it much more than that of the *Orthoptera*. The structure of the legs is so well known, as to render it needless for me to say more, than that our author uses the terms commonly employed by French writers.

The *mesothorax* is, in *Coleoptera*, generally one-half smaller than the *metathorax*; as the *elytra*, not being much used in flight, do not require such powerful muscles as the wings. It is composed of fourteen parts, besides several small ones connected with the *elytra*, (*proalæ*, Newman). The upper surface consists of a triangular slightly convex piece, (*l'ecusson*); the anterior part of which is emarginate; but the emargination is filled by an almost membranous plate, (*le limbe de l'ecusson*). Another triangular plate occupies about two-thirds of the anterior part of the lateral margin—is directed downwards, and terminates in two slender *apophyses*. This is called the “*lateral apophysis*” of the *ecusson*; the two branches are the anterior and posterior *cornua*, (*cornes antérieure et postérieure*).

In some *Coleoptera* these are separated from the body of the *apophysis*, and may then be called the “*anterior scapulars*.”

What is commonly called the *ecusson*, (*scutellum*), is merely a portion of this part, which is elevated, and visible between the *elytra*. The external margin of the "*limbe*," and the base of the lateral *apophysis* of this part, are united by a small horizontal and triangular plate, to which is attached the long extensor muscle of the *coxa* of the second pair of legs. A small thread-like part, arising from the anterior angle of the *ecusson*, and united to the first "*pièce iliaque*," is the anterior clavicle.

The lower part of the *mesothorax* is occupied by the *mesosternum*, (*sternum moyen*), which in many *Coleoptera* is so closely united to the *metasternum* as not to leave the least trace of a suture. Its form is similar to that of the *prosternum*, offering a central part and two *alæ*, with an internal *apophysis* (*episternale moyenne*), corresponding in its situation to the anterior episternal. On each side of the *mesothorax* is a tetragonal plate, composed of two parts; the first of which, the first *ilium*,<sup>f</sup>) (*première pièce iliaque*), is united below to the *alæ* of the *mesosternum*, and above to a membranous space in which the *elytra* are fixed. The second *ilium* is united to the first by its anterior margin; its inferior margin closes laterally the opening of the *mesosternum*, which receives the *coxa* of the second pair of legs; behind it is united by a membrane to the *metathorax*, and above, to the same membranous space as the first *ilium*. At the point of union between the first and second *ilium*, is a short *apophysis*, formed by a fold of their margins, to which is articulated the *coxa*. Superiorly, this fold is prolonged, and continued with the anterior margin of the first *ilium*, sending forth two *apophyses*; one (*apophyse transverse des iliaques*) directed inward, forward and downward, serving for an attachment to many muscles; the other (*apophyse alifère du prothorax*), shorter, horizontal, serving as the point of articulation of the *elytra*. The second pair of *stigmata* are placed in the second *ilium*, but are not visible externally. In the supra-anterior part of the cavity, which receives the *coxa*, is a moveable piece, analogous to the *rotula* of the *prothorax*. The *elytra* present, near the middle of their anterior margin, a strong bifurcate *apophysis*, receiving

<sup>f</sup> Not an appropriate name; for can we fancy any analogy between parts of the *mesothorax* and *metathorax* of insects and the *ossa innominata* of the higher animals?—D.

between its two divisions the external branch of the aliferous *apophysis*. Besides this direct articulation, each *elytron* articulates indirectly with the "ecusson" and first *ilium* by four small moveable pieces; one (*préépaulière*), placed in front of the bifurcate *apophysis* of the *elytra*; the others, (*épaulières antérieure, moyenne, et postérieure*), placed behind the same *apophysis*. Their situation and structure can only be learned by a very careful examination of the animal itself.

The *metathorax* is formed of eighteen parts, ten of which have their analogues in the *mesothorax*. Its under surface is occupied by a *sternum* resembling that of the *mesothorax*, but double its size; its wings are rhomboidal, and extend from the *mesothorax* to the *coxæ* of the last pair of legs (*metapedes*, Newman), to which they are united by a squamose articulation. The lateral angle of these wings presents a small *apophysis*, on which are articulated, on one hand, the *coxæ* of the *metapedes*, and, on the other, the second *ischium*. On the medial line of the *sternum* (*metasternum* of authors) rises a stout vertical plate, terminated by three long *apophyses*, one directed forward, the other obliquely, outward and upward. The vertical plate is the posterior episternal *apophyses*; the branches are its anterior and lateral *cornuæ*.

On each side of the *mesothorax* are two parts analogous to the *ilia*, but differently formed; these are the *ischia*, or *pièces ischiatiques*. The second *ischium* is a flat semi-oval plate, placed above the wing of the *metasternum*, occupying its whole width, and united to it by a squamose articulation. Its upper margin is united to the first *ischium*, which is of a very irregular form, presenting behind a quadrangular external part placed on a level with the second *ischium*; to which it is united by its inferior margin; posteriorly, it borders upon the hinder *coxa*; above, it partly covers the membranous band of the first segment of the *abdomen*, (*propodeon*, Newman); its anterior part is united to the *pièce costale*. Its antero-inferior angle is prolonged into a narrow band, bounding the upper margin of the second *ischium* for about two-thirds of its length, when it rises, and forms a long *apophysis*, (*alifère postérieure*), directed upwards, forward, and inwards, serving to support the wing.

The costal (*pièce costale*) is an almost membranous plate,

situated above the first *ischium*, occupying the space between its posterior angle and the posterior aliferous *apophysis*. In the interior of the *mesothorax* are two parts, resembling, in form, the bell of a trumpet. These, which are in fact merely the tendons of certain muscles, are called the *cupules* of the wings. The first, (*grande cupule de l'aile*,) is situated at the anterior part of the first *ischium*, and receives the anterior extensor muscle of the wing;—the second, (*petite cupule de l'aile*,) is placed at the posterior part of the *pièce costale*, and receives the posterior extensor muscle of the wing.

The upper part of the *metathorax* is formed by a large very convex piece, (*clypeus*,<sup>§</sup>) which is however, in reality, formed of seven parts; one only of which is distinct in the *Melolonthæ*; and in most of the *Coleoptera* their sutures are scarcely visible. In the other orders they are not to be traced. In this insect the *clypeus*, which occupies all the upper part of the *metathorax*, is nearly a trapezium, of which the larger parallel side is foremost, emarginate in the middle, forming, in part, a large opening closed by a thin transparent membrane, (*la toile*.) The upper surface of the *clypeus* is marked by a deep channel, (*gouttière médiane*,) throughout its whole length; its anterior margin, on each side of its emargination, forms a very projecting tubercle; in front of which, forming the antero-lateral angle of the *clypeus*, is the *axillifère*. The *diaphragme* is a large trapezoidal piece, curving obliquely downwards, and partly separating the *mesothorax* from the *metathorax*; at each of its anterior angles is a small rounded piece analogous to the clavicle of the *mesothorax*,—hence this may be termed the posterior clavicle. Two triangular pieces, placed one on each side of the *clypeus*, near the posterior angles, are the posterior scapulars.

The name *tergum*, or *pièce tergale*, may be given to a large triangular plate, which descends from the posterior margin of the *clypeus* and of the scapulars into the interior of the body, to furnish an attachment to many muscles, and also to separate the *abdomen* from the *metathorax*. The wings are articulated to the *metathorax* by means of five parts analogous to the

§ This name cannot with propriety be applied to this part, having been given by Fabricius to a totally different part. M. Sträus is too much disposed to overlook what has been done by others.

*préépauière* and *épauières* of the *mesothorax*. The first is termed *préaxillaire*; the others *première*, *seconde*, *troisième*, and *quatrième axillaire*.

The *mesothorax*, and *metathorax*, of the other *Coleoptera*, offer but little different from that of the *Melolonthæ*; but there are modifications which may be pointed out as serving to throw light on the subject of classification and comparative anatomy. In *Forficula*, the *thorax*<sup>h</sup> is much nearer in form to that of *Lepisma* than to that of *Coleoptera* or *Orthoptera*, differing most, however, from that of the last order. In fact, it is precisely intermediate between that of *Lepisma* and *Staphylinus*. In *Staphylinus olens*, the seven pieces which form the *clypeus* are separated by very distinct sutures. In the Apterous *Coleoptera* the absence of wings causes considerable difference in the form of the *thorax*. The membranous space in which the wings are inserted is wanting, or, rather, is filled by the greater development of the neighbouring parts; the *tergum*, which is curved inwards where the wings exist to serve as an attachment for the muscles, now regains its primitive form, as the upper portion of the first abdominal segment. Lastly, the upper surface of the *metathorax* becomes membranous; and the different parts of which it is composed no longer present the different *apophyses* which were necessary in the winged species.

The *abdomen*, bearing no external member which can influence its structure, its segments take the most simple structure possible,—each, with the exception of the first, being merely composed of two principal parts, one superior, the other inferior, united by a membranous space, becoming less and less wide towards the extremity. This allows the *abdomen* to dilate, or contract according to the state of the *viscera*.

EDWARD DOUBLEDAY.

<sup>h</sup> In this instance and another, seven lines below, our correspondent has applied this term to the *meso-* and *metathorax*, united; in all other instances he has made his names conform with those of Mr. Newman, at p. 394.—ED.

(To be continued.)



ART. LIX.—*Essay on the Classification of Parasitic Hymenoptera, &c.* By A. H. HALIDAY, Esq. M.A.

(Continued from page 350.)

*Of the Ichneumones of the Second Line, (Ichneumones adsciti, Essenbeck.)*

THE authors who have treated of the family at large are enumerated and noticed in detail by Professor Gravenhorst, in the Prolegomena to his History of European *Ichneumones*. It was not till the year 1811 that this supplemental branch was distinguished from the proper *Ichneumones*, by Doctor Nees Von Essenbeck, whose system is more fully unfolded in the ninth volume of the New Series of Transactions, published by the Imperial Academy of the Physical Sciences,<sup>a</sup> and has been followed by modern entomologists with few exceptions. That of Spinola, which Latreille adopted, and has adhered to in his latest works, differs in result (as detailed by them) from that first mentioned, only as respects the position of the genus *Agathis*, whose affinity to the *Bracones* is admitted by Latreille himself.<sup>b</sup> But, accurately examined, this method will be found to fail, as the variations of the *palpi* (on which it is founded) are much more extensive than those it comprehends. That of Von Essenbeck is therefore as superior in certainty as it is in facility of application; while the few Apterous species<sup>c</sup> are, by their habit, easily assigned to their proper station in the family. He has, however, employed the principle of Spinola for the distinctive characters of his secondary groups, the *Bracones* and *Bassi*, a division which is accordingly defective in a similar degree. The difficulty of applying such a test appears from the fact that this most accurate observer has made glaring transpositions,<sup>d</sup> even among the genera strictly reducible to the lines of his own method. Professor Fallen, in a recent Essay, while he adopts the primary division of Von Essenbeck, has rejected these minor groups; but, in reducing the number and extending the

<sup>a</sup> Nova Acta Phys.-Med. Acad. Cæsar. Leop. Carol. Nat. Curios.

<sup>b</sup> Règne Animal, N. E. Tom. V. p. 288.

<sup>c</sup> I am acquainted with but two, *Aphidius Ephippium* and *Alysia aptera*.

<sup>d</sup> *Calinus*, *Spathius*, *Ilormius*, *Blacus*, *Perilitus*.

limits of the genera, has produced an arrangement which seems less simple and natural. Of the genera, seven<sup>e</sup> had been previously established (but not all equally well defined) by Fabricius, Latreille, Schranck, and Jurine; the rest we owe to the labours of the same accomplished naturalist, who has besides described at length a considerable number of the European species; of which, also, several will be found dispersed among the Fabrician genera, and more collected and arranged in the Ligurian Fauna of Spinola. Seven species only are noticed by Linné; two of which are placed among his *Ichneumones majores*, four with the *minuti*, and one is appended to the genus *Cynips*. The little that is known of their instincts and economy is to be sought in the pages of Reaumur, and of the incomparable Swede, in patient observation almost *his* equal, and in his systematic views (may I not say) unrivalled among his contemporaries. A few of the more familiar species have also been figured, and their habits noticed, by some of the older writers upon insects, as Madame Merian, Frisch, &c.; and some interesting contributions to their history, in recent publications, are to be consulted under their respective heads.

As the general form is similar throughout the family, the second chapter of Gravenhorst's Prolegomena may be referred to for an elaborate account of the external anatomy. I shall merely allude to some characters which pervade the present branch, reserving the consideration of other distinctions for the minor groups to which they are confined. In general it may be remarked, that these exhibit greater variety in the details than exist among the proper *Ichneumones*: the defined white or yellow markings there so prevalent are wanting here; the white ring of the *antennæ* is also excluded from the characters of the group, by Von Essenbeck; but I am acquainted with one instance where the female has such a distinction.<sup>f</sup> In the upper wings the exterior areolet of the disk is always open, the anterior is mostly complete, which is never the case in the others; the cubital area is usually of more uniform breadth, and the second areolet of moderate or ample dimensions; sometimes that area is contracted in the middle, and

<sup>e</sup> *Agathis*, *Bracon*, *Sigalphus* (*Sphæropyx*), *Microgaster*, *Chelonus*, *Incubus* (*Aphidius*), *Alysia*.

<sup>f</sup> *Rogas dispar*. Hal.

this areolet becomes very minute. Of the lower wings, also, the nervures are disposed after a peculiar type, to which, among the proper *Ichneumones*, *Porizon* and some of the *Cremasti* make an approach; a few have two radial areolets, some also two cubital, and, in one extensive group, the commencement of a complete discoidal areolet beyond the second brachial is traced by a recurrent nervure.

Their habits, so far as ascertained, present no broad distinction from the rest of the family. I am not aware that any of them are hyperparasitic; but in their earlier states they are themselves obnoxious to the attacks of certain of the proper *Ichneumones*, of the *Chalcides*, and the *Oxyuri*. For their transformation, the majority enclose themselves in a silky cocoon; this is dispensed with in a few instances, where the nature of their nidus renders such a protection unnecessary.

*Tabula Synoptica.*

Abdomen	}	sub pectus incurvatile . . . . .	APHIDINI.
		haud incurvatile: <i>Areola disci antica</i>	{
		contigua completa . . . . .	SIGALPHINI.
		remota s. incompleta: <i>brachialis posterior alarum posticarum emittens</i>	{
			nervum unicum BRACONII.
			nervos binos .° AGATHENSES.

*Tribus 1.—APHIDINI. Haliday.*

*Complectitur genus unicum.*

GEN. I.—APHIDIUS. *Essenbeck.*

Incubus. *Schrank.*

Hybrizon. *Fallen.*

*Thorax brevis gibbus: abdomen sub pectus incurvatile: aculeus breviter exertus, compressus: valvula ventralis carinata anum superans.*

Caput postice contractum: vertex late rotundatus: occiput angustum truncatum undique marginatum: mandibulæ forcipatæ, cuneatæ, parum curvatæ, apice emarginatæ s. acute bidentes: labrum subtrigonum apice appendiculatum: palpi varii maxillares ad summum 4-articulati: caput et abdomen thoraci annexa solito inferiùs: thorax brevis antice gibbus: alæ superiores areola disci antica vel subcontigua, vel sæpius incompleta: inferiores nervis longitudinalibus binis tantum, areolam brachialem sæpius

apice indiscretam includentibus : abdomen sub pectus incurvatile ; segmenta anteriora inter se et cum metathorace liberrimè articulata, secundum insuper in medio flexile : sextum ventrale compressum ultra septimum dorsale productum, aculeum inferne fulciens : aculeus breviter exertus, valvulis latis compressis formæ variæ.

*Larva* in aphidibus solitaria interiora corporis consumens : *metamorphosin* subit intra cutem induratum *Aphidis* folliculo nullo confecto : *imago* intra paucos dies evolat per anum ejus dehiscentem : abdomen sub pectus incurvatum ejaculans aculeo resupinato aphidem eminus pungit.

Species pleræque perparvæ : *Aphides* speciei propriæ sectantur singulæ, perpaucis exceptis quæ liberius vagantur : *marum* colores ut plurimum obscuriores unde *feminarum* discrimen facilius.—Ob multitudinem specierum et habitum discrepantem genus in sectiones plures s. subgenera dispertiendum videtur.

*Tabula Synoptica Sub-generum.*

<i>Areola disci antica</i>	completa : <i>cubitalis</i>	{	unica in apicem alæ effusa . . .	PRAON.
	orbiculatum . . .	TRIONYX.		
			incompleta : <i>abdomen</i>	{
lanceolatum : <i>Valvula</i> <i>ventralis</i>	{	bicornis . . . . .		
			inermis . . . . .	APHIDIUS.

Subgen. I.—PRAON. *Haliday.*

*Aphidius. Essenbeck. Fam. III.*

*Areola disci antica completa cubitalis unica in apicem alæ effusa : stigma intus attenuatum : abdomen lanceolatum subsessile : antennarum articulorum numerus varius, maris auctus : palpi maxillares 4-, labiales 3-articulati.*

Caput oblato-globosum : mandibulæ profundius et acute bidentes : mesothoracis scutum sulculis 2 ordinariis ante scutellum conniventibus impressum, tomentosum : abdomen lanceolatum ; segmentum 1<sup>mm</sup>. breve basi utrinque angulatum : aculeus conicus horizontalis aut nonnihil ascendens : abdomen *maris* brevius lineari-obovatum :—huic ut et reliquis subgeneribus quotquot areola disci antica completa gaudent, postica apice latior est quam reliquis, nervi exinde ducti haud ortu contigui, stigma interne

attenuatum et productum, areola brachialis insuper alarum posticarum completa.

Subgenus optime distinctum. Abdominis et aculei forma *Ephedros* refert, *A. validum* insuper thorace pubescente et petiolo brevi, sed trophi, antennæ, alæque satis dirimunt. *Trionyx* antennis et trophis propior est, plura vero discrepant. Reliqua subgenera longius recedunt.

Sp. 1. A. P. dorsalis. *Hypostomate, antennis basi, pectore, pedibusque flavo-ferrugineis.* (Long. .14—; alar. .29—).

*Femina.*—Caput nigro-fuscum nitidum, hypostomate et ore flavo-ferrugineis: palpi prælongi pallidiores: antennæ 20-21-articulatæ basi latè flavescens: thorax nigro-fuscus nitidus subtus flavo-ferrugineus: pedes longi graciles: alæ longissimæ amplæ hyalinæ sub radio infumatæ, stigmatè piceo-pallido (in vivis flavescens), nervis fuscis radice et squamulis piceis: abdomen fusco-ferrugineum, segmento primo nigro-fusco postice coarctato: aculeus niger. Rarior: adsunt tres *feminæ* tantum.—(*In Museo Societatis Entomologicæ.*)

Sp. †2. A. P. exoletus. *Hypostomate antennis basi pectore pedibus et abdomine flavo-ferrugineis.* (Long. ♀, .07—, ♂, .06.)

Bracon exoletus. *Berl. Mag.* V. 30, Sp. 47.

Aphidius exoletus. *Ess. Act. Acad.*

Præcedenti simillimus videtur. Descriptionem fusiorem petas Acutorum Berolinensium loco infra laudato.

Sp. 3. A. P. volucris. *Pedibus ferrugineis, antennis feminæ circiter 20-articulatis.* (Long. .12—; alar. .24, aut minor.)

*Fem.*—Caput et thorax nigra, os lutescens: antennæ 18-21-articulatæ nigræ vel basi ferrugineæ: palpi paulo breviores: pedes ferruginei aut flavo-ferruginei: coxæ posticæ, nonnunquam etiam femora basi infuscata: alæ obscure hyalinæ stigmatè piceo pallido, in vivis lutescente, nervis fuscis: abdomen fuscum basi dilutiùs aut fulvescens: segmentum primum fuscum brevius quam in *A. dorsali* et minus coarctatum: aculeus niger.—*Mas.* antennæ totæ nigræ 21-23-articulatæ: pedes obscuriores, femora postica infuscata.

*Hab.* in memoribus satis frequens, præsertim in salicetis.—(*Mus. Soc. Ent.*)

Sp. 4. A. P. flavinodis. *Ore, antennis basi, pectore, pedibus et abdominis basi flavo-ferrugineis.* (Long. .11; alar. .24.)

*Fem.*—Caput nigrum, os et palpi flavescentes: antennæ 18-19-articulatæ basi late flavescentes: thorax niger, subtus flavo-ferrugineus: alæ hyalinæ stigmatate flavescente, nervis fuscis: pedes flavo-ferruginei: abdomen fuscum, segmento 1<sup>mo</sup>. toto, 2<sup>do</sup>. basi flavo-ferrugineis.

*Habitat* cum præcedente rarius.

*Obs.*—Hujus et præcedentis alæ minores, pedes breviores quam in specie prima.

Sp. 5. A. P. abjectus. *Pedibus fusco-ferrugineis, antennis feminae circiter 14-articulatis.* (Long. .08 —; alar. .16 —.)

*Fem.*—Caput et thorax nigra: antennæ capite cum thorace paulo longiores, 14-, rarius 13-articulatæ, articulo 3<sup>tio</sup>. basi pallescente: pedes fulvo-ferruginei, posteriorum femora basi, tibiæ medio, tarsi apice, fusciscentes: alæ obscurè hyalinæ stigmatate piceo-pallido, nervis fuscis: abdomen piceum, basi media dilutius segmento primo nigricante. Statura multo brevior quam præcedentium.

*Hab.* inter Aphides *Angelicæ sylvestris* autumno passim; etiam in *Salice* obvius.—(*Mus. Soc. Ent.*)

#### Subgen. II.—EPHEDRUS. *Haliday.*

Aphidius. *Ess.* Fam. I.

*Areola antica disci completa; cubitales tres: abdomen lanceolatum subsessile aut subpetiolatum: stigma intus attenuatum: antennæ utriusque sexus 11-articulatæ: palpi maxillares 4-, labiales 2-articulati.*

Caput oblato-globosum: antennæ *feminae* articulo tertio longiore, sequentibus decrescentibus; *maris* articulis subequalibus vel tertio parum elongato: mesothoracis scutum sulculis ante scutellum conniventibus, pubescens aut glabrum: alæ anticæ areola cubitali intermedia oblonga prope basin nervum recurrentem excipiente: abdomen *feminae* lanceolatum apice compressum, *maris* brevius lineari-obovatum: aculeus conicus parum ascendens.

Sp. 6. A. E. validus. *Abdominis segmento primo brevi subrectangulo, stigmatate angusto intus parum elongato.* (Long. .1 +; alar. .2 +.)



*Fem.*—Caput et thorax nigro-picea, punctulata, pubescentia: antennæ breviores quam in *A. lacertoso* articulo 3<sup>tio</sup>. luteo: alæ fumato-hyalinæ stigmatē dilute piceo, nervis fuscis: stigma angustius quam in *A. plagiatore* sed latius et minus elongatum quam in *A. lacertoso*: pedes ferruginei: abdomen oblongo-lanceolatum piceum, plaga media baseos pallescente: segmentum primum granulatum opacum fuscum, brevius et crassius quam reliquis, subrectangulum basi gibbum: aculeus crassior fere vomeriformis apice ascendens niger. *Mas*, simillimus. Antennæ totæ nigræ. Statura tota multo brevior quam sequentium.

*Hab.*——rarissimè.—(*Mus. Soc. Ent.*)

Sp. 7. *A. E. plagiator. Abdominis segmento primo lineari, stigmatē latiore intus parum elongato.* (Long. .1 ±; alar. .2 ±.)

*Fem.*—Nigra nitida: antennæ breves compressæ: alæ obscure hyalinæ nervis fuscis stigmatē piceo: pedes antichi rufo-picei, intermedii infuscati, postici obscuriores trochanteribus et tibiis basi aut latius rufescentibus: abdomen lineari-lanceolatum, piceum, plaga media baseos pallida, petiolus linearis in medio fere obsolete tuberculatus: aculeus gracilis, conicus, niger. *Mas*, similis plerunque minor, pedibus obscurioribus.

*Hab.* in memoribus passim minus frequens.—(*Mus. Soc. Ent.*)

*Bracon plagiator. Berl. Mag. V.*

*Obs.*—A sequente facile distinguendus colore obscuriore, alis haud infumatis, stigmatē forma, antennis brevibus, plerunque etiam statura minore.

Sp. 8. *A. E. lacertosus. Abdominis segmento primo lineari, stigmatē angusto, intus valde elongato.* (Long. .14 —; alar. .26 —.)

*Fem.*—Nigra nitida: antennæ concolores pedicello ferrugineo, articulo tertio longissimo: alæ quam in præcedentibus longiores, fumato-hyalinæ nervis fuscis, stigmatē piceo (in vivis lutescente): pedes ferruginei, femora postica fusca: abdomen lineari-lanceolatum plaga media baseos pallescente, petiolus ut in præcedente: aculeus gracilior niger: stigma huic angustius et internè attenuato-elongatum unde areola cubitalis prima solito longior. *Mas*, antennis nigris.

*Habitat*, in agris passim *Aphides Ervi* forsitan et alias pungens ♂. (*Mus. Soc. Ent.*)

♂ In oviposition it carries the abdomen like the genuine *Aphidii*, but pierces the back of the *Puceron*, for which the slight inclination of the borer seems adapted, and the contact is less instantaneous, being often prolonged for several seconds.

*Variat. femina*, minor : antennæ basi ferruginæ, scapo fusco : pedes toti ferruginei : abdomen obscure ferrugineum lateribus infuscatum : aculeus concolor.

*Hab.* in salicetis et alibi haud infrequens.

Subgen. III.—TRIONYX. *Haliday.*

*Areola antica disci completa, cubitales tres : stigma intus attenuatum : abdomen orbiculatum, petiolatum : antennarum articulorum numerus varius mari auctus : palpi maxillares 4-, labiales 3-articulati.*

Caput transversum rotundatum : palpi longiusculi : mandibulæ profundius et acute bidentes : mesothoracis scutum sulculis ordinariis ante scutellum conniventibus impressum, glabrum : alæ ut in *Ephedro* : abdomen orbiculatum planum, petiolo gracili lineari ante medium utrinque denticulato, segm<sup>to</sup>. 2<sup>do</sup>. maximo lævi, reliquis brevissimis linearibus : aculeus decurvus infernè valde dilatatus, deltoideus, apice tricuspis.

Alæ hujus subgeneris et præcedentis omnino similes, sed statura tota antennæ, petiolus, et abdomen (aliquatenus etiam aculei forma) *Monoctonum* referunt. Trophi ab utroque discrepantes cum *Praone* melius congruunt.

Sp. 9. A. T. deltiger. (Long. .1 ; alar. .2.)

*Femina*.—Caput et thorax nigra, nitida, os et palpi lutescentes : antennæ 19—21-articulatæ fuscæ articulis 4 aut 5 baseos flavo-ferrugineis : alæ hyalinæ nervis fuscis, stigmatate luteo-piceo : forma stigmatis fere qualis *A. valido* : pedes, abdomen et aculeus flavo-ferruginea : abdomen lateribus vel etiam dorso postice infuscatum. — *Mas*, antennæ 21-articulatæ fuscæ, articulo tertio flavescente : os piceum palpibus lutescentibus : abdomen paulo angustius, fuscum basi dilutius, petiolus saturatiùs ferrugineus.

*Hab.* in agris rarius.—*Mas* semel captus *femina* pluries.—(*Mus. Soc. Ent.*)

Subgen. IV.—MONOCTONUS. *Haliday.*

*Areola disci antica et cubitales interior confluentes : stigma intus attenuato-elongatum : abdomen orbiculatum petiolatum : antennarum articulorum numerus varius mari auctus : palpi maxillares 4-, labiales 2-articulati.*

Caput transversum rotundatum : palpi labiales brevissimi : mesothoracis scutum glabrum læve, vel antice sulculis abbreviatis

obsoletis impressum: alæ apice longitudinaliter rugulosæ, stigmate angustissimo introrsum valde elongato: cubitus a stigmate fere recta descendens, angulatus et mox abruptus: areola magna irregularis brevior est quam subgeneri ultimo, fere sub stigmate clausa: abdominis et petioli forma quales Subgeneri præcedenti: aculeus decurvus, cuspidatus, basi inferne angulato-dilatatus.

De relatione hujus cum proxime præcedente pauca præmissa sunt: —*mares* nonnulli minores areola indistincta a maribus Subgenerum sequentium similiter deficientibus, formâ stigmati perspectâ discerni poterunt. *A. Crepidis*, (Sp. 21.) autem petioli formâ propior, quoad cætera longè discrepat.

Sp. 10. A. M. nervosus. *Antennis* feminæ 16-articulatis, *areola distinctissima*. (Long. .9; alar. .18—.)

*Fem.*—Nigra; antennæ basi flavescens scapo fusco: alæ obscuræ stigmate pallide-piceo, nervis validis fuscis: pedes ferruginei, femora postica infusata: petiolus fuscus: abdomen antice dilute piceum, postice fuscum: aculeus piceus.

*Hab.* Rarius: *feminæ* binæ tantum adsunt.

Sp. 11. A. M. Caricis. *Antennis* feminæ 13-articulatis, *areola subtilissimè delineatâ*. (Long. .07; alar. .13±.)

*Femina.*—Nigro-fusca: antennæ plerunque basi lutescentes scapo fusco: alæ obscure hyalinæ stigmate pallido, nervus areolam externe ambiens tenuissimus vix conspicuus: pedes lutei aut ferruginei: abdomen dilute piceum s. fusco-ferrugineum apice fuscum: petiolus brevior quam præcedente: aculeus piceus aut lutescens. —*Mas* niger: antennæ longitudine corporis 16-articulatæ nigræ: geniculi pedum picei aut ferruginei: abdomen angustius quam *feminæ*, dilute piceum apice nonnunquam petiolo fuscis: variat colore dilutiore.

*Hab.* in *Festuca fluitante*, *Carice*, &c. paludum; in gramine locis humidis.—(*Mus. Soc. Ent.*)

#### Subgen. V.—TRIOXYS. Haliday.

*Areola disci antica et cubitales unâ effusæ: stigma trigonum: abdomen lanceolatum petiolatum: valvula ventralis bicornis: antennæ* feminæ 11-, *rarius* 10- aut 12-articulatæ, *maris* 13-articulatæ: *palpi maxillares* 4-, *labiales* 2-articulati.

Caput transversum rotundatum crassius quam præcedentibus: antennæ *feminæ* breves nonnunquam apice crassiores: mesotho-

racis scutum lævissimum glabrum: areolæ in medio alæ ne vestigium quidem adest: cubitus haud angulatus sed arcuatus, ante apicem alæ abruptus, longior tamen quam *Aphidiis* genuinis: petiolus linearis tuberculis vario situ prominulis: aculeus fere ut in *Monoctono*, decurvus inter cornua bina acuta ipso longiora e valvula ventrali (segmento 6<sup>to</sup>.) orta et apice nonnihil sursum curvata.

*Mares* nonnulli minores e subgenere ultimo areola indistincta similiores, cubito breviora, antennarum articulis pluribus, ple-runque etiam stigmatibus angustioribus differunt.—*Feminarum* vero discrimen statim patet ob apparatus insolitum aculei.

Sp. 12. A. T. auctus. *Antennis* feminae 12-articulatis petiolo ante medium tuberculato. (Long. .07; alar. .13.)

*Fem.*—Caput et thorax nigra nitida, os fulvescens: antennæ basi fulvescentes: alæ obscure hyalinæ stigmatibus (in vivis luteo) nervisque dilute piceis: stigma angustius quam reliquis: pedes fulvo-ferruginei, posteriorum coxis, femoribus tibiisque medio tarsis apice fuscis: abdomen piceum basi, media dilutius aut fulvescens: petiolus fulvo-ferrugineus crassiusculus ante medium utrinque denticulatus. — *Mas*, antennæ graciliores et longiores quam in *A. Heraclei* ♂, nigrae: femora antica supra, tibiæ medio infuscatæ: pedes posteriores obscuriores quam *feminae*.

*Hab.* in *Salicibus* haud infrequens.—(*Mus. Soc. Ent.*)

Sp. 13. A. T. pallidus. *Pallide flavus: capite thoraceque nigris, antennarum articulis septem exterioribus fuscis: (antennis feminae 11-articulatis gracilibus, petiolo ante medium tuberculato.)* (Long. .08; alar. .15.)

*Fem.*—Os flavum; antennæ filiformes graciles et ratione corporis longiores quam in reliquis: alæ hyalinæ stigmatibus flavo-pallido, nervis dilute fuscis, radice et squamulis piceo-stramineis: pedes vel toti pallide flavi vel posticorum femoribus tibiisque medio fusciscentibus: abdomen gracile segmentis intermediis, vel etiam posticis infuscatis.

*Hab.* in *Carice* paludum rarius; etiam in *Coryli* foliis semel captus.

Sp. 14. A. T. Angelicæ. *Antennis* basi pedibus anticis et geniculis fulvo-ferrugineis: (antennis feminae 11-articulatis filiformibus, petiolo bituberculato.) (Long. .08; alar. 15.)

*Fem.*—Caput et thorax nigra: os et palpi lutescentes: antennæ breviores quam in sequente, apice haud incrassatæ: alæ (ut in

sequentibus etiam) hyalinæ nervis fuscis, stigmatè dilute piceo (in vivis lutescente), radice et squamulis piceis: pedes fulvo-ferruginei, posteriorum femora supra, tibiæ medio, tarsi apice infuscati: coxæ posticæ fusæ: abdomen lineari-lanceolatum fuscum aculeo concolore, basi media et petiolo dilutius: valvula ventralis et cornua lutescunt: petiolus gracilis utrinque bidentatus medio infuscatus.

*Hab.* inter Aphidis *Angelicæ sylvestris* autumnò parum frequens.—  
(*Mus. Soc. Ent.*)

Sp. 15. A. T. *Centaureæ*. *Pedibus anticis et geniculis lutescentibus*: (*antennis* feminæ 11-articulatis *filiformibus, petiolo pone medium tuberculato.*) (Long. 11.; alar. .19.)

*Fem.*—Caput et thorax nigra: antennæ graciles nigræ, breviorè, quam in *A. aucto*: palpi picei: pedes antiqui lutescenti-ferruginei, postici picei trochanteribus et basi tibiarum ferrugineis: abdomen lineari-lanceolatum nigro-piceum, segmenti secundi medio pallescente: petiolus gracilis inter medium et apicem denticulatus.

*Hab.* in Aphidibus *Centaureæ nigræ* minus frequens.<sup>h</sup>

Sp. 16. A. T. *Aceris*. *Pedibus anticis et geniculis abdominisque basi et apice luteis*: (*antennis* feminæ 11-articulatis *longiusculis apice crassioribus, petiolo ante medium tuberculato.*) (Long. .12; alar. .21.)

Aphidius *Cirsii*. *Curt. B. E.* 383.

*Fem.*—Caput nigrum, os lutescens: antennæ multo longiores quam in sequentibus, sensim incrassatæ articulo ultimo magno oblongo: thorax niger: pedes lutei, posteriorum femora, tibiæ medio, tarsi apice, fuscescentes aut picei: coxæ posticæ fusæ: abdomen dorso fuscum postice lutescens fere croceum: petiolus sordide luteus, ante medium denticulatus.

*Prodiit* mihi ex Aphidibus *Aceris Pseudoplatani* Julio mense.

Sp. 17. A. T. *Heraclei*. *Hypostomate* *antennis basi, pedibus anticis et geniculis, abdominisque basi et apice luteis*: (*antennis* feminæ 11-articulatis *brevibus apice crassioribus, petiolo bituberculato.*) (Long. .09; alar. .17.)

*Fem.*—Caput nigrum, facie tota sub antennis et ore luteis: antennæ

<sup>h</sup> I have observed this species attacking the pucerons of the Centaury; its proceedings are similar to those of the true *Aphidii* (see the note under *A. Rosæ*, Sp. 27): it pierces the under side of the puceron, and by an equally instantaneous touch; nor could I perceive that the singular anal horns serve any purpose in this operation.

sensim incrassatæ articulo ultimo magno, basi clarè lutescentes : thorax niger collo luteo rarius piceo : pedes lutei, posteriorum femoribus et tibiis basi denita tarsisque apice fuscis : coxæ posticæ fuscæ : abdomen luteum medio fuscescens : petiolus utrinque circa medium denticulis 2 minutis, sive crenulatus : cornua analia apice sursum curvata insigniùs quam in præcedentibus.—*Mas*, fere totus niger antennis concoloribus : pedes antichi posteriorum trochanteres tibiæ tarsique basi sordide lutei : abdomen nigropiceum basi sordide lutescens.

*Habitat* in Aphidibus *Heraclei Sphondylii* florentis Julio mense vulgatissimus, posthâc vix obvius.—(*Mus. Soc. Ent.*)

Sp. 18. A. T. letifer. *Capite thoraceque nigris pedibus anticis geniculis et abdominis basi apiceque lutescentibus : (antennis et petiolo fere ut in præcedente.)* (Long. .08; alar. .15.)

*Fem.*—Præcedenti similis : caput totum nigrum : antennæ paulo breviores nigræ prope basin pallescentes scapo ipso fusco : thorax niger : pedes obscuriores, tarsi breviores : abdomen antice sordidius lutescens petioli medio infuscato.

*Prodiit* mihi ex Aphidibus *Salicis ulmi-foliæ*, Junio mense.

Sp. 19. A. T. minutus. *Capite thoraceque nigris, pedum geniculis fulvescentibus : (antennis feminæ 11-articulatis brevissimis.)* (Long. .07; alar. .13.)

*Fem.*—*A. brevicorni* simillimus sed antennæ 11-articulatæ, articulis tamen duobus apicis arcte conjunctis, ultimo haud elongato. Pedes picei geniculis ferrugineis aut fulvis : tarsi breviores : abdomen piceum ano obscurè lutescente.

*Captus* in *Buxo Balearica* Aphidibus scatente Junio mense.

Sp. 20. A. T. brevicornis. *Antennis feminæ 10-articulatis.* (Long. .06; alar. .1 +.)

*Fem.*—Nigra : antennæ perbreves apice crassiores articulo ultimo magno oblongo, tertio basi pallescente : pedes picei ; geniculis, anticorum etiam femoribus tibiisque subtus ferrugineis : abdomen pallide piceum lateribus infuscato, ano obscure lutescente : petiolus fere in medio obsolete denticulatus, nonnunquam bituberculatus.

*Hab.* in umbelliferis, *Angelica sylvestri* præcipuè, parum frequens.—(*Mus. Soc. Ent.*)

(*To be continued.*)



ART. LX.—*Colloquia Entomologica.*

(This contribution is not by the author of the former series.)

SCENE—*An open space in a Beech-wood, Gloucestershire.*  
ENTOMOLOGUS and TYRO seated on the ground.

TYRO. See, *Macroglossa stellatarum!*—I knocked him down with my hat as he was banqueting on the sweets of a honey-suckle—

ENT. —thrusting his long tongue into the flowers; and, if alarmed, darting off like an arrow.

TYRO. Yes; directly he caught sight of me, he whisked away: and I should have taken him for one of those moths that wear their good-looking name in the shape of a *Greek letter* embroidered on their cloak, which we so often see flying about flowers in the sunshine.

ENT. *Plusia gamma.*

TYRO. Probably. But my quarry quickly returned to his feast; and, as I took care to stand perfectly still, he seemed to be better reconciled to me, and I had time to take more notice of him, as he quaffed cup after cup of the delicious nectar;—I soon saw what he was, and quickly pounced on him.

ENT. They are by no means common. I have a large plant of *Centranthus latifolius*, which they regularly frequent every year: two or three sometimes humming (for the motion of their wings makes a melodious, though not loud hum—as I dare say you observed) about it; at once inserting their elongate *maxillæ* into its little upright tubular corollas; and, as they fly with their body nearly parallel to the ground, they are obliged to bend them to get to the bottom of the flowers;—and I notice, they do not describe a curve, as one would suppose would be the case with so flexible an instrument, but are bent quite at an angle.

TYRO. I think I noticed something of the sort just now in some butterflies which were flitting about a bed of thistles on the edge of the wood. I watched them, as they alighted on a head, turn completely round; and, after examining it on all

sides, as if in search of a tit-bit, began their meal; and I observed, when they wished to taste the sweets of a floret near their mouth, they did not alter their position, but, bending their trunk in the shape of a syphon, plunged it into its nectary.

ENT. Look at those butterflies, full of enjoyment, basking in the bright sunshine, now spreading out their wings—*maculis insignis et auro*—or, if the shadow of a cloud passes over, suddenly closing them, and in an instant shooting up a dark line against the sky, which, standing out from amidst the florets, reminds one of a furled banner towering above the bristling lances of some warlike host;—

TYRO. —or, "*parva componere magnis*,"—like the spiry aloe, piercing out from the lion-haunted brushwood of South Africa; which, seen by some pious missionary, as he addresses himself to repose after a weary day's journey, pointing upwards to the calm moon-lit sky, raises his thoughts to Heaven, and he forgets the fatigues and dangers of his toilsome way, in the contemplation of peaceful realms of everlasting rest, to gain which for himself and his fellow men, he has exchanged a happy home for the dangers that now surround him.—I want to know, and I don't doubt you can tell me, the name of a bee which sadly disfigures *Stachys lanigera* in my garden; it seems as great an enemy to this plant as the leaf-cutter bee is to the rose, making holes in its leaves; and this it does not effect like that insect, by cutting pieces out, but by despoiling them of their down, often in little patches;—the portions of the leaf thus deprived of their natural covering, dry up, and soon decay, from exposure to the influence of the sun and rain.

ENT. Your little depredator is the female of *Anthidium manicatum*.

TYRO. I was a good deal amused with them; they are remarkably industrious little creatures: one I watched was so intent on her work as to let me get near enough to hear her pluck up the down, which she did with a noise like that of a horse grazing. Every successive mouthful was thrust under her body, where it seemed to be formed into a little ball; when she had collected enough, she flew off with it, bending in her head and tail to keep her load in its place—but I never could track her home.

ENT. I believe she uses it to cover the outside of her cells:

but I have a *nidus* under observation, and I hope soon to be able to satisfy your inquiries about them.

TYRO. I shall expect to learn all about them;—*you* seem to have such good opportunities for observation. I can't help fancying to myself how pleasantly you wile away many an otherwise care-full hour in your delightful garden, amidst "*omnia copia narium*," watching your favourites, who, like little familiars, reveal to you, as if by the force of some secret spell, what they conceal from more superficial, or less talented observers.

ENT. Such pursuits possess, above most others, the power of tranquillizing the agitations of a troubled spirit,—of inducing those feelings, that mood of mind, in which, if past sorrows are not all forgotten, their remembrance recurs to the mind deprived of its poignancy. Often have I perceived them to be

“ Deformis agrimonie  
Dulcibus alloquiis,”—

and it is pleasant to think that the happiness afforded by these pursuits is accessible to all, or most of us, how or wherever situated. As a French naturalist has well observed,—he is addressing those engaged in the study of natural history:—  
“ Dans les vastes plaines et au milieu des bois touffus, sur le haut des monts et dans le fond de la vallée solitaire, vers le bord des ruisseaux paisibles et sur l'immense surface de l'océan, vous serez sans cesse entourés des objets de votre étude.”

TYRO. Very true; yet how many are so regardless—take so little note of what passes around them, that they would go to their graves without discovering half the beauties of nature, if no one unfolded its leaves for them;—thus losing some of the purest pleasures the embodied soul is capable of enjoying, for want of an interpreter. Such interpreters, while they open to many a new and inexhaustible source of pleasure, are of great utility; and we must love and venerate the man who employs his talents in thus increasing the amount of human happiness. With what a host of delightful associations such names as Ray, Kirby, and White, are connected!

ENT. I will confess to you, I have no higher ambition than thus

“ To build myself, in gentle hearts,  
A shrine of lasting memory.”

But I think, after all, it is to the study of Entomology, as a science, that your observations will most forcibly apply.

TYRO. Well, I hardly know; though I have sometimes thought, as I have been resting in the shade of some lofty—

ENT.—

“ Qua pinus ingens, albaque populus  
Umbram hospitalem consociare amant  
Raucis; et obliquo laborat  
Lympha fugax trepidare rivo.”

TYRO. Leave out the poplar and it will do very well, even to the *Lympha fugax*; for, where I lay, the sleep-inviting murmur of a viewless stream falls gently on the ear. I was just thinking of a favourite spot.

ENT. Where?

TYRO. Oh, just by us. *My* pine stands on a little knoll, overlooking a beautiful piece of water that, almost surrounded by woods, seems to repose on the green lap of the forest: on one side is a hill which, after many an undulating swell, slopes gradually off to the water's edge; and so deep is its repose, one feels some difficulty in persuading oneself that the wood ends with the bank, as it is reflected on the bosom of the quiet lake.

ENT. You forget the trees must be upside down—a position which would be very unpicturesque.

TYRO. Oh! you don't know the place, so you can hardly judge. I must tell you, my position is some considerable height above the water, and looks down abruptly on it, for the hill just here on this side suddenly becomes precipitous; the bank rises, rampart-like, from the water, and, on the opposite side, the margin is fringed with low-growing trees and shrubs, so that no deflected stems appear in the lake, to *prove* it an illusion, which is, indeed, so perfect as would need immersion to dispel, if it were not for that pair of swans which, more like apparitions than material beings, noiseless as a mist-wreath floating across the midnight sky, move, queen-like, along, and scarcely disturb the sleeping surface of that dark silent flood; the ripple in their wake dying ere it reach those *Nymphæ luteæ*, which, with their broad island-like leaves, the resort of water-beetles, and golden flowers rising up amongst them, like the

crescent-tipped minarets of an eastern city, come too to the aid of the senses, and act as counsel for reason against imagination. Then the humming in the air—

“That undefined and mingled hum,  
Voice of the forest never dumb,”

which you entomologists, I think, are not yet agreed as to the cause of. No sign of animal life, but the gambols of various kinds of insects disporting around me; and, as I have amused myself with observing them, and have watched brilliant flies hovering over the flowers, and hardly ever alighting, seeming to live on their most delicate breath, the very acme of insect happiness,—and the tiny beetle climb slowly up to the top of a bent, suddenly take flight on some instinct-directed errand,—and listened to the wilding-bee humming his evening orisons as he darted into the cup of the hare-bell, where he is soon lost in forgetfulness, perhaps, even before his nature-provided hammock has recovered the equilibrium his entrance disturbed,—and as hundreds of silver-bedropped moths—but it is idle to re-detail these things to you—you who are so well acquainted with Nature’s “shews and forms,” and have so often roamed through field and forest engaged in pursuit of these interesting creatures.

ENT. Let us then admire them as the creation of a Divine Architect—let us enter the vestibule of that temple, to the unveiled glories of whose interior, the science which makes us more perfectly acquainted with this wonderfully-beautiful portion of Nature’s works, would introduce us.

TYRO. It is there we are permitted to trace—

“The unambiguous footsteps of the God  
Who gives its lustre to an insect’s wing,  
And wheels his throne upon the rolling worlds.”

(*Exeunt.*)

#### ART. LXI.—*Notice of Entomological Works.*

1. *Die Arachniden. Getren nach der Natur abgebildet und beschrieben von D. Carl Wilh. Hahn. Erster Band. Viertes Heft. Mit sechs fein ausgefalteten Tafeln. Nurnburg. 1833.*—In this number are figured one species of

*Mygale*, two of *Lycosa*, and thirteen of *Theridion*, of which eight are now described for the first time.

2. *Iconographie, &c. des Coléoptères d'Europe; par M. le Comte Dejean, et M. le Docteur J. A. Boisduval. Tome troisieme. 5<sup>me</sup>. Livraison.*—The group *Feronia* is completed in this number; it also contains figures of the genera *Camptoscelis*, *Myas*, and *Cephalotes*.

3. *Magasin de Zoologie; par M. Guerin.*—It would be waste of time and space to enumerate all the *Annulosa* lately figured in this interesting work; we shall, therefore, only point out some of the most remarkable. In plate 41 (part *Insecta*) there is the figure of a *larva*, stated to be that of *Anthia sex-guttata*; it is so decidedly different from that of any Adephagous insect we have hitherto seen, that we find our credulity somewhat taxed in believing it. Our correspondent, Mr. Newman, has given a very correct outline of this remarkable *larva*, Plate III., Fig. 6, to which we invite our readers' attention. *Metopias curculionides*, a new genus of *Pselaphidæ*, found in Cayenne, remarkable for the anterior part of the head being produced into a horn, at the end of which are placed the antennæ. *Calodromus Mellyi* (Pl. 34), a new genus of *Coleoptera*, allied to the *Brentidæ*, and found on the coast of Coromandel: this is a truly remarkable insect; the basal joint of the *metatarsi*<sup>a</sup> is three times the length of the rest of the leg. *Cephaleus infumatus*, a new Hemipterous genus. There is a clever monograph on the Crustaceous genus, *Mithrox*, by Milne Edwards. De Laporte's excellent Essay on the *Hemiptera* is concluded.

4. *Annales de la Société Entomologique de France: Tome I., Trimestre 4, et Tome II. Trimestre 1 et 2.*—These, like the preceding number, contain many interesting and clever essays; the principal are, "Notice on the Entomology of French Guiana, by M. Lacordaine;" "Observations on Dahlborn's Monograph of the Scandinavian Bombi, by M. Pelletier St. Fargeau;" "Memoir on fifty Species of Insects, either new or little known, by M. de Laporte;" "Continua-

<sup>a</sup> *Tarsi of the posterior legs*; we adopt the word from Mr. Newman. *Vide ante*, p. 415.



tion of a Catalogue of Corsican Lepidoptera, by M. Rambur;" "On the Structure of the Nest of *Mygale fodiens*, by M. Audouin;" a figure of the nest is given, shewing the singular door by which its entrance is closed. "Division of the genus *Satyrus* into nine groups, by characters taken from the nervures of the wings and from the antennæ, by M. Duponchel;" "Essay on the genus *Lampyris*, by M. de Laporte;" *Lampyris* is here divided into nineteen genera, fourteen of which are new; we admire the elegance of M. de Laporte's names, and wish that our English entomologists could avoid those clumsy and barbarous compounds with which they often disgrace their compositions. "On the Metamorphosis of *Ceratopogon*, with the descriptions of two new species, by M. F. E. Guerin;" "A century of new *Carabidæ*, by M. Gory;" "Essay on the *Buprestidæ*, by M. Solier;" characters of thirty-four genera are given, with accurately executed dissections of all but three of them. "M. Fisher on some genera of Orthoptera." We look on these "Annales" with kindly affection, and recommend them to all scientific entomologists.

5. *Catalogue des Coléoptères de la Collection de M. Le Comte Dejean, Livraison 1<sup>e</sup>. et 2<sup>de</sup>.*—This catalogue, with synonyms and habitats, is essential to the general collector. The author pays too little attention to the names of genera established in this country; we cannot help thinking, that courtesy should suggest their adoption, where they enjoy the right of priority. However, let us endeavour to make ourselves of that importance which shall demand notice; we have hitherto been too much engaged in making beautiful drawings, in inventing hard names, in theorizing, in criticizing, in petty bickering; all the time thus spent is lost to science, and our neighbours have gone by us while we have been busied on mere nothings; they have embraced the substance, we the shadow; let us cease to be superficial, and we shall not have to complain of want of fair dealing.

6. *Observationes nonnullæ in Coleoptera Indiæ Orientalis, &c. &c. Maximilianus Perty. 1831.*—Ours reader will conclude, and with justice, that it must be something unusually flowery that can tempt us to notice a book two years old.

How we came to have omitted it until now we cannot imagine, but we hasten to repair the injury the learned author has suffered at our hands. The work begins with twelve theses, which we give at length, because we admire such of them as we can understand, and because we are astonished at the depth of those we don't understand, *risum teneatis*, that is no mistake, though, perhaps, a little egotistical; we mean, we are astonished to find *anything* which we can't understand. What connexion exists between these theses and the beetles of the East Indies, we cannot at present make out.

## THESES.

## I.

Per antithesin factus est mundus, et per antagonismum conservatur.

## II.

In corporum cœlestium genesi theoria aggregationis momenti majoris est quam Vulcanismus et Neptunismus.

## III.

Maris decrescentia non tam ab evaporatione, aut consumptione per naturam organicam, quam ex penetratione versus orbis terrarum centrum deducenda.

## IV.

Ignis in terrarum orbe centralis sanè est admittendus.

## V.

Quod sunt vires mechanicæ in natura organica, id sunt vires organicæ in regno animali et vegetabili; quod sunt vires organicæ in natura organica, id sunt vires psychicæ in gente humana; per omnem naturam perpetua analogia, vires eædem non qualitate sed evolutione tantum diversæ.

## VI.

Expone mihi graminis humillimi indolem, tunc ego phantasiam et mentis humanæ agitationem tibi explicabo.

## VII.

Conditio animalium psychica certò et exclusivè ex eorum organizatione derivari potest.

## VIII.

Oxygenum et photogenium sunt potentiæ vivificæ universales.

## IX.

Limites exacti inter initia regni utriusque organici non inveniendi sunt.

## X.

In generatione plantarum et animalium simplicissimorum a causis elementaribus destinatur, utrum particula aliqua materiæ organizandæ planta, an animal futura sit.

## XI.

A massæ nervosæ copia proportionali et processus respiratorii gradu in genere animalium magnitudo dependet: ideo Insecta et Arænidæ molis tam exiguæ sunt.

## XII.

Organisatio infusoriorum perfectior, a celeberrimo Ehrenberg nuperrime detecta generationi eorum spontanæ non contradicit.

And then the gauntlet is thrown down to all who choose to enter the lists in the way of disputation; for our part, we would admit the central penetration of sea, or spontaneous generation, or any thing, rather than accept the challenge.

Hæc theses defendere paratus sum si forte T. T. oppositores exiis, quam ex dissertatione materiam disputandi eligere maluerunt.

We would have translated all these theses, but found our little store of school Latin is grown mouldy for want of use, and we bartered our Ainsworth, the day before we left, for a double-bladed knife, and gave our lexicon *in*; we began the task, but the words *antagonismum*, *Vulcanismus*, *Neptunismus*, *psychicæ*, &c., &c., made us pause.

7. *The Entomology of Australia, in a series of Monographs; by George Robert Gray, &c. Part I, containing Phasma.*—This work, as far as the plates are concerned, is admirable, and does the artist infinite credit. The scientific character of the work would have been raised, by anatomical figures of the mouth of each genus; but we suppose these have been omitted as likely to injure the general appearance of the plates, with which we are so delighted, that we feel little inclined to say anything about the letter-press; but duty must be attended to, and we therefore inform our readers that this part of the work is no improvement: how Mr. Gray could trust himself on such a task, we cannot think! he should have taken Stoll and Audinet-Serville, and studied them for weeks, before he ventured on *Orthoptera*. He says of the *Phasmidæ*, “they belong to the first section, *Cursoria*, or walkers, and differ very much from the other family of the

same section, termed *Mantidæ*," &c. From this it follows, that there are but two sections of the *Cursoria*; so that *Blatta* must be invested with the powers of leaping, and placed among the *Saltatoria*, or—an equal violation of nature—joined hand in hand with *Phasma*, whilst this last is separated from its near neighbours, *Mantis*, *Empusa*, and *Phyllium*. *Forficula* and *Thrips* are also Orthopterous; the former has long since been included among the *Cursoria*, which, by the way, we would, with Mr. Gray's permission, Gallicise "*Coueurs*," and Anglicise "*Runners*." Audinet-Serville was wrong, as we conceive, in separating *Mantis* and *Spectrum*, not but what these constitute distinct families, but because they naturally fall into two others equally so, and the stirps *Phasmina*, MacLeay, thus divides into five distinct families, the first, however, being excluded by that author:—

1. MANTISPIDÆ. Alis 4 æqualibus.
2. EMPUSIDÆ . . Capite in cornu producto.
3. MANTIDÆ . . Capite simplice.
4. PHASMIDÆ . . Corpore lineari, plerumque aptero.
5. PHYLLIIDÆ . Corpore dilatato, alato.

The detailed characters of these families should have been supplied, and then those particular families to be described should have been subdivided into genera, and these genera again into species. As it is, we are left entirely to our option as to what genus we choose to refer each species: the descriptions, we observe, are in the neuter; thus agreeing with *Phasma*, yet we can find no characters of such a genus. The whole of the letter-press, moreover, is turned out of hand in a careless unscientific manner, which we really regret, seeing the beauty and accuracy of the plates. We observe the name of one of our most eminent entomologists<sup>b</sup> is given throughout incorrectly;—colours are described in a way no entomologist can understand, and violations of orthography and grammar might be pointed out. We intreat Mr. Gray to exercise a little more care, if he ever expects his work to obtain the patronage of the scientific.

8. *Genera Dytyceorum auctore, Dr. Guil. Ferd. Erichson. Berlin, 1832.*—This is a little book that every body should

<sup>b</sup> The Rev. Frederick William Hope.

have; it is a *sine quâ non* to the entomologist; the price is almost nothing, and it is full of information. For the benefit of those who do not choose to purchase, we will transcribe the following

SYNOPSIS GENERUM.

A. Coxæ posticæ amplæ.

I. Tarsi anteriores articulo quarto distincto.

a. Tarsi antichi *maris* patellati.

1. CYBISTER. Pedibus anterioribus extus, posticis in utroque sexu utrinque ciliatis, his unguiculo, unico, porrecto, fixo.
2. EUNECTES. Pedibus anterioribus intus, posticis in utroque sexu utrinque ciliatis, unguiculis duobus subæqualibus, porrectis.
3. ACILIUS. Pedibus anticis extus, posticis in utroque sexu utrinque ciliatis, his unguiculis duobus inæqualibus, porrectis superiore fixo: tarsis subtus articulis tribus primis ciliatis.
4. HYDATICUS. Pedibus anterioribus extus, posticis in utroque sexu utrinque ciliatis, his unguiculis duobus inæqualibus, superiore fixo; tarsis subtus articulis quatuor primis ciliatis.
5. DYTICUS. Pedibus anterioribus extus, posticis in *mare* utrinque, in *femina* modo supra ciliatis, his unguiculis duobus æqualibus mobilibus.

b. Tarsi antichi *maris* simpliciter dilatati.

6. COLYMBETES. Scutello conspicuo; pedibus posticis in *mare* utrinque, in *femina* modo supra ciliatis; unguiculis inæqualibus superiore fixo, inferiore hoc triplo brevior; palporum labialium articulo secundo tertio evidenter longiore.
7. ILYBIUS. Scutello conspicuo; pedibus posticis in *mare* utrinque in *femina* modo supra ciliatis, unguiculis inæqualibus superiore fixo, inferiore hoc parum brevior; palporum labialium articulo secundo tertio subæquali.
8. AGABUS. Scutello conspicuo; pedibus posticis in *mare* utrinque in *femina* modo supra ciliatis: unguiculis inæqualibus mobilibus.
9. COPELATUS. Scutello conspicuo; pedibus posticis in utroque sexu utrinque ciliatis; unguiculis inæqualibus mobilibus.

10. *LACCOPHILUS*. Scutello inconspicuo; antennis tenuibus setaceis; pedibus posticis unguiculis inæqualibus superiore fixo, porrecto.
11. *NOTERUS*. Scutello inconspicuo; antennis crassiusculis fusiformibus; pedibus posticis unguiculis æqualibus, mobilibus.
- II. Tarsi anteriores articulo quarto obsolescente.
12. *HYPHYDRUS*. Tarsis posticis compressis, unguiculis inæqualibus porrectis; superiore fixo.
13. *HYDROPORUS*. Tarsis posticis filiformibus, unguiculis inæqualibus, mobilibus.
- B. Coxæ posticæ angustæ.
- I. Antennæ 11-articulatæ, infra oculos insertæ.
14. *PELOBIUS*.
- II. Antennæ 10-articulatæ, in fronte insertæ.
15. *HALIPLUS*. Palporum maxillarium articulo ultimo minuto, subuliformi.
16. *CNEMIDOTUS*. Palporum maxillarium articulo ultimo reliquis majore conico.

A detailed character of the whole group, as to internal and external anatomy, habit, &c., and a detailed description of each genus, is given in the same clear and intelligible manner as this *synopsis*.

9. *Magazine of Natural History*.—The principal entomological papers that have appeared in this excellent magazine, since our last notice, are by the Rev. W. T. Bree, Mr. Yarrell, and Dr. Johnson. So great a proportion of our readers see this work, and we have already swelled our reviews to so unusual a length, that we must dispense with quotations or criticisms. One of our correspondents alludes to the decrease of matter and wood-cuts; this, however, we trust is merely casual, and we hope to see the original quantity again. We miss Rusticus in the late numbers; he complained to us, some time since, that Mr. Loudon had “pruned” his epistles with rather too free a hand; but we hope he has forgiven this, and enriched Mr. Loudon, as he has ourselves, by a twelve-months’ store. The July number contained some laughable observations about ourselves, from the pen of Mr. Westwood: we believe we had been reviewing him, but the particulars have escaped our memory.



10. *Annales des Sciences Naturelles*, par M. Adouin.— This is a work of great value; its editor is talented as a writer and reasoner, and one of the most accomplished entomologists of the day. In the number of these *Annales* for January 1833, is a very long and philosophical memoir, by Professor Baer, which contains some allusions to insects. In the same number is a memoir, by Milne Edwards, on the mouths of some *Crustacea*. In Vol. XXVII., page 316, is a paper by Mr. Westwood, on *Crustacea*. In Vol. XXVI., p. 369, a memoir by M. Pictet, on *Nemoura*; and another, (Vol. XXVIII., p. 44,) by the same author, on *Perla*. M. Pictet remarks, that the *Nemouræ* part with their tails, and the *Perlæ* preserve them, when they arrive at perfection: we were aware the presence or absence of this appendage was a distinguishing characteristic of the *imagines* of these families; but certainly did not know that both possessed it in the prior stages. The author remarks on the fact of these tribes possessing an active *pupa*, as being new; we have known this from our childhood; and have often picked the skin of the *pupa* from reeds, &c. after the imago had burst from it and taken wing. M. Pictet accuses Mr. Curtis unjustly of having drawn the nervures of the wings of *Perla cephalotes* incorrectly, seemingly not aware that these nervures differ, not only in different specimens, but even in the opposite wings of the same insect.

11. *London and Edinburgh Philosophical Magazine*, &c., Vol. II., p. 443. — Mr. Westwood has here concluded his "Descriptions of several new British Forms among the Parasitic Hymenopterous Insects." 1. *Monodontomerus*; this genus is the same as *Priomerus*, Walker; the species described by Mr. Westwood has fewer denticulations beneath the *metafemora* than the species described by Mr. Walker; however, from the figure given, Mr. Westwood's species appears to have two slight denticulations near the apex of the thigh, besides the one mentioned. Dalman's *Torymus dentipes* is a totally different genus, and we think may be the same as Mr. Walker's *Torymus caliginosus*. 2. *Mesopolobus* is not at all allied to *Pachylarthrus*; the abdomen is sessile;—the species described, *M. fasciventris*, is very abundant in the vicinity of London. 3. *Platymesopus*; one species of this genus is very common near London in May; the *mesotibiæ*

in the female are not dilated. 4. *Gastrocistrus*; in this genus the second and third joints of the antennæ are very minute; it has more affinity to *Spalangia* than to *Callimome* or *Eupelmus*. 5. *Trichogramma*; the species described is only one-seventh of a line in length; it has the *scutum* of the *mesothorax* very much developed, the *scutellum* very small; we believe its *tarsi* are tetramerous. 6. *Aprostocetus*, likewise, has the *tarsi* tetramerous; the oviduct is exerted. 7. *Embolemus*; a singular genus, having wings like *Alysia*; and *antennæ* like *Proctotrupes*. 8. *Hemisius*; allied to *Telenomus*, Haliday.

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ART. LXII.—*Entomological Notes*. BY EDWARD NEWMAN,  
ESQ., F. L. S.

(Continued from page 416.)

CLASS.—DIPTERA.

NATURAL ORDER.—————? *incl.*

GENUS.—TEPHRITIS. *Latreille.*

Teph. Alciphron. Fem. *Griseo-viridis*; *proalis hyalinis*,  
*maculis 4 marginalibus fuscis.*

Head, between the eyes, deep ochreous; mesothorax, grey-green approaching to brown after death; it has several darker shades, and two black spots, near the hinder margin of its scutum; the segments then are greenish-brown and unicolorous to the telum, which is, in the female, elongate, and of a clear ferruginous brown. The wings are clear, with the exception of four small fuscous spots either on or near their upper margin; the first of these is situated half-way from the insertion towards the tip, and is quite marginal; the second is a little farther from the insertion, and not quite marginal; the third and fourth are still exterior, and are perfectly marginal. The legs are brown. (Breadth 5 lin.)

Taken in June, July, and August, in the Isle of Wight, Coombe, Birch, and Darent woods, on the *Centaurea nigra*; in size and form it much resembles *Teph. Cornuta*.

*Teph. Theora. Obscure griseo-viridis; fem. telo nigro; proalis fusco reticulatis.*

Head, between the eyes, somewhat ochreous; mesothorax and following segments, dirty greyish-green, until the telum, which in the females is black; wings reticulated with brown, which forms a stronger double irregular blotch on the costal margin; another near the middle of the lower margin, and a third towards the tip;—these three are at their edges united. The legs are pale. (Breadth  $3\frac{1}{2}$  lin.) (*Mus. Soc. Ent.*)

This insect is nearly allied to *Teph. Leontodontis* of Meigen, than which however it is less, and, in other respects, sufficiently distinct. It is also related to *Teph. flavicauda* of Meigen, from which it is readily distinguished by the colour of the terminal segment; the three or four segments before these have occasionally a pair of black dots on each. It is one of the commonest species in Britain, having been taken in abundance in Scotland, Cambridgeshire, Oxfordshire, &c., and in the neighbourhood of London, at Hampstead, Southgate, Coombe, Camberwell, Deptford, Birch, and Darent.

*Teph. Alethe. Nigra, proalis nigro contaminatis.*

Entirely black; wings reticulated, and clouded with black. (Breadth 3 lin.) (*Mus. Soc. Ent.*)

Taken at Birch-Wood and at Southgate, in considerable abundance, somewhat resembling *Teph. flavicauda* in the markings of its wings, but is constantly less.

*Teph. Hebe. Brunnea; mesothoracis scutello<sup>a</sup> ochraceo; proalis hyalinis fasciis sex brunneis longitudine variis.*

Brown; with the head between the eyes, and the legs paler; the scutellum of the mesothorax ochraceous: the wings are very transparent, with six transverse fasciæ, and the costal margin brown,—the first, counting from the insertion of the wing, is broad, obscure, and extends from margin to margin; the remaining five are very distinct; the second is medial, not reaching either margin; the third touches the upper margin, and extends three-parts of the way towards the lower; the fourth is very short,

<sup>a</sup> I use the term *scutellum* more in conformity with general practice than to express any belief of my own in its accuracy. I suspect the part in question will prove the fourth section of this segment, or the *mesothoracic postscutellum*. I prefer, however, adhering to a possible error, to the risk of falling into a new one.

touching the upper margin only; the fifth is very long, attached to the upper margin, and, at half its length, taking a bend towards the body of the insect; the sixth resembles the fourth, and is nearly apical.

Taken by Mr. Walker at Southgate. I have seen but one specimen of this very beautiful insect.

NATURAL ORDER.—MUSCITES, *ined.*

GENUS.—TRIXA. *Meigen.*

*Trix. scutellata.* *Nigra; mesothoracis scutello, pedibusque ferrugineis.*

Black, slightly clouded and variegated with grey: head, above, black; below, including the front and antennæ, ferruginous: mesothoracic scutellum, and legs, also ferruginous: the remainder of the trunk black: wings, exteriorly, smoky; interiorly, the upper portion stained with saffron. (Breadth 1 inch.)

Taken in Epping Forest by Mr. Doubleday.

CLASS.—COLEOPTERA.

NATURAL ORDER.—SILPHITES, *ined.*

GENUS.—CATOPS. *Paykul.*

*Cat. nubifer.* *Fuscus; prothorace medio fusco, lateribus ferrugineis.*

Head black: antennæ, with the three basal joints, pale ferruginous, and shining; then, to the apex, fuscous, with the exception of the apical joint, which is paler: prothorax ferruginous, bearing a fuscous cloud centrally, which extends to none of its margins: mesothorax, ferruginous: elytra fuscous: the latter, at the shoulders, more or less ferruginous, in some specimens, which are possibly immature, the latter colour pervades nearly the whole of the elytra: legs fusco-ferruginous. (Length  $1\frac{1}{4}$  lin.)

Taken at Halifax; and is apparently very distinct from any species described as British.

*Cat. frater.* *Pullus, leviter villosus; pedibus fusco-ferrugineis.*

Head black; antennæ, with the two basal joints, ferruginous, then fuscous, with the exception of the apical joint, which is paler;

prothorax black, with a brown villosity; elytra perfectly without the usual striæ, excepting the pair which runs parallel with the suture, black, slightly tomentose and rugose; legs, fusco-ferruginous. (Length,  $1\frac{3}{4}$  lin.)

Taken at Halifax. It somewhat resembles *Cat. fornicatus* at first sight, but is very much smaller, also blacker; and the elytra want the striæ, so apparent in that species, and have the appearance of rugosity, rather than reticulation, which distinguishes *C. fornicatus*. These appearances, both of reticulation and rugosity, are merely the effect of a different arrangement of minute punctures.

Cat. soror. *Niger, elytris pedibusque piceis.*

Head black; antennæ, with the four basal joints, and half of the fifth, ferruginous; prothorax black, with a brown villosity; elytra and legs pitchy-black; the former rugose, faintly striated. (Length  $1\frac{1}{4}$  lin.)

Taken at Halifax. It is more round, and rather shorter in proportion than any other species with which I am acquainted. The antennæ also differ; but the general appearance of this, and the preceding species, is very similar excepting in size; the present is the smaller. These three species are in the cabinet of Mr. Davis.

#### NATURAL ORDER.—BYRRHITES, *incl.*

##### GENUS.—BYRRHIUS. *Linneæus.*

Byr. rufiventer. *Aurco-fuscus, tomentosus; ventre pedibusque ferrugineis.*

Head, prothorax, and elytra, brown, with a villosity of a golden-brown hue; antennæ black; the whole under-surface and legs ferruginous. (Length  $3\frac{1}{4}$  lin.)

Taken round London, and in many other situations, in abundance; it has usually been confounded with *B. pilula*; than which, however, it is smaller, rounder, and different, in being invariably of a clear red-brown beneath; whereas, *B. pilula*, in the same parts, is invariably jet-black. I find, by having kept specimens alive, that age does not incline the two species to assimilate.

NATURAL ORDER.—SCARABÆITES, *ined.*GENUS.—PHYLLOPERTHA. *Kirby.*

Phyl. suturalis. *Chalybeo-atra; elytris testaceis, margine circumdata nigra.*

Head black, with a chalybeous tinge: antennæ, with the shaft, testaceous, the club black: prothorax and mesothorax black, with a chalybeous tinge: elytra testaceous, with black hairs, and the entire margins black: the legs and whole of the under-surface are black, with testaceous hairs. (Length  $3\frac{1}{2}$  lin.) (*Mus. Soc. Ent.*)

Taken by Mr. Bevington, in immense profusion, on the sea-coast in the north of Ireland. In the black line, which completely surrounds each elytron, and the black hirsuties of the elytra, it differs from every species with which I am acquainted.

NATURAL ORDER.—ELATERITES, *ined.*GENUS.—ATHOÛS. *Eschscholtz.*

Ath. Campyloides. *Ferrugineus, oculis nigris.*

Ferruginous, the eyes only being black. (Length  $4\frac{1}{2}$  lin.)

This species was beaten out of elder, at Ramsgate, by my friend, R. Foster; it appears distinct from the *Elater longicollis* of Fabricius, in having the elytra less deeply striated and less flat, and in being altogether wider; the prothorax is not quite so acutely angled posteriorly, and the general appearance of the insect is that of *Campylus dispar*. I have but three specimens, all of which agree in the above distinctions, and also in wanting entirely the margin which usually distinguishes *E. longicollis*.

NATURAL ORDER.—CERAMBICITES, *ined.*GENUS.—CYLINDERA.<sup>b</sup> *Newman.*

Caput prothoracis latitudo: oculi prominentes: antennarum articulis 1°. paullò incrassato, 2°. parvo, cæteris ad apicem pedetentim attenuantibus: prothorax elongatus fere cylindricus medio paullò incrassatus: elytra parallela: femora incrassata. Characteribus aliis vix *Callidio* differt.

<sup>b</sup> Κυλινδρος *cylindrus*, δερη *collum*.



*Cyl. pallida.* *Testacea, oculis fuscis.*

The head, antennæ, prothorax, elytra, and legs, are entirely of a pale brown colour; the eyes alone are darker: the prothorax and elytra are slightly rugose; the former has an indented ring near the anterior, and another near the posterior, margin. (Length 4 lin.)

Mr. Bently's rich cabinet contains a specimen of this insect. Mr. Ingpen has taken it more than once, and I possess one which was taken at Camberwell. I have reason to believe that it is not an uncommon insect, but, from a similarity of colour, has been taken for *Callidium variabile*, a species to which widely differing insects appear to have been frequently referred.

GENUS.—TRITOMACRUS.<sup>c</sup> *Newman.*

Caput prothorace paullo angustius: mandibulis elongatis, porrectis, vix dentatis, apice arcuatis: oculi prominentes: antennis corpore valdè longioribus, articulo 1<sup>o</sup>. incrassato, 2<sup>o</sup>. brevissimo, 3<sup>o</sup>. longissimo, cæteris longitudine decrescentibus, et ad apicem pedetentim attenuantibus: prothorax elongatus, depressus, indentatus, lateribus convexis: elytra postice paullo angustiora; femora præcedente minus incrassata. Characteribus aliis vix *Obrione* differt.

*Trito. testaceus.* *Testaceus, oculis fere concoloribus, antennis corpore valde longioribus.*

Testaceous, the eyes being nearly of the same colour: the antennæ are much longer than the body, pubescent, and taper gradually to a point. (Length 5 lin.; antennæ 8 lin.)

The only specimen I have seen of *Tritomacrus testaceus* is in Mr. Bently's cabinet, and named *Obrium pallidum*; it was taken by Mr. Whitecroft, in Ireland. I should have been very glad to have retained the specific name, but thought it more applicable to the preceding species, and did not like to give them both the same name. From the descriptions, I think it will be seen, that *Tritomacrus* is more nearly allied to *Obrium*, *Cylindera* to *Callidium*, forming, together with those genera, a beautifully connected series.

<sup>c</sup> *Τριτος tertius, μακρος longus*:—third joint long; in all the *Cerambycites* *this* is partially the case, but in the present instance very remarkably so.

## CLASS.—NEUROPTERA.

NATURAL ORDER.—LIBELLULITES, *ined.*

Genus *Libellulam* ut a Doct. Leach circumscriptum, audendo iterum dividere in terram ambiguam periclitor: nihilominus mihi videtur, character unicus “*metalæ sexibus ambobus compares*” non sufficit, propterea distinctiones novas in corporis figuram conditas, attentavi: instrumenta cibaria haud examinavi, quoniam genus satis determinatum instanter universus monstrat aspectus, sanctiuntque characteres enumerati existimo.

GENUS.—SYMPETRUM.<sup>d</sup> *Newman.*

Caput metathorace latius: propodeon, podeonque in commisura incrassata: segmenta sequentia lateribus compressa: protelum ac adjacentia plus minusve incrassata: tetum minutum: teli appendices notas cæteris distinctas vix præbent: alarum stigma utrinque convexum.

The remaining species of Dr. Leach's genus, *Libellula*, widely differ from each other in the form of the posterior segments, and in the length of the superior caudal appendages of the male; but in none of them are these segments compressed as in the genus *Sympetrum*; they will, in all probability, resolve eventually into three distinct genera, and as such I had once prepared them for publication, together with *Sympetrum*, as below,<sup>e</sup> but a dislike to name-giving induced me to relinquish them.

A. *Sexus colore discrepantes.*

Symp. Scoticum. Mas, *purpureo-nigrum, maculis flavis; alis hyalinis: pedibus nigris.* Fem. *olivaceum, maculis flavis: subtus nigrum; alis hyalinis basi flavis.* Mas et Fem. *stigmatate nigro, pedibus nigris.*

<sup>d</sup> Συμπιεζω *comprimo, ητρον abdomen.*

<sup>e</sup> *Sympetrum*; abdomen laterally compressed. Ex. *Vulgatum*, Linn. &c. *Orthetrum*; abdomen laterally parallel. Ex. *Cærulescens*, Fab. *Cancellatum*, Linn.

*Platetrum*; abdomen depressed and dilated. Ex. *Depressum*, Linn. *Conspurcatum*, Linn.

*Leptetrum*; abdomen conical and pointed. Ex. *Quadrinacutum*, Linn. *Prænubilum*, Newman.

I may add that it is with great pleasure I have seen the divisions of Clairville's genus, *Colymbetes*, lately raised by our friends on the continent to the rank of genera. They had long since been similarly divided and labelled with MS. names in my own cabinet—causing much good-humoured raillery among my acquaintance, at my love of making divisions.

Libellula Scotica. *Leach.* E. E. IX. 136, *descr.*

Id. *Donovan.* XV. Pl. 523, *icon.*

*Male*, purple-black, with an oblique, yellow, elongate blotch on the mesothorax; another on the metathorax, besides several smaller spots of the same colour: the deca-ton and protelum likewise bear on each two distinct yellow spots: the wings are very clear, without any saffron tint at the base. *Female*, olivaceous, with the yellow spots on the anterior segments, as in the male; the posterior segments having the inferior portion black. The male and female have the stigma of the wings, and the legs, entirely black. (Length  $12\frac{1}{2}$  lin.; breadth 19 lin.) (*Mus. Soc. Ent.*)

Taken in Scotland and some parts of England.

Symp. rufo-stigma. Mas. *Rufum.* Fem. *Olivaceum linea dorsali nigra.* Mas et Fem. *Alis sordide hyalinis basi croceis stigmatè, maribus præcipue, rufo; pedibus nigris.*

*Male*, brilliant red. *Female*, olivaceous, the lateral portions of the meso- and metathorax inclining to yellow, variegated with black oblique lines: the acute keel of the posterior segments is tipped with black, the lower portion is also inclining to black. In both sexes the wings have a tinge of brown over the whole surface, and a saffron-coloured spot at their base: the stigma of the males, particularly, is bright red: the legs are black, with the under surface of the profemora in the females excepted, which is yellow. (Length 13 lin.; breadth 21 lin.) (*Mus. Soc. Ent.*)

This species is particularly abundant. I have examined no London collection without observing specimens of it; it is not allied to any described species; the red male instantly distinguishes it from *S. Scoticum*, the black legs and diminutive size from *S. vulgatum*.

Symp. vulgatum. Mas. *Rufescens.* Fem. *Olivaceum: alis sordidè hyalinis basi vix croceis, stigmatè infumato; femoribus tibiisque flavis, lineis nigris; tarsis nigris.*

Libellula vulgata. *Lin.* *Syst. Nat.* I. 901? (alis hyalinis corpore griseo cauda simplici.)

Id. *Fab. Lat. Charp, Vanl, &c.*

Id. *Schæff,* Tab. 92, fig. 1 (mas); Tab. 137, fig. 1 (fem.): *icon.*

*Male*, red. *Female*, olivaceous, the lateral portions of the meso- and metathorax inclining to yellow, and streaked with black; a

slender black line passes centrally along the sides of the posterior segments, though occasionally interrupted; another black line, below this, is never interrupted: the wings in both sexes have a saffron tinge at the base,—in the females, extending along the costal margin: the stigma is smoke colour: the legs are yellow, with slender black lines, excepting the tarsi, which are totally black. (Length 16 to 17 lin.; breadth 25 lin.)

This species is also abundant round London, but never seen in company with the last. I have examined the authentic Linnæan specimen, and find it does not perfectly agree with this insect; but probably time has so altered its colours, that it would be scarcely fair to introduce a new name.

*Sexus colore assimilantes.*

Symp. basale. Mas et Fem. *Flavescens; alis, basi et marginibus costalibus, croceo tenuiter suffusis, stigmatè infumato, pedibus nigris, profemoribus subtus flavis.*

Libel. basalis. *Steph. Syst. Cat. I. 309.*

*Male and female*, dull yellow, approaching in parts to olivaceous: a series of irregular black spots, on the sides of the posterior segments, form an interrupted line: the meso- and metathorax are likewise marked with black, in the same manner as *Symp. vulgatum*: the wings are beautifully stained with saffron-colour at the base, and along the costal margin: the stigma is smoke-coloured: the legs are black, with the exception of the under surface of the profemora, in the female, which is yellow, and the coxæ and trochanteres, which are of peculiarly pale and delicate straw-colour. (Length 15 lin.; breadth 22 lin.)

Mr. Stephens, who kindly transmitted me his typical specimen, has the credit of first noticing this species as distinct from the others, and I have adopted his name, although I should have preferred a more distinguishing one, as the one he has chosen is more or less applicable to every species of the restricted genus *Libellula*. It does not appear an abundant species, though occasionally found near London. I have never met with it.

Symp. flaveolatum. Mas et Fem. *Flavescens; alis, metalis præsertim, latè croceis; stigmatè flavo; pedibus nigris extus flavo lineatis.*

- Libellula flaveolata.* Linn. Faun. Succ., descr.  
 flaveola. Fab. Latr. Charp. Vand., &c.  
 Id. Schæff., Tab. 4, fig. 1, icon.

*Male* and *female*, yellow, with a continuous black line extending on each side from the metathorax to the telum: fore-wings with a saffron-coloured blotch at the base, and another, in the *females*, near the centre of the upper margin: hind-wings with a large blotch of the same colour at the base: stigma opaque, straw-coloured: legs black, with a yellow line externally on the femora and tarsi. (Length 15 lin.; breadth 22½ lin.)

Taken, but rarely, in the neighbourhood of London; more abundant in Scotland. Most of these species vary in the disposition and mode of marking; they are also subject to have pale legs, when killed immediately on emerging from the pupa, and to change their colour by being kept: if due allowance is not made for these variations, much confusion will ensue. I shall feel obliged to any of your correspondents who can supply me with either of the two last described species, or any remarkable *Libellulites*, on loan.

Should these Notes meet with approbation, I hope, in another volume, to renew them, having made but slender progress with the stores on hand.

EDWARD NEWMAN.

#### ART. LXIII.—*Varieties.*

46. *Moths attracted by Sugar*, (Vid. ante, p. 310.)—I have observed that the bottles filled with sugar and water which are frequently hung against walls to attract wasps, and so preserve the wall-fruit, will attract moths also. I once knew an instance of *Catocala nupta* getting into one of them. If sugar barrels are heated, they will attract moths much sooner than when cold; some gauze should be so placed as to prevent the moths from injuring themselves, and a person should stand near with a net ready. *Sphinges*, and other moths, come to feed on honeysuckles and all sweet flowers.

J. C. DALE.

47. *Names of Captain Blomer's Insects*, (Vid. ante, p. 317.)—As some doubt seems to be attached to the names sent by Captain Blomer to the Entomological Magazine, I

may state, that the Captain sent them to me for names, and I beg to make a few corrections. *Polia bicaudata* should be *Perla bicaudata*; *Ceria conopsoides* should be *Doros conopseus*; *Bombus Harrisellus* should be *B. subterraneus*; *Osmia maritima* should be *Megachile maritima*; *Andrena aurata* should be *A. armata*; *Tabanus vittatus* is in Curtis's Guide, G. 1185, Sp. 5. The remainder I cannot at present explain.

J. C. DALE.

48. *Acanthosoma picta*, (Vid. ante, p. 287.)—I saw this insect, with the same name attached, in the Linnæan cabinet. I took four or five in Middleton Park, near Oxford, on the juniper-bushes; and Mr. Matthews has taken them through last winter in great abundance at the same place.

J. C. DALE.

49. Genus *Charissa*.—I have taken *C. serotimaria* on a chalk soil, as in the Isle of Wight, for instance, and always whitish; *C. Pullaria*, on stony chalk, at Dover, is rather darker; and another variety, on Portland stone, darker still; besides a variety at Monk's Wood, which appears intermediate. I have taken *C. dilucidaria* at Teignmouth, between grass and heath; and one, very nearly allied, on the Mendip Hills, out of furze and on old walls. *C. obscuraria*, which I have taken on Parley Heath, is very dark indeed. Is it not possible that all these are but one species?

J. C. DALE.

50. Genus *Carabus*.—I first detected *C. cancellatus* as being distinct as British, in Mr. Ingpen's cabinet, where it was ticketed *C. monilis*, and had been overlooked by several entomologists for some time previously. *C. auratus* is stated to have been found at Exmouth. On looking at the cabinet of insects in the British Museum, I find a specimen of this insect ticketed thus, "*Ex Mus. D. Pitt qui legit prope Exeter.*" Mr. Wailes has also a specimen, found by a gentleman near Canterbury, and conveyed home in a snuff-box.

J. C. DALE.

51. *Generic Names should be of Greek derivation*, (Vid. ante, p. 314.) SIR, The zeal of Δ, in support of this canon,



has led him into the inadvertence of charging to my friend, Mr. Curtis, as an innovation, a practice adopted by many other of the most eminent entomologists. As  $\Delta$  seems to restrict his remarks to the present practice, it is needless to go back to the authority of Linné or Fabricius; but opening the entomological parts of *Le Règne Animal*, and Stephens's Catalogue, I take a few out of the numerous examples I find there, not to defend the principle, but to shew how far it is an innovation.

Yours, &c.

A. H. HALIDAY.

[Mr. Haliday gives a considerable list from Latreille, Lamarck, Stephens, &c., of generic names decidedly of Latin origin; it is no innovation, yet still we are disposed to recommend the use of Greek-compounded words in preference.—ED.]

52. *Burrowing Hymenoptera*.—SIR, The following brief enumeration comprehends all the *Hymenoptera* of the burrowing tribes which have occurred to me on the eastern coast of Ireland, from Dublin northwards:—*Ceropales maculatus*; *Pompilus pulcher, niger, gibbus, fuscus, exaltatus*; *Larra ichneumoniformis*\*; *Mellinus arvensis*; *Stigmus Troglydytes*\*; *Pemphredon lugubris*\*, *unicolor*; *Crabro 4-maculatus, palmipes, elongatulus*\*, *bidens*\*, (Haliday); *Rhopalum tibiale*\*, *rufiventre*\*; *Oxybellus uniglumis*. Of *Crabro bidens*, I subjoin the following description:—

Cra. *bidens*. Mas. *Niger, nitidissimus*; *capite, thoraceque pubescentibus, ocellis in triangulum æquilatus positis, clypeus utrinque mucronato, abdomine latitudine et longitudine thoracis*.

Statura et magnitudo *Cr. Leucostomæ* caput robustum, supra subquadratum, fusco pubescens, facie ut in reliquis argentea: antennæ breviusculæ, haut ciliatæ; metathorax breviter rotundatus, lævis sulculo medio longitudinali, scutello (cordiformi) indistincto; abdomen fere latitudine thoracis et vix longius, nitidissimum, apice flavescenti-pellucido; pedes graciles coxis haud lanatis, metatarso antico lineari recto, calcaribus posticis dilutius fuscis.

Taken on the sand-hills, Bay of Dundrum; August.

A. H. HALIDAY.

53. *Observations respecting the Genus Castnia*, (Vid. ante, p. 309.)—SIR, When I alluded to the fact that *Castnia* sits with its wings deflexed, I was not aware that Mr. Swainson

had recorded it in his "Zoological Illustrations," or I should have alluded to him with all the respect due to one of no little knowledge in entomology, and who is justly regarded on the continent as the first ornithologist of Great Britain. I may just say, that I have more than once seen *Castnia* sitting with its wings deflexed, and that I hope ere long to see it again, if any are yet to be found in a land far dearer to me

" ——— in its darkness and showers,  
Than the rest of the world in its sunniest hours."

I am, Sir,

THE ANONYMOUS REVIEWER OF SPHINX V.

— Hall, April 15, 1833.

54. *Observations on Mr Newman's Osteology*, (Vid. ante, p. 409.)—SIR, It was my wish to have made an observation or two on Mr. Westwood's article (XLI.); but, as I may give offence, I shall confine myself to Mr. Newman's Osteology. I know not how Mr. Newman can have made so great a mistake, as to state that the anterior wings, or *pseudelytra*, in *Strepsiptera*, were attached to the *prothorax*; such certainly was the opinion of Mr. Kirby and of M. Latreille, but I had the good fortune to clear up the doubt by dissection, and in the three genera I have published, it is distinctly stated in the letter-press, that they are attached to the *mesothorax*; Mr. Newman has unfortunately referred to my genera *Elenchus* and *Halictophagus*, and I had not sufficient materials to illustrate those interesting genera so fully as might have been wished; but if Mr. Newman will do me the favour to refer to the genus *Stylops*, which I engraved myself that it might be accurate, and published in August 1828, he will see the different parts of the insect separated, and placed in their relative positions; and at figures D. 9. and K. 9. the *pseudelytra* are represented attached to the *mesothorax*. This being the only insect of the order I have had an opportunity of fairly investigating, any trifling errors in the other two genera must be attributed to the want of materials for examination; and I have stated in my remarks upon *Halictophagus* (folio 433<sup>b</sup>), alluding to the situation of the *pseudelytra*, "they are so placed that, without dissecting the *Stylops*, it would be utterly impossible to ascertain to what part they were attached."

I am, Sir, yours, &c.

JOHN CURTIS.

Upper Charlotte Street, 23d of August, 1833.

55. *Insensibility in Insects.* (Vide ante p. 105.)—SIR, A word with reference to Mr. Bird's interesting paper on the sensations of insects. On the 5th of July last, while resting from the heat and fatigue of the morning in the midst of the fens near Whittlesea Mere, I caught a dragon-fly, (*Æschna maculatissima*, Lat.), which was temporarily reposing on a blade of grass near me, and I was induced to try an experiment with it in regard to its sense of feeling. I held the insect by the wings, and then directed its tail to its mouth, anticipating, from the pre-eminent voracity of these insects, it would at least attempt to bite itself; but, to my astonishment, it not only seized upon its caudal appendages, but actually bit off a portion, which it swallowed, and proceeded gradually to consume its body until the four terminal segments thereof were completely eaten up!—by accident the insect then escaped, and fled away as briskly as ever! Does not this experiment obviously show that the sense of feeling in insects, (if it exist at all,) must be extremely obtuse?

J. F. STEPHENS.

56. *Portrait of Lord Brougham.*—On the reverse, as a medalist would say, of *Hipparchia Janira*, is to be traced a very tolerably defined profile, in some specimens no very bad likeness, of the Lord Chancellor Brougham. If this curious feature in a very common butterfly has not before been noticed, which I believe to be the case, perhaps it may be admitted as a "Variety" in a corner of the Entomological.

I am, respectfully,

TYRENSIS.

Lark-hall Lane, Clapham,  
Aug. 12, 1833.

57. *Public Entomological Collection.*—SIR, May I venture a suggestion, which perhaps may appear futile or impracticable? In justice to those who undertake the elucidation of some extensive branch of entomology, or the more arduous labour of a *Fauna*, as one of the irregulars of the camp, I feel it imperative on us, if we do nothing in clearing, at least not to contribute towards encumbering the Augean stable. Were there any public collection in which the describers of new genera and species might deposit examples, labelled with the names, adding to their lucubrations a reference to such cabinet,

or enumerating in the Entomological Magazine the deposits made; it would, I imagine, prove a facility to future inquirers, at least with regard to such species as are not rare, and therefore of most importance. I doubt not that the possessors, even of unique specimens, although they may be unwilling to transfer them to other private collections with equal risk of dispersion, would in many cases cheerfully yield them for the sake of more permanent utility. In order to put this idea into practice, it would be necessary to find some depôt where such would obtain room, and be generally accessible; and being unacquainted with the state and economy of the musea of the metropolis, I do not know if these requisites could be fulfilled.

Yours, &c. A. H. HALIDAY.

[The establishment of the Entomological Society exactly supplies the *desideratum*; if it will be any convenience to our correspondents to transmit through our hands any contributions to the general collection now forming by the Society, we shall feel gratified in obliging both the donors and the Society.—ED.]

58. *Rather remarkable Beehive.*—For some years past a swarm of bees has been observed about the chimney of the Robin Hood public-house in Bedford; on removing some bricks from a cavity or dumb chimney yesterday se'nnight, three regular tiers of combs were found, from which was extracted between thirty and forty pounds of honey. It is calculated that this industrious fraternity has sojourned in this singular retreat for the last eleven years.—*Northampton Mercury.*

59. *Moths swallowed alive.*—I was surprised the other evening on looking at a *Caprimulgus*, which my brother had shot in the forest, to see a moth come out of its mouth, perfectly alive, and fly away: and, what is still more remarkable, on opening the crop the next morning, it contained several other moths, all *Noctuïtes*, which had lived all night in this strange prison, and when thus released, ran about the table fluttering their wings.

EDWARD DOUBLEDAY.

60. *Wire-worm.*—SIR, I take the liberty of inclosing you a couple of what I believe are wireworms, and which are commonly called so in this neighbourhood. Whatever they may

be, their ravages for many years have been very considerable. Wheat and potatoes are the great objects of their attack: wheat is cut through towards the crown of the root; the potatoes are not sensibly affected in their growth, but when dry in the autumn are found to be much hollowed. Grass-land I have never seen injured here by any grub; we have no old meadow; our general system is the convertible husbandry,—three years ley, and then two or three course crops. The ravages of these grubs are partial; some fields are laid waste, while others, within a quarter of a mile, remain perfectly free from them; again, they continue for some years in one place, and then disappear.

J. P— BOSKENNA.

61. *Wireworm?* — Another grub closely resembling the enclosed, but in reality different, is found amongst the wireworms; but I cannot at this moment procure a specimen: these grubs appeared in a ley field which had been pared by a breast-plough in February last. On moving the paring about six weeks afterwards, in order to burn it, the grubs were found collected in great numbers immediately under; the opportunity of destroying them was not lost, but several still appeared in ploughing the ground. My principal object in addressing you is to inquire, whether any effectual and economical method is known of stopping the progress of this ravager?

J. P— BOSKENNA.

62. *Turnip-fly.*—In common with other parts of the country, we suffer severely from the turnip-fly (*Haltica Nemorum*.) They are discovered easily enough in the turnip-grounds, but unhappily we are not acquainted with any means of checking them, with the exception of elder-bushes; and these, however, are very inefficient remedies for the evil.

J. P— BOSKENNA.

[The writer of these remarks and queries particularly enjoins non-publication; we should however consider ourselves unpardonable in withholding them. We hope our correspondent will furnish us with a sheet-full of such notes for every number;—he will not only elicit information from others, but he is himself giving information. We should prefer publishing his name, but will not insist on that.—ED.]

63. *Inquiry respecting Ants.*—SIR, I shall feel obliged by your asking, as an anonymous query in your valuable magazine, whether any mode of destroying ants in gardens is known.

G. T.

Bristol.

64. *Genus Altica.*—SIR, Allow me to comment on the mode of spelling *Haltica*, adopted by yourself at p. 364. It certainly should be *Haltica*, if it means “given to jumping,”—*άλτικα*, the original word, having the aspirate corresponding to our *h*.

C. S. BIRD.

Burghfield, 2d July, 1833.

[We feel obliged to the Rev. Mr. Bird for this criticism, which is classically a correct, scientifically and technically an erroneous one: there are many generic names to which we should be glad to apply the laws of elegance, euphony, &c.—but we must bow to custom. Mr. Bird, perhaps, may not be aware, that *Altica*, not *Haltica*, is the original name;—it strikes us, at this moment, that he may have supposed us guilty of an innovation of which we had no idea.—ED.]

65. *Entomological Society.*—SIR, In the account that you gave us at p. 390 of the formation of the Entomological Society of London, you state that all the entomologists whose addresses could be obtained received notices that such was to take place:—now, Sir, I must beg you will contradict that statement; for there are four practical entomologists with whom I am acquainted, as well as myself, that received no such notice, whose addresses were well known. You will oblige many of your entomological readers by giving publicity to this; for, to them, it does appear there has been great neglect, or party feeling has actuated some of the officers.

J. CHANT.

3, Critchell Place, New North Road,  
August, 1833.

[We have received many other letters on this subject, some abusive ones, and all but Mr. Chant's nameless. Mr. Chant is quite right and justified in taking up the matter in the open, manly, and spirited manner which he has done; and we willingly retract our assertion, that invitations were sent “to all



entomologists whose addresses could be obtained:" such ought to have been the case; and we presumed too readily that it was so;—but we must add our firm conviction, that there was no other reason for the omission, so justly complained of, than the neglect of the parties by whom the task was undertaken; the *onus* is not with the Society, or any of its officers,—for let us call to Mr. Chant's recollection, that the Entomological Society dates its existence from the day on which the meeting we gave an account of was held at the Thatched House;—at *that meeting* the officers were appointed;—before *that meeting*, therefore, there could be no officers; and whatever party feeling was exhibited previously is not chargeable on the officers then appointed;—*we know of no such feeling*;—and, did it exist, there is no more effectual way of *annihilating* it than for all honest and independent men, like Mr. Chant, to join the Society instantly; and, by a majority of votes, stultify all attempts at illiberal measures, supposing that any should be proposed. We appeal to Mr. Chant's good sense, whether he ought to say "party feeling has actuated some of the officers," when he confessedly refers to what took place before those officers were even thought of. We hope to see Mr. Chant and his four friends, at eight o'clock on the first Monday in November, enter *all* their names, as original members, at 17, Old Bond Street; and we hope we may meet them, and all other right-spirited entomologists, on the first Monday of every succeeding month, for many, many years.—ED.]

66. *Observations on Varieties.* — SIR, Every entomologist resident in the country, who consequently has not the privilege of inspecting, any day, the unrivalled cabinet of Mr. Stephens, or some other of the larger metropolitan collections, must frequently be at a loss to satisfy himself whether any variety of the species of an insect differing much from the type, especially amongst the *Noctuidæ* and subsequent families of the *Lepidoptera*, is in reality a mere variety, or an undescribed species. On the other hand, the London entomologists, from the nice distinctions which the number of species they possess enables them to draw, are too ready to consider such varieties as distinct species, especially if the insect is not found near town; and few specimens have got into their cabinets. I need not here allude to the numerous supposed species of the

genus *Agrotis*, which Mr. Haworth describes, and which have now been satisfactorily reunited, but would only refer to one or two recent instances. *Polia Chi* is stated to be almost peculiar to the more northern parts of this island; and, I presume, most of the specimens found in the London cabinets have been collected in Derbyshire and Yorkshire. The great uniformity in the general colouring of these specimens would almost induce one to suppose they had been taken by only a few collectors. It was not therefore much to be wondered at, that Mr. Curtis should have pronounced one of the dark varieties a new species, nor that Mr. Stephens, having never seen the collecting links, should subsequently have described a similar variety received from Edinburgh, under the name of *P. olivacea*. Near Newcastle the insect is rather common, and occurs of every shade, from the hoary tinge of what is described as the typical variety in Mr. Stephens' Illustrations, or even from an almost pure white, to the olive-green of his *P. olivacea*. The diversity of colouring in an extensive series is really beautiful; for, besides meeting with specimens of both sexes, having all the wings dark-coloured, or dark anterior and light posterior, and *vice-versâ*, or all light coloured, some are scattered over with fulvous spots, like *P. dysodea*, whilst, in others, the strong black markings form a striking contrast with the hoary tints of the wing. In fact, scarcely two specimens are precisely similar. It has generally been supposed that the *larva* of this moth feeds on the *Sonchi*, *Lactuceæ*, &c.:—but I am inclined to believe that its food is lichens. My reason is, that the perfect insect, when discovered in repose,<sup>a</sup> is always to be met with on walls overgrown with lichens; and every entomologist knows that moths in general, with the exception of the species whose larvæ feed on the *Cryptogamia* encrusting stones, or at least are presumed to do so as the *Bryophilæ*, *Alcis muraria*, *Aplocera cæsiata*, &c., dislike roosting on stones. Besides, I have taken specimens in such situations so very recent, that they could not have quitted the pupa state more than a few minutes previously. I regret that my attempts to rear the insect from the egg, or to discover the larvæ, have hitherto been unsuccessful.

<sup>a</sup> I never knew of more than a single example being taken on the wing, and that was in the immediate vicinity of the park-wall at Meldon, which is a very ancient one.

Like most other moths, *Polia Chi* may be found in the winged state for several weeks; and I consider its season as extending from the middle of August to the middle or latter end of October.

Mr. Curtis has, from a similar paucity of specimens, fallen into an error in describing as a new species *Chareas Hibernica*. His insect is only *C. graminis*, which is subject to considerable variation in the light or antler-shaped markings of the anterior wings. I was very much struck with the size of the specimen figured by Mr. Curtis; but he shewed me another of the usual variety, quite as large, captured by himself in Norfolk. Either the climate must have had great influence, or the particular *larvæ* from which the above were produced, must have been, *par excellence*, gourmands; for I never took a specimen hereabouts much exceeding 1 inch 1 line from tip to tip.

GEORGE WAILES.

67. *Economy of the Hive-Bee*.—SIR, The common Hive-Bee (*Apis mellifica*, Linn.) has long and deservedly been the theme of many writers on the wonders of the Insect world. The following observations relative to it may, perhaps, prove new and not altogether uninteresting. Against the south front of our house, in the vicinity of this town, several plants of the *Passiflora cærulea*<sup>b</sup> are trained, which cover it to the height of some twenty feet, or thereabouts; and, from July to November, the constant succession of its beautiful flowers attract great numbers of the Hive-Bee, especially during autumn, when flowers productive of much honey are scarce. Every one knows the passion-flower, and need hardly be told that one series of the rays of the nectary closely surrounds the stipes or shaft, whilst other two are beautifully spread over the horizontal leaves of the corolla; but, perhaps, few are aware that the tube of the calyx contains several drops of pure and delicious honey. On the arrival of each Bee, I can at once tell whether it has been a prior visitor or not, by its

<sup>b</sup> Though foreign to Entomology, I may mention that two years ago the plants perfected their fruit, both in the open air and greenhouse, being, as that eminent horticulturist and true lover of nature, Mr. Neill, of the Canon Mills, near Edinburgh, informed me the other day, the most northern spot where they had yet done so.

mode of procedure. Should it be a first visit, the little busy creature is for a time quite at a loss: it, of course, scents the honey, but cannot discover the entrance to the store-house. Convinced that there is plenty of the object of its search in the flower, the Bee hurries over the surface in all directions, now running its head fast between the corolla and the outer double series of the rays of the nectary, now entangling itself amongst the beautiful rays themselves, and anon mounting the stipes and ransacking the parts of fructification. At length, after a bustling scene, which frequently lasts for two or three minutes, and which the Bee's certainty that honey is concealed somewhere in the neighbourhood prevents its quitting in despair, sometimes apparently by mere chance, at others by running the scent home, its indefatigable labours are rewarded. Now, with its tongue inserted amongst the rays surrounding the shaft, and past the projecting rim which almost closes the entrance to the tube of the calyx, it drinks its fill, and flies off for the hive to deposit its treasure and profit by experience on a future trip. Far different is the manner of the Bee that has been at the work before; it wastes not a moment of the time, which the approach of winter renders doubly valuable, but at once alights on the flower, runs to its centre, and plunging its tongue into the liquid sweet, hurries back loaded to the hive.

Yours, &c.

GEORGE WAILES.

68. *Death of Mr. Haworth.*—Adrian Hardy Haworth, a Fellow of the Linnæan and Horticultural Societies of London, and author of *Lepidoptera Britannica*, and several Essays on various subjects connected with Zoology and Botany, died of *cholera*, on Saturday, the 24th of August, 1833, aged 66. The previous evening he had enjoyed his usual health. Mr. Haworth was sincerely and justly esteemed by a large portion of the scientific world.

69. *Discovery of Sphinx Nerii in England.*—SIR, Another addition has been made to our visiting *Sphingidæ*, by the capture of the splendid *Deilephila* (may I call it?) *Nerii*, at Dover, about ten days since. From the state of the specimen which I have this day examined it must have been very recently disclosed, the tips of its wings and the top of its head alone being slightly injured by its captor, a lady residing

in the above town. As this insect, in its larva state, feeds on an exotic plant, the *Nerium Oleander*, its appearance must be purely accidental: its geographical limits I believe terminating in the south of France. J. F. STEPHENS.

Sept. 16th, 1833.

70. *Longevity of Lepisma saccharina, and other Insects.*—SIR, Had not an unexpected occupation, incidently connected with entomology, unfortunately prevented me, I intended to have composed a short monograph upon some neglected group of insects, and to have forwarded it to you for your present volume; and my time being now fully engaged in preparing for the recommencement of my “Illustrations,”<sup>c</sup> still hinders me from carrying my design into execution: however, there is one subject to which I wish to direct attention, viz. the *longevity of insects*, and other annulose animals; my notice having been called thereto by the following occurrence. In June, 1831, I obtained a considerable number of the common “Wood-” or “Sugar-fish,” (*Lepisma saccharina*, L.), out of a box imported from India; these were packed away in pill-boxes in a place of safety for future investigation; but, as they belonged to a group of *annulosa*, to which my attention was but slightly devoted, they were suffered to remain untouched:—my surprise was great, when, in June last, [1833], in clearing my boxes for a projected excursion to Cambridge, &c., I found one of the *Lepismæ* alive and merry, after so protracted a confinement—about two years—in the box were only a few grains of magnesia, or the white powder employed by chemists in packing their pills. I this year kept a specimen of *Cloëon pallidum*—one of the reputed short-lived *Ephemeridæ*—alive from the 20th of May to the 9th of June. In February, 1832, I saw a living specimen of *Hæmaticherus Heros*, that was taken in the preceding August at Padua; a proof that insects belonging to the section *Longicornes*, Lat., occasionally survive the winter—a fact which I believe has hitherto been doubted.<sup>d</sup> I

<sup>c</sup> A number of which, Mr. Stephens informs us, will appear on the 31st of October.—ED.

<sup>d</sup> A *Saperda Carcharias*, which I bred on the 5th of July last, from a pupa that was given to me by my friend, J. A. Power, Esq., who dug it out of an aspen on the 30th of June preceding, in Bottisham Fen, died on the 24th of July following: of this insect more than 200 specimens have been taken this year.

have elsewhere mentioned the circumstance of a *Conocephalus*, now in my collection, which was caught in China, and brought alive to England, where it lived several weeks, having subsisted on tea during its captivity. *Cicadæ* and *Achetæ* have frequently been kept a long time in confinement, it is said on account of their chirping, which the natives, who thus keep them, are supposed to be very partial to; but no authentic record of the longevity of any particular individual specimen has been commemorated. The almost marvellous account by Mr. Marsham, in Vol. X. of the Linnæan Transactions, concerning a *Buprestis splendens*, which was cut out of the wood of a desk which had been upwards of thirty years in an office at Guildhall, London; and the history of a *Trogosita mauritonica*, by Mr. Kirkup, who kept it alive twenty-one months, as related in the Entomological Transactions, Vol. I. p. 329, with an additional note by my late lamented friend, A. H. Haworth, Esq., may be pointed out.

Yours, &c.

J. F. STEPHENS.

71. *Remarkable Capture of Butterflies.*—SIR, Perhaps the following notes of the capture of about half our British butterflies, in the course of a few days, and without any particular searching for them, may be interesting; if so, they are at your service.

*Papilio Machaon.* The larva in various stages of growth on 29th June, Sedge Fen, Camb., by W. Christy, Esq.; and 4th and 5th July at Whittlesea Mere.

*Gonepteryx Rhamni.* W. M. 4 and 5 July; M. W. 6 July; H. 11 July.

*Pontia Brassicæ,*  
*Rapæ,*  
*Napi.* } W. M. not abundant; in bad condition, remains  
of the spring brood.

*Mancipium Cardamines.* W. M. 4 July; H. 10 July.

*Pieris Cratægi.* W. M. and M. W. 4—6 July; in great plenty, but going off.

*Argynnis Aglaia.* W. M. 4 and 5 July; plentiful.

*Paphia.* M. W. 4—6 July; H. 10—13 July; D. 18 July.

*Vanessa C-album.* M. W. 5 and 6 July; three specimens.

*Io.* Ramsgate, 17 July; Coombe Wood, 28th; two specimens.



- Vanessa Urticæ.* W. M. 5 and 6 July; in great abundance.  
*Polychloros.* M. W. 4 July? H. 10 and 11 July; sparingly.  
*Atalanta.* Ramsgate, 17 July; one specimen only.
- Cynthia Cardui.* Madingley Wood, Cambs. 1 July; Devil's Ditch, 4 July.
- Apatura Iris.* M. W. 6 July; several; H. 11 and 12 July; just appearing. This insect was also taken at Caen Wood, Hampstead, in July.
- Hipparchia Semele.* D. 18 July; one specimen only.
- Ægeria.* M. W., &c. }  
*Megæra.* M. W., &c. } not very common.
- Galatea.* M. W., 4 July; W. M. 5 and 6 July; H. 10—13 July; D. 18 July; abundant in each locality.
- Janira,*  
*Tithonus,* } M. W., &c.; common: borders of woods  
*Hyperanthus.* } and meadows.
- Pamphilus.* H. 10—13 July; abundant.
- Thecla W-album.* Madingley Wood, 1 July; one specimen.
- Pruni.* M. W. 4—6 July; in plenty, but in shattered condition.
- Quercus.* H. 10—12 July; common.
- Lycæna Phlæas.* M. W. 4 July; H. 10 July; D. 18 July.
- Dispar.* W. M. 5 and 6 July; in plenty.
- Polyommatus Alsus.* Madingley Wood, 1 July; Dover, 18 July.
- Acis.* Madingley Wood, 1 July; not common.
- Arion.* M. W. 4 July. This insect I did not take myself; but, as I understand, a single and remarkably fine specimen was found by a labourer, and given to Mr. Strickland.
- Corydon.* Devil's Ditch, 4 July.
- Adonis.* D. 18 July; just appearing.
- Alexis.* M. W., &c.; common.
- Argus.* D. 18 July; common.
- Agestis.* D. 18 July; just appearing.
- Thymele Tages.* D. 18 July; just appearing.
- Pamphila Sylvanus.* M. W., &c.; common.
- Linea.* M. W., &c.; plentiful.

(Note. — W. M. Whittlesea Mere; M. W. Monk's Wood; H. Hertford; D. Dover.—*J. F. S.*)

Yours, &c.

J. F. STEPHENS.

Hermitage, South Lambeth,  
 Aug. 31, 1833.

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## LIST OF THE GENERA AND SPECIES

DESCRIBED IN THIS VOLUME.

ISOSOMA *Walk.*  
 atrum *Walk.*  
 longulum *Dal.*  
 fumipenne *Walk.*  
 crassicorne *Walk.*  
 simile *Walk.*  
 angustipenne *Walk.*  
 brevicorne *Walk.*  
 hyalipenne *Walk.*  
 longicorne *Walk.*  
 breve *Walk.*  
 minor *Walk.*  
 elongatum *Walk.*  
 petiolatum *Walk.*  
 cornutum *Walk.*  
 tenuicorne *Walk.*  
 pusillum *Walk.*  
 breviventre *Walk.*  
 angustatum *Walk.*  
 dissimile *Walk.*  
 fulvicolle *Walk.*  
 depressum *Walk.*  
 lineare *Walk.*  
 attenuatum *Walk.*  
 SYSTOLE *Walk.*  
 albipennis *Walk.*  
 EURYTOMA *Ill.*  
 verticillata *Fab.*  
 longipennis *Walk.*  
 Abrotani *Panz.*  
 apicalis *Walk.*  
 curta *Walk.*  
 collaris *Walk.*  
 nitida *Walk.*  
 gracilis *Walk.*  
 annulipes *Walk.*  
 minuta *Walk.*  
 rufipes *Walk.*  
 DECATOMA *Spin.*  
 Cooperi *Curt.*  
 biguttata *Swed.*  
 obscura *Walk.*  
 ininaculata *Walk.*  
 plana *Walk.*  
 mellea *Walk.*  
 variegata *Walk.*  
 minuta *Walk.*

unicolor *Walk.*  
 tenuicornis *Walk.*

ELAPHRUS *Fab.*  
 splendidus *Esch.*  
 Lapponicus *Gyll.*

BYRRHUS *Lin.*  
 Alpinus *Newm.*  
 COLYMBETES *Clair.*  
 Snowdonius *Newm.*

ÆGERIA *Fab.*  
 Apiformis *Lin.*  
 Bembeciformis *Hub.*  
 PYROPTERON *Newm.*  
 Chrysidiforme *De Vil.*  
 BEMBECCIA *Hub.*  
 Ichneumoniformis *Fab.*  
 SYNANTHEDON *Hub.*  
 Estriforme *Bork.*  
 TROCHILIUM *Scop.*  
 Tipuliforme *Lin.*  
 Muscæforme *V. T. V.*  
 Allantiforme *Newm.*  
 Sphegiforme *W. V.*  
 CONOPIA *Hub.*  
 Myopæformis *Bork.*  
 Formicæformis *Esp.*  
 Culiciformis *Lin.*  
 PARANTHRENE *Hub.*  
 Vespiformis *Lin.*

COLIAS *Fab.*  
 Electra *Lin.*

MEGASTIGMUS *Dal.*  
 transversus *Walk.*  
 dorsalis *Fab.*  
 PRIOMERUS *Walk.*  
 pachymerus *Walk.*  
 TORYMUS *Dal.*  
 caliginosus *Walk.*  
 CALLIMOME *Spin.*  
 regalis *Walk.*  
 cynipedis *Lin.*  
 Rorboris *Walk.*



## LIST OF THE GENERA AND SPECIES

quadricolor *Walk.*  
 Geranii *Curt.*  
 pretiosus *Walk.*  
 Bedeguaris *Lin.*  
 varians *Walk.*  
 formosus *Walk.*  
 scutellaris *Walk.*  
 Hederæ *Walk.*  
 Arundinis *Curt.*  
 macropterus *Walk.*  
 flavipes *Walk.*  
 Dauci *Curt.*  
 basalis *Walk.*  
 confinis *Walk.*  
 autumnalis *Walk.*  
 nitens *Walk.*  
 brevicauda *Walk.*  
 abdominalis *Walk.*  
 mutabilis *Walk.*  
 microstigma *Walk.*  
 chloromerus *Walk.*  
 latus *Walk.*  
 microcerus *Walk.*  
 æqualis *Walk.*  
 chlorinus *Walk.*  
 leptocerus *Walk.*  
 micropterus *Walk.*  
 bicolor *Walk.*  
 leucopterus *Walk.*  
 viridi-æneus *Walk.*  
 curtus *Walk.*  
 meridionalis *Walk.*  
 Euphorbiæ *Walk.*  
 Capræ *Walk.*  
 terminalis *Walk.*  
 inconspicuum *Walk.*  
 mæstum *Walk.*  
 apicalis *Walk.*  
 affinis *Fons.*  
 littoralis *Walk.*  
 tarsalis *Walk.*  
 arvernicus *Walk.*  
 notatus *Walk.*  
 nigratarsus *Walk.*  
 straminei-tarsus *Walk.*  
 attenuatus *Walk.*  
 lætus *Walk.*  
 versicolor *Walk.*  
 fuscipennis *Walk.*  
 minutus *Walk.*  
 gracilis *Walk.*  
 posticus *Walk.*  
 exilis *Walk.*  
 fuscicornis *Walk.*  
 nitidulus *Walk.*  
 ater *Walk.*  
 pubescens *Walk.*  
 stigma *Fab.*  
 ORMYRUS *West.*  
 punctiger *West.*  
 nigro-cyaneus *Walk.*

PERILAMPUS *Lat.*  
 pallipes *Curt.*  
 nigricornis *Newm.*  
 Italicus *Fab.*  
 aureo-viridis *Step.*  
 auriceps *Step.*  
 femoralis *Step.*

---

CULEX  
 detritus *Hal.*  
 CERATOPOGON  
 distinctus *Hal.*  
 brachialis *Hal.*  
 gracilis *Hal.*  
 ULA *Hal.*  
 mollissima *Hal.*  
 LIMNOBIA  
 decora *Hal.*  
 senilis *Hal.*  
 demissa *Hal.*  
 pavidia *Hal.*  
 DICRANOMYIA  
 oscillans *Hal.*  
 GERANOMYIA *Hal.*  
 unicolor *Hal.*  
 TIPULA *Lin.*  
 dispar *Hal.*  
 SCIOPHILA  
 pictipennis *Hal.*  
 ANARETE *Hal.*  
 candidata *Hal.*  
 CATOCHA *Hal.*  
 latipes *Hal.*  
 SCATOPSE  
 infumata *Hal.*  
 BIBIO  
 nigriventris *Hal.*  
 hybridus *Hal.*  
 CYRTOMA  
 melæna *Hal.*  
 TRICHINA  
 elongata *Hal.*  
 HILARA  
 matrona *Hal.*  
 HEMERODROMIA  
 melanocephala *Hal.*  
 HELEODROMIA *Hal.*  
 immaculata *Hal.*  
 bipunctata *Hal.*  
 stagnalis *Hal.*  
 fontinalis *Hal.*  
 LEPTOSCELES *Hal.*  
 guttata *Hal.*  
 irrorata *Fall.*  
 exoleta *Hal.*  
 TACHYPEZA  
 arenaria *Hal.*  
 graminum *Hal.*  
 umbrarum *Hal.*  
 PIPUNCULUS  
 modestus *Hal.*  
 exiguus *Hal.*

## SPANIA

Fallenii *Hal.*

## MEDETERUS

alpinus *Hal.*

## DOLICHOPUS

jucundus *Hal.*plumipes *Hal.*litoreus *Hal.*rupestris *Hal.*campestris *Hal.*patellatus *Hal.*

## PIPIZA

interrupta *Hal.*

## MUSCA

Chloris *Hal.*degener *Hal.*macellaria *Hal.*

## LISPE

adscita *Hal.*SCHOENOMYZA *Hal.*

## DRYOMYZA

mollis *Hal.*

## COELOPA

gravis *Hal.*simplex *Hal.*parvula *Hal.*sciomyzina *Hal.*

## TETANOCERA

vittata *Hal.*

## PIOPHILA

luteata *Hal.*

## PANDORA

basalis, *Hal.*

## SEPSIS

putris *Hal.?*superba *Hal.*minor *Hal.*

## TEPHRITIS

Plantaginis *Hal.*

## LAUXANIA

amica *Hal.*sordida *Hal.*PHYLLOMYZA *Hal.*

## HETERONEURA

spurca *Hal.*

## STEGANA

annulata *Hal.*

## CAMAROTA

aurifrons *Hal.*

## MERO MYZA

viridula *Hal.*

## CHLOROPS

lateralis *Hal.*fulvifrons *Hal.*agnata *Hal.*

## AGROMYZA

flavo-notata *Hal.*

## LEUCOPIS

obscura *Hal.*

## NOTIPHILA

madizans *Fall.?*

## DROSOPHILA

tristis *Fall.*ingrata *Hal.*melanogaster *Hal.*cameraria *Hal.*

## EPHYDRA

defecta *Hal.*pygmæa *Hal.*fossarum *Hal.*Hecate *Hal.*infecta *Hal.*micans *Hal.*sibilans *Hal.*æstuans *Hal.*paludum *Hal.*lutosa *Hal.*graminum *Hal.*compta *Hal.*interrupta *Hal.*cesta *Hal.*

## OPOMYZA

tremula *Hal.*asteia *Hal.*

## BORBORUS

hamatus *Hal.*nivalis *Hal.*Zosteræ *Hal.*fuscipennis *Hal.*vagans *Hal.*aterrimus *Hal.*

## PHORA

debilis *Hal.*similis *Hal.*galeata *Hal.*

## EUPETHECIA

nigropunctata *Chant.*HOLOPARAMECUS *Ct.*Depressus *Curt.*PARAMECOSOMA *Cur.*Bicolor *Curt.*LISSODEMA *Curt.*Heyana *Curt.*MACROCENTRUS *Cur.*Bicolor *Curt.*PLANCUS *Curt.*Apicalis *Curt.*SILO *Curt.*Flavipes *Curt.*RHIZOLITHA *Curt.*LAMPETIA *Curt.*HOMŒOSOMA *Curt.*Gemina *Curt.*DASYSTOMA *Curt.*Salicella *Hub.*CHEIMAPHASIA *Curt.*Gelatella *Lin.*EDERESA *Curt.*Semitestacella *Curt.*CHRYSOCORIS *Curt.*Angustipenella *Guide.*

## LIST OF THE GENERA AND SPECIES

EUPTERYX *Curt.**Hortensis Curt.*AMBLYCEPHALUS *Ct.**Germari Curt.*AGALLIA *Curt.**Consobrina Curt.*MEGOPHTHALMUS *C.**Bipunctatus Curt.*PHRYNOMORPHUS *C.**Nitidus Curt.*APHRODES *Curt.**Testudo Curt.*CRIOMORPHUS *Curt.**Albo-marginatus Curt.*GALEATUS *Curt.**Spinifrons Fall.*ASPIDOTOMA *Curt.**Capitata Wolff.*PANTILIUS *Curt.**Tunicatus Fab.*LORICULA *Curt.**Pselaphiformis Curt.*CHLAMYDATUS *Curt.**Marginatus Curt.*HEBRUS *Curt.**Pusilla Fall.*NOTIOPHILUS *Dum.**aquaticus Lin.**metallicus Wat.**nitidulus Wat.**parallelus Wat.**Davisii Wat.**Newmanni Wat.**tibialis Step.**brevis Wat.**latior Wat.**pusillus Wat.**parvulus Wat.**rufipes Kug.**striatus Wat.**latus Wat.**nitidus Wat.**biguttatus Fab.**substriatus Wat.**Quadripunctatus Dej.*SEPSIS *Fall.**cynipsea Lin.**fulgens Hoff.**hilaris Mei.**flavimana Mei.**maculipes Walk.**concinna Walk.**ruficornis Mei.**nigripes Mei.**violacea Mei.**punctum Fab.**ornata Mei.*NEMOPODA *Desv.**cylindrica Fab.**stercoraria Desv.**nigricornis Mei.**tarsalis Walk.**fumipennis Walk.*ENICOPUS *Walk.**annulipes Mei.*THEMIRA *Desv.**putris Lin.**pilosa Desv.**minor Hal.**Leachi Mei.*SALTELLA *Desv.**nigripes Desv.*HELOBIA *Leach.**lata Newm.**varicornis Newm.**impresa Newm.*LEISTUS *Fröl.**nigricans Newm.**Janus Newm.**indentatus Newm.*CALATHUS *Bon.**apicalis Newm.*ACANTHOSOMA *Curt.**picta Newm.*AMPHIBOLUS *Wat.**atricapillus Wat.*HYDRENA *Kug.**riparia Kug.**pulchella Müll.**concolor Wat.**nigropicea Wat.**melanocephala Wat.**testacea Curt.**nigrita Müll.**pygmæa Wat.**minutissima Step.**gracilis Müll.*SPALANGIA *Lat.**hirta Hal.**nigra Lat.*LÆSTHIA *Hal.**vespertina Hal.*PIRENE *Hal.**varicornis Hal.**chalybia Hal.**eximia Hal.**graminea Hal.*OMPHALE *Hal.**salicis Hal.*CALLEPTILES *Hal.**latipennis Hal.*OOCOTONUS *Hal.**insignis Hal.**vulgatus Hal.**hemipterus Hal.**litoralis Hal.**pictus Hal.*LITUS *Hal.**cynipseus Hal.**dimidiatus Hal.*

ANAPHES *Hal.*  
 fuscipennis *Hal.*  
 ANAGRUS *Hal.*  
 atomus *Lin.*  
 incarnatus *Hal.*  
 ustulatus *Hal.*  
 POLYNEMA *Hal.*  
 ovulorum *Lin.*  
 pusillus *Hal.*  
 fuscipes *Hal.*  
 atratus *Hal.*  
 euchariformis *Hal.*  
 MYMAR *Hal.*  
 pulchellus *Hal.*  
 EUSTOCHUS *Hal.*  
 atripennis

CRATOMUS *Dalm.*  
 megacephalus *Fab.*  
 nigripes *Step.*  
 EPIMACRUS *Walk.*  
 rufus *Walk.*  
 SYNTOMOPUS *Walk.*  
 thoracicus *Walk.*  
 incurvus *Walk.*  
 DIPARA *Walk.*  
 petiolata *Walk.*  
 PSILOCERA *Walk.*  
 obscura *Walk.*  
 PROSODES *Walk.*  
 ater *Walk.*  
 MERISMUS *Walk.*  
 aculeatus *Walk.*  
 fronto *Walk.*  
 flavicornis *Walk.*  
 megapterus *Walk.*  
 clavicornis *Walk.*  
 rufipes *Walk.*  
 TOXEUMA *Walk.*  
 fuscicornis *Walk.*  
 Ericæ *Walk.*  
 CORUNA *Walk.*  
 clavata *Walk.*  
 PACHYNEURON *Walk.*  
 formosum *Walk.*  
 CYRTOGASTER *Walk.*  
 vulgaris *Walk.*  
 Scotica *Walk.*  
 thoracica *Walk.*  
 pusilla *Walk.*  
 clavicornis *Walk.*  
 obscurus *Walk.*  
 rufipes *Walk.*  
 tenuis *Walk.*  
 cingulipes *Walk.*

NYSSIA *Goda.*  
 Tau-aria *Newm.*  
 SIREX *Lin.*  
 nigricornis *Fab.*  
 ISOGENUS *Newm.*  
 nubecula *Newm.*

LIBELLULA *Lin.*  
 prænubila *Newm.*

DICYCLUS *Walk.*  
 æneus *Walk.*  
 fuscicornis *Walk.*  
 tristis *Walk.*  
 brevicornis *Walk.*  
 PACHYLARTHURUS *W.*  
 Smaragdinus *Curt.*  
 flavicornis *Hal.*  
 patellanus *Dal.*  
 MISCOGASTER *Walk.*  
 gibba *Walk.*  
 elegans *Walk.*  
 rufipes *Walk.*  
 maculata *Walk.*  
 fuscipennis *Walk.*  
 notata *Walk.*  
 obscura *Walk.*  
 fuscipes *Walk.*  
 obscuripennis *Walk.*  
 antennata *Walk.*  
 maculipes *Walk.*  
 hortensis *Walk.*  
 lucida *Walk.*  
 diffinis *Walk.*  
 chrysochlora *Walk.*  
 annularis *Walk.*  
 viridis *Walk.*  
 annulipes *Walk.*  
 Scotica *Walk.*  
 ænea *Walk.*  
 tarsalis *Walk.*  
 nitidipes *Walk.*  
 brevisventris *Walk.*  
 lugubris *Walk.*  
 tenuicornis *Walk.*  
 ovata *Walk.*  
 nitida *Walk.*  
 cinctipes *Walk.*  
 nigro-ænea *Walk.*  
 convexa *Walk.*  
 apicalis *Walk.*  
 tumida *Walk.*  
 tristis *Walk.*  
 dissimilis *Walk.*  
 semiaurata *Walk.*  
 costalis *Walk.*  
 philochortoides *Walk.*  
 cyanea *Walk.*  
 brevis *Walk.*  
 contigua *Walk.*  
 linearis *Walk.*  
 filicornis *Walk.*  
 femorata *Walk.*  
 MICROMELUS *Walk.*  
 rufo maculatus *Walk.*  
 pyrrogaster *Hal.*  
 ISOCYRTUS *Walk.*  
 lætus *Walk.*

LIST OF THE GENERA AND SPECIES.

SPANIOPUS *Walk.*  
 dissimilis *Walk.*

APHIDIUS  
 PRAON *Hal.*  
 dorsalis *Hal.*  
 exoletus *Ess.*  
 volucris *Hal.*  
 flavinodis *Hal.*  
 abjectus *Hal.*  
 APHIDIUS  
 EPHEDRUS *Hal.*  
 validus *Hal.*  
 plagiator *Berl. Mag.*  
 lacertosus *Hal.*  
 APHIDIUS  
 TRIONYX *Hal.*  
 deltiger *Hal.*  
 APHIDIUS  
 MONOCTONUS *Hal.*  
 nervosus *Hal.*  
 Caricis *Hal.*  
 APHIDIUS  
 TRIONYS *Hal.*  
 auctus *Hal.*  
 pallidus *Hal.*  
 Angelicæ *Hal.*  
 Centaureæ *Hal.*  
 Aceris *Hal.*  
 Heraclei *Hal.*  
 letifer *Hal.*

minutus *Hal.*  
 brevicornis *Hal.*

TEPHRITIS *Latr.*  
 Alciphron *Newm.*  
 Theora *Newm.*  
 Alethe *Newm.*  
 Hebe *Newm.*  
 TRIXA *Meig.*  
 scutellata *Newm.*  
 CATOPS *Payk.*  
 nubifer *Newm.*  
 frater *Newm.*  
 soror *Newm.*  
 BYRRHUS *Lin.*  
 rufiventer *Newm.*  
 PHYLLOPERTHA *Kir.*  
 suturalis *Newm.*  
 ATHOUS *Esch.*  
 Campyloides *Newm.*  
 CYLINDERA *Newm.*  
 pallida *Newm.*  
 TRITOMACRUS *Newm.*  
 testaceus *Newm.*  
 SYMPETRUM *Newm.*  
 Scoticum *Lea.*  
 rufo-stigma *Newm.*  
 vulgatum *Lin.*  
 basale *Step.*  
 flaveolatum *Lin.*  
 CRABRO  
 bidens *Hal.*

END OF VOL. I.

## ERRATA.

---

- Page 7, line 30, *for anterior read posterior.*  
12, — 3 *from bottom, for scutellum read scutum.*  
— — 2 *from bottom, for scutum read scutellum.*  
38, — 19, *for Escli read Esch.*  
— — 23, *for 139, read 130.*  
39, — 2, *for has read have.*  
63, — 16, *for Epistoma read Episterna.*  
106, — 14, *for shun read shew.*  
110, — 11 *from bottom, for be read are.*  
— — 4 *from bottom, for began read begun.*  
151, — 6 *from bottom, for hedges read sedges.*  
161, — 16, *for irrorata read guttata.*  
170, — 2 *from bottom, after approximate insert :*  
176, — 6, *for sides read grey colour of the sides.*  
220, — 2 *of note, for compilations read compilation.*  
261, — 7, *before 4-articulati insert ad summum.*  
262, — 21, *add as a synonym, Microdus obscurator, N.*  
— — 23, *before 5-articulati insert ad summum.*  
— — 25, *for Adelius read Acælius.*  
— — 26, *for radicales read radiales.*  
263, — 8, *read A. Os breve. MICRODUS.*  
— — 12, *read B. Os rostriforme. AGATHIS. Ag. malvacearum, Lat.*  
— — 13, 14, 15, 16, *erase entirely.*  
— — 26, *read CYANOPTERUS. Bracon flavator, F.*  
*Br. denigrator, E. B.*  
264 — 24 and 26 *erase the words in parentheses.*  
265 — *erase the last three lines.*  
271 — 21, *for 11-articulatæ read 12-articulatæ.*  
274 — 2, *for 12-articulatæ read 13-articulatæ.*  
275 — 21, *for 14-articulatæ read 13-articulatæ.*  
389 — 6 *from bottom, for La Lepède read La Cepède.*  
417 — 10, 9, and 8, *from bottom, dele, being erroneous.*  
Several other mistakes occur, most of them too obvious to need correction.
- 

## DIRECTIONS TO BINDER FOR PLACING THE PLATES.

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THE  
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MAGAZINE.

VOL. II.



SINE ME DARE LUMINA TERRIS.

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M DCCC XXXIV.

“ Truth must be sought with a pure and simple heart ; it is only to be found in nature, and it should be communicated only to good men.”

CHATEAUBRIAND.

“ The philosopher has conferred on the moralist an obligation of surpassing weight. In unveiling to him the living miracles which teem in rich exuberance around the minutest atom, as well as throughout the largest masses of ever-active matter, he has placed before him resistless evidence of immeasurable design.”

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## EXPLANATION OF THE PLATES.

### PLATE V.—See ART. VI.

- Fig. 1. Skull of *Hydrous piceus*, upper side.  
 2. Ditto ditto, lower side.  
 3. Head of ditto.  
 4. Mandible of ditto.  
 5. Maxilla of ditto.  
 6. Labium of ditto.  
 7. Antennæ of ditto.  
 8. Labrum of ditto.  
 9. Maxilla of *Melolontha vulgaris*.  
 10. Ditto *Acilius sulcatus*.  
 11. Ditto *Cychrus rostratus*.  
 12. Ditto *Acheta domestica*.  
 13. Ditto *Perla bicandata*.  
 14. Ditto *Trichiosoma lucorum*.  
 15. Skull of *Æschna maculatissima*.  
 16. Ditto *Vespa Crabro*.

### PLATE VI.—See ART. VI.

- Fig. 1. Labrum and mandibles of *Amaryssus Machaon*, (from Savigny.)  
 2. Ditto ditto *Vanessa Cardui*, (from ditto.)  
 3. Ditto ditto *Pontia Daplidice*, (from ditto.)  
 4. Ditto ditto *Zygæna Scabiosæ*, (from ditto.)  
 5. Head of *Crambus cannarum*, (from ditto.)  
 6. Maxilla of *Zygæna Scabiosæ*, (from ditto.)  
 7. Ditto *Crambus cannarum*, (from ditto.)  
 8. Ditto *Pontia Daplidice*, (from ditto.)  
 9. Labium of *Crambus cannarum*, (from ditto.)  
 10. Head of a *Pyralis* from North America.  
 11. Skull of a *Bombus*, under side.  
 12. Mouth of *Tabanus bovinus*.

### PLATE VII.—See ART. XVI.

- Fig. 1. *Rbipipteryx Marginatas*.  
 2. Mouth of ditto.  
 3. Skull of ditto.  
 4. Hind-leg of ditto.  
 5. Fore-leg of ditto.  
 6. Telum, &c., of ditto.  
 7. Antenna of ditto.

### LETTERS IN PLATES V. VI. and VII.

Æ. Epicranium.  
 æ. Clypeus.  
 œ. Ocelli.  
 Æ. Gula.  
 œ. Mentum.  
 Œ. Oculi.  
 y. Antenna.  
 j. Mouth.  
 a. Labrum.  
 e. Lingua.  
 i. Mandible.  
 o. Maxilla.

o. 1. Insertio of Maxilla.  
 o. 2. Maxilla proper.  
 o. 3. Palpifer of Maxilla.  
 o. 4. Lacina of ditto.  
 ö. Galea.  
 ô. Maxipalpus.  
 u. Labium.  
 u. 1. Insertio of Labium.  
 u. 2. Labium proper.  
 u. 3. Palpiger of Labium.  
 u. 4. Ligula.  
 ũ. Labipalpus.

### PLATES VIII. and IX.—See ART. XXXIV.

PLATE VIII. *Deilephila Euphorbiæ*.

Middle figure, male; lower figure, female; upper figure, under side.

PLATE IX. *Deilephila Euphorbiæ*.

Eggs; *Euphorbia Paralias*, with newly-hatched larvæ; larva 5 weeks old, uncoloured; full-grown larva; pupa.

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*List of Subscribers for Five Copies of this Volume, to whom we return our most sincere thanks.*

W. BENNETT.  
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## INTRODUCTION.

---

IN presenting the Second Volume of our Magazine to the public, we feel ourselves called upon to express our gratitude for the liberal support which it owes to our Subscribers, and for the valuable contributions with which they have enriched it.

We are particularly indebted to Mr. Ingall and Mr. Raddon: the former engraves gratuitously for the Magazine, and the latter has presented us this year with two beautiful plates illustrating *Deilephila Euphorbiæ*.

We are delighted to observe the increasing regard for the study of insects, which is sufficiently manifested by the Entomological Societies both at home and abroad. The Entomological Society of London, warmly advocated in its progress by this Magazine, has arrived at a degree of prosperity never previously attained by an Entomological Society in this country, although so many have been formed. The first part of the Transactions of this Society has already been published in a neat and compendious form, embellished with seven copper-plate engravings, and is a work well worthy the attention of entomologists. The Entomological Society of France, contemporaneous with that in which this Magazine originated, has continued publishing quarterly numbers, keeping pace with our own, and containing papers of great and rare merit.

We trust that we have maintained the promises given in the Introduction to our First Volume. We have alternated our scientific essays with many of a popular character, or of public utility. Our pages are free from party feeling; and in our judgments we have been regardless of the approbation or displeasure of others.

Both the periodical publications on British Entomology so often commended in our pages are continued with regularity and with wonted utility and beauty. We recommend Mr. Swainson's "Discourse on the Study of Natural History" (lately published in "Lardner's Cyclopædia") to the attention of entomologists; it is well worthy their perusal. Among the entomological works announced for publication, we may mention "A Grammar of Entomology," by Mr. Newman; a similar work proposed by Mr. G. R. Gray; a volume on Genera, by Mr. Westwood; "An Essay on the British Fossorial Hymenoptera," by Mr. Shuckhard; a second edition of Dr. Bevan's "Honey Bee;" and also of Mr. Samouelle's "Entomologist's Useful Compendium," &c. &c. On the continent, Leon Dufour's "Recherches sur les Hémiptères," and Pictet's admirable "Recherches sur les Phryganides," deserve our highest praise. Perty "On the Insects collected in Brazil by Spix and Martius;" Klug's "Symbolæ Physicæ, or an Account of the Insects collected in Northern Africa and Occidental Asia by Hemprich and Ehrenberg;" and the Atlas to the "Voyage de la Coquille," are all splendidly illustrated folio works. Professor Gravenhorst, so justly celebrated for his "Ichneumonologia Europæa," is about to publish descriptions of the *Staphilinites*. Nees ab Essenbeck has issued a second edition of his "Ichneumones Adsciti." Lastly, some valuable observations on the *Tenthredinites* and the *Histeritites*, with characters of many genera and species before undescribed, will be found in Klug's work on the Insects in the Royal Museum at Berlin.

We may add, that the increased, and still increasing, circulation of the Entomological Magazine, renders its continuance a matter of certainty. It was not projected as a source of profit, nor has it hitherto yielded any; what little may accrue will be instantly expended in the colouring of plates, the engraving of wood-cuts, or any other manner that may be deemed acceptable to our Subscribers.



Fig 1



Fig 2



Fig 5



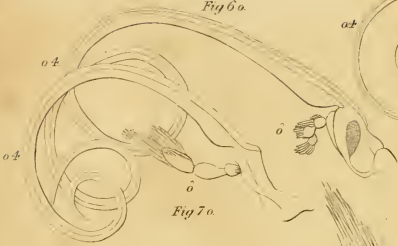
Fig 3



Fig 4



Fig 6 a.



o

Fig 8 o.

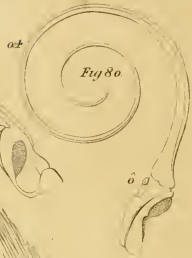


Fig 7 o.

Fig 9 u.

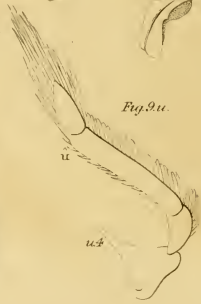


Fig 10

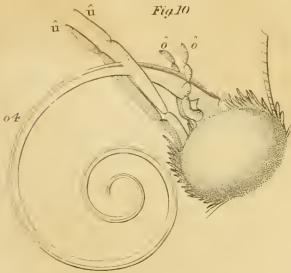


Fig 12

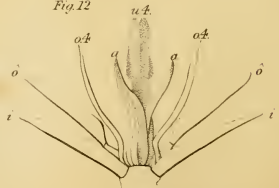


Fig 11.



THE  
ENTOMOLOGICAL MAGAZINE.

JANUARY, 1834.

ART. I.—*Colloquia Entomologica.*

Γνωθι σεαυτον.

SCENE—*The Parlour at the Bull Inn, Birch-wood-corner.*

VENATOR, AMBULATOR, ENTOMOPHILUS, and ERRO, seated  
at a round table.

[*Argument.*—They extol each other's contributions to the first volume of the Fire-fly: they bewail the opposition made to the Fire-fly: they hope for better times: the conversation turneth—they speak of the Entomological Society: the conversation turneth again—they speak of Rusticus, of Mr. Yarrell, of Dr. Grant, of Mr. Bell, of Mr. Kirby, of Dr. Leach, of Mr. MacLeay, of Mr. Curtis, of Mr. Charles Curtis, of Mr. Stephens: the conversation again turneth—they elect an Editor for the second volume of the Fire-fly: the retiring Editor chargeth the Editor-elect. *Corderius secundus.*]

VENATOR. I've been thinking——

ENTOMOPHILUS. I saw you were fatigued.

ERRO. He! he! that's too bad:—Moffy supposes no one has a right to think but himself.

AMBULATOR. Yes. I overheard Chrysis-cyanea congratulate him on having entered the field of thought, and ever since——

ERRO. Now that's a shame—nobody knows who I meant by Chrysis-cyanea.

VEN. Nobody does *not* know—if ever you let out who the triangle belongs to, you may expect a challenge from more than one.

ENT. What does the triangle mean, Am.?

AMB. His own initial, to be sure, D; sometimes he signs double D.

VEN. In exposures, and those kind of things, the D to be pronounced broad, as in the French.

ENT. Roey—*was* that you?

VEN. As sure as my name's ———.

ENT. Oh! very well, very well; I'll expose the fallacy of the triangle next number.

ERRO. It's all their nonsense! I should have been ashamed to have written it.

AMB. Never mind'em, Mr. Moffy, I intend to read Sphinx Vespiformis myself this winter; I have tried a dozen times, but I always fall asleep over it.

ERRO. It had rather that effect on me.

ENT. A proof of its value. I am sometimes rather restless in the night, and then I open the Magazine at Chalcy or Straus, and either sends me off like an opiate. I keep the Mag. by the bed-side for the purpose.

AMB. The medical properties of Clericus and double D, I should imagine, to be sudorific.

ERRO. And Osteology occasions cough, by sticking in the trachea:—but John Curtis has put an extinguisher on that.

ENT. The Osteology's nothing to me; one of ———'s writers say it isn't mine.

ERRO. What envious mortal has done that?

AMB. Who does he say wrote it, then?

ENT. Haliday.

VEN. Haliday! he'll very soon set that at rest; Haliday's one of the most honourable men I know.

ENT. I think he'll look queerish, when he sees all my rigmarole fathered upon him.

AMB. What shall you do?

ENT. Do! nothing! laugh and grow fat.

ERRO. I say, Ambulator,—(*leaning across the table*)—

Parca non mendax dedit et malignum  
Spernere vulgus.

ENT. How does that run in the vernacular?

AMB. Something in this way:—

Th' indulgent fates to you have given  
A glorious boon, a boon of heaven,  
A joyous soul, that laughs to scorn  
The envy of the lowly born.

VEN. Capital!—good!—very good!

ENT. Born! Pedigree has nothing to do with it.

ERRO. Verbatim. The *malignum vulgus* requires *that*. I never could string two lines of rhyme together.

AMB. What! Yes, Osteology was only a kind of prop to Sphinx Vespiformis, a buttress to support it a little longer—it must fall. I agree with double D, in thinking we are too fond of theory; what he says is very good.

ERRO. Yes, Doctor Dichotomy's right enough; it's all true.

VEN. What unmerciful fellows; I'm right glad you have not me to quiz. Why, you have offended half the publishing entomologists in England, without a quarter of the lashing you give one another.

AMB. Oh! no, not offended. We have never ventured beyond fair criticism. No one would lower himself by taking offence at fair criticism.

ERRO. We hold up our Fire-fly to enlighten them; it's all intended kindly; they can't have any reason to be enraged.

AMB. Neither had the jailers of poor Mary; yet, who was so ill-treated? the light of her lovely countenance, turned on them, seemed to demonize them.

ENT. Why not give that in verse.

Languidly over the water,  
Each echoing bugle-note  
Gave warning, to Scotia's daughter,  
Of cruel oppressor's boat.

And so with our lovely rover,  
The voice of each favoured sage  
She illumined in passing over  
Repays for her light with rage.

AMB. Pretty.

ENT. Venator, we wait.

ERRO. He's glad enough to quit the subject of theory—you—

ENT. Theory, theory! by constant bandying from mouth to mouth, the gloss of the originality, of the outcry against it, begins to wear off;—down with theory, down with theory! Give us facts, we want facts! poor fools!—Come, Venator, begin, “Unaccustomed as I am”—

VEN. Gentlemen, our loyalty being unquestionable, we need not waste words in displaying it. With your leave, let us begin with “Success to the Fire-fly, and good-will to her



opponents;" for we all know that we have been severe, very severe; let us, therefore, recollect this, and not resent or notice those little ebullitions of ill-feeling towards us, which our own criticisms have called forth. I find that individuals expected that we should notice nothing but attacks upon ourselves, that no crime against the public was to come under our notice; our plan in this respect is now better known: we have shown our impartiality, and not only returned measure for measure, but have given handsome interest into the bargain—the warning will be salutary. The operations going on against us, both privately and publicly, are evident; but let us appear not to see them. No; let us do even more than that; let us select some two or three of the most active of our enemies, and say every good of them that we can, consistently with truth; that will be a noble revenge. Gentlemen, "Success to the Fire-fly, and good-will to her opponents."

OMNES. Excellent. "Success," &c.

AMB. I think that we have found that it would be wiser to refrain in future from expressing any opinion on the affairs of others, when unconnected with science; some of my entomological friends have thought we had better not have interfered in a recent case, not on account of our observations being undeserved, but because the matter was below our jurisdiction.

ERRO. And then we should have been loudly and fairly charged with partiality.

*Incidit in Scyllam qui vult vitare Charybdim.*

VEN. We could have done no other than we have done, without laying ourselves open to that charge which would be the most injurious of all: depend upon it, we are right as far as we have gone. Now, if you please, conciliate.

AMB. Don't you think we shall find that very difficult? we have certainly done nothing yet to allay the feeling against which we have declared war; but really, I think, we have made matters worse. We seem to have raised a storm we cannot control; the waves of opposition threaten the Fire-fly on all sides.

ERRO. Down she must go—

*Ast illam ter fluctus ibidem,  
Torquet agens circùm, et rapidus vorat æquore vortex.*

AMB. I hope not—

Excutitur pronusque magister  
Volvitur in caput.

ENT. English only, to-night.

ERRO. They'll shake the captain by the collar, and then give him a thump of the head. I see Chry—

ENT. Very elegant, indeed!

ERRO. —sis-cyanea has imitated my *monstror*.

AMB. Yes, and aped Rusticus.

ERRO. What profanation!

VEN. No, no, it won't come to that.

AMB. What!

ENT. I agree with you about disregarding all attacks, aye, even returning good for evil; but we must persevere in well-doing. Ambulator observes, we can't control the storm; what of that? does not the sun illumine that ocean whose restless waves he has no power to allay?

ERRO.—

Like moonlight on a troubled sea,  
Brightening the storm it cannot calm.

ENT. And shall our Fire-fly refuse her ray to enlighten a science whose votaries are at war? Never, never! Let them oppose her; let them speak evil of her; let them go about persuading others to mutiny, and desert her: heed them not; they shall not prevail against her, while her rays are the rays of genius, her light the light of truth.

VEN. I believe it; people don't like to be told that they ought to see the difference; that there is a want of the merit it promised at first, and so on. It is very difficult to mislead those who really read; they like to judge for themselves.

ENT. And wherefore should they not? man is an inquiring animal; his mind, perchance, may wander, perchance may waver, perchance may bend from its own weakness, may be lured by interest, warped by pride, case-hardened by obstinacy, blinded by ambition,—but these are the exceptions: believe me, the mind of man naturally, instinctively, aye unwittingly, turns towards the truth, as a sun-flower towards the sun.

AMB. I hope we shall find it so; indeed, I believe it; I think too well of mankind to doubt it; and we need not mind about these little troubles, if we triumph at last.

VEN. Trouble does not harm us ; it very often teaches us wisdom.

ERRO. But it weighs us down by a perpetual weight, and teaches us unhappiness also.

ENT. Trouble, in harrowing the soul, also chastens and enriches it, as the balmy breezes of Arabia, in breaking up the surface of the Red Sea into multitudinous billows, impregnate it with their perfume. But, as for the Fire-fly, trouble will do her no harm ; she will float, like the petrel, securely on the roughest sea. Opposition may assail her and threaten her, as the clanging blast of brazen trumpets, or as the lurid painted pile of sunset clouds, staining ocean with their lustre ; yet shall it shortly, surely cease, from its want of power to exist, as those trumpet-notes melt into nothingness among the hills, or as those clouds,—like the cities of the island of Atlantis sinking turret after turret, dome after dome, below the insatiable waters,—subside beneath the sea-girt horizon.

VEN. Mr. Entomophilus, we wait.

ENT. “ Success to the Entomological Society.”

OMNES. “ Success,” &c.

AMB. I am glad to see the Society in such a thriving condition ; at first I was rather fearful there was a little spirit of opposition to us, but I was soon undeceived on that head.

ERRO. What a delightful scene it was, when that dear old man took the chair, and the whole room rang with applause ; he would have spoken, but his emotion was too great,—*vox faucibus hæsit* ; he would have bowed to us, but he had lost the power ; his feelings conquered him, and he sank back into his seat, voiceless and unmanned. I wonder how many of the present race of entomologists will live to be so greeted. I would not, for the world, have lost that meeting.

VEN. What becomes now of the idea that the Society is the offspring of a party ?

ERRO. It would be a good bit of fun to talk to them about it now:—The *party*-Society met, &c. ; Kirby in the chair ; Ambulator, Venator, and I, standing behind him ; Children, Spence, Entomophilus, Blomer, Bennett, Waterhouse, &c. round the table ; and crowded benches of entomoes filling up the room, dotted here and there with a Horsfield, a Yarrell, a Stephens, a Sykes, a Bowerbank——

VEN. Better avoid it, the sarcasm would be too biting: a *party*, headed by Kirby, Spence, Children, Horsfield, Yarrel, and Sykes!!

ENT. How infinitely ridiculous! I know no men more completely above all such paltry feeling.

VEN. Nothing can possibly be more liberal, than the mode in which the affairs of the Society have been conducted. One thing we must insist on—collection and library—before any publication is thought of.

ERRO. I understand that there are some members publication mad. I was told of a paper, ready cut and dried, by our friend *Chrysis-cyanea*, as *Ambulator* terms him; as it was about myself, I obtained a copy of the title, (*reads from a slip of paper.*) “Notes upon the impropriety of Mr. ——’s placing the double dot over the u in Straus, and omitting it over the u in Durckheim, at page — of the *Entomological Magazine*; together with philosophical remarks upon the affinities of my new genus *Hypothenemanogarthroides*, by A. E. J. ——, Esq. F. L. S. &c.”

VEN. An excellent quiz.

ENT. It is the rock on which the Society will probably split. I have induced ten individuals to join the Society; all, except one of whom, inquired whether we should publish that kind of rubbish. I assured them not.

AMB. The president is a man of sense, and a man of spirit; —he never will—

ENT. Some thanks to me for proposing him. Eh?

VEN. Yes: the Society owes you a vote of thanks. There is no individual in England so well adapted for the chair.

AMB. He never will encourage such rubbish.

ENT. Not he:—Come, *Ambulator*, we wait.

AMB. What?—Me?—Oh!—“Success to the Study of the Economy of Nature.”

OMNES. “Success,” &c.

AMB. I shall be understood as expressing my admiration of the great revealer of Nature’s secrets, when I merely say, Success to that branch of our study. I can imagine nothing more beautiful in poetry than the first of his *Sapphics*.

Hued like a rainbow, &c.

is exquisite.

ERRO. The sentiments are beautiful; but I don't like Sapphics altogether; I was made read them at school, and, *par consequence*, don't much like them now I've left; and, it's my opinion, Sapphics don't do for the English language. There is one part, the last verse I think it is—

AMB.—

No! Like these creatures, trouble, toil, and prison,  
Chequer his pathway to a bright hereafter,  
When he shall mount him to the happy regions,  
Made to receive him.

ERRO. It is that alone makes life worth living for — the belief in *that*; there is but little on this earth—

ENT. Pish! Excuse me, Roey. I must stop that strain. Melancholy, avaunt! This earth has lots of flowers worth plucking, and you can find them as easily as any one.

VEN. How any one, with his stores of knowledge, can indulge in that stupid, nervous, Byronic kind of misanthropy, I can't think.

ENT. A contented mind, like the rosy morning sun, tinges every earthly object with its own beauteous hue, bathes in sunshine the face of universal nature: fame is not honourable; the bad attain it as easily as the good; and riches, to me, seem scarcely to gild the future more than the present.

AMB. But fancy does paint for us a future brighter than the present, though beyond the reach of riches, or any earthly gratification.

ENT. Alas, fancy has no pinions that will bear us beyond the tomb!

VEN. We have wandered into a useless discussion from talking of the Sapphics of Rusticus. As Erro observes, they will not do for English. I shewed them to my friend Dr. S——, who I consider an excellent judge; he acknowledged they were full of beauty, and as good as English Sapphics could be; but the fact is, Sapphics do not suit the genius of our language.

ENT. Genius of our language! Not suit the genius of those people who have no genius, I take you to mean. Oh, Genius, thou undefined and undefinable creature!—thou art not talent, nor wisdom, nor learning! What art thou, then, airy being, that floatest around and about and above us, instantaneously wafting from thy bright—thy ambrosial wing—to

some selected favourite, a thought, that others might ponder for in vain; anon, lighting up the eye of sorrow like sunshine in a shower? Where is thy site, and where thy home? Oh, give me wings, that I may mount up above the—

AMB. —heads of common men!

ERRO. Yet I have seen genius weighing like an incubus on trembling brains, till all was dark; or, if the eye retained the power to flash, flashing in mockery.

VEN. Mr. Erro, I believe we wait for you.

ERRO. I must adopt your plan, and wish—"Success to the Study of Zoology."

OMNES. "Success to the Study of Zoology."

AMB. The mind does not point to a single individual so forcibly as in the former instances.

ERRO. I intended the compliment, if from me it is one, to three of our countrymen.

VEN. Grant, Bell, and Yarrel.

ERRO. Yes, those are the three. I don't know which stands first.

ENT. Nor I; when I reflect on the merits of either, I consider him for the time the *first*. The sterling sense and clear head of Yarrel; the indefatigable energy of the Doctor; and the accomplished accuracy of Bell, are equally to be admired: the humility with which these great men receive, and the modesty with which they impart information, must raise them high in the estimation of all who know them.

AMB. I wonder that neither Mr. Yarrel nor Mr. Bell has been elected a Professor of Zoology.

ENT. Bell would make an excellent one. What a lustre he would confer on a college!—his lectures are exquisitely clear and beautiful. I have never heard Yarrel lecture; I believe he does not. Dr. Grant's matter is sound; his style clear and concise, with just sufficient repetition to force every head, not wooden, to comprehend.

AMB. His lectures, that we attended together last winter at Bruton Street, were really admirable; but he allowed rather too little time to entomology.

VEN. Allow me the pleasure of proposing—"Success to the Study of Entomology."

OMNES. "Success," &c.

VEN. I would from courtesy exclude the present company,

otherwise a reply would be requisite. Of those not present—Kirby, Leach, and MacLeay, seem to be the most eminent.

ENT. Decidedly. But the accurate pencil of Curtis!

ERRO. Which?

ENT. The elder brother, John Curtis;—his “British Entomology” is, beyond all comparison, the most valuable work on Entomology our country has produced;—and I consider it far from being a credit to us that its circulation is so limited.

ERRO. His brother is a good artist: his drawings in Mr. Stephens’ early numbers are very beautiful; equal to any thing I know of.

ENT. We must not refuse our meed of praise to Stephens; his undertaking is a most laborious one.

AMB. Yes; I hope he will have courage to complete it.

VEN. Gentlemen;—Is it not time that we proceed to the grand business of this meeting—the appointment of an Editor for 1834?

ENT. I have the straws prepared:—Are you ready?

AMB. Oh, Mr. Entomophilus will take it again, I hope!

ENT. Not I; once in four years is quite often enough.

ERRO. I shan’t draw.

VEN. Yes, yes! Fair play!—The compact was so made at first.

ENT. Is the longest or shortest to be the lucky man?

VEN. If length decides it—the matter is easily settled. (*Bowing to Ambulator.*)

ENT. Straws, I mean. (*Hands the straws; they draw lots.*)

ERRO. Oh, the shortest is the man! I’ll draw last. No;—pass it on.

AMB. Delta’s is the shortest.

VEN. Mr. Erro’s the man.

ERRO. It’s mine.

ENT. And the lot fell upon the triangle.

ERRO. How tiresome!

ENT. It will be capital fun for you, Roey.

ERRO. The Boys and the Frogs.

ENT. You’ll find it so pleasant, Roey!

An Editor leads an easy life;

The pleasures, believe me, are many:—

Plague, jealousy, envy, fear, and strife,

The evils—I never found any.

} *Simultaneously.*



There, one contributor sends me a new invention for catching tadpoles; another, sixteen sheets, closely written in black ink, and closely crossed in red, and wishes it set up in large type, as Mr. How-d'ye-call-him always prints in that way, and allows six guineas per sheet paid in advance, which you are respectfully requested to remit directly;—a third wants a receipt for killing fleas;—a fourth sends one for killing bugs;—a fifth selects original poetry from the Penny Magazine, at the moderate charge of one-pound-one;—a sixth gives a long tale about a monster which frightened his wife into fits, and sends the monster itself in a wine-glass, with the lid of a tobacco-box tied on the top for fear of accident,—the monster turns out to be a common honey-bee;—a seventh transmits nineteen hundred and fifty-three insects, to be named, which have been collected in sugar-bottles, but which have been duly dried in the sun, and squeezed into a tea-cup;—an eighth ingeniously economises space, by striking four on one pin, and kindly permits me to print the list when named;—a ninth questions whether the Magazine is not too large;—a tenth questions whether it is not too small; an eleventh suggests that it should be printed in twelvemo;—a twelfth recommends quarto;—a thirteenth insists on its being monthly;—a fourteenth thinks that once a year would be often enough;—a fifteenth declares it is too scientific;—a sixteenth, that it is too popular, et cetera, et ceteræ, et cetera. Oh!—

An Editor leads an easy life;  
The pleasures, &c.

One author complains, that his work has been published two months, and I have not noticed it;—another, that I have pointed out his defects, and not his merits;—a third, that I have misunderstood his meaning;—a fourth, that his errors were only typographical;—seven, that I don't make enough of them;—(O, I should like to buy all the Entomologists at my valuation, and sell them at their own!)—A twelfth, that I was influenced by envy;—a thirteenth, that I espouse a party;—a fourteenth, that his philosophy deserved an analysis — which, by the way, I had tried, and found the only element, smoke;—a fifteenth looks hot at me;—a sixteenth looks cold at me;—a seventeenth looks lukewarm;—an eighteenth grumbles that I praised So-and-so's book;—a nineteenth grumbles that I did

not praise it enough. Then come a ream of errors in my last number, philosophically and argumentatively pointed out;—thirteen abusive letters for delaying publication;—twenty-one for giving worse contributors a better place;—fifteen on allowing errors to pass the press;—and forty-three on giving too much editorial matter, to the exclusion of more important and original communication; et cetera, et ceteræ, et cetera. Oh!—

An Editor leads an easy life;  
The pleasures, &c.

Then the printer puts me off and off, till it comes to the last day, and I have to let half the mistakes go by after all, and have to stay in town till all the coaches are gone, and then walk all the way home through the mud, and, wet through with rain, get robbed of my watch, stopped by the police, and experience, in one night, half the miseries of human life. Well, at last, the Firefly comes out; the public beholds it, but don't touch; the publisher (*bowing across the table to VENATOR*) meets me with a most gracious smile, talks to me of his love of science, of his desire to promote the study, of my eminent qualifications, of the increasing sale, of the certainty of eventual success, of the mildness of the weather, of the hardness of the times, of the war in Portugal, of the improvements at London Bridge; and adds, *à la postscript*, as a thing of minor importance, that the Mag. has incurred a pecuniary loss of so many pounds, so many shillings, and so many pence; for which, in the pleasantest way in the world, he reminds me that I am responsible, et cetera, et ceteræ, et cetera. Oh!—

An Editor leads an easy life;  
The pleasures, believe me, are many:—  
Plague, jealousy, envy, fear, and strife,  
The evils,—I never found any.

ERRO. Ah! there *is* trouble. Well, I must,—I suppose,—there ought to be some fame.

AMB. You can praise yourself, as ——— does.

ENT. Poor empty fellow!—I suppose he fancies he can trumpet loud enough for posterity to hear him!

(*They remain sitting.*)

ART. II.—*Monographia Chalciditum.* By FRANCIS  
WALKER, ESQ. F. L. S.

(Continued from Vol. I. page 466.)

“ ——— the green myriads in the peopled grass.”

*Family.*—LEUCOPSIDÆ.

GENUS LEUCOPSIS,<sup>a</sup> *Fabricius.*

Vespa . . *Swammerdam, Sulzer, Christ.*

Cynips . . *De la Tourette, Gmelin.*

Leucopsis. *Fabricius, Gmelin, Latreille, Olivier, Villers,  
Rossi, Cuvier, Panzer, Jurine, Walckenaer,  
Illiger, Spinola, Fuessly, Dalman, Klug,  
Fonscolombe.*

Leucopsis. *Lamarck, Dumeril.*

Corpus punctatum, supra pubescens: caput mediocre, transversum, thorace vix angustius, anticè ubi scapi insident excavatum: oculi mediocres: ocelli 3, supra verticem trigonè dispositi: antennæ *maris* et *fem.* similes, medio frontis insertæ, 14-articulatæ, clavatæ, pubescentes; scapus in canaliculo frontali receptus; flagellum subincurvum; articulus 1<sup>us</sup>. s. scapus elongatus; 2<sup>us</sup>. brevis, cyathiformis; 3<sup>us</sup>. elongato-cyathiformis; 4<sup>us</sup>. et 7 sequentes ferè lineares, latiores, breviores; 12<sup>us</sup>. mediocris, apice angustior; 13<sup>us</sup>. et 14<sup>us</sup>. minimi, vix conspicui: labrum breve, transversum, anticè impressum: mandibulæ ferè rectæ, æquales, bidentatæ; dentes obtusi; internus brevis, latus, ferè geminus: maxillæ elongatæ, graciles, apice acuminatæ, externè pilosæ, internè apicem versus in lobum productæ bipartitum tenuem mollem ciliatum: palpi 4-articulati, filiformes; articulus 1<sup>us</sup>. elongato-cyathiformis; 2<sup>us</sup>. longior; 3<sup>us</sup>. 2<sup>o</sup>. brevior; 4<sup>us</sup>. 2<sup>o</sup>. longior: mentum elongatum, angustum, apice trispinosum: palpi 3-articulati, ferè filiformes, menti apicem versus inserti; articuli subclavati, 2<sup>us</sup>. 1<sup>o</sup>. brevior, 3<sup>us</sup>. longior: labium ferè cordiforme, molle; anguli antichi producti; margo anticus ciliatus, medio impressus: thorax ovatus: prothoracis scutellum maximum, subquadratum, anticè paullò angustius; segmenta reliqua dorsalia supra occulta; pectus parvum: mesothoracis scutum maximum;

<sup>a</sup> Δευκὸς ἄλβος, ὀψις facies. I think, with Dumeril, that the name of the genus is derived from these words.

parapsides scuto in unum confusæ; scutellum magnum, semicirculus; paraptera et epimera trigona; sternum magnum, medio canaliculatum: metathoracis scutellum parvum, plerumque apice bispinosum; postscutellum maximum; epimera et paraptera trigona; sternum magnum: propedes<sup>b</sup> graciles; coxæ trigonæ, mediocres; trochanteres parvi; tibiæ paullò arcuatæ, apice latiores, et dentibus nonnullis minutis et spina elongata valida subarcuata armatæ: mesopedes longiores, graciliores; tibiæ rectæ, femoribus paullò longiores, externè basim versus impressæ; spina apicalis brevior, tenuior; cæteri propedum: metapedum coxæ maximæ, angulus internus serratus; femora maxima, ovata, externè convexa, internè plana, subtus dentibus plurimis armata; tibiæ valdè arcuatæ, subtus canaliculatæ, femoribus appressæ, apicis angulus internus productus, acuminatus; cæteri propedum: tarsi omnes subtus ciliati, articulus 1<sup>us</sup>. elongatus, sequentes longitudine decrescentes, ultimus 2<sup>o</sup>. longior; ungues arcuati, subtus basi dentibus plurimus minutis armati; pulvilli minimi: proalæ plicatæ; nervus subcostalis costam alæ medium versus attingens, et inde ferè ad apicem productus, ubi costam attingit ramulum emittens furcatum; furca antica mox abrupta; postica alæ apicem versus producta; nervus in alæ disco, brevis, insulatus; nervus 3<sup>us</sup>. longitudinalis alæ basi proveniens, medio crassior, apicem versus furcatus; furcæ ambæ marginem posticum attingentes; nervus 4<sup>us</sup>. marginis postici medium occupans; areolæ paucae, apertæ, non benè determinatæ: metalæ parvæ; nervus subcostalis a basi, ubi costa jungitur, ferè ad alæ apicem productus; nervi duo longitudinales indistincti; hamus nervo subcostali ante alæ apicem insertus: abdomen sessile, elongato-ovatum, compressum, apice rotundum; *maris*, segmentum 1<sup>um</sup>. magnum; 2<sup>um</sup>. maximum, ferè omne abdominis dorsum occupans; 3<sup>um</sup>. minimum, vix conspicuum; subtus abdomen segmenta 5 ventralia conspicua, subæqualia: *fem.* abdomen dorso ubi oviductus insidet canaliculatum; segmentum 1<sup>um</sup>. maximum; 2<sup>um</sup>. minimum, 1<sup>o</sup>. ferè occultum; 3<sup>um</sup>. mediocre; 4<sup>um</sup>. majus, latera latiora; 5<sup>um</sup>. parvum; 6<sup>um</sup>. maximum, 5<sup>i</sup>. dorso recurvum, subtus quoque recurvum; subtus abdomen lamina elongata, angusta, carinata, segmenta omnia ventralia occultat: oviductus segmenti 6<sup>i</sup>. apice emersus, dorso recurvus.

These insects, in the larva state, are parasitic upon the

<sup>b</sup> I have adopted this and similar terms, from Mr. Newman's letter on Osteology, published in Vol. I. p. 400.

mason-bees and wasps. The trophi, particularly the lingua and maxillæ, are more developed than in most *Chalcidites*.

DIVISIO I. *Metafemora subtus dentibus 8 armata.*

Sp. 1. *Leuc. grandis.*

*Leucospis gigas* . . *Rossi Faun. Etrusc. ed. Illiger. II.*  
130; *Fonsc. Ann. Sci. Nat.* 26. 273.

*Leucospis gallica* . . *Rossi Mant.* 135. 298.

*Leucospis dorsigera.* Var. *Hochenwarth Schrift. Berl. Ges.*  
VI. 341. Taf. 8. fig. 1, 2; *Christ.*  
*Bienen.* 225. Tab. 19. fig. 9.

*Leucospis grandis* . *Klug. Act. Nat. Cur. Berl.* VI. 66. 1.

Sp. 2. *Leuc. gigas.* Mas et fem. *Nigra, flava variegata,*  
*prothoracis scutello flavo marginato, mesoscuti dorso*  
*bimaculato, oviductu abdominis basim non attingente.*

*Cynips nigra, &c.* . . *De la Tourette Acad. des Sci.* 9. 730.  
fig. 1—5.

*Cynips lugdunæa* . . *Gmel.* 1. 5. 2653. 26.

*Sphex dorsigera* . . *Sulzer. Gesch.* 196. Tab. 27. fig. 11.

*Leucospis dorsigera.* *Fabr. Syst. Ent.* 361. 1; *Spec. Ins.*  
1. 457. 1; *Mant. Ins.* 1. 284. 1;  
*Gmel.* 2739. 1; *Oliv. Encyclop.*  
*Hist. Nat. Ins.* VII. 352. 1. Pl. 100.  
fig. 8. 9; *Fuessly Archiv.* 2. Tab.  
18. 51. fig. 1—10.

*Leucospis gallica* . . *De Villers Ent.* III. 261. Tab. 8.  
fig. 18.

*Leucospis gigas* . . . *Fabr. Ent. Syst.* II. 245. 1; *Syst.*  
*Piezat.* 168. 1.; *Panz. Faun. Ins.*  
*Germ.* 84. Tab. 17. 18.; *Coqueb.*  
*Illustr. Icon.* I. 23. Tab. 6. fig. 1.;  
*Spin. Ins. Lig.* fascic. 1. 63.; *Latr.*  
*Hist. Nat. des Ins.* XIII. 219. 2.;  
*Gen. Crust. et Insect.* IV. 24.; *Règne*  
*Anim.* III. 475.; *Nouv. Edit.* V.  
296.; *Nouv. Dict. d'Hist. Nat.* XVII.  
514.; *Klug. Act. Nat. Cur. Berl.*  
VI. 66. 2.

Leucopsis gigas. . . *Lam. Anim. sans Vertèbres. IV. 151.*;  
*Dumeril Dict. des Sci. Nat. XXVI.*  
 169.

*Mas.*—Nigra, flavo pubescens: caput inter oculos flavo bimaculatum: labium rufescens: oculi fuscii: ocelli sordidè albidi: antennæ apice rufæ; articulus 1<sup>us</sup>. flavus, extùs et apice supra niger: prothoracis scutellum flavo marginatum; mesothoracis scuti dorsum flavo bimaculatum, latera flavo vittata; super scutelli dorsum macula flava, anticè valdè emarginata; epimera ferè tota flava: metathoracis scutellum apice acutè bispinosum: abdomen flavo bifasciatum et apice maculatum: pedes flavi; pro- et mesocoxæ nigræ; metacoxæ nigræ, flavo supra basi et subtus apice maculatæ; trochanteres fuscii; pro- et mesofemora basi nigrofusca aut nigra; metafemora nigra, extùs flava nigro maculata; dentes nigri; 1<sup>us</sup>. brevis; 2<sup>us</sup>. et 3<sup>us</sup>. elongati, acuminati; cæteri obtusi, longitudine decrescentes; metatibiæ subtus nigrofusca; tarsi fulvi: alæ iridescentes, fusca; costa saturatior.

*Fem.*—Abdomen supra flavo 4-fasciatum, subtus rufofuscum, nitidum; fasciæ dissimiles, interruptæ: abdominis segmenti 1<sup>mi</sup>. oviductus medium attingens, fuscus; tegmina nigra. (Corp. long. 4½—6 lin.; alar. 9—12 lin.)

July; South of France. M. F. de Laporte has taken it near Paris.

Sp. 3. *Leuc. nigricornis.*<sup>c</sup> *Fem. Nigra, flavo-variegata, prothoracis scutello flavo-bifasciato, mesoscuti dorso immaculato, oviductu abdominis basim non attingente.*

*Leucopsis dispar. a. Fonscol. Ann. Sci. Nat. 26. 275.*

Nigra, flavo pubescens: caput immaculatum: labium rufescens: oculi fuscii: ocelli sordidè albidi: antennæ apice fusca; prothoracis scutellum flavo bifasciatum; fascia antica medio angustior: mesothoracis scuti latera flavo vittata; epimera flavo maculata; metathoracis scutellum inerme?; super dorsum macula flava, anticè valdè emarginata: abdomen utrinque supra flavo 4-maculatum, subtus rufo-fuscum; maculæ dissimiles: abdominis segmenti 1<sup>mi</sup>. oviductus apicem attingens, fuscus; tegmina nigra: pedes flavi; coxæ nigræ; metacoxæ supra basi et subtus apice flavo maculatæ; trochanteres nigrofusci; pro- et mesofemora basi nigra; metafemora nigra, externè flava nigro maculata; dentes nigri, 1<sup>us</sup>. brevis, 2<sup>us</sup>. et 3<sup>us</sup>. elongati, acumi-

<sup>c</sup> This, and many of the following species, were sent to me by M. F. de Laporte, with the MS. names which I have adopted.

nati; cæteri obtusi, longitudine decrescentes; metatibiæ subtus nigro-fuscæ; tarsi fulvi: alæ iridescentes, fuscæ; costa saturator. (Corp. long. 6 lin.; alar. 12 lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 4. Leuc. intermedia. Fem. *Nigra, flavo variegata, prothoracis scutello flavo-marginato, mesoscuti dorso unimaculato, oviductu abdominis basim superante.*

Leucospis dorsigera . *Rossi Mant.* 134. 297. *De Villers Ent.* III. Pl. 8, fig. 17. *Panz. Faun. Ins. Germ.* 15. Tab. 17.

Leucospis intermedia . *Illiger. Edit. Faun. Etrusc.* II. 130. *Klug Act. Nat. Cur. Berl.* 67. 4.

*Nigra, flavo pubescens: caput inter oculos flavo bimaculatum: labium rufescens: oculi fuscii: ocelli sordidè albidi: antennæ nigræ; articulus 1<sup>us</sup>. flavus, extùs et apice supra niger: prothoracis scutellum flavo marginatum: mesothoracis scuti dorsum flavo unimaculatum, latera flavo vittata; super scutelli dorsum macula flava, anticè valdè emarginata; epimera flavo maculata: metathoracis scutellum apice acutè bispinosum: abdomen flavo 4-fasciatum, subtus rufo-fuscum; fasciæ dissimiles, basalis et apicalis interruptæ: oviductus mesothoracis ad scutelli medium productus, fuscus; tegmina nigra: pedes flavi; coxæ nigræ; metacoxæ supra basi flavo maculatæ; trochanteres fuscii; pro- et mesofemora basi nigra; metafemora nigra, extùs flava, nigro maculata; metatibiæ subtus nigro-fuscæ; tarsi fulvi: alæ iridescentes, fuscæ; costa saturator. (Corp. long. 5 lin.; alar. 9 lin.)*

July; South of France.

Sp. 5. Leuc. varia. Fem. *Nigra, flavo variegata, prothoracis scutello flavo bifasciato, mesoscuti dorso bimaculato, oviductu abdominis basim non attigente.*

Leucopsis intermedia . *Lamarck. Anim. sans Vertèbres.* IV. 152.

Leucopsis varia . . *Klug Act. Nat. Cur. Berl.* VI. 67. 3.

*Nigra, flavo pubescens: caput inter oculos flavo bimaculatum: labium rufescens: oculi fuscii: ocelli sordidè albidi: antennæ*



apice rufo-fuscæ; articulus 1<sup>us</sup>. fulvus, apice fuscus; 2<sup>us</sup>. nigro-fuscus; 3<sup>us</sup>. et 4<sup>us</sup>. rufi: prothoracis scutellum flavo bifasciatum; fascia antica medio angustior, posticè incisa: mesothoracis scuti latera flavo vittata, dorsum flavo bimaculatum; super scutelli dorsum macula flava, anticè valde emarginata; epimera ferè tota flava: metathoracis scutellum apice acutè bispinosum: abdomen supra flavo 4-fasciatum, subtus fuscum; fasciæ dissimiles, interruptæ: abdominis segmenti 1<sup>mi</sup>. oviductus ferè basim attingens, fuscus; tegmina nigra: pedes fulvi; coxæ nigræ; metacoxæ supra basi et subtus apice flavo maculatæ; trochanteres nigri; pro- et mesofemora basi fusca; metafemora utrinque nigro maculata; dentes nigri; 1<sup>us</sup>. brevis; 2<sup>us</sup>. et 3<sup>us</sup>. elongati, acuminati; sequentes obtusi, longitudine decrescentes: alæ iridescentes, fuscæ; costa saturatior. (Corp. long. 4—4½ lin.; alar. 9—9½ lin.)

July; South of France.

Sp. 6. Leuc. aculeata.

Leucospis aculeata . Klug. *Act. Nat. Cur. Berl.* VI. 68. 5.

DIVISIO II. *Metafemora subtus dentibus 10 armata.*

Sp. 7. Leuc. Biguetina. Mas et Fem. *Nigra, flavo variegata, prothoracis scutello flavo bifasciato, fascia postica abbreviata.*

Leucospis gibba . . Klug. *Act. Nat. Cur. Berl.* VI. 70. 8.

Leucospis Biguetina *Jurine, Nouv. Method. Hyménopt. &c.* 307. Pl. 13. 45.

*Mas.* Nigra, pubescens: caput immaculatum: labium rufescens: oculi fusci: ocelli sordidè albidi: antennæ omninò nigræ: prothoracis scutellum flavo bifasciatum; fascia antica medio angustior, postica abbreviata: mesothoracis scuti latera flavo vittata; super scutelli dorsum fascia flava, anticè valde emarginata; epimera ferè tota flava: metathoracis scutellum apice acutè bispinosum: abdomen gibbum, supra flavo trifasciatum: pedes flavi; coxæ nigræ; trochanteres fusci; pro- et mesofemora basi fusca; metafemora nigra, apice supra flava, subtus dentibus 10 nigris armata, dens basalis magnus, cæteri minimi; metatibiæ subtus pallidè fuscæ; tarsi fulvi: alæ iridescentes, subfuscæ; costa et apex saturatiores.

*Fem.* Abdomen flavo 4-fasciatum; fasciæ 3<sup>a</sup>. et 4<sup>a</sup>. interruptæ, hæc quoque abbreviata: oviductus abdominis medium attingens. (Corp. long. 3½ lin.; alar. 6½ lin.)

*Var. β.*—*Fem.* Mesothoracis scuti dorsum flavo bimaculatum.

Described from specimens taken near Paris by M. F. de Laporte.

### DIVISIO III. *Metafemora subtus dentibus 15 armata.*

Sp. 8. *Leuc. dorsigera.* Mas et *Fem. Nigra, flavo variegata, prothoracis scutello flavo bifasciato, fascia antica abbreviata.*

*Leucospis cœlogaster* . *Schrank Schriften Berl. Gesellschaft. I.* 301. Tab. 8. fig. 4—6. *Faun Boica* II. 2. 221. 1980. *Gmel.* 2741. 2. *Oliv. Encycl. Hist. Nat. Ins.* Tom. VII. 532. 3. *Hochenwarth. Schriften Berl. Ges.* VI. 344. Tab. 8. fig. 34.

*Leucospis dubia* . . *Schrank. Fauna Boica.* II. 2. 222. 1981.

*Leucospis dorsigera* . *Fabr. Ent. Syst.* 2. 246. 2.; *Syst. Piezat.* 168. 2. *Latr. Hist. Nat. des Ins.* XIII. 281. 1. *Gen. Crust. et Insect.* IV. 24. *Règne Anim.* III. 475; *Nouv. Edit.* V. 296. *Nouv. Dict. d'Hist. Nat.* XVII. 513. Pl. G. 3. 7. *Panz. Faun. Ins. Germ.* 58. 15. *Illig. Edit. Faun. Etrusc.* II. 130. et 280. 856. β. *Spin. Ins. Lig.* Fasc. I. 63. *De Vill. Ent.* III. 260. 1. Tab. 8, fig. 17. *Klug Act. Nat. Cur. Berl.* 69. 6.

*Leucospis dispar* . . *Fabr. Syst. Piezat.* 169. 6.

*Leucospis intermedia* *Spin. Ins. Lig.* Fascic 4. 236. *Fonscol. Ann. Sci. Nat.* 26. 274.

*Leucopsis dorsigera* . *Lam. Anim. sans Vertèbres.* IV. 151. *Dumeril. Dict. des Sci. Nat.* 26. 169. Pl. 34, fig. 2.

*Mas.* *Nigra, pubescens: labium rufescens: oculi fusci: ocelli sordidè albi: antennæ nigre; articulus 1<sup>us</sup>. flavus, apice et supra fuscus:*

prothoracis scutellum flavo bifasciatum; fascia antica abbreviata; postica per scutelli latera producta: mesothoracis scutum immaculatum; super scutelli dorsum fascia flava integra aut paullò emarginata; epimera flavo maculata: metathoracis scutellum inerme: abdomen supra flavo 4-fasciatum; fasciæ 1<sup>ma</sup>. et 4<sup>ta</sup>. abbreviatæ: pedes flavi; coxæ nigræ; metacoxæ subtus apice flavo maculatæ; trochanteres nigro-fusci; pro- et mesofemora basi fusca; metafemora nigra, subtus versus basin et supra flava; dentes nigri, basalis magnus, cæteri minimi; metatibiæ subtus nigræ; tarsi fulvi: alæ iridescentes, subfuscæ; costa et apex saturatiores.

*Fem.* Scapi omninò flavi: abdomen supra flavo trifasciatum, subtus rufo-fuscum; fasciæ interruptæ, inter 1<sup>am</sup>. et 2<sup>am</sup>. maculæ duæ laterales flavæ: oviductus abdominis basim attingens: profemora nigro-fusca, apice flava; intermedia pallidiora: protibiæ extùs fusco vittatæ. (Corp. long. 2 $\frac{3}{4}$ —4 lin.; alar. 4—6 lin.)

*Var. β.—Mas.* Antennæ omninò nigræ: prothoracis fascia postica non per scutelli latera producta: metacoxæ nigræ, apice subtus fusco maculatæ; pro- et mesofemora nigro-fusca, apice flava; metafemora nigra, basi subtus et supra apice flavo maculata; pro- et mesotibiæ extùs fusco vittatæ; metatibiæ subtus et intùs nigræ.—Species distincta?

*Var. γ.—Fem.* Abdominis fascia apicalis angusta, abbreviata: metafemora nigra, supra apice flava.

Described from specimens taken near Paris, by M. F. de Laporte.

Sp. 9. Leuc. bifasciata.

Leucospis, &c. . . *Fuessly Archiv.* III. Tab. 18. fig. 11.

Leucospis bifasciata . *Klug. Act. Nat. Cur. Berl.* 70. 7.

#### Family CHALCIDIDÆ.

Structura varia: reliquis hujus ordinis characteres sequentes immutati eam distinguunt; oviductus infra abdomen occultus; metapedes femoribus et coxis maximis, tibiis arcuatis; proalæ ultra medium nervus ordinarius ramulum emittens brevissimum, nonnunquam furcatum: ocelli 3, supra verticem trigonè dispositi: pro- et mesocoxæ trigonæ, mediocres: tarsi plerumque graciles; articulus 1<sup>us</sup>. elongatus; sequentes longitudine decrescentes; ultimus 2<sup>o</sup> longior.

## Characteres Generum.

Caput	{	inerm. Petiolus	{	Antennæ	{ elongatus.	{ medio frontis insertæ . . . . .	I. SMIERA.		
					{ prope os insertæ . . . . .	II. EPITRANUS.			
		brevissimi. Antennæ	{	{	prope os insertæ.	Metatibiae	{ acuminatæ . . . . .	III. CHALCIS.	
							{ non acuminatæ.	{	{ graciles . . . . .
						apice	{ Metatarsi		{ crassi . . . . .
							{	{	{
		armatum . . . . .					VII. DIRHINUS.		

GENUS I.—SMIERA, *Spinola*.

Sphex. *Linnæus, Fabricius, Villers, Sulzer, Schrank, Christ.*

Chrysis. *Fabricius.*

Vespa. *Geoffroy, Fourcroy.*

Chalcis. *Fabricius, Gmelin, Panzer, Hubner, Rossi, Latreille, Stewart, Olivier, Spinola, Donovan, Lamarck, Leach, Samouelle, Dalman, Fonscolombe, Cuvier, Jurine, Illiger, Walckenaer, Dumeril.*

Smiera. *Spinola, Curtis.*

Corpus punctatum, pubescens : caput mediocre, transversum, thorace vix angustius, anticè ubi scapi insident excavatum : antennæ 13-articulatæ, medio frontis insertæ, *maris* fusiformes aut filiformes, *fem.* clavatæ ; articulus 1<sup>us</sup>. elongatus, in-canaliculo frontali receptus ; 2<sup>us</sup>. minutus ; 3<sup>us</sup>. minimus, vix conspicuus ; 4<sup>us</sup>. elongatus ; 5<sup>us</sup>. et 5 sequentes longitudine decrescentes ; clava triarticulata, ovata : labrum breve, transversum, apice ciliatum : mandibulæ parvæ ; una ferè recta, subquadrata, tridentata ; altera arcuata, bidentata ; dentes obtusi : maxillæ elongatæ, apicem versus internè in lobum productæ latum ciliatum apice incisum ; palpi 4-articulati, filiformes ; articuli 1<sup>us</sup>. et 3<sup>us</sup>. breviores ; 2<sup>us</sup>. et 4<sup>us</sup>. longiores : mentum elongatum, angustum ; palpi 3-articulati, subfiliformes, articulus 3<sup>us</sup>. acuminatus, setosus : labium angustum, fissum : thorax ovatus : prothoracis scutellum minimum, posticè incurvum ; pectus parvum : mesothoracis scutum maximum ; parapsides optimè determinatæ ; scutellum maximum, semicirculus ; paraptera et epimera trigona, maxima ; sternum parvum : metathoracis scutellum parvum ;

postscutellum maximum; paraptera et epimera trigona; sternum parvum: petiolus elongatus, linearis, abdomine brevior: abdomen glabrum, gibbum, compressum, coarctatum, nonnunquam apice elongatum et acuminatum; segmentum 1<sup>um</sup>,<sup>d</sup> maximum; cætera breviora; segmenta ventralia pauca *maris* abdominis apicem versus conspicua: *fem.* lamina angusta segmenta omnia ventralia et oviductum nisi ad apicem abscondit: propedes breves; trochanteres parvi; femora subclavata; tibiæ apice spina elongata valida armata; ungues elongati, subarcuati: pulvilli minuti: mesopedes longiores et graciliores, cætera propedum: metapedum coxæ maximæ, elongatæ; femora maxima, ovata, subtus dentibus plurimus armata, quorum basalis maxima; tibiæ valdè arcuatæ, subtus canaliculatæ, femoribus appressæ; apicis angulus internus productus, acuminatus; cætera propedum: proalæ nervus ordinarius ante medium costæ junctus, inde per costam ferè ad alæ apicem productus: nervi duo longitudinales sinuati, indistincti, anticus furcam emittens ramulo stigmatali junctam: metalæ angustæ; nervus ordinarius ultra medium productus, apice hamo armatus.

DIVISIO 1. *Abdomen breve, vix longius quàm latum.*

Latreille supposed that these insects infest the *Stratiomydæ*, or other *Diptera*, that are aquatic in their larva state. *C. xanthostigma*, Dalm. is parasitic upon a species of *Hylotoma*.

Sp. 1. *Smi. nigrifex.* Mas et Fem. *Nigra, petiolo et pedibus flavis, his nigro variegatis.*

*Sphex nigrifex.* . . . *Sulzer, Hist. Ins.* 191. 1. fig. 27. 1.

*Vespa &c.* . . . . *Geoffroy, Ins. Par.* II. 380. 16.

*Vespa dearticulata.* *Fourc. Ent. Par.* Tom. II. 437. 16.

*Sphex sispes* . . . *Fabr. Sp. Ins.* I. 446. 61. *Villers, Ent.*  
Tom. I. 222. 6.

*Chrysis sispes* . . . *Fabr. Syst. Ent.* 359. 15.

*Chalcis sispes* . . . *Fabr. Mant. Ins.* I. 272. 1. *Ent. Syst.*  
II. 194. 1. *Syst. Piezat.* 159. 1.  
*Gmel. Syst. Nat.* I. 5. 2742. 1.  
*Hubn. Naturf.* 24. 54. 18. Tab. 2.

<sup>d</sup> The second segment of my preceding descriptions; the petiole being considered as the first. The other alterations require no explanation.

fig. 22. *Panz.* 77. 11. *Stew.* II. 236. *Rossi, Faun. Etrusc.* II. 58. 802. *Oliv. Encycl. Méthod.* V. 438. 2. *Spin. Ins. Lig.* fasc. 1. 62. *Latr. Règne Anim.* III. 474; *Nouv. Edit.* V. 295. *Nouv. Dict. d'Hist. Nat.* VI. 23. 10. *Lam. Anim. sans Vertèbres,* IV. 153. *Fonscol. Ann. Sci. Nat.* XXVI. 275. 1.

*Smiera sispes* . . . *Spinola. Ann. du Muséum d'Hist. Nat.* Tom. XVII.

*Smiera petiolatus* . *Curtis Brit. Ent.* 472.

*Mas.*—Nigra, pilis canis vestita: caput inter oculos flavo bimaculatum: oculi ocellique fusci: antennæ fusiformes, corporis dimidio longiores; scapus nitidus; clava articulis 2 præcedentibus paullò brevior: palpi maxillares articulis 4; 1<sup>us</sup>. mediocris; 2<sup>us</sup>. vix longior; 3<sup>us</sup>. brevior; 4<sup>us</sup>. elongatus, fusiformis, setosus: palpi labiales articulis 3; 1<sup>us</sup>. et 2<sup>us</sup>. breves; 3<sup>us</sup>. longior: mesothoracis scutellum apice bisponosum; squamulæ flavæ: petiolus flavus: abdomen nitidum; segmenta 1<sup>um</sup>. et 2<sup>um</sup>. maxima; sequentia parva, subæqualia: pedes nigri; metacoxæ supra apice spinosæ; pro et mesofemora apice flava; metafemora flava, apice et supra basi nigra, subtus dentibus 13 nigris armata; pro et mesotibiæ fuscæ, apice basique flavæ; metatibiæ apice flavæ; tarsi fulvi, apice fusci: alæ subfuscæ; nervi fusci.

*Fem.*—Antennæ breviores, tenuiores, clavatæ: metafemorum dens basalis multò longior et crassior: petiolus brevior: abdominis segmenti 1<sup>i</sup>. latera latiora; 2<sup>um</sup>. parvum, 1<sup>i</sup>. margine ferè occultum; 3<sup>um</sup>. magnum, latera 1<sup>i</sup>. margine ferè occulta; sequentia minima: oviductus rufo-fuscus. (Corp. long. 3 lin.; alar. 5 lin.)

Common in the South of Europe; rare in the North. July; South of France; on aquatic plants. M. F. de Laporte has taken it near Paris.

Sp. 2. *Smi. sispes.* *Mas et. Fem. Nigra, metafemoribus tarsisque rufis.*

*Sphex sispes* . . *Linn. Syst. Nat.* XII. 2. 943. 13. *Faun. Succ.* 1657.

*Chalcis clavipes.* *Fabr. Mant. Ins.* I. 272. 2. *Ent. Syst.* III. 2. 195. 2. *Syst. Piezot.* 159. 2. *Gmel. Syst. Nat.* 1. 5. 2742. 2. *Hüb.*

*Naturf.* 24. 56. 19. Tab. 2. fig. 23.  
*Oliv. Encycl. Méthod.* V. 438. *Rossi Faun. Etrus.* II. 58. 803. *Latr. Règne Anim.* III. 474; *Nouv. Edit.* V. 295.  
*Nouv. Dict. d'Hist. Nat.* VI. 13. Pl. B. 23. 10. *Panz.* 78. fig. 15. *Don.* XI. 57. 379. *Lam. Anim. sans Vertèbres,* IV. 153. *Leach, Ed. Encycl.* IX. 144. *Samouelle,* 271. Pl. 8. fig. 6. *Fonscol. Ann. Sci. Nat.* XXVI. 276. 2.

*Smiera clavipes* . *Spin. Ann. du Muséum, &c.* Tom. XVII.

*Chalcis sispes* . *Dalm. Act. Kongl. Vetensk. Acad. Handl. für är.* 1820.

*Smiera sispes* . . *Curtis, Brit. Ent.* 472.

*Mas.*—Nigra, pilis canis vestita: oculi ocellique fusci: antennæ subfiliformes, corporis dimidio breviores; scapus nitidus: palpi maxillares articulis 4; 1<sup>us</sup>. brevis, extùs excavatus; 2<sup>us</sup>. multò longior; 3<sup>us</sup>. brevis, 1<sup>o</sup>. æqualis: mentum quàm *S. nigrificis* latius: palpi articulis 3 ferè æqualibus; 2<sup>us</sup>. paullò brevior: mesothoracis scutellum apice bisponosum; squamulæ fuscae: petiolus quàm *S. nigrificis* brevior: abdomen nitidum: pedes nigri; pro- et mesofemora apice rufa; metafemora rufa, apice nigra, subtus dentibus 8 inæqualibus armata; pro- et mesotibiæ nigro-fuscae; metatibiæ nigrae; tarsi rufi, apice fusci; alæ subfuscae, apice fuscae; nervi fusci.

*Fem.*—Antennæ paullò breviores, clavatae: oviductus rufo-fuscus.  
 (Corp. long.  $2\frac{3}{4}$ — $3\frac{1}{4}$  lin.; alar.  $4\frac{3}{4}$ — $5\frac{1}{4}$  lin.)

*Var. β.*—Metafemora extùs flavo maculata.

Described from specimens taken at Paris by M. F. de Laporte. Unlike *C. nigrifex*, it abounds more in the North than in the South of Europe.

There are three more described European species; viz.—

Sp. 3. *Smi. melanaris*.

*Chalcis melanaris* . . *Dalm. Act. Kongl. Vetensk. Acad. Handl. für är.* 1820.

*Smiera Macleanii* . . *Curtis, Brit. Ent.* 472.

Taken lately in Essex.



Sp. 4. Smi. biguttata.

Chalcis biguttata. . . *Spin. Ins. Lig.* Fasc. 4<sup>us</sup>. 231.

Sp. 5. Smi. xanthostigma.

Chalcis xanthostigma. *Dalm. Act. Kongl. Vetensk. Acad. Handl. für är.* 1820.

DIVISIO II. *Abdomen apice elongatum et acuminatum.*

The exotic species of this division, and of some genera nearly allied to it, are very numerous.

Sp. 6. Smi. subpunctata. Mas et Fem. *Flava, nigro variegata, alis hyalinis.*

*Mas.*—Flava, vix pubescens: caput subtus nigro fasciatum: oculi virides: ocelli fuscii: antennæ subfusiformes, fusæ, subtus fulvæ: mesothoracis scutum anticè nigrum, medio nigro vittatum; parapsides nigro maculatæ; paraptera nigro maculata, maculæ inter scutum et scutellum conjunctæ; super scutellum macula teli-formis nigra; pectus nigro bimaculatum: metathoracis scutellum nigro fasciatum: petiolus abdominis dimidio brevior: abdomen elongato-ovatum, nitidum, fulvum; maculæ 5 dorsales et apex nigrae; segmentum 1<sup>um</sup>. flavum, magnum; cætera parva; pedes flavi; metacoxæ extùs nigro maculatæ; metafemora subtus basi et apice nigro maculata, subtus dentibus 14 nigris armata; dens basalis magna, cæteri minimi; metatibiæ basi, apice et subtus fusæ; ungues et pulvilli fuscii: alæ hyalinæ, iridescentes; nervi fulvi.

*Fem.*—Antennæ subclavatæ: abdomen apice acuminatum; segmentum 1<sup>um</sup>. magnum; 2<sup>um</sup>. et 4 sequentia minuta; cætera elongata: oviductus fuscus. (Corp. long. 2½ lin.; alar. 3 lin.)

*Var. β*—*Mas*, abdomen fulvum, fusco fasciatum.

Taken in St. Vincent's island, by the Rev. Lansdown Guilding: described also from a Cayenne specimen in the collection of M. F. de Laporte.

Sp. 7. Smi. fulvescens. Mas et Fem. *Lætè ferruginea, abdomine fusco, alis hyalinis.*

*Mas.*—Ferruginea, subtus pallidior, vix pubescens: oculi virides: ocelli fuscii: antennæ subfusiformes, fuscae, subtus fulvæ: petiolus gracilis, abdominis dimidio brevior: abdomen elongato-ovatum, nitidum, ferrugineum, supra fusco fasciatum: pedes flavescentes; metafemora subtus dentibus 14 nigris armata; dens basalis magna, cæteri minimi; metatibiæ subtus fuscae; ungues et pulvilli fuscii: alæ hyalinæ, iridescentes; nervi fulvi.

*Fem.*—Antennæ subclavatae: petiolus quàm *maris* brevior: abdomen acuminatum; segmenta apicalia elongata; apex nigro-fusca: oviductus omninò occultus. (Corp. long. 2½ lin.; alar. 3 lin.)

*Var. β.*—*Mas*, abdomen fuscum, basi fulvo fasciatum.

Taken in St. Vincent's island, by the Rev. Lansdown Guilding.

## GENUS II.—EPITRANUS,<sup>e</sup> Walker.

*Fem.*—Corpus punctatum, sparsè pubescens: caput mediocre, transversum, ferè trigonum: antennæ 14-articulatae, subfusiformes, corporis dimidio breviores, basi approximatae, prope os insertae: articulus 1<sup>us</sup>. valdè elongatus, flagelli dimidio longior; 2<sup>us</sup>. brevis; 3<sup>us</sup>. minimus; 4<sup>us</sup>. et 11 sequentes subæquales; clava 3-articulata, conica, articulis 10<sup>o</sup>. et 11<sup>o</sup>. brevior et angustior: mandibulæ angustæ; una recta, bidentata, dentes acuti, externus magnus; altera apice arcuata, dente brevi acuto terminata: thorax ovatus: prothoracis scutellum mediocre, posticè incurvum; pectus parvum: mesothoracis scutum mediocre; parapsides optimè determinatae, maximæ, convexæ; paraptera et epimera trigona, magna; scutellum maximum, ferè rotundum; sternum parvum: metathoracis scutellum et postscutellum parva; sternum magnum: petiolus linearis, abdominis dimidio longior: abdomen elongato-ovatum, vix compressum, subtus carinatum, apice acuminatum; segmentum 1<sup>um</sup>. maximum, ferè ad apicem productum; cætera minima, brevissima: oviductus occultus: pro- et mesopedum coxæ parvæ; femora clavata; tibiæ apice spina elongata, valida, arcuata armatae; ungues et pulvilli minuti: metapedum coxæ apice angustiores; femora subtus dentibus 9 armata; quorum basalis maximus, obtusus; cæteri minimi, acuti; tibiæ *Smieræ*: alæ breves; nervi indistincti.

Sp. 1. *Epi. fulvescens.* Fem. *Rufo-fuscus, tarsis flavis, alis albis.*

<sup>e</sup> ἐπὶ ἀντὲ, τριπλὸς planus.

Caput punctatum : oculi ocellique fuscæ : antennæ fuscæ ; articulus 1<sup>us</sup>. fulvus : thorax punctatus ; squamulæ flavæ : petiolus striatus : abdomen nitidum, glabrum : metatibiæ subtus fuscæ ; tarsi flavi ; ungues et pulvilli fuscæ : alæ albæ, iridescentes ; nervi flavi. (Corp. long. 1½—2 lin. ; alar. 2—2½ lin.)

Taken in St. Vincent's Island, by the Rev. Lansdown Guilding.

GENUS III.—CHALCIS, *Fabricius*.

Vespa . . . . *Linnæus, Geoffroy, Fourcroy.*

Chalcis . . . *Fabricius, Gmelin, Rossi, Latreille, Panzer, Olivier, Lamarck, Cuvier, Spinola, Dumeril, Dalman, Leach.*

Brachymeria. *Westwood.*

Corpus punctatum, pubescens : caput mediocre, breve, transversum, thorace non latius, anticè ubi scapi insident excavatum : oculi mediocres : ocelli trigonè dispositi : antennæ 13-articulatæ, plus minusve fusiformes, medio frontis insertæ ; articulus 1<sup>us</sup>. elongatus ; 2<sup>us</sup>. mediocris ; 3<sup>us</sup>. minimus ; 4<sup>us</sup>. et 6 sequentes crassi, subæquales, longitudine decrescentes ; clava 3-articulata, conica, articulis 2 præcedentibus brevior : mandibulæ arcuatæ, bidentatæ ; dentes obtusi, internus brevior : maxillæ elongatæ, angustæ, intùs apicem versus in lobum tripartitum productæ : palpi 4-articulati, ferè filiformes ; articuli 1<sup>us</sup>. et 3<sup>us</sup>. breves ; 2<sup>us</sup>. longior ; 4<sup>us</sup>. multò longior, fusiformis : mentum ovatum : palpi articulis 3 ; 1<sup>us</sup>. et 3<sup>us</sup>. apice crassiores ; 2<sup>us</sup>. brevis : labium angustum, fissum : thorax ovatus : prothoracis scutellum magnum, subquadratum, posticè excavatum, anticè angustius ; pectus parvum : mesothoracis scutum maximum ; parapsides benè determinatæ ; scutellum maximum, latius quàm longum, apice plerumque bispinosum ; paraptera et epimera magna, trigona ; sternum parvum : metathorax parvus ; scutellum mediocre : petiolus brevissimus : *maris* abdomen gibbum, vix duplo longius quàm latum ; segmentum 1<sup>um</sup>. maximum, dimidium occupans ; 2<sup>um</sup>. mediocre ; sequentia minima ; segmenta 7 aut plura ventralia subtus abdomen conspicua, quorum 1<sup>um</sup>. et 2<sup>um</sup>. magna, reliquæ minuta : *fem.* abdomen paullò longius et acutius, infra carinatum ; segmenta ventralia vix conspicua : propedes mediocres ; coxæ trigonæ ; trochanteres parvi ; femora paullò incrassata ; tibiæ subclavatæ, rectæ, apice spina magna arcuata armatæ ; ungues et

pulvilli mediocres: mesopedes paullò longiores et tenuiores; spina tibialis brevior et gracilior; cætera propedum: metapedes et alæ *Smieræ*.

Sp. 1. Chal. femorata. Mas. *Nigra, pedibus flavis, meta-femoribus nigro fasciatis.*

Chalcis femorata . *Panz. Faun. Ins. Germ. Fasc. 84. fig. 16.*  
Chalcis flavipes . *Latr. Gen. Crust. et Insect. IV. 26.*

*Nigra*, pilis canis vestita: oculi fusci: ocelli rufo-fusci: antennæ subfusiformes, nigræ, apice rufo-fuscæ: mesothoracis scutellum apice acutè bispinosum; squamulæ flavæ: abdomen nitidum, punctatum: pedes flavi; coxæ nigræ; trochanteres fusci; pro- et mesofemora basi nigra; metafemora nigro cingulata, subtus dentibus 12 inæqualibus armata; pro- et mesotibiæ subtus fusco maculatæ; metatibiarum canaliculorum margines fusci; ungues et pulvilli fusci: alæ subhyalinæ; nervi fusci. (Corp. long.  $2\frac{1}{2}$ —3 lin.; alar.  $4\frac{1}{2}$ —5 lin.)

Taken near Paris, from the pupæ of *Zygæna Filipendulæ*, by M. F. de Laporte.

Sp. 2. Chal. flavipes. Fem. *Nigra, pedibus flavis, meta-femoribus basi nigris, alis subhyalinis.*

Chalcis flavipes . *Fabr. Ent. Syst. II. 197. 10. Syst. Piezat. 167. 32. Latr. Hist. Nat. des Ins. XIII. 220. Panz. Fasc. 78, fig. 16. Fonscol. Ann. Sci. Nat. XXVI. 276.*

*Nigra*, pilis canis vestita: oculi fusci: ocelli rufo-fusci: antennæ fusiformes, nigræ, apice rufo-fuscæ: mesothoracis scutellum inerme; squamulæ flavæ: abdomen nitidum, ferè glabrum: pedes flavi; coxæ nigræ; trochanteres fusci; pro- et mesofemora basi nigra; metafemora nigra, apice flava, subtus dentibus 13 aut 14 inæqualibus armata; pro- et mesotibiæ subtus fusco maculatæ; metatibiæ subtus fuscæ; ungues et pulvilli fusci: alæ subhyalinæ; nervi fusci. (Corp. long. 3 lin.; alar. 5 lin.)

Taken near Paris, by M. F. de Laporte. It may be the female of the preceding species.

Sp. 3. Chal. distinguenda. Mas et Fem. *Præcedenti, minor, nigra, pedibus flavis, metafemoribus basi nigris, alis hyalinis.*

*Mas.* Nigra, pilis canis vestita: oculi fuscii: ocelli rufo-fuscii: antennæ subfusiformes, nigrae, apice rufo-fuscae: mesothoracis scutellum dentibus 2 brevissimis obtusis armatum; squamulae flavae: abdomen nitidum, sparsè punctatum: pedes flavi; coxæ nigrae; trochanteres fuscii; femora nigra, apice flava; metafemora subtus dentibus 12 armata; pro- et mesotibiæ subtus fusco maculatae; metatibiæ subtus fuscae; ungues et pulvilli fuscii: alæ hyalinae; nervi fuscii.

*Fem.* Antennæ fusiformes, paullò breviores et crassiores: mesothoracis scutellum inerme. (Corp. long. 2—2½ lin.; alar. 4—4½ lin.)

Taken near Paris, by M. F. de Laporte. July; South of France.

Sp. 4. Chal. tibialis. Mas. *Nigra, pedibus flavis, pro- et mesotibiis nigro maculatis.*

Nigra, pilis canis vestita: oculi fuscii: ocelli rufo-fuscii: antennæ nigrae, apice rufo-fuscae: mesothoracis scutellum apice bispinosum; squamulae flavae: abdomen nitidum, sparsè punctatum et pubescens: pedes flavi; coxæ nigrae; trochanteres fuscii; femora nigra, apice flava; metafemora subtus dentibus 12 armata; pro- et mesotibiæ extùs et subtus nigro maculatae; metatibiæ subtus nigrae; ungues et pulvilli fuscii: alæ hyalinae; nervi fuscii. (Corp. long. 2 lin.; alar. 4 lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 5. Chal. annulipes. Mas et Fem. *Nigra, pedibus flavis, tibiis omnibus nigro maculatis.*

Chalcis flavipes . . *Fabr. Ent. Syst. II. 197. 10. Syst. Piezat. 167. 32.?*

*Mas.* Nigra, pilis canis vestita: oculi fuscii: ocelli rufo-fuscii: antennæ nigrae, apice rufo-fuscae: mesothoracis scutellum apice tubercu-

latum; squamulæ flavæ: abdomen nitidum, sparsè punctatum et pubescens: pedes flavi; coxæ nigrae; trochanteres fusci; pro- et mesofemora basi nigra; metafemora nigra, apice supra flavo maculata, subtus dentibus 12? armata; pro- et mesotibiæ extùs et subtus nigro maculatæ; metatibiæ basi et medio nigro-fusca, subtus quoque nigro-fusca; ungues et pulvilli fusci: alæ hyalinæ; nervi fusci.

*Fem.* Antennæ paullò breviores et crassiores: scutellum inerme. (Corp. long.  $1\frac{1}{4}$ — $2\frac{1}{2}$  lin.; alar.  $2\frac{1}{4}$ — $4\frac{1}{2}$  lin.)

Described from specimens taken in St. Vincent's Island, by the Rev. Lansdown Guilding: also, from a Cayenne one in the collection of M. de Laporte.

Sp. 6. Chal. cingulata. *Fem. Nigra, pedibus flavis, tibiis omnibus fusco maculatis.*

Nigra, pilis canis vestita: oculi fusci: ocelli rufo-fusci: antennæ nigrae, apice rufo-fusca: mesothoracis scutellum inerme; squamulæ flavæ: abdomen nitidum, ferè glabrum, sparsè pubescens: pedes flavi; coxæ nigrae; trochanteres fusci; femora nigra, apice flava; metafemora subtus dentibus 12 armata; pro- et mesotibiæ extùs et subtus fusco maculatæ; metatibiæ supra medio et subtus omninò fusca; ungues et pulvilli fusci: alæ hyalinæ; nervi fusci. (Corp. long. 2— $2\frac{1}{2}$  lin.; alar. 4— $4\frac{1}{2}$  lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 7. Chal. minuta. *Mas. et Fem. Nigra, pedibus flavis nigro variegatis, tarsis rufis.*

- Vespa minuta . . . *Linn. Syst. Nat.* 952. 28.  
 Vespa, &c. . . . *Geoffroy. Ins.* II. 380. 15.  
 Vespa femoralis . . . *Fourc. Ent. Par.* II. 437. 15.  
 Chalcis minuta . . . *Fabr. Mant. Ins.* I. 272. 3. *Ent. Syst.* II. 195. 4. *Syst. Piezat.* 165. 23. *Gmel. Syst. Nat.* I. 5. 2742. 3. *Latr. Hist. Nat. des Ins.* XIII. 220. *Règne Anim.* III. 474; *Nouv. Edit.* V. 296. *Nouv. Dict. d'Hist.*

*Nat.* VI. 13. *Rossi, Faun. Etrusc.*  
 II. 58. 804. *Oliv. Encycl. Méthod.*  
 V. 439. 5. *Panz.* Fasc. 32. Tab. 6.  
*Lam. Anim. sans Verteb.* IV. 153.  
*Dum. Dict. des Sci. Nat.* VIII. 69.  
 Pl. 34. fig. 1. *Leach, Edin. Encycl.*  
 IX. 144. *Fonscol. Ann. Sci. Nat.*  
 XXVI. 277.

*Chalcis femorata* . *Dalm. Kongl. Vetens. Acad. für är*  
 1820.

*Brachymeria minuta.* *Westw. Lond. & Edinb. Phil. Mag.*  
*Third Series.* Vol. I. 127.

*Mas. Nigra, pilis canis vestita: oculi fusci: ocelli rufo-fusci: antennæ nigræ, apice rufo-fuscae: mesothoracis scutellum apice bispinosum; squamulæ flavæ: abdomen ferè glabrum, sparsè pubescens: pedes flavi; coxæ nigræ; trochanteres fusci; femora nigra, apice flava; metafemora subtus dentibus 12 armata; tibiæ fusco cingulatæ; metatibiæ subtus quoque fuscae, basi rufo-fuscae; tarsi pallidè rufi; ungues et pulvilli fusci: alæ subfuscae; nervi fusci.*

*Fem.* Antennæ paullò breviores et crassiores: scutellum inerme: abdomen longius. (Corp. long. 2—2½ lin.; alar. 4—4½ lin.)

*Var. β.—Mas.* Tibiæ nigro cingulatæ.

Taken near Paris, by M. F. de Laporte. July; South of France. September; Lizard Point, Cornwall.

Sp. 8. *Chal. podagrica.* *Fem. Nigra, pedibus rufis, flavo variegatis.*

*Chalcis podagrica.* *Fabr. Mant. Ins.* I. 272. 5. *Ent. Syst.*  
 II. 196. 6. *Syst. Piezat.* 166. 24.  
*Gmel. Syst. Nat.* 1. 5. 2743. 5. *Hubn.*  
*Naturf.* 24. 57. 20. Tab. 2. fig. 24.  
*Oliv. Encycl. Méthod.* V. 439. 7.  
*Fonscol. Ann. Sci. Nat.* 26. 277.

*Chalcis femorata.* *Fem. Dalm. Kongl. Vetens. Acad. Handl.*  
*für är 1820.*

*Nigra, pilis canis vestita: oculi fusci: ocelli rufo-fusci: antennæ nigræ, apice rufo-fuscae: mesothoracis scutellum apice tubercu-*



latum; squamulæ flavæ: abdomen ferè glabrum, sparsè pubescens: pedes rufi; coxæ nigræ; metacoxæ apice rufæ; femora apice supra flava: metafemora subtus dentibus 12 armata; tibiæ basi et apice flavo maculatæ; metatibiæ subtus fuscæ; ungues et pulvilli fusci: alæ hyalinæ; nervi fusci. (Corp. long. 2—2½ lin.; alar. 4—4½ lin.)

*Var. β.* Pro- et mesopedes ferè omninò rufi.

Taken by M. F. de Laporte, near Paris. July; South of France.

Sp. 9. Chal. vicina. Fem. *Nigra, pedibus nigris, femoribus apice tarsisque rufis.*

*Nigra*, pilis canis vestita: oculi fusci: ocelli rufo-fusci: antennæ nigræ: mesothoracis scutellum inerme; squamulæ flavæ: abdomen ferè glabrum, sparsè pubescens: pedes nigri; trochanteres fusci; pro- et mesofemora apice rufo-flavescentia; metafemora apicem versus rufescentia, apice supra flavo notata, subtus dentibus 12 armata; pro- et mesotibiæ nigro-fuscæ, apice basi subtusque rufescentes; metatibiæ nigræ, supra basim versus et apice flavo maculatæ; tarsi pallidè rufi; ungues et pulvilli fusci: alæ sub-fuscæ; nervi fusci. (Corp. long. 1¾—2 lin.; alar. 3¾—4 lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 10. Chal. parvula. Mas et Fem. *Nigra, pedibus nigris, femoribus apice tarsisque flavis.*

*Chalcis minuta.* *Dalm. Kongl. Vetens. Acad. Handl. für år 1820.*

*Mas.* *Nigra*, pilis canis vestita: oculi fusci: ocelli rufo-fusci: antennæ nigræ, apice rufo-fuscæ: mesothoracis scutellum apice bispinosum; squamulæ flavæ: abdomen ferè glabrum, sparsè pubescens: pedes nigri; trochanteres fusci; femora apice flava; mesofemora subtus dentibus 12 armata; pro- et mesotibiæ nigro-fuscæ, apice basi subtusque flavæ; metatibiæ extùs basi et apice flavescentes; tarsi flavi; ungues et pulvilli fusci: alæ hyalinæ; nervi fusci.

*Fem.* Antennæ paullò breviores et crassiores: scutellum inerme; abdomen longius. (Corp. long. 1—1¾ lin.; alar. 2—3¾ lin.)

Taken near Paris, by M. F. de Laporte. July; South of France.

GENUS IV. HALTICELLA,<sup>f</sup> *Spinola*.

Chalcis. . *Fabricius, Gmelin, Rossi, Hubner, Olivier, Latreille, Spinola.*

Halticella. *Spinola.*

Caput mediocre, transversum, thorace vix angustius, anticè ubi insident scapi excavatum : antennæ 13-articulatæ, prope os insertæ ; *maris* subfusiformes, *fem.* subclavatæ, paullò breviores ; articulus 1<sup>us</sup>. elongatus, 2<sup>us</sup>. cyathiformis, 3<sup>us</sup>. minimus, 4<sup>us</sup>. et 6 sequentes subæquales, magni ; clava triarticulata, conica, articulis 2 præcedentibus brevior : mandibulæ arcuatæ, apice bidentatæ ; dentes vix acuti : maxillæ elongatæ, apice intùs in lobum quasi articulatum productæ ; palpi 4-articulati, breves ; articulus 1<sup>us</sup>. mediocris ; 2<sup>us</sup>. crassior, cyathiformis ; 3<sup>us</sup>. parvus ; 4<sup>us</sup>. elongatus, fusiformis, setosus : mentum elongato-ovatum ; palpi 3-articulati, menti apice insertæ, breves ; articulus 2<sup>us</sup>. minimus : labium rotundum, integrum, anticè ciliatum : thorax ovatus : pectus parvum : prothoracis scutellum mediocre, subquadratum, posticè incisum : mesothoracis scutum magnum ; parapsidum suturæ distinctæ ; scutellum magnum, subrotundum : metathoracis scutellum, paraptera et epimera magna ; illum medio canaliculatum : petiolus brevissimus : *maris* abdomen ovatum, convexum ; segmentum 1<sup>um</sup>. maximum, abdominis dimidio vix brevius ; 2<sup>um</sup>. mediocre ; sequentia parva ; subtus abdomen segmenta 6 ventralia conspicua, quorum 1<sup>um</sup>. et 2<sup>um</sup>. magna, cætera parva : *fem.* abdomen elongato-ovatum, subtus carinatum ; segmenta ventralia occulta : propedes mediocres ; femora subincrassata ; tibiæ apice spina elongata valida arcuata armatæ : mesopedes paullò tenuiores ; spina tibialis multo brevior et gracilior : metapedes coxis femoribusque maximis ; hæ subtus dentibus 12 minutis armata ; tibiæ arcuatæ, subtus canaliculatæ, apice intùs productæ, acuminatæ et spina armatæ : alæ *Chalcidis*.

Sp. 1. Hal. pusilla. Mas et Fem. *Nigra, femoribus apice flavis, tarsis fulvis, alis subfuscis.*

Chalcis pusilla. . *Fabr. Mant. Ins. I. 272. 5. Ent. Syst. II. 197. 8. Syst. Piezat. 167. 29. Gmel. Syst. Nat. I. 5. 2743. 6. Hübn. Naturf. 24. 57. 21. Tab. 2. fig. 25. Ross. Faun. Etrusc. II. 59. 807. Oliv. Encycl. Méthod. V. 439. 8.*

Halticella pusilla. *Spin. Ann. Mus. Hist. Nat. Tom. XVII.*

<sup>f</sup> ἄλτικος saltator, κέλλω celeriter moveo. It is usually spelt *Haltichella*.

Nigra, punctata, pilis canis vestita : oculi fuscii : ocelli rufo-fuscii : mesothoracis scutellum inerme ; squamulæ flavæ : abdomen nitidum, glabrum, basi nudum : pedes nigri ; pro- et mesofemora apice fulva ; metafemora apice flava ; pro- et mesotibiæ fusca, basi, apice et subtus fulvæ ; metatibiæ apice et macula basim versus fulvæ ; tarsi fulvi ; ungues et pulvilli fuscii : alæ subfusca, medio obscuriores : nervi fuscii. (Corp. long.  $1\frac{1}{4}$ — $1\frac{3}{4}$  lin. ; alar.  $2\frac{1}{4}$ — $2\frac{3}{4}$  lin.)

Taken near Paris by M. F. de Laporte.

GENUS V. HOCKERIA,<sup>g</sup> *De Laporte.*

Chalcis . . *Fabricius, Gmelin, Olivier, Latreille.*

Halticella. *Spinola, Olivier, &c.*

Hockeria. *De Laporte.*

Caput *Halticellæ* : antennæ 13-articulatæ, prope os insertæ ; *maris* subfusiformes, corporis dimidio longiores ; *fem.* subclavatæ, paullò breviores ; articulus 1<sup>us</sup>. flagelli dimidii longitudinem ; 2<sup>us</sup>. cyathiformis ; 3<sup>us</sup>. et 8-sequentes subæquales ; 12<sup>us</sup>. et 13<sup>us</sup>. minimi, vix conspicui : os *Halticellæ* : thorax ovatus : pectus parvum : prothoracis scutellum magnum, quadratum : mesothoracis scutum magnum ; parapsides benè determinatæ ; scutellum magnum, subrotundum ; paraptera et epimera mediocria : metathoracis scutellum maximum, medio canaliculatum : *maris* abdomen sessile, ovatum, convexum ; segmentum 1<sup>um</sup>. magnum ; sequentia parva, apicem versus longitudine decrescentia ; subtus abdomen segmenta 7 ventralia conspicua, basalia apicalibus longiora : *fem.* abdomen elongato-ovatum, subtus carinatum ; segmentum 1<sup>um</sup>. maximum, abdominis dimidio paullò brevius ; 2<sup>um</sup>. mediocre ; 3<sup>um</sup>. 4<sup>um</sup>. et 5<sup>um</sup>. parva ; 6<sup>um</sup>. latius ; segmenta ventralia vix conspicua : propedes mediocres ; tibiæ apice spina armatæ ; tarsi breves ; ungues et pulvilli minuti : mesopedes paullò tenuiores : metapedes elongati ; coxæ maximæ, trigonæ ; femora magna, ovata, subtus apice dentibus 2 magnis obtusis armata ; tibiæ arcuatæ, subtus canaliculatæ, apice latiores et spinis 2 armatæ : proalæ nervus ordinarius costæ partem brevissimam occupans ; ramulus stigmatalis minimus, vix furcatus.

This genus forms the second division of *Chalcis*, in Latreille's *Gen. Crust. et Ins. &c.* Spinola placed it with *Chalcis pusilla* in his genus *Halticella*, which was probably formed on the species belonging to it ; but this being uncertain, I have

<sup>g</sup> ὄγκηρος tumidus.

adopted De Laporte's generic name. The peculiar form and low insertion of the antennæ, and the very short part of the costa occupied by the ordinary nervures of the superior wings, are characters possessed also by the *Encyrtidæ*.

Sp. 1. Hoc. bispinosa. Fem. *Nigra, pro- et mesotibiis tarsisque omnibus rufis, proalis medio fuscis, albo maculatis.*

Chalcis bispinosa . . *Fabr. Syst. Piezat.* 166. 28. *Fonscol. Ann. Sci. Nat.* 26. 279. 9.

Halticella bispinosa. *Spin. Ann. Mus. Hist. Nat.* Tom. XVII. *Oliv. Nouv. Dict. d'Hist. Nat.*

*Nigra, nitida, punctata, vix pilosa: oculi fuscii: ocelli rufo-fuscii: mesothoracis scutellum apice bispinosum; squamulæ rufo-fuscæ: abdomen nitidissimum, glabrum, acuminatum, subtus rufo-fuscum; pedes nigri; pro- et mesotibiæ omnino, et metatibiæ apice rufæ: tarsi rufi; ungues et pulvilli fuscii: alæ subfuscæ; proalæ medio fuscæ, albo bimaculatæ; nervi fuscii. (Corp. long. 2 lin.; alar. 2 $\frac{3}{4}$  lin.)*

Taken near Paris, by M. F. de Laporte.

Sp. 2. Hoc. bifasciata. Fem. *Nigra, tarsis rufis, proalis fusco bifasciatis.*

Chalcis bimaculata. *Fonscol. Ann. Sci. Nat.* XXVI. 280. 11.

*Nigra, obscura, punctata, pilosa: oculi fuscii: ocelli rufo-fuscii: antennæ nigrae, graciles, thorace longiores: mesothoracis scutellum inerme; squamulæ nigrae: abdomen *H. bispinosæ* sed brevius, nitidum, glabrum, basi nudum, subtus rufo-fuscum; pedes nigri; femora postica subtus fusca; coxæ, tibiæ apice tarsique rufescentes; ungues et pulvilli fuscii: alæ subfuscæ; proalarum fasciæ medio connectæ: nervi fuscii. (Corp. long. 1—1 $\frac{1}{2}$  lin.; alar. 2—2 $\frac{1}{4}$  lin.)*

Taken near Paris, by M. F. de Laporte.

Sp. 3. Hoc. hetera. Mas. *Nigra, pedibus rufis, metafemoribus et tibiis nigris, mesothoracis scutello integro.*

*Nigra, nitida, punctata, pilosa: oculi fuscii: ocelli rufo-fuscii: antennæ nigrae, gracillimæ, corporis dimidio longiores; scapus perlongus: mesothoracis scutellum inerme; squamulæ rufo-*

fuscæ: metathoracis scutellum maximum, apice utrinque productum: abdomen nitidum, glabrum, subtus apice rufo-fuscum: pedes rufi; coxæ nigrae; trochanteres fusci; pro- et mesofemora basi nigra; metafemora nigra, apice supra rufa; metatibiæ nigrae, apice rufæ; tarsi et ungues fusci: alæ subfuscæ; proalæ medio obscuriores; nervi fusci. (Corp. long.  $1\frac{1}{4}$  lin.; alar.  $2\frac{1}{4}$  lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 4. Hoc. nigra. Mas. *Nigra, metafemoribus tarsisque omnibus rufis.*

Chalcis Dargelasii? *Latr. Hist. Nat. des Crust. &c. XIII. 221.*

Nigra, obscura, punctata, pilosa: oculi fusci: ocelli rufo-fusci: mandibulæ rufæ: antennæ nigrae, thoraci breviores: mesothoracis scutellum inerme; squamulæ nigro-fuscæ: metathoracis scutellum maximum: abdomen nitidum, glabrum: pedes nigri; metafemora rufa, basi extûs, nonnunquam quoque supra et subtus nigra; tarsi rufi; ungues et pulvilli fusci: alæ hyalinæ; nervi pallidè fusci. (Corp. long.  $1\frac{3}{4}$ —2 lin.; alar.  $2\frac{1}{2}$ — $2\frac{3}{4}$  lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 5. Hoc. nigripes. Mas. *Nigra, tarsis rufis, mesothoracis scutello integro.*

Chalcis nigripes. *Fonscol. Ann. Sci. Nat. XXVI. 280. 10.*

Nigra, obscura, punctata, pubescens: oculi fusci: ocelli rufo-fusci: antennæ nigrae: mesothoracis scutellum convexum, integrum; squamulæ nigrae: metathoracis scutellum maximum, striatum: abdomen nitidum, glabrum, basi nudum: pedes nigri; metacoxæ nitidissimæ; trochanteres, ungues et pulvilli fusci: tibiæ apice rufæ: tarsi rufi: alæ subhyalinæ; nervi fusci, basi pallidiores. (Corp. long.  $1\frac{1}{2}$  lin.; alar.  $2\frac{1}{4}$  lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 6. Hoc. rufipes. Mas. *Nigra, pedibus rufis, metafemoribus et tibiis nigris, mesothoracis scutello bispinoso.*

Chalcis rufipes . *Oliv. Encycl. Méthod. V. 440. 11.*

Chalcis clavipes? *Rossi.*

Chalcis armata . *Dalm. Kongl. Vetens. Acad. Handl. für är. 1820. Var.?*

Cynips armata. . *Panz. Faun. Insect. Germ. 74. 9. Var.?*

*Nigra*, obscura, punctata, pilosa: oculi fuscii: ocelli rufo-fuscii: antennæ nigræ, graciles, corporis dimidio longiores: mesothoracis scutellum elevatum, apice spinis duabus longis obtusis armatum; squamulæ nigro-fuscæ: abdomen nitidum, glabrum, ferè nudum: pedes rufi; coxæ nigræ; trochanteres fuscii; pro- et mesofemora fusco cingulata; metafemora nigra; metatibiæ nigræ, apice rufæ; tarsi et ungues fuscii: alæ subfuscæ; proalæ medio obscuriores, macula prope stigma hyalina: nervi fuscii. (Corp. long. 1—2 lin.; alar. 2—2 $\frac{3}{4}$  lin.)

*Var. β.* Pro- et mesotibiæ fusco cingulatæ.

Taken near Paris, by M. F. de Laporte; also in England, by Mr. Curtis. *Var. β* is described from an English specimen.

Sp. 7. Hoc. unicolor. *Mas. Nigra, pedibus omnino nigris, alis hyalinis.*

*Nigra*, obscura, punctata, pilosa: oculi fuscii: ocelli rufo-fuscii: antennæ nigræ, corporis dimidii longitudinem: mesothoracis scutellum elevatum, apice spinis duabus brevissimis armatum; squamulæ nigræ: abdomen nitidum, glabrum, ferè nudum: pedes nigri: alæ hyalinæ; nervi fuscii. (Corp. long. 1 lin.; alar. 1 $\frac{3}{4}$  lin.)

July; South of France.

#### GENUS VI. NOTASPIS,<sup>h</sup> *Walker.*

*Mas.*—Caput magnum, transversum, thorace latius, anticè ubi insident scapi excavatum: oculi magni, prominentes, globosi: antennæ 13-articulatæ, subclavatæ, apice acuminatæ, prope os insertæ, corporis dimidio breviores; articulus 1<sup>us</sup>. antennæ triente longior; 2<sup>us</sup>. mediocris; 3<sup>us</sup>. minimus; 4<sup>us</sup>. et 6 sequentes mediocres, subæquales; clava conica, articulis 9<sup>o</sup>. et 10<sup>o</sup>. longior: thorax ovatus: pectus parvum: prothoracis scutellum mediocre, subquadratum: mesothoracis scutum mediocre; parapsides benè determinatæ, magnæ, convexæ; squamulæ maximæ, globosæ; paraptera magna; scutellum maximum, metathoracem abdominisque basim transiens, apice acuminatum: metathorax parvus: abdomen sessile, ovatum, convexum; segmentum 1<sup>um</sup>. maximum; cætera minima: pro- et mesopedes mediocres, femora subclavata, tarsi graciles; metapedes magni, coxæ trigonæ, femora ovata, tibiæ subtus canaliculatæ, tarsi crassi brevesque: alæ *Hockeria*.

<sup>h</sup> νῶτος dorsum, ἀσπίς clypeus.

Sp. 1. Not. formiciformis. Mas. *Æneus, antennis fuscis, tarsis fulvis, alis albis.*

*Ænea*, obscura, punctata, haud pubescens: oculi fuscii: ocelli rufo-fuscii: antennæ fuscæ; articulus 1<sup>us</sup>. æneus: thorax punctis magnis profundèque excavatis scaber; latera ferè glabra; squamulæ rufo-fuscæ, nitidæ; mesothoracis scutellum elevatum, subtus apicem unidentatum: abdomen nitidum, glabrum: pedes nigro-ænei; trochanteres fuscii; tibiæ apice fulvæ; tarsi fulvi; ungues et pulvilli fuscii: alæ albi, iridescentes; nervi pallidi, vix conspicui. (Corp. long.  $\frac{4}{5}$  lin.; alar.  $1\frac{1}{4}$  lin.)

Taken in St. Vincent's island, by the Rev. Lansdown Guilding.

#### GENUS VII. DIRHINUS, *Dalman.*

Chalcis. *Jurine, Latreille, Spinola.*

*Mas.*—Caput magnum, thorace non angustius, multò longius quàm latum, anticè inter oculos tuberculis duobus armatum, posticè sub prothorace productum; tubercula lata, obtusa, apice serrata: oculi mediocres, globosi: antennæ 13-articulatæ, subclavatæ, per longum striatæ; articulus 1<sup>us</sup>. elongatus; sequentes mediocres; ultimus minimus, vix conspicuus: mandibulæ arcuatæ; una bidentata; altera tridentata: thorax elongato-ovatus: pectus parvum: prothoracis scutellum magnum, subquadratum: mesothoracis scutum angustum; parapsides benè determinatæ; scutellum mediocre: metathorax magnus: abdomen ovatum, petiolatum, supra planum, subtus carinatum, apice retusum: segmenta dorsalia subtus abdomen marginem formantia; 1<sup>um</sup>. s. petiolus crassum; 2<sup>um</sup>. maximum; cætera minima: segmenta nonnulla ventralia conspicua: tibiæ apice spina armatæ: pro- et mesofemora clavata: metapedes magni; coxæ elongatæ; femora ovata, subtus serrata; tibiæ arcuatæ, subtus canaliculatæ; tarsi graciles: proalæ angustæ; nervus ordinarius costam longum occupans; ramulus stigmatalis vix ullus.

This genus is allied to *Cerocephala, Spalangia, &c.*

Sp. 1. Dir. cornigerus. Mas. *Ater, genibus tarsisque rufis, alis hyalinis.*

Chalcis cornigera. *Jur. Nouv. Méthod. Hyménopt.* 315. Pl. 13. 47. *Spin. Ins. Lig. Fascic.* 3<sup>us</sup>. 164. 8.



Nigra, obscura, punctata, pubescens: oculi fusci: ocelli rufo-fusci: antennæ nigræ: caput scabrum: thorax lævior: squamulæ rufo-fusæ: metathorax carinatus, utrinque spinosus: abdomen nitidum, glabrum, basi striatum: pedes nigri; trochanteres fusci; pro- et mesofemora apice rufa; metafemora basi unidentata; pro- et mesotibiæ basi apiceque rufæ; tarsi rufi; ungues et pulvilli fusci: alæ hyalinæ; proalæ ad costam fusæ; nervi fusci. (Corp. long. 2 lin.; alar.  $2\frac{1}{4}$  lin.)

Taken near Paris, by M. F. de Laporte.

ART. III.—*Capture of Insects at Burghfield.*—By the Rev. C. S. BIRD, M. A. F.L.S.

*Burghfield Hill House, near Reading, Aug. 1833.*

SIR,—Having resided at this place about ten years, and employed my leisure hours in making an Entomological Collection, I think I have ascertained pretty nearly what this locality affords, amongst the more conspicuous insects at least; and, with your permission, I shall be happy to register, in your Magazine, the result of my researches. The country around me is woody, particularly abounding in elms, and my house is close to several copses, containing large, though not old, oaks, &c.; and at the distance of half a mile I have the range of a heathy common, terminating in fir-groves. There is no chalk, that I am aware of, within six miles.

I am particularly attached to *Lepidoptera*,—probably only because I have been most successful in this order. This success I owe to the use of a lamp to attract moths. During the moonless nights of summer, I sit with a Sinumbra-lamp, and perhaps one or two smaller lamps, placed on a table, close to the window. The moths speedily enter the room, if the weather be warm. I have had a levee of more than a hundred between the hours of ten and twelve. In the spring, too, and autumn, I have been frequently fortunate, though generally having my patience sufficiently tried. In March, for instance, I have taken many specimens of *Biston prodromarius* in one evening; *Glæa rubricosa*, and *Lytæa leucographa*, have accompanied them. In April and May, *Cucullia fissina*, and *Peridæa serrata*, have visited me. When November has arrived,

*Petasia cassinea* and *Pæcilocampa populi* have crowded into my room. Of course, at such cool times of the year the window must be kept shut, till the moths knock for admittance. If at any time of the year a warm mist pervade the air, there is almost a certainty of success. But should any one be induced by this account to try the lamp, he must make up his mind to experience more of unfavourable evenings than favourable. There is, however, this advantage in my sedentary plan of mothing, that it can be combined with reading or writing; and the intervals between the arrivals need not be lost.

Moths are extremely sensible of any keenness in the air; a north or east wind is very likely to keep them from venturing abroad. Different species have different hours of flight. Thus, on a mild and dark November evening, *Pæcilocampa populi* will occupy from seven to ten o'clock, after which it will make way for *Petasia cassinea*, which will fly till one or two in the morning. I have, for experiment-sake, sat up in the summer till three o'clock, when the whole heaven was bright with the rising sun, and moths of various kinds have never ceased arriving in succession till that time. Some of them must come from a considerable distance. *Scotophila porphyrea*, being a heath-moth, must come nearly a mile.

Moths, like butterflies, have their peculiar modes of flight, by which I can generally distinguish them on their entrance, before I can see their colours. Some announce themselves by a loud knock on the floor; this is the case with *Leiocampa dictæa*. Some ascend instantly to the ceiling; as *Agrotis corticea*. Many, I might say the majority, pass the lamp rapidly; and this shews the comparative inutility of using a lamp out of doors, where only those that loiter about it can be taken. Some have a soft and gentle flight; as, for instance, *Cosmia pyralina*, one of my most welcome visitors, whose entrance I am usually made aware of by seeing something drop down on the table, as quick as hail, but as light as a fleece of snow; whilst, on the contrary, the conceited vagaries and absurd violence of *Clisiocampa neustria*, are absolutely amusing; and *cratægi* and *populi* are nearly as bad. It is not the *Nocturna*<sup>a</sup> alone that come to me in the night,—many of

<sup>a</sup> When I use the term, *Nocturna*, I do it in the enlarged sense of Latreille; though Stephens prefers the term, *Pomeridiana*, for the families *Hepialidæ*,

what Mr. Stephens calls the *Semidiurna*, the *Geometridæ*, accompany them at all hours. Nor, indeed, is it *Lepidoptera* alone,—many Coleopterous insects are attracted, particularly *Oncomera podagragriæ*; and, as might be expected, the male of *Lampyris noctiluca*. I have also occasionally been plagued by *Harpalidæ*, far from odoriferous, in great numbers; and now and then I have caught a *Colymbetes*. I am sometimes teased by swarms of small gnats; and the house-cricket has once or twice entered. *Reduvius personatus* has been amongst my captives. A few common Ichneumons and *Tipulæ* are frequent guests. But I must not weary you with details. At the same time, it may be worth while to say a word on my method of securing my prey. Suppose that, with or without using a *bag-net*, I have imprisoned a moth under an inverted wine-glass, I then light a small piece of German tinder, half the size of a sixpence, or less, and introduce it under the edge, and by means of the smoke the insect is stupified almost immediately. It is then wholly in my power, though it would quickly revive:—I pierce it; and, by means of a pin dipped in oxalic acid, and thrust into the body beneath the thorax, I prevent its revival, and fix it on the setting-board. The German tinder does not injure the colours, as brimstone would, whilst it puts the moth so completely in my power for a few moments, that the specimens I thus take and kill, are often as perfect and beautiful as if I had bred them. Of course I use it for insects taken in the day, or bred, as well as for those captured by the lamp.

Let me now proceed to give a List of the Insects, not quite common, which occur at Burghfield, particularly the *Lepidop-*

*Bombicydæ*, *Notodontidæ*, and *Arctidæ*. The males of many genera in these families do indeed fly in pursuit of the female in the afternoon, (*Pomeridianum tempus*), but I have taken males of the genera *Pygæra*, *Clostera*, *Cerura*, *Stauropus*, *Notodonta*, *Leiocampa*, *Lophopteryx*, *Ptilodontis*, *Chaonia*, *Petasia*, *Peridea*, *Saturnia*, *Lasiocampa*, *Trichiura*, *Pæcilocampa*, *Clisiocampa*, *Odenestis*, *Psilura*, *Dasychira*, *Demas*, *Leucoma*, *Porthesia*, *Arctia*, *Phragmatobia*, *Spilosoma*, *Nudaria*, in the dead of the night. It is obvious, therefore, that they fly in the night also, probably for the same purpose; and if they have a name to distinguish them from the rest of the *Nocturna*, it should be indicative merely of the force of attraction in the female. Perhaps the males have the bump of amativeness unusually developed. But if such a distinguishing name were given them to shew their peculiar propensity of what is called “assembling,” it must include several genera, of what even Stephens calls the *Nocturna*; as, for instance, *Anarta*, *Brepha*, *Plusia*, *Heliolithis*, *Phytometra*, *Euclidia*, &c.

*terous* ones. Those which I do not take by the lamp, I will mark with an asterisk :—

I.—LEPIDOPTERA. ( <i>Steph. Cat.</i> )	<i>Graphiphora brunnea</i>	<i>Catocala sponsa</i> *
	<i>triangulum</i>	<i>Brepha parthenias</i> *
<i>Colias Electra</i> , and the pale	<i>baja</i>	<i>Fidonia ericetaria</i> *
variety *	<i>C. nigrum</i>	<i>Bupalus piniarius</i> *
<i>Leucophasia sinapis</i> *	<i>Orthosia munda</i>	<i>favillacearius</i>
<i>Pieris crataegi</i> *	<i>sparsa</i>	<i>Lampetia prosapia</i>
<i>Nemeobius Lucina</i> *	<i>miniosa</i>	<i>Amphidasis hispidaria</i>
<i>Melitea Artemis</i> *	<i>pistacina</i>	<i>Biston prodomarius</i>
<i>Selene</i> *	<i>lunosa</i>	<i>Crocallis elinguaris</i>
<i>Argynnis aglaia</i> *	<i>lota</i>	<i>bidentata</i>
<i>paphis</i> *	<i>flavilinea</i>	<i>Geometra illunaria</i>
<i>Vanessa polychloros</i> *	<i>macilenta</i>	<i>angularia</i>
<i>Cynthia cardui</i> *	<i>Mythimna turca</i>	<i>quercinaria</i>
<i>Apatura Iris</i> *	<i>grisea</i>	<i>almiaria</i>
<i>Hipparchia Galathea</i> *	<i>Grammesia trilinea</i>	<i>canaria</i>
<i>Thecla Betulæ</i> *	<i>bilinea</i>	<i>illustraria</i>
<i>W. Album</i> *	<i>Glæa rubricosa</i>	<i>Ellopia fasciaria</i>
<i>Quercus</i> *	<i>Amphipyra pyramidea</i>	<i>Hipparchus papilionarius</i>
<i>Rubi</i> *	<i>Dypterygia pinastri</i>	<i>vernarius</i>
<i>Polyommatus Argiolus</i> *	<i>Xylina rhizolitha</i>	<i>cythisarius</i>
<i>Corydon</i> *	<i>Xylophasia epomidion</i>	<i>viridatus</i> *
<i>Smerinthus Tiliæ</i> *	<i>combusta</i>	<i>Cleora bajalaria</i> *
<i>Acherontia Atropos</i> *	<i>Hadena contigua</i>	<i>Alcis conversaria</i>
<i>Sphinx Convolvuli</i> *	<i>ochracea</i>	<i>roboraria</i>
<i>Deilephila Elpenor</i> *	<i>lithoriza</i>	<i>Azinophora pulveraria</i>
<i>Sesia Fuciformis</i> *	<i>cucubali</i>	<i>Larentia cervinaria</i>
<i>Trochilium Crabroniforme</i> *	<i>capsincola</i>	<i>Cidaria quadrifasciaria</i>
<i>Egeria Cynipiformis</i> *	<i>saponariæ</i>	<i>Harpalyce immanata</i> *
<i>Hepialus Hectus</i> *	<i>Heliophobus popularis</i>	<i>psittacata</i>
<i>Velleda</i> *	<i>Mamestra furva</i>	<i>Electra testata</i> *
<i>Carnus</i> *	<i>psi</i>	<i>Xerene albicillata</i> *
<i>Zeuzera Esculi</i> *	<i>Euplexia lucipara</i>	<i>Pbibalapteryx vitalbata</i>
<i>Clostera curtula</i>	<i>Hama basilinea</i>	<i>Scotosia vetulata</i>
<i>Cerura furcula</i>	<i>Apamea didyma</i>	<i>Rhamnata</i>
<i>latifascia</i>	<i>nictitans</i>	<i>Triphosa undulata</i>
<i>bifida</i>	<i>Miana latruncula</i>	<i>Charissa obscuraria</i> *
<i>Stauropus fagi</i>	<i>æthiops</i>	<i>operaria</i> *
<i>Notodonta ziczac</i>	<i>humeralis</i>	<i>Chesias spartiata</i>
<i>Leiocampa dictæa</i>	<i>terminalis</i>	<i>simulata</i> *
<i>dictæoides</i>	<i>fasciuncula</i>	<i>Lobophora henapterata</i>
<i>Ptilodontis palpina</i>	<i>Scotophila porphyrea</i>	<i>sexalisata</i>
<i>Chaonia roboris</i>	<i>Achatea piniperda</i> *	<i>dentistrigata</i>
<i>dodonæa</i>	<i>Miselia compta</i>	<i>Eupithecia linariata</i>
<i>Petasia cassinea</i>	<i>Polia advena</i>	<i>subfulvata</i>
<i>Peridea serrata</i>	<i>tincta</i> *	<i>venosata</i>
<i>Lasiocampa rubi</i> *	<i>serena</i>	<i>succenturiata</i>
<i>Trichiura crataegi</i>	<i>Acronycta alni</i> *	<i>elongata</i>
<i>Pæcilocampa populi</i>	<i>Thyatira derasa</i>	<i>Minoa euphorbiata</i>
<i>Psilura monacha</i>	<i>batis</i>	<i>Bapta bimaculata</i> *
<i>Dasychira fascelina</i>	<i>Ceropacha fluctuosa</i>	<i>punctata</i>
<i>Demas coryli</i>	<i>duplaris</i>	<i>Emmelesia decolorata</i>
<i>Hypercampa dominula</i> *	<i>diluta</i>	<i>luteata</i>
<i>Euthemonia russula</i> *	<i>flavicornis</i>	<i>alchemillata</i>
<i>Arctia villica</i> *	<i>Tethea subtusa</i>	<i>sylvata</i>
<i>Phragmatobia fuliginosa</i>	<i>retusa</i>	<i>bifasciata</i>
<i>Diaphora mendica</i> *	<i>Bombycia viminalis</i>	<i>rivulata</i>
<i>Callimorpha miniata</i>	<i>Cymatophora Oo</i>	<i>Hercyna clathrata</i>
<i>Lithosia aureola</i>	<i>Cosmia diffinis</i>	<i>Ptychopoda virgulata</i>
<i>flava</i>	<i>affinis</i>	<i>aversata</i>
<i>griseola</i>	<i>pyralina</i>	<i>Macaria liturata</i> *
<i>Gnophria rubricollis</i> *	<i>Xanthia fulvago</i>	<i>Ennomos flexula</i>
<i>Setina eborina</i> *	<i>gilvago</i>	<i>Platypteryx lacertula</i>
<i>Triphæna fimbria</i> *	<i>croceago</i>	<i>Drepana hamula</i>
<i>interjecta</i>	<i>Gortyna micacea</i>	<i>uncula</i>
<i>janthina</i>	<i>flavago</i>	<i>falcataria</i>
<i>Cerigo texta</i>	<i>Leucania comma</i>	<i>Hypena rostralis</i>
<i>Lytæa umbrosa</i>	<i>fluxa</i>	<i>Polygogon barbalis</i>
<i>leucographa</i>	<i>phragmatidis</i>	<i>Cledeobia costestrigalis</i>
<i>Charæas cespitis</i>	<i>pudorina</i>	<i>Pyrausta sordidalis</i> *
<i>graminis</i>	<i>Cucullia fissina</i>	<i>Hydrocampa sambucata</i>
<i>Rusina ferruginea</i>	<i>Plusia festuæ</i>	<i>nymphæata</i>
<i>Agrotis corticea</i>	<i>Heliolithis marginata</i>	<i>lemnata</i>
<i>suffusa</i>	<i>dipsacea</i>	<i>stratiolata</i>
<i>vitta</i>	<i>Anarta myrtilli</i> *	<i>Margaritia cineris</i> *
<i>cinerea</i>	<i>Ophiusa lusoria</i>	<i>thapsalis</i> *

Nola cucullatella  
 Cloephora prasinana \*  
 Tortrix pillerana \*  
 Cnephasia lepidana \*  
 Sarrothrips degeneranus \*  
 Afzelianus \*  
 ilicanus \*  
 Peronea cristalana \*  
 favillaceana \*  
 tristana \*  
 plumbosana \*  
 trigonana \*  
 rufana \*  
 borana \*  
 asperana \*  
 variegana \*  
 gnomana \*  
 tripunctulana \*  
 bistriana \*  
 Leptogramma liturana \*  
 squamana \*  
 Cheimatophila castaneana \*  
 Argyrolepia Turionella \*  
 Dasyceera Olivella \*  
 sulphurella \*  
 Adela sulzella \*  
 Crambus falsellus  
 Pterophorus galactodactylus \*  
 calodactylus \*  
 punctidactylus \*  
 II.—DIPTERA.  
 Pedicia rivosa  
 Limnobia xanthoptera  
 ocellaris

Atherix Ibis  
 Sargus Reaumuri  
 Odontomyia tigrina  
 argentata  
 Stratiomys chamæleon  
 furcata  
 Microdon apiformis  
 Sphegina clunipes  
 Xylota lenta  
 Spilomyia femorata  
 Criorhina asilica  
 Sepedon palustris

## III.—HYMENOPTERA.

Zareea fasciata  
 Lophyrus rufus  
 Lyda sylvatica, and two new  
 species  
 Sirex juveneus  
 Peltastes polyzonias  
 Chrysis fulgida  
 Cynips aptera

## IV.—COLEOPTERA.

Cychnus rostratus  
 Calosoma inquisitor  
 Callistus lunatus  
 Badister cephalotes  
 Chlænienus vestitus  
 Lucanus cervus  
 Copris lunaris  
 Typhæus vulgaris  
 Onaloplia ruricola

Agrilus viridis  
 Campylis dispar  
 Hylobius abietis  
 Alophus triguttatus  
 Rhynehites betulæ  
 populi  
 Saperda cylindrica  
 Donacia rustica  
 Cassida vittata  
 rubiginosa  
 nobilis  
 Coccinella ocellata  
 guttata  
 Endomychus coccineus  
 Ripiphorus Paradoxus  
 Oncomera podagrariæ

## V.—ORTHOPTERA.

Acrida viridissima  
 Locusta flavipes  
 Gryllotalpa vulgaris  
 Blatta Lapponica

## VI.—HEMIPTERA.

Reduvius personatus  
 Ranatra linearis  
 Notonecta maculata

## VII.—NEUROPTERA.

Raphidia ophiopsis  
 Acentria vivosa ?

REMARKS.—*Polyommatus Corydon*.—I mention this, not as rare, but because there is no chalk near. I have only taken one specimen here.

*Thecla W. Album*.—This appeared in the greatest profusion in my garden, five or six years ago.

*Gortyna flavago*.—I took the pupæ in the hollow of large thistles, in July, 1832.

*Achatea piniperda*.—The pupæ lie just under the moss, in fir plantations.

*Leucania*.—In this genus I formerly included what I now find, from Curtis's British Entomology, to be *Nonagria Vectis*. I took it amongst the rushes at Black Gang Chine, in the beginning of July, about eight years ago.

*Cucullia*.—In this genus, *Asteris* has been taken at Bradford, six miles hence; as also *Orichalcea*, in the genus *Plusia*.

*Acentria nivosa*.—My specimen was so named for me; but I have reason to think it will belong to a new genus, about to be named by Mr. Stephens. I took it six or seven years ago.

*Cynips aptera*.—Several specimens were found in cavities within a root something like a ground-nut, dug up in the fields, and lying on a heap of dirt. I could not find the leaves of the plant, nor could any one distinguish the root.

ART. V.—*Thoughts on the Geographical Distribution of Insects.* By DELTA.

Tramite quo tendis, majoraque viribus audes?

SIR,—Perhaps there is no branch of Entomology more worthy of attention than the geographical distribution of insects; yet this is totally disregarded by almost every entomologist. He who carefully excludes from his collection of British Insects every doubtful species, arranges in his exotic cabinet species after species, genus after genus, without once thinking of indicating the part of the world whence they may have been obtained; or, if he does note this, it is in so general a manner, that little is to be learnt from it,—a line of one of six different colours, which serve to indicate Europe, Asia, New Holland, Africa, and North and South America, being thought abundantly sufficient.

In Dejean's *Cat. des Coléoptères* we certainly find the native country of each species pointed out rather more clearly; but sometimes, even there, we are left to guess as to what part of a region, extending over  $50^{\circ}$  of latitude, and as many of longitude, and offering, at its two extremities, a difference of  $30^{\circ}$  Fah. of temperature, is the principal station of an insect. Besides this deficiency in exactness, there is an omission of still more consequence:—no notice is taken of the range over which a species extends.

From this want of care and accuracy in pointing out that country which is the principal station of a species, and the extent of its range over other countries, arise difficulties, which overwhelm us in our attempts to arrive at any thing like a correct view of the geography of insects; and which, joined to our limited knowledge of extra-European species, forbid our speaking with confidence on any part of this subject. It has been well and truly observed with regard to plants, by an illustrious traveller, that it is impossible to enter fully into their geography unless we are thoroughly acquainted with the distinctions, the characters, and the names of each species:—  
 “ Ne tamen obliviscare, quemadmodum Physiologia animalium sine Anatome esse non potest, neque Geologia sine Oryctognosia, eodem modo te Geographiam Plantarum penitus inspicere non posse, nisi Botanicæ innitens, singularum



specierum notas, characteres, nomina accuratissime dignoscas." It would be fruitless for me, possessing so limited a knowledge of species as I do, to attempt to point out the geographical distribution of either species or families: this also is far from my plan. I merely wish to point out, with the utmost diffidence, in what I suppose others to have erred, and to show what it is that our attention ought to be directed to. To detect and avoid error is one step gained towards arriving at truth:

Virtus est vitium fugere, et sapientia prima  
Stultitia caruisse.

Were we to follow the plan adopted by Humboldt, in his excellent *Prolegomena de Dist. Geog. Plant.* we should commence by estimating the total number of insects already known, and proceed to calculate what portion of them belong to the polar circle, the temperate zones, and the regions between the tropics, and also the relative proportions which the different classes bear to one another in different latitudes. But so little attention is paid by foreign collectors to any classes but *Lepidoptera* and *Coleoptera*, that we are left without any precise data on which to found our calculations. Were we to judge from what we see of foreign insects, we should be led to believe that these two classes increase in number of species as we proceed from the poles towards the equator much more than the other classes; but this is greatly to be doubted. Perhaps in the *Hymenoptera*, *Diptera*, and *Neuroptera*, the countless myriads of individuals of particular species which occur in the warmer regions, may have some influence in diminishing the general number of species; and therefore there may be some reason for believing these classes not to increase in an equal ratio with the others. Moreover, a large proportion of the *Neuroptera* are aquatic in their larva and pupa states, consequently these families are less likely to be rich in species in regions like the intertropical parts of the world, where almost every stagnant water, excepting the large lakes, is evaporated during the dry season, and where most of the smaller streams partake of the character of torrents. We find aquatic insects to be in general much less influenced by climate than terrestrial. In *Coleoptera*, the largest species are inhabitants of the temperate zone; and, of the three hundred and twenty-three species of *Hydrocanthares* indicated



in Dejean's Catalogue, only about one-fourth belong to the tropical parts, whilst in the terrestrial *Adephaga* the proportion is about one-third. In the *Libellulæ*, those from equatorial regions yield in *bulk* to our own, although in some species the abdomen is of extraordinary *length*. Those *Lepidoptera* also, which in the larva state may be almost termed aquatic, offer no striking difference in size between those from within the tropics, and from the northern parts of the temperate zone. We have therefore good reason for believing that aquatic insects are but little influenced by climate, a conjecture rendered the more probable by the wide range of certain species which are found to extend from lat. 45° north to lat. 10° south; and to be common to the Old and New World.

The proportion of aquatic *Hemiptera* is so small, and so nearly that of *Coleoptera*, that we cannot suppose this order to be less influenced by climate; and the *Orthoptera*, being altogether terrestrial, are, of all classes, the most exposed to this influence.

Had we sufficient data, it would be well worth inquiring what proportion the number of species in each of the great divisions of the globe bears to the whole, and also in what ratio the species in a given space increase in number as we proceed towards the equator. Perhaps, if we reason upon what has been observed with regard to plants, we may arrive at more correct conclusions than if we trust to our more imperfect knowledge of foreign species.

Humboldt states, that, of 38,000 species of plants described and preserved in *Herbaria*, 7,000 belong to Europe, 6,000 to Asia, 3,000 to Africa, 5,000 to New Holland and the Isles of the Pacific, and 17,000 to America. The ratio of increase in proceeding southwards, for latitudes 68°, 45°, 0°, is as 1 : 4 : 12. This is, in all probability, nearly the case in insects.

Another point to which our attention should be directed is the proportion which the number of genera bears to that of species. In plants, we find, whether we proceed towards the poles, or the summits of lofty mountains, that the number of species diminishes much faster than that of genera: "Nam in regiones cum frigidis, tum aridas genera zonarum propinquarum semper unam alteramve speciem quasi colonos immittunt: unde fit numerum generum magis ibi crescere quam specierum."

In comparing the productions of places situated under the same parallel of latitude, but differing greatly in longitude, reference must always be had to the inflexion of the isothermal lines, and also to the difference between the mean summer and mean winter temperature. If, in our idea of the mean temperature of a place, we are guided solely by latitude, we shall err most surprisingly. Peking and Philadelphia are nearly  $2^{\circ}$  more south than Rome, yet at Rome we find the mean temperature  $15.8^{\circ}$  centigrade, whilst, at the two former, it is only  $12.7^{\circ}$  cent., a difference of  $3.1^{\circ}$  cent. degrees, about  $5.6^{\circ}$  of Fahrenheit's scale. The mean summer and mean winter temperature offer still greater differences: at Rome, the latter is  $+7^{\circ}.7$ ; at Peking,  $-3^{\circ}.1$ ; at Philadelphia,  $+1^{\circ}.1$ ; the former, at Rome and Philadelphia, is  $24^{\circ}$ , at Peking,  $28^{\circ}.1$ . If we proceed westward, from the shores of the Atlantic, until we arrive at the basin of the Mississippi, we shall find the mean temperature about  $2^{\circ}$  Fah. less than on the coast at the same latitude, a difference which would increase as we proceeded towards the Rocky Mountains, were not the summers so extremely hot as in some degree to counterbalance the intense cold of the winters.<sup>a</sup> The temperature of the western coast of North America appears to differ but little from western Europe. In the eastern parts of Europe the temperature more nearly resembles that of America on its eastern shores: Nicolaieff, on the Black Sea, about  $5^{\circ}$  of latitude south of us, having a mean temperature of about  $2^{\circ}$  Fah. less than ours.

In tracing the changes of form, which are observable in insects, as we proceed towards the equator, we must remember that it is only from those inhabiting the parts but little elevated above the level of the sea that our inferences should be drawn. If we disregard the effect of elevation we shall be sure to fall into error. *Styraciflua liquidambar*, which, at Xalapa, clothes the sides of the mountains at an elevation of three or four thousand feet, in New England is met with only in the plains. Its true climate, therefore, is not that of Mexico, but of the northern parts of the United States. The same will hold good with regard to insects; and therefore we have no right to call an insect tropical unless we know the elevation of the

<sup>a</sup> At Council Bluffs, on the Missouri, the thermometer has a range of  $129^{\circ}$  Fah., or from  $-21^{\circ}$  to  $+108^{\circ}$ .

parts which it inhabits, and how far the effect of that elevation is increased or diminished by peculiar local circumstances.

But we must not suppose that the insects of an elevated region will altogether resemble those of a neighbouring more northerly region where the mean temperature is the same. The productions of a country are influenced, as I before remarked, by its mean annual temperature, its mean summer and mean winter temperature, and by the greater or less difference between these two last. Hence, if we compare the birds, insects, or plants of Europe, with those from the eastern parts of North America, which have a corresponding mean temperature, we shall find those of America to bear a much greater resemblance to those from the tropical regions of that continent than ours do to those of any part of Africa south of the Great Desert. This may be accounted for by the great heat of the summers in the Atlantic States, which fully equals, if it does not exceed, the common temperature of the low regions of the tropics. Perhaps, also, that great ocean of sand which extends from the western shores of Africa to the Persian Gulf, with scarce any interruption, may, conjointly with the Mediterranean, have obstructed the spread both of animals and plants towards the north. No species of that lovely group, which may be called the humming-birds of the Old World, has ever been found to visit Europe; and our summer visitants, finding in the northern parts of Africa, amongst—

—groups of lovely date-trees bending  
Languidly their leaf-crowned heads  
Like youthful maids, when sleep descending,  
Warns them to their silken beds,—

a climate entirely conformable to their habits, never make the fruitless attempt to cross the desert.

But in the New World nothing occurs to prevent the spread of species as far north as their organization will allow; and therefore we find some of the birds of its equinoctial regions, summer visitants, even of the inhospitable regions of Canada. *Trochilus colubris*, I believe, has been found as far north as lat. 54°.

On the eastern shores of America and Asia tropical forms are intermixed with those of the temperate zone in an extraordinary manner. *Bamboos*, *Cycadææ*, *Epidendra*,

intermixed with pines, or *Limodoræ*, *Cacti*, *Passifloræ*, *Bignoniæ*, *Lauri*, *Magnoliæ*, and palms mingled with the northern forms of oaks and firs, offer a landscape of unequalled variety. In insects we find the same singular mixture; and whilst many of those of the United States so nearly resemble our own, as at first sight to raise a doubt of their being distinct, others are so lovely, so tropical in form and hue, that we find it difficult to believe them inhabitants of a country where the winter frosts impede the navigation of the rivers.

The irregular distribution of heat over the surface of the globe, and the variety of other causes which affect the development of insects, forbid our dividing the globe into insect climates, which are to extend over so many degrees of latitude and longitude, as proposed by Latreille, who, after objecting to the divisions of Fabricius, as artificial and vague, proceeds to divide the globe into certain divisions, each of which is to be considered as a peculiar insect climate.

He commences by separating the globe into three portions: the first dividing line extends, from pole to pole, in long.  $31^{\circ}$  W.; the second is nearly identical with the 66th eastern meridian; and the third with the 175th western. Thus we have three great divisions: one, containing Europe, the Azores, Iceland, part of Greenland, Africa and its islands, and the western part of Asia. The second comprises the middle and east of Asia, the great continent of Australia, and some of the isles of the Pacific. The third division, including all America, the Sandwich, Society, Friendly, and part of the Marquesas Islands, is divided into equal portions by a line nearly corresponding with the 106th meridian.<sup>b</sup>

These are again divided by lines parallel to the equator, and distant from each other  $12^{\circ}$  of latitude. Beginning at lat.  $84^{\circ}$  N. and  $60^{\circ}$  S. we shall thus have twelve climates for each of the great divisions; namely, seven Arctic, and five Antarctic, distinguished by the terms, equatorial, tropical, supra-tropical, intermediate, superior, subpolar, and polar; the two last only in the Arctic climates. These are again divided at every 24th meridian. Without remarking on the impropriety of

<sup>b</sup> In converting the longitudes into our own way of reckoning them, I have allowed only  $2^{\circ}$  for the difference in longitude between Paris and London. This is not quite enough, Paris being 9 min.  $21.6$  sec. east of Greenwich.

including New Holland in the same division as Asia, and separating these from the isles of the Great Ocean to add them to America, we will just consider how far the smaller divisions are consonant with nature.

America has always been the land most dear to my heart. Her boundless forests, her stupendous mountains, her unrivalled rivers, her lakes, her cataracts, have haunted my imagination from my earliest youth. I had hoped to have passed my younger days in exploring the endless treasures that her fruitful regions offer to the naturalist; and, should my life be lengthened to a longer date than it now in all probability will be, to have passed my more advanced years "en el retrato lisongero que ofrèce este pais virtuoso y feliz, mientras otros muchos del globo no presentan mas que escenas de ruina y de miseria." But, "dis aliter visum est." Nevertheless, my mind is constantly recurring to those lands so dear to it; and, therefore, when reflecting on the subject of these divisions, I naturally began with considering how far they would agree with nature in the New World. We shall soon see the result.

North America is divided into two unequal parts by a line nearly agreeing with the 103d meridian. It is to be again divided by lines in latitudes 72°, 60°, 48°, 36°, 24°, and 20°; and these subclimates are again to be divided by lines distant 24° of longitude. But does this agree with nature? is this in accordance with the inflection of isothermal lines? are the natural boundaries attended to? I will merely point to that space comprised in the western intermediate subclimate, which includes the basin of the Colombia, the northern plains of New Mexico, the sources of the Missouri and Platte, and nearly the whole course of these two rivers until their junction. This surely is a division containing countries as different in climate, soil, and productions, as can possibly be found. The plants of the east of Asia differ less from those of the territory of Oregon than these last from those of the regions east of the Chippewayan. The isothermal lines which decline towards the south until they reach the Chippewayan or Rocky Mountains, suddenly bend northward after crossing this chain. Let any one who has read the travels of Lewis and Clarke across the Chippewayan to the Pacific Ocean call to mind the extraordinary change of climate which they found on crossing those

mountains. On the eastern side, the climate is dry to excess, the vegetation scanty, scarce offering food sufficient for any of the larger quadrupeds. The bison, which, more to the east, roam in herds of fifteen or twenty thousand, no longer find food for their countless numbers; a few argalis (*Americè, big-horns*) and a straggling antelope are the sole occupiers of these sterile plains; scarce a tree enlivens the desolate landscape; rain is rare, but at times descends in torrents. Though the summers are extremely hot, the winter temperature often reaches the point at which mercury congeals, but is rendered less difficult to bear by the great dryness of the winter months. But how different is every thing to the west of the mountains. Close to their base the climate is mild and dry; but, as we advance to the shores, it becomes more and more rainy, resembling much that of Ireland. The winters are mild, scarcely ever frosty, but the rains are continual; the summer moderately warm, with frequent rains. The vegetation is here totally different; and, instead of being barren of trees, the firs often exceed three hundred feet in height. Can any suppose this to be rightly considered as a subclimate, the insects of which are to resemble one another as much as those of the department of the Seine resemble those of Prussia?

Again; let us turn to South America, and survey the space bounded by the 79th and 55th meridians, and by the 12th northern parallel and the equator. Is this an insect climate or subclimate? assuredly not. But first how are we to understand these terms? I should define them thus. Nature has given to each species certain assigned limits; these it cannot pass. In some the greater degree of flexibility of organization enables them to extend over a wide space, but of others the range is much more confined. Certain forms also are peculiar to certain regions. Supposing that we start from any fixed point, we will say the extreme northern limit of insects, and proceed southward until the greater portion of species differ from those we have left behind us, and the general form is materially altered; we have now arrived at a new subclimate; proceed farther, until we find the whole, or nearly the whole, of the species different, and these new species presenting a different general form, we have now reached a new climate. The same will apply, if we suppose



that our course is directed parallel to the equator, or rather if it follows the direction of the isothermal lines.

In the want of a sufficient knowledge of the country, we may be guided by its natural boundaries, the course of rivers, the direction of mountains, the interposition of deserts, &c. Spix and Martius remark, that most of the great tributaries of the Marañon have a peculiar flora; Burchell remarks, that the Great Karro is the limit of Cape plants, nearly all the plants from the banks of Gariep and the country adjoining being entirely different; and lastly, Latreille observes, that lofty chains of mountains are mostly real limits in the geography of insects, and therefore it is not surprising that *the insects of New Granada are totally different from those of Cayenne and Demerara*. This last remark is true, very true; but we shall see how entirely in his distribution of subclimates he has overlooked this circumstance. I have before observed, that in all things relating to the division of the earth into insect-climates we have nothing to do with mountains, except in so far as they form natural boundaries which prevent the spread of species beyond them.

Let us return from this long digression to that subclimate which includes the Republic of New Granada and Venezuela, part of that of the equator (del Ecuador), Demerara, Berbice, parts of Surinam, of French and of what was Portuguese Guiana. First, we have the shores of the Pacific; and what relation have the insects from those shores to those of the shores of Cape Paria? Are not these regions separated by snow-clad mountains, whose summits are never looked down upon by any earthly being save the condor? Do not these mountains mark the limit which the western species cannot pass? If we follow the shores of the Atlantic as far as the 55th meridian, we arrive at that very country the insects of which Latreille has pronounced to be totally different from those of New Granada, even to the east of the Magdalena; and moreover, this region, which stretches from the mouths of the Oronoco to that of the Amazons, is divided by a line which separates Cayenne from Berbice and Demerara. Guiana, or the country included between the Rio Negro, the Oronoco, and the Maranon, is a vast Hylæa, a level and almost uninterrupted tract of forest, which cannot be better described than in the words of the illustrious Prussian traveller:—"Sylvæ



sumanæ vastitatis, ob æstus fere intolerabiles immanibus serpentibus, crocodiles, tigride jaguare atque vario et malefico genere animalium infestæ.”

In some places this general character is modified by peculiar local circumstances, but still every where is to be found an excessively luxuriant vegetation. “Forests, the growth of thousands of years, of an impenetrable thickness, fill the humid country situated between the Oronoco and the Amazons. Immense masses of lead-coloured granite narrow the foamy beds of the rivers. The mountains and woods resound unceasingly with the roar of cataracts, the growl of the jaguar, or the dull howl of the red monkey, which foretells the approach of rain. In those places where the lowness of the waters leaves a sandy beach uncovered, with open mouth, but motionless as a rock, lies a crocodile, whose scaly body is covered with birds. The tiger-marked boa, his tail fixed round the trunk of a tree, his body rolled upon itself, sure of his prey, lays in ambush on the bank; suddenly he uncoils to seize the young bull which is just passing.” Such is the picture which Humboldt, in his beautiful “*Tableaux de la Nature*,” has sketched of these regions. Such are the characters of a country, one-fourth of which is excluded from this subclimate, whilst those low level plains, which bound it on the north, and of which the following picture has been drawn by the same traveller, are included in it.

“At the foot of the chain of mountains which resisted the violent action of the waves, when in the early age of our planet their irruption formed the Gulf of Mexico, commences a vast plain which stretches beyond the reach of sight. When we have left behind us the smiling vallies of Caraccas, and the Lake of Tacarigua, sprinkled with islets, and reflecting in its waters the images of the plantains with which it is surrounded; when we have quitted the fields adorned by the tender verdure of the sugar-cane of Taiti, or the bowers shaded by the thick foliage of the cacao, the view is borne towards the south, over steppes or deserts, which rise insensibly, and terminate the horizon in a distance without bounds. Quitting those places where Nature is so prodigal of organic life, the astonished traveller enters upon a desert devoid of vegetation. Not a hill or rock rises like an island in this immense void.” In the dry season, not a plant is to be seen save a few *Mauritia* palms

and the *Melocactus*, whose spines the mules remove with their fore-feet to drink the refreshing juices contained under its spherical envelope. At length the season of the rains arrives, and “hardly is the surface of the earth moistened, when the desert is clothed by *Killingia*, and an infinity of *Gramineæ*. In the morning, the herbaceous sensitive plant opens its drowsy leaves to salute the rising sun, as do also the aquatic plants, by opening their delicate flowers, and the birds, by their songs.” The boa and crocodile, which have remained torpid, buried in the ground during the dry season, rise as from their tombs;—all nature is reanimated. But, alas! after suffering all that can be caused by extreme drought, these unhappy regions are doomed to undergo the opposite extreme. The floods spread, until nearly the whole of the lands are a vast lake, only to be dried up by the action of the sun in the dry season. Surely, the productions of this region can bear no relation to those of the Hylæa of the Oronoco, or of the valleys of Cape Paria, Caraccas, or Santa Martha.

This will serve to show the impropriety of neglecting to regard natural boundaries.

I am yours, most truly,

Δ.

(To be continued.)

#### ART. V.—*Entomological Society.*

FIRST SITTING.—NOVEMBER.

SINCE the meeting in May, the proceedings of which we published in our fourth number, the council of the Entomological Society has been unremitting in its exertions. A code of bye-laws has been prepared; rooms have been engaged and furnished; and a collection has been made already rivaling in extent, surpassing in accuracy of nomenclature and neatness of arrangement, most of our metropolitan cabinets.

On Monday, agreeably to advertisement, the members of the Society met at 17, Old Bond-street. When we entered the room, about twenty minutes past eight, we found it quite crowded with the leading entomologists of the day: we also

remarked that a considerable number of ladies were present; this we announce with great pleasure, for their countenance is, in every undertaking, an earnest of success: we understand that ladies are eligible as members, and that several have already joined the Society. Among the gentlemen present, we recognized the Rev. Mr. Kirby, who had the same day, as we heard, travelled to London expressly to attend the meeting, and Mr. Spence, Mr. Kirby's coadjutor in the great work with which every entomologist is acquainted.<sup>a</sup>

The chair was first taken by MR. CHILDREN, who said that, before proceeding to the regular business of the Society, he must trespass a few minutes on the attention of the meeting. He was delighted to see before him so numerous and so distinguished an assembly; a delight greatly enhanced by the presence of ladies. The object of the Society was to study the forms, the habits, the economy, he might say, the moral character, of insects. He could remember the time when the idea of associating for such a purpose would have been treated with ridicule and contempt, but happily a very different feeling now prevailed: we were now beginning to perceive that *Natura nusquam magis quam in minimis tota est*. Many gentlemen present would be aware that this was not the first attempt that had been made in this country to establish a similar society; he would not dwell on the cause of want of success in that instance, but he would say, and say with all his heart, let the proceedings of the present Society be conducted with peace, good-feeling, and unanimity, and then it *must* succeed. *Concordiâ parvæ res crescunt; discordiâ maximæ dilabuntur*. This was, in fact, the first meeting of the Society; a previous meeting had indeed taken place, at which officers had been appointed and formal business arranged, but that must be looked on as merely a preliminary meeting. He would remind the meeting, as an incentive to exertion, of the establishment and present prosperity of an Entomological Society in France: that Society has been joined by most of the first entomologists of Europe, and had already published a volume and a half of valuable scientific Transactions: that Society had unanimously elected the great patriarch of the science, the late illustrious Latreille, to the office of Honorary

<sup>a</sup> Kirby and Spence's Introduction to Entomology. We only record the presence of honorary members and distinguished visitors.

President. This Society had followed the example; we had our patriarch as well as France; a patriarch who had laboured for years in the cause of science—a patriarch in every way worthy of a similar honour; if France had reason to be proud of her Latreille, so had England of her Kirby. He warmly congratulated the meeting on the presence of the distinguished individual to whom he alluded, and he was sure the meeting united with him in the sentiment. (*Applause.*)

Mr. KIRBY rose, and expressed his thanks to the President for the kind manner in which he had spoken of him, and to the Society for the honour that they had conferred on him, and for the flattering marks of their approbation. He could not make a long speech, but he assured the Society that all he could do to advance its interests he would do; at seventy-four years of age, he trusted that much could not be expected of him; he found that his eyes began to fail him, and without eyes an entomologist could do but little: he could not sit down without reminding the meeting that the world was indebted for most interesting and important portions of the work, of which his own name stood conjointly as author, to his friend beside him;—and the reverend gentleman laid his hand affectionately on the shoulder of Mr. Spence, and was unable to proceed; during the pause, the meeting loudly expressed their gratification in the scene. Mr. Kirby hoped that Mr. Spence might be elected an honorary member, saying, that he considered him as much deserving of that honour as himself.

The PRESIDENT then proposed, that Mr. Spence be elected an honorary member, which was carried by acclamation.

Mr. SPENCE, in returning thanks, avowed that he had attended the meeting, with his two sons, for the express purpose of joining the Society; he was much gratified to find his favourite study in such good esteem, as the establishment of this Society, and the magnitude of the present meeting, proved it to be. He had lately returned from the continent; when in France, he had seen Mr. Lefebvre, the Secretary of the French Entomological Society, who had expressed his warmest wishes for the welfare of the English one, and his hopes that the two Societies would commence, and continue, an amicable intercourse.

The PRESIDENT said that, having opened the proceedings of

the meeting, he should now vacate the chair in favour of the Honorary President. As soon as Mr. Kirby appeared in the chair, so legitimately his own, he was received with a simultaneous and most enthusiastic burst of applause; we have never before, at a scientific meeting, witnessed such a scene; the worthy man was quite conquered by his feelings, and sat down at last unable to utter a single word.

The SECRETARY then read a code of By-laws.

It was proposed and resolved, that Mr. W. B. Spence be appointed Foreign Secretary to the Society.

Mr. W. B. SPENCE returned thanks.

It was proposed, seconded, and resolved, that the thanks of the Society be given to Mr. Yarrell, for his obliging and unremitting exertions in engaging and furnishing apartments, and his zealous attention to the interests of the Society.

It was proposed, seconded, and resolved, that the thanks of the Society be given to Mr. Waterhouse, the Honorary Curator, for his assiduous services.

It was proposed, seconded, and resolved, that the thanks of the Society be given to Messrs. Hope, Newman, and Davis, for their kind and laborious exertions in framing and preparing the By-laws of the Society.

The FOREIGN SECRETARY then read a most interesting account of a meeting of the German naturalists at Breslau. As he was proceeding,

Mr. SPENCE, SEN. rose, and said:—I beg, Sir, to be allowed to interrupt a moment, and offer a few words in explanation. The fly described by Dr. Hammerschmidt, which has proved very injurious to the wheat in Bohemia, is a species of *Cecidomyia*; and it is not a little remarkable, that Dr. Hammerschmidt should have given it the very same name which you applied, Sir, to a species some years back; *Cecidomyia Tritici*. It is, however, very different from that insect; the injury done by Dr. Hammerschmidt's *Cecidomyia* is occasioned by the larvæ eating into the stem, and thus weakening the plant; whereas, Sir, your insect fed on the flowers of the wheat, and thus prevented their fructifying. Its characters also are very different. The destructive Hessian fly, described by the American entomologist, Mr. Say, appears to be a species of the same genus, but certainly differs from both the others; the immense destruction it causes is said to be occasioned

—and if it should prove so, it is a very singular fact—by the pressure of the pupæ against the grain while in a tender and immature state. I beg, Sir, to call your attention, and that of the meeting, to the great advantage which our agricultural interests would derive from a close and minute investigation of the economy of all those minute but injurious animals which prey upon our crops, and to observe how important it is to acquire a knowledge of this before attempting the application of a remedy.

The FOREIGN SECRETARY finished reading the communication.

The HONORARY PRESIDENT then announced, that the next meeting would be held on the first Monday in December, and future meetings on the first Monday of each succeeding month, and that the chair would be taken at eight o'clock precisely; also, that the time for original members joining the Society had been prolonged to the first of January, 1834, in order to allow ample time for those enrolling their names who might not, previously to the present meeting, have been made acquainted with the plan and objects of the Society.

#### SECOND SITTING.—DECEMBER 2.

The room was excessively crowded; a considerable number of members not even being able to find seats. This will, we believe, be remedied before another meeting, arrangements having been made for the introduction of several more benches. The fact is, that even the most ardent of the originators of the Society formed no idea of the magnitude and importance which it was so soon to attain. We observed in the room Mr. Spence, Dr. Grant, Dr. Roget, &c.

The SECRETARY read a "Paper on the Nomenclature of the Parts of the Head of Insects, by Mr. Newman."<sup>b</sup> Some pen and ink drawings, illustrative of the subject, were handed round the room.

The SECRETARY read a "Paper on the Hessian-fly," handed by Mr. Spence, stating, that published accounts of this insect were full of inaccuracies.

Mr. SPENCE made a few observations in explanation.

The PRESIDENT read a letter from Mr. Westwood, calling the attention of the Society to the entomological affairs of the

<sup>b</sup> See Article VI.



Linnaean Society, especially to a paper of his own on *Diopsis*, a very singular genus of Diptera, having the eyes placed on long foot-stalks. Mr. Westwood will continue to report any entomological matter that may come before that Society.

The Rev. F. W. HOPE read a paper by himself, technically describing some newly-discovered and very remarkable forms of Coleopterous Insects, which we should have been pleased to publish, but we accidentally heard that Mr. Hope intended them for some other destination. When this is the case we shall make it an imperative rule to be silent. Beautifully finished drawings, illustrative of the species described, were exhibited.

The CURATOR then came to the table, and with that air of genuine modesty which is ever the companion of true genius, made the following communication. I believe it has been supposed by several writers, that the mandibles of Lucanus (the Stag-beetle) are designed for perforating the bark of trees, and thus causing the sap to flow, on which the insect is said to feed; but I do not recollect ever seeing this confirmed on positive authority. During the past summer I kept a stag-beetle alive for several weeks: I allowed him to bite my finger with his mandibles, which he did with great strength and perseverance for some seconds; and immediately, on relaxing his hold, applied alternately one of his antennæ and the galea of his maxillæ to the indentation, as if to ascertain whether any moisture was flowing from the wound. The stag-beetle has a small patch of golden-coloured hair near the base of the fore-leg, the use of which, I believe, has never been pointed out:—it is evidently for the purpose of cleaning the antennæ, which, after touching saccharine fluids, become sticky. The insect does this in the most adroit manner, bending back the antenna and placing it beneath the leg, and then drawing it out slowly. The specimen which I had became after a time tame and playful, sometimes amusing himself by tossing about a ball of cotton with his horns. He was very fond of sugar moistened, and of the juice of raspberries.

The PRESIDENT alluded to the lamented death of Mr. Haworth; and proposed that a minute should be made expressive of the esteem of the Society for the deceased, and regret at his loss.



ART. VI.—*Osteology, or External Anatomy of Insects.*—  
By EDWARD NEWMAN, ESQ., F. L. S.

(Continued from Vol. I. p. 413.)

“I find it impossible to give, according to the present state of the science in England, any satisfactory description of insects without making some previous observations on their anatomical nomenclature.”

MACLEAY.

“Ce que personne n'avait encore tenté j'ai osé l'entreprendre.

SAVIGNY.

LETTER II.—ON THE HEAD OF INSECTS.

[Read at the Entomological Society; sitting of the 2d December.]

SIR;—It has been already stated, that an insect is composed of thirteen segments, and that of these the head is the first. It appears scarcely to admit of a doubt, that the head of an insect is composed of four distinct portions. That the portions of the head are merely sections, appears to me consistent with the general harmony of Nature.<sup>a</sup> The second segment in the locust tribes, and the third segment in the bee tribes, present to the inquirer a quadruple division by far more manifest. You will however remark, and it is of no mean importance, that, while the portions of the second, third, and following segments, are united by suture, those of the head have a freely moveable articulation. That the portions of the head are segments, is argued from the circumstance, that those organs which in one group are employed for manducation, in another serve solely for progression. When this is the case, the organs thus modified differ in no material characters from those of the second, third, and fourth segments. Consequently, it is said, that by their increase of importance to that of true organs of locomotion, they also raise the portions which bear them to an importance equal to that of those portions which uniformly bear such organs.

These changes in the uses to which organs are applied we frequently detect in progress in intervening groups. They afford the most obvious distinguishing characters. A man is termed a biped; a horse, a quadruped; and not incorrectly: yet the number of limbs in each is the same. In man, the first pair of limbs is essential to feeding; in

<sup>a</sup> The segments of the head, which are sometimes three, but typically four, are therefore of course only to be considered as secondary.—*MacLeay*.

the horse, these are purely organs of locomotion, and differ in no respect from the other organs destined to the same end; but in many animals we find them applied with perfect ease to either purpose. The adaptation of the same organs to different purposes in the superior animals is obvious; consequently, in the inferior, fairly to be inferred. Conclusions of this kind have been stigmatized as theoretical. Be it so: theory may be sound as well as unsound. When theory is a compound, of which facts are the ingredients, it is sound. In the present instance, facts are the ingredients. Whether the four portions of the head be primary or secondary parts,—in other words, whether they be segments or sections of segments, seems to hinge on another question; *viz.* whether a single segment can bear four feet; for it seems scarcely to admit of a doubt, that, in some annulate animals, the part which is analogous to the head of tetrapterous hexapods has four organs of progressive motion employed as feet. This circumstance appears to me by no means more remarkable, than that the third and fourth segment should each bear four organs of progressive motion, two of them adapted to walking, and two to flight. On these grounds I have considered the four parts of the head as so many sections of a segment, and consequently equivalent to the sections of succeeding segments. To give them the same names, however, while a doubt remains, would be objectionable; more especially, as a nomenclature sufficiently definitive has been long established, although in its application confused and various. The parts of the head are the skull, the lips, the feeler-jaws, and the mandibles. These are the four sections of a segment. To simplify and conform to received ideas, the three last must be treated of as the *mouth*, of which, in tetrapterous hexapods, they constitute the component parts.

The skull of insects is compact, solid, and osseous. It has a large opening in front, in which is situated the mouth; another behind, through which pass the *oesophagus*, spinal cord, blood-vessels, muscles of connexion with the *prothorax*, &c.; and two smaller ones, generally in front, above that of the mouth, in which are placed the antennæ. There are two compound eyes, one on each side, so closely soldered into the skull, that, in case of fracture, the separation does not take place at the suture. Desvoidy well observed, that the eyes

form the lateral regions of the skull. Besides these compound eyes, insects have generally two or three *ocelli*, or simple eyes. These, like the true eyes, are firmly fixed in the skull, and are alike incapable of being separated from it without fracture. The simple eyes are situated usually on the crown of the head; their number is generally, in *Lepidoptera*, two; in *Diptera*, three; in *Hymenoptera*, three; in *Coleoptera*, none;<sup>b</sup> in *Orthoptera*, three; in *Hemiptera*, two. With the exception of the compound and simple eyes, the skull is a single, continuous, and undivided piece. Entomologists have endeavoured to assign names to the different regions of the skull, but have hitherto been unable to establish them. It cannot be too frequently or too emphatically repeated, that names of parts having unfixed limits are objectionable, as leading to confusion. An author might establish his nomenclature from a single species, provided inquiry was directed to that species alone. The anatomy of a beetle's or locust's skull gives us scarcely any idea of that of a butterfly's. A nomenclature well adapted to the skull of a cockchafer would be useless for that of a dragon-fly. Fabricius describes no parts but the forehead, *clypeus*, throat, and simple and compound eyes. Latreille, Burmeister, and many others, recapitulate the labours of preceding writers. Desvoidy is original, precise, and clear, but his nomenclature is adapted solely to *Diptera*.<sup>c</sup>

<sup>b</sup> In the fourth number of Germar and Zincken Sommer's Magazine, it is affirmed, that they are discoverable in Gravenhorst's genus *Omalium*, but not in the kindred genera *Micropeplus* and *Anthophagus*. Upon examining the former genus, I find, that although *Omalium planum* and affinities, *O. Striatulum*, and some others, appear not to have them, yet with the aid of a good magnifier they may be discovered in most species of that genus, as likewise in *Evæsthetus*. I find them also very conspicuous in *A. Caraboides* and other *Anthophagi*, but some species appear to want them.—Kirby.

On a prétendu que les *Anthophagus*, les *Omalium* et les *Paussus* avaient de ces yeux simples; mais j'avoue que je n'ai jamais pu les apercevoir. — *Straus-Dürckheim*.

<sup>c</sup> La tête offre six régions principales : le front; la face; la région inférieure; la région postérieure : les yeux forment les deux régions laterales. 1. Le front (*frons*) ou la région frontale, s'étend de la partie postérieure de la tête, à la base des antennes, et d'un œil à l'autre œil. Il se divise en trois parties. La partie la plus postérieure, et celle qui ordinairement a le moins d'étendue est située derrière les stemmates, et porte le nom de vertex (*vertex*.) La partie stemmatique, ou les stemmates (*stemmata*), placée entre le vertex et le vrai front, consiste en une petite pièce ordinairement demi-circulaire, où les yeux lisses sont implantés. Le front, le vrai front (*frons*) s'étend d'un œil à l'autre et de la région

Straus-Dürckheim's description of the skull of a cockchafer is beautifully simple; and the only one yet pub-

stemmatique à la base des antennes. Il offre sur son milieu deux pièces ordinairement adossées et colorées assez régulières : ce sont les frontaux (*frontalia*.) A la partie antérieure du front, dans un triangle plus ou moins prononcé, vers l'origine des frontaux, on remarque deux pièces plus ou moins développées, et qui parviennent même à separer les frontaux, et a s'intercaler entre eux dans toute leur longueur : ce sont les inter-frontaux (*interfrontalia*.) Les parties latérales du front sont formées, ainsi que je le dirai, par le prolongement des optiques. La region frontale est ordinairement plus développée sur les femelles que sur les mâles. 2. La face (*facies*) est la région qui s'étend plus ou moins verticalement de la base des antennes à l'épistome et transversalement d'un œil à l'autre œil; c'est à tort que les entomologistes Allemands la nomment hypostome (*hypostoma*). Cette région se compose de diverses parties distinctes qui meritent d'être spécialement caractérisées. La portion médiane offre deux fossettes (*foveæ*) verticales ou obliques, qui servent de support aux antennes dans le repos : ces fossettes, faites de deux pièces souvent très distinctes, forment quelquefois une cloison par l'adossement de leur côtés internes; alors elles emittent une petite crête, plus ou moins aiguë à leur point de jonction. Le long du côté externe de chaque fossette s'étend une pièce, plus ou moins développée, plus ou moins cili-gères, qui part de la base des antennes, longe le bord de la face, prend un peu plus de volume vers son angle antérieur, et porte un gros cil avec une sorte de moustache, due à d'autres cils moins forts. Ces deux pièces qui portent le nom de faciaux (*facialia*) sont souvent cili-gères le long des bords du péristome. Les médianes (*mediana*) sont des pièces ordinairement triangulaires, souvent un peu colorées, et susceptibles d'acquérir un certain développement, qu'on remarque entre les faciaux et les pièces du pourtour de l'œil un peu au-dessus des pièces latérales du péristome; ils ne montent jamais jusqu'à la base des antennes. Je nomme optiques (*optica*) les pièces plus ou moins bombées, qui entourent l'œil sur la face, montent jusqu'à la base des antennes, s'étendent jusqu'au vertex, et jusque derrière l'œil. Souvent ils forment vers les antennes la crête aiguë ou l'angle qui sépare le front d'avec la face. Ils sont ordinairement piligères surtout à la région frontale; plusieurs observations tendent à me faire croire que, vers l'angle frontal, ces pièces optiques sont manifestement séparées. Si ce fait vient à se confirmer, on aura les optiques frontaux (*optica frontis*) et les optiques de la face (*optica faciei*.) Ces optiques correspondent à une portion des joues (*genæ*) des auteurs. 3. La région inférieure située entre la face et la région postérieure, offre une cavité où la base de la trompe et la plupart de ses muscles prennent leur attache, et où la trompe se retirée ordinairement pendant le repos. Cette cavité que je nomme péristome (*peristoma*) est formée de deux pièces latérales qui se soudent en avant et en arrière. J'appelle épistome (*epistoma*) son bord antérieur, qui en haut se soude avec les fossettes et se développe souvent en bec. Cet épistome affecte diverses formes qu'il importe beaucoup de remarquer : sur quelques genres, il est manifestement formée par deux pièces. Les faciaux longent latéralement les pièces du péristome et souvent ils y sont ciliés. Les lateraux (*lateralia*) sont de deux pièces ordinairement assez développées et faciles à distinguer, que l'on voit sur les côtés inférieurs du péristome. Ils s'étendent sur les médians, et s'avancent jusque sous la partie un peu postérieure des yeux. Dans plusieurs genres on voit, sous l'épistome une petite pièce semicirculaire, solide est bien detachée, qui recouvre la base antérieure de la trompe : c'est le chaperon (*clypeus*) des autres insectes. 4. La region postérieure, évidemment

lished that is *generally* applicable.<sup>d</sup> It will be of small service to name, with the greatest nicety, the parts visible in one genus or family. With exquisite talent Savigny has remarked, that naturalists multiply facts to admiration, but invariably decline generalizing them.<sup>e</sup> It is this generalizing, this universal application, that we stand in need of. We want a nomenclature that can be applied to all.

The only portion of the skull to which any general names can be attached, are these:—the *Epicranium*, or upper portion of the skull, of which the *Clypeus* or *shield*, and *Ocelli* or *simple eyes*, are constituent parts; the *Gula* or *throat*, which is the under portion of the skull, of which the *Mentum* or *chin*, is a constituent part;<sup>f</sup> and the *Oculi* or *eyes*, which are the lateral portions. The *neck*, of various authors, as applied to a part of the head, is nothing more than an elongation of the

composée de deux pièces larges, inférieures, et laterales, se trouve en contact avec la face antérieure du prothorax. Elle est percée d'un trou pour le passage des nerfs, des trachées et du tube digestif. A sa partie supérieure, entre les yeux, et au-dessus de ce trou, on doit distinguer le cérébral (*cerebrale*) ou la pièce qui fait suite au vertex et qui recouvre le cerveau. 5 et 6. Les yeux a réseau, ou les grands yeux forment les régions latérales de la tête. Ils offrent rarement quelque chose de remarquable et sont toujours entourés dans leur circonférence par les optiques, un peu moins développées en arrière qu'en devant.—*Desvoidy*.

<sup>d</sup> Le crâne du *Melolontha* est composé de six pièces soudées entre elles, et qui je nomme la pièce Epicrânienne, ou simplement l'Epicrâne, le Chaperon, la Basilaire, la Prébasilaire, et les deux Cornées des yeux. 1. La pièce Epicrânienne comprend la majeure parti de la tête, dont elle occupe principalement la région supérieure. 2. La Chaperon est une seconde pièce impaire de la tête, placée transversalement au devant du bord antero-supérieur de l'épicrâne, avec lequel elle se soude, et dont elle fait la continuation. 3. La pièce Basilaire, également impaire, occupe la partie inférieure et postérieure de la tête: sur les côtés, elle s'unit par suture avec l'épicrâne. 4. Je donne le nom de Prébasilaire à une quatrième pièce impaire du crâne, placée au-devant de la basilaire dont elle fait la continuation. 5 et 6. Les Cornées des yeux forment les seules pièces paires qui entrent dans la composition du crâne: ce sont deux calottes ovales, convexes, enchassées dans les deux grandes ouvertures latérales de l'épicrâne.—*Straus-Dürckheim*.

<sup>e</sup> Les entomologistes multipliaient à l'envi les observations; mais ils se dispensent de les généraliser; ils créaient chaque jour des genres nouveaux, et les premiers fondemens de cet édifice auquel ils travaillaient avec tant d'ardeur n'existaient point.—*Savigny*.

<sup>f</sup> It will be seen by a reference to Latreille's last work, Cours d'Entomologie, that he finally decides the *mentum* to be a *portion of the skull, and not of the lip*; in fact, he declares that the part he means is the *prébasilaire* of Straus-Dürckheim. See Cours d'Entomologie, p. 204. Le menton ou ganache n'est que prolongement de cet espace inférieur et gulaire de la tête que M. Straus nomme *pièce prébasilaire*.—*Latreille*.





Fig 1 A.



Fig 2 B



Fig 3 A

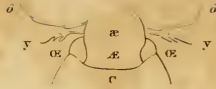


Fig 4 i



Fig 5 o.

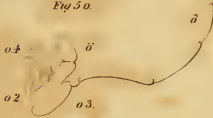


Fig 6 u.

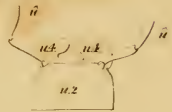


Fig 7 y



Fig 9 o.



Fig 8 a



Fig 10 o

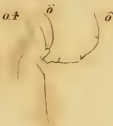


Fig 11 o

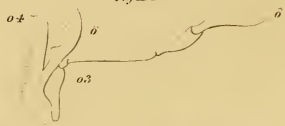


Fig 12 o

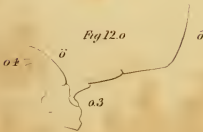


Fig 13 o



Fig 14 o.



Fig 15 A.

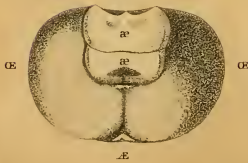
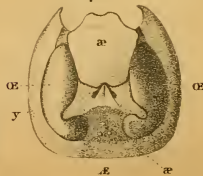


Fig 16 A.





skull posteriorly.<sup>g</sup> If description requires more definite limits, parts may be intelligibly designated by their propinquity to other parts. The shield is that part of the skull which is immediately above the mouth, and whose office is to shield it from injury. It was considered by Fabricius a part of the mouth. It is described by him as a corneous porrected part of the head, covering the mouth above, horizontally. It is divided by him into two parts, the *disk* and the *limb*: the limb is the upper lip, the disk is the true shield.<sup>h</sup> It is called by Straus-Drückheim, &c., *chaperon*; by Kirby, *nose*. In *Lepidoptera*, the shield is little apparent; it is hidden by the scales. In *Diptera*, it is more readily distinguished. In *Hymenoptera*, it is very distinct; you will recognize it, in the large corneous piece embraced by the lower portion of the eyes in the hornet.<sup>i</sup> In *Coleoptera*, it is sometimes obscure, as in *Hydrous*;<sup>k</sup> sometimes very conspicuous, as in *Copris*. In *Orthoptera*, it is always distinct. In several orders of this class, the suture, uniting the shield with the upper part of the skull, is membranaceous; hence the lip and shield move simultaneously with the mandibles in mastication. This is a departure from a general law of nature, and its occurrence is well worth remarking; as the motion of the shield might induce an observer to suppose it the lip, which would consequently become a new and supernumerary elementary part.<sup>l</sup> In *Hemiptera*, it is frequently raised and conspicuous, but its limits are indistinct. In the central group, the dragon-flies, it is raised, conspicuous, distinct, and horizontally divided into two.<sup>m</sup> The *Epicranium* is the whole upper region of the skull, bounded in front by the shield when distinct; laterally, by the eyes; and behind, by the junction of the head with the *prothorax*. Its extent is greatest in *Coleoptera*;<sup>n</sup> least, in *Diptera* and *Neuroptera*.<sup>o</sup> The *Oculi*, or *eyes*, are large lateral portions of the skull, known to every one. The *Ocelli*, or *simple eyes*, are small, highly convex lenses, soldered into

<sup>g</sup> *Necrophorus*. Head, with a distinct neck.—*Stephens*.

<sup>h</sup> *Clypeus*. Horizontalis capitis pars cornea porrecta os superne tegens. a. discus b. limbus.—*Fabricius*.

<sup>i</sup> Plate V. fig. 16. æ.

<sup>k</sup> Plate V. fig. 1, and 3. æ.

<sup>l</sup> Je suis convaincue lorsqu'on aura mieux examiné la bouche des insectes, proprement dits, on trouvera quelle forme qu'elle affecte elle est toujours essentiellement composée des mêmes élémens.—*Savigny*.

<sup>m</sup> Plate V. fig. 15. æ. æ.

<sup>n</sup> Fig. 3. Æ.

<sup>o</sup> Fig. 15. Æ.

the top or crown of the skull. The *Gula*, or *throat*, is the portion immediately below the under lip, and extends to the union of the head with the *prothorax*. The fore-part of the throat is sometimes called the *mentum*, but has no fixed limit. The *mentum* of MacLeay is the *labium* of Fabricius.

The parts of the skull are these: the crown, the two eyes, the throat. These are the four divisions of a section.

I would propose these names for the—

FIXED PARTS OF THE HEAD.<sup>P</sup>

- (Æ) EPICRANIUM, or *upper part of the skull*.
- (æ) CLYPEUS, or *shield of the mouth*.
- (œ) OCELLI, or *simple eyes*.
- (Æ) GULA, or *throat*.
- (œ) MENTUM, or *chin*.
- (Œ) OCULI, or *eyes*.

MOVEABLE PARTS OF THE HEAD.

- (y) ANTENNÆ, or *cranial feelers*.
- (j) OS, or *mouth*.

As before observed, the great development of one part necessarily requires the proportionate diminution of another part. A part increases or decreases in volume precisely as the organs it may bear require muscle for their guidance and government; on the (acknowledged) plan, that, for so much muscular exertion so much muscle must be provided, which muscle must occupy so much space. This is well illustrated by the head of insects. Professor Sang has prettily observed, that every instrument, whether it be for the generation or transference of power, has a best size and a best form. Nature, in the formation of her instruments, has always adopted that best size and best form. If her creatures wanted but to see, a globular eye floating in space might perhaps be the uniform character of the animal world. If to see and to eat, an eye and a mouth would be given. If to move swiftly in the air were desirable, wings must be supplied; if, on the earth, legs must be added; if in the water, fins. To carry all these organs,

<sup>P</sup> In this table the parts marked with small diphthongs are variable and inconstant; those with capital diphthongs are constant throughout the classes. The diphthongs and letters refer to figures in Plate V.

Fig 1



Fig 2.



Fig 5



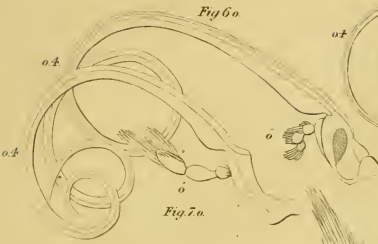
Fig 3



Fig 4



Fig 6 o



ot

Fig 8 o

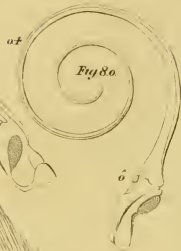


Fig 7 o

Fig 10

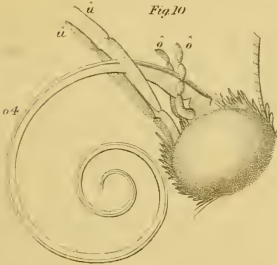


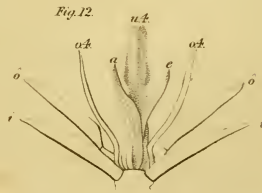
Fig 9 u



Fig 11



Fig 12





and to contain muscle to guide and govern them, a body must be added. Each part of the body will be of best size, and best form, for the functions it has to perform. We have seen that insects, in the *larva* state, have a very uniform allowance of muscle to each segment. In the *imago*, the charge of supporting the whole body in the air is entrusted sometimes to a single segment; and, in order to supply sufficient strength for the purpose, nature robs the neighbouring segments of their muscle, and gives it the one which needs it. In the head, the mouth, feelers and eyes operate, in the same manner, one on another. Observe the dragon fly, the emperor of his tribe:<sup>3</sup> his wings rustle as he hovers stationary and hawk-like in the air; his appetite is insatiable; his food, the active occupants of his own element,—it is given to him in charge to set bounds to the increase of the insect race; he beholds his prey afar off; he darts on it with the rapidity of a lightning-flash. To devour it, ere life is departed, is the work of an instant. He sails round and round; he soars up and up. When the sky is serene he seeks his prey, like the swallows, almost beyond the reach of human sight. What organs does such an animal require? Are they not these; eyes, mouth, and wings? How has Nature provided for his wants? Regard his head: below, it is all mouth; above, it is one continuous eye. Contemplate his wings: their character is strength and lightness, power and activity. His body is slender and graceful; like a rudder, it serves as an instrument wherewith to shape his course. Porrected feelers, whether cranial, labial, or maxillary, would be comparatively useless to an animal whose dependence for support is on the keenness of its vision and the velocity of its flight. We find them but little prominent; his every organ of the required size. The same law obtains as certainly and unvaryingly in form. There is truly a best size and a best form, and nature always provides it.

The fixed organs of the head, manifesting but slight variations, require no further comment. The *antennæ* or cranial feelers, and the mouth, are the only moveable organs. The *antennæ* are too well known to dilate on. The mouth must be considered more at large. The union of the head with the *prothorax* is by an articulation much more free than that between either of the following

<sup>3</sup> Genus *Anax* of Leach.

segments. Its power of motion is principally dependent on its relative size as regards the *prothorax*; sometimes it greatly exceeds that segment in size, and it is then loosely suspended at its extremity; sometimes it is much less than the *prothorax*, and received almost entirely within it, as a ball in a cup.<sup>r</sup>

The mouth of insects is essentially uniform. Its united parts work to the same end by different modes. Nature arrives at her object by the most direct means. Her plans are the perfection of simplicity. It may sometimes appear otherwise to us; that it does so is attributable to our ignorance, not her error. The construction of the mouth is peculiarly simple: even amid all the confused and laboured nomenclature with which descriptions of it have been loaded, its exquisite simplicity renders it intelligible to the meanest capacity. A celebrated lecturer well said, in allusion to the rage of the day for theoretical ideas and metaphorical allusions, "A stomach, gentlemen, is a stomach." In like manner, a mouth is a mouth, not a *proboscis*, nor a *haustellum*, nor a *trunk*, nor an *antlia*, nor a *promuscis*, nor a *tongue*, nor a *rostrum*, nor a *rostrulum*, nor a *rostellum*, but simply a mouth. The terms *haustellate* and *mandibulate*, as applied to the mouth of

<sup>r</sup> Dans les insectes l'articulation de la tête sur le corselet présente deux dispositions principales. Dans l'une les points de contact sont solides, et le mouvement est subordonné à la configuration des parties; dans l'autre l'articulation est ligamenteuse: la tête et le thorax sont réunis par des membranes. L'articulation de la tête, par le contact des parties solides, se fait de quatre manières différentes: 1. Où la tête porte, à sa partie postérieure, un ou deux tubercules lissés, que reçoivent des cavités correspondantes, dans la partie antérieure du corselet (*Scarabæus*, *Lucanus*, *Cerambyx*, &c.), dans ce premier cas la tête est mobile d'avant en arrière: 2. Où la partie postérieure est absolument arrondie, et tourne sur son axe, dans une fossette correspondante, de la partie antérieure du thorax (*Curculio*, *Brentus*, &c.), la tête se meut en tous sens: 3. Où la tête est tronquée postérieurement, et présentant une surface plate, et articulée tantôt sur un tubercule du thorax, tantôt sur une surface aplatie et correspondante (presque tous les Hyménoptères et plusieurs Diptères, *Tabanus*, *Musca*, *Syrphus*, &c.) 4. Enfin, où, comme dans quelques espèces d'*Attelabes*, la tête se renverse en arrière par un tubercule arrondi, reçu dans une cavité correspondante du thorax; le bord de cette cavité est échancré et ne permet le mouvement de la tête que dans un seul sens. Il n'y a guère que dans les insectes Orthoptères, et dans quelques Neuroptères qu'on remarque l'articulation ligamenteuse: la tête, dans cette disposition articulaire, n'est gênée que dans ses mouvements vers le dos, par qu'elle est retenue par une avance du thorax, mais au-dessous elle est absolument libre. Les membranes ou les ligamens s'étendent du pourtour du trou occipital à celui de la partie antérieure du corselet, ce qui donne une grande étendue aux mouvements.—*Cuvier*.

insects, are unavailable as distinctive characters. To Clairville has been assigned the merit of distinguishing between these supposed different kinds of mouth. He does not deserve it. Aristotle remarks, that some insects possessed teeth for devouring every thing, whilst others had only a tongue for sucking liquids.<sup>s</sup> Fabricius was well aware of the distinction; he placed together the four classes, *Coleoptera*, *Orthoptera*, *Neuroptera*, and *Hymenoptera*; and in a separate group, *Lepidoptera*, *Hemiptera*, and *Diptera*.<sup>t</sup> Lamarck applied the distinction to divisions. Clairville named those divisions. Savigny investigated more thoroughly, and proved the difference to be rather apparent than real. Aristotle's was the observation of a true naturalist; that of Fabricius no less so; Lamarck's was the application of a systematist; Clairville's the clever and apt idea of a nomenclaturist; Savigny's the discovery of a philosopher. I have not happened to meet with, in print, a distinctive character by which these supposed groups can be separated. It is a dichotomous one. Like all dichotomies, it consists of a positive and a negative. It is this:— in the mandibulate classes the mandibles *do*, in the haustellate classes the mandibles *do not*, move horizontally. It has no reference to the possession of mandibles: all insects possess mandibles. The food can never reach the *oesophagus* without passing through an intermediate space. Its passage through this space is by suction; the space is called the *haustellum*. The butterfly and the beetle alike possess this *haustellum*; it varies only in length. Any difficulty in obtaining food, which the bulk of the head and body may occasion, is provided for by nature by an elongation of this *haustellum*. When, combined with this difficulty, the food is solid, the mouth is placed at the extremity of this *haustellum*, as in weevils. When the food is liquid, the parts of the mouth itself are elongated, and, united, form the *haustellum*, as in bees and butterflies. The caterpillar eats solid substances; its mouth is necessarily hard for their mastication: the bulk of its head and body offer no obstruction to its obtaining an ample supply of food; the passage to the *oesophagus* is short. The butterfly subsists on

<sup>s</sup> Τῶν δ' ἐντόμων τὰ μὲν ἔχοντα ὀδόντας, παμφάγα ἐστί· τα δὲ γλῶτταν μόνον τοῖς ἕργοις τρέφεται, πάντοθεν ἐκχυλίζοντα ταύτη. Aristotle.

<sup>t</sup> This appears to have been the first division of this kind that is at all clearly defined.



fluids ; its mouth requires no hardness ; the bulk of its head and body offers an obstruction to its obtaining a sufficient supply of its food, which is generally concealed in the nectary of flowers ; the passage to the *œsophagus* is lengthened, and the difficulty overcome. The caterpillar produces the butterfly ; one is haustellate, the other mandibulate : they cannot be placed in separate classes. The mouth sometimes varies as much and as abruptly in the same insect in its different stages, as in any two different insects in their final stage. In others it remains nearly the same, or gradually approaches its perfection with every change of skin. In *Orthoptera* and *Hemiptera* the latter is the case : in these classes, every *ecdysis* is a *metamorphosis* ; the food and economy undergo no change, the organs therefore require none. Nature never provides uselessly. Fabricius beautifully observes, that it is the part of the wise man to study these things ; to observe, record, and add them to the stores of science ; to weigh well the mysteries of Nature, and trace the hand of a Creator in the wonders of his creatures. Lamarck says, that each peculiar form has been acquired by degrees,<sup>u</sup> and by striving to attain a particular object.<sup>x</sup> He appears to have forgotten, that if honey had been denied to the bee until its little mouth had lengthened out into a thread-like tube, starvation and extinction of its race must have been the consequence. Kirby, in reference to this, exclaims, It is grievous that this eminent zoologist, who in other respects stands at the head of his

<sup>u</sup> La nature, dans toutes ses opérations, ne pouvant procéder que graduellement, n'a pu produire tous les animaux à-la-fois : elle n'a d'abord formé que les plus simples ; et passant de ceux-ci jusqu'au plus composés, elle a établi successivement en eux différens systèmes d'organes particuliers, les a multipliés, en a augmenté de plus en plus l'énergie, et, les cumulant dans les plus parfaits, elle a fait exister tous les animaux connus avec l'organisation et les facultés que nous leur observons.—*Lamarck. An. sans Vert.*

<sup>x</sup> Premièrement, quantité de faits connus prouvent que l'emploi soutenu d'un organe concourt à son développement, le fortifie, et l'agrandit même ; tandis qu'un défaut d'emploi, devenu habituel à l'égard d'un organe, nuit à ses développemens, le détériore, le réduit graduellement, et finit par le faire disparaître, si ce défaut d'emploi subsiste, pendant une longue durée, dans tous les individus qui se succèdent par la génération. On conçoit de là qu'un changement de circonstances forçant les individus d'une race d'animaux à changer leur habitudes, les organes moins employés dépérissent peu à peu, tandis que ceux qui le sont davantage, se développent mieux et acquièrent une vigueur et des dimensions proportionnelles à l'emploi que ces individus en font habituellement.—*Lamarck. Phil. Zool.*



Fig. 1.



Fig. 4. u.



Fig. 5. a

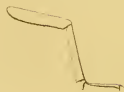


Fig. 2.

δ δ o.4. ũ u.4 ũ o.4. ö δ

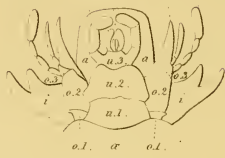


Fig. 6.



Fig. 3.

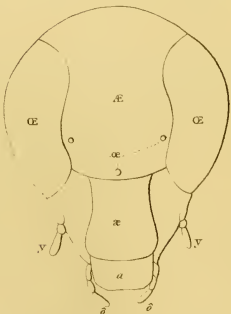


Fig. 7. γ.



science, should patronize notions so evidently absurd and childish. Cuvier wisely remarks, that there is no proof that the differences which at the present day distinguish animals from each other can have been produced by circumstances.

Thirty years ago, in this country, we were so bound by the fetters of the Linnæan system, that the mouth of insects was never resorted to as likely to afford distinctive characters. Our great writers in their generic descriptions make no allusion to it. Marsham's<sup>y</sup> *Coleoptera*, and Haworth's<sup>z</sup> *Lepidoptera*, at this day the only continuous descriptive lists of the species of whole classes that we possess, are dependent for their principal characters on the antennæ alone. At the present time it is far otherwise. The value of the mouth, in furnishing characters, is well known: its anatomy, therefore, cannot be a matter devoid of interest.

The mouth of insects I have already traced to three sections; the lips, the maxillæ, and the mandibles. I am now about to consider it in another light, as consisting of seven primary parts, as under;—

No. 1. (a) LABRUM, or *upper-lip*, bearing inferiorly the (á) EPIPHARYNX, or *valve*.

2. (u) LABIUM, or *lower-lip*, bearing the (ú) LABIPALPI, or *labial-feelers*, and, moreover, divided into:—

(u 1.) INSERTIO, or *insertion*, (*stipes* of MacLeay).

(u 2.) LABIUM, or *true lip*, (*mentum* of MacLeay).

(u 3.) PALPIGER, or *feeler-bearer*.

(u 4.) LIGULA, or *limb*, (*labium* of MacLeay).

3 & 4. (i) MANDIBULÆ, or *mandibles*.

5 & 6. (o) MAXILLÆ, or *feeler-jaws*, bearing the (ó) MAXIPALPI, or *maxillary-feeler*, and the (ö) GALEA, or *helmet*, and divided into:—

(o 1.) INSERTIO, or *insertion*.

(o 2.) MAXILLA, or *true feeler-jaw*,

(o 3.) PALPIFER, or *maxillary feeler-bearer* . . . . . } united, the *stipes* of Kirby.

(o 4.) LACINIA, or *blade*.

7. (e) LINGUA, or *tongue*, (*hypopharynx* of Savigny).

The whole of these parts are not equally developed. The

<sup>y</sup> *Scarabæus*. Antennæ clavatæ, capitulo fissili.—*Marsham*.

<sup>z</sup> *Papilio*. Antennæ versus apicem clavato-capitatæ, in sectione ultima plus minusve uncinatæ.—*Haworth*.

mode of their development affords characters by which classes are distinguished; the degree of their development, and the variation of their form, those for subordinate divisions. The diminution of a part until it escapes our notice is no proof of its non-existence; otherwise, the discovery of a part by a highly-magnifying power might be termed its creation. In the foregoing table, it will be seen that there are some parts originating in, and totally dependent on, the others. These are the feelers and *galea*; which may be termed secondary parts. Now secondary parts cannot exist without the primary parts which bear them. The presence of labial-feelers ensures a *labium*; the presence of maxillary-feelers ensures a *maxilla*. I feel considerable hesitation in considering the tongue, or *hypopharynx* of Savigny, a primary part. It is, however, of little moment what nominal value we may set on it. Its importance is precisely that of the tongue in the human mouth. It originates at the *pharynx* in common with the two lips, and is a portion of the same section.

The situation of the mouth is commonly in the lower part of the head, a little forward, calculated for feeding readily while the head is naturally inclined; it is bounded above by that part of the skull called the *clypeus*, and below by that part termed the *mentum*, from both of which it is perfectly distinct. I will now endeavour to trace the variations of its parts.

The first part of the mouth is the LABRUM, or *upper lip*. Fabricius, in describing this part, is very inaccurate. He has confounded it with the *clypeus*. He describes its variations in different genera. He alludes in one genus to the *clypeus*, in another to the *labrum*; in a third he unites the two. You will remark, it is never sutured to the skull; it is always free, moveable, and distinct. It unites with the lower-lip, and forms with it a distinct section. It bears on its under side the *Epipharynx*. It is usually an osseous piece, freely articulated to the *clypeus*, and originating below and within it. It is of variable shape; never palpigerous; and it serves as a cover to the other parts of the mouth. In *Lepidoptera*, the upper-lip is an unimportant part, and appears to have escaped the notice of naturalists, until detected by the accurate Savigny.<sup>a</sup> It is a thin flat scale-

<sup>a</sup> On voit d'abord que la lèvre supérieure doit être très petite et très peu apparente; elle est mince, membraneuse, quelquefois demicirculaire, mais le plus

like piece, projecting but little beyond the *clypeus*. It is generally pointed; and its under surface or *epipharynx* is formed to fit exactly the aperture at the base of the feeler-jaws. It has thus partially the power of a piston, and assists in drawing fluids through the tube formed by the united feeler-jaws. In *Diptera*, the parts of the mouth are generally very obscure; but when a peculiar mode of feeding requires active exercise, you will find they are called into very obvious existence, and each becomes fully developed. The *Diptera*, like the *Lepidoptera*, live principally by suction; but unlike them, have frequently to pierce the cuticle of the object, the juices of which they seek to extract. This operation calls into action organs which were dormant in the honey-sucking butterflies. The blood-suckers among *Diptera* offer the best examples of a developed mouth. The upper-lip is large, long and sharp-pointed in *Tabanus*.<sup>b</sup> In *Culex*, it is longer still, and more slender. If equal development of the primary parts constitutes perfection in the mouth of insects, then *Tabanus* and *Culex* may be said to possess perfect mouths. In these the primary parts are equally developed. In *Sphæromias*, and other nearly allied genera, you will find the upper-lip deeply grooved beneath, and partially receiving the other organs, as in *Hemiptera*. In *Rhyphus*, it has a tendency to the same form. In the *Asilites*, it is plain, stiff, and but half the length of the other organs. In the *Empites* it is long, and forms the outer cover of the beak of these insects. In *Medeterus*, if I have not mistaken, it is palmate; the central lobe being longest, the next to it next in length, and the external ones shortest. In *Æstrus*, the *labrum* and whole mouth have disappeared. Clark, in his valuable Essay on the Bots of Horses, speaks of the mouth of *Æstrus* as a simple aperture;<sup>c</sup> thus implying the existence of a *pharynx*; I confess I have not found it. Desvoidy appears to have a new theory regarding the mouths of *Diptera*. If it prove correct, nearly all the received nomenclature must fall.<sup>d</sup> In *Hymenoptera* the upper-lip is short,

souvent allongée en pointe, appliquée contre la base de la trompe et reçue dans la suture moyenne de manière à fermer exactement le léger écartement qui se trouve entre ses deux filets.—*Savigny*.

<sup>b</sup> In Plate VI. is represented the mouth of *Tabanus bovinus*.

<sup>c</sup> Os, apertura simplex, neque ullo modo exertum.—*Clark*.

<sup>d</sup> La trompe (proboscis) des Diptères, selon moi, n'est point formée par la

solid, bony, and somewhat quadrate. Unlike the same part in *Diptera*, it cannot be bent without injury. It either retains the bend or it breaks. It is not always visible externally. In the bee it is conspicuous: in the wasp it is hidden by the *clypeus*. In *Coleoptera* it retains a similar character. It varies much in development. The *Scarabæites* have the upper-lip small. I cannot consider, with Olivier, that it is in any case absolutely wanting,<sup>e</sup> although the great stag-beetle is almost without it. In these orders<sup>f</sup> the *clypeus* supplies its place: whence the error of Fabricius in confounding the two. In the rapacious beetles it is large. In *Anthia* and *Cicindela* it is very conspicuous. In all water-beetles it is fully developed; the difference in their economy does not affect it.<sup>g</sup> In *Orthoptera* its character continues the same, its relative size larger. In *Hemiptera* it has changed. It continues rigid, and is injured by bending: but it is longer and more pointed than in the three preceding classes. It is grooved to receive the *labium*, and is the only part of the mouth that is detached. In *Issus* it is sharper than a needle. In the other *Cicadites* it is more obtuse. In the *Cimicites*, again, it is sharp; and the same in the *Nepites*. The mouth in *Neuroptera* has no common character. Neuropterous orders, with the exception of the central one, *Libellulites*,<sup>h</sup> assimilate in all their characters to the classes to which they approach. I cannot, therefore, detail

lèvre inférieure, comme celle des Hyménoptères, mais par les mâchoires. Dans les *Myodaires*, elle est ordinairement membraneuse, quelquefois solides et triarticulée. La base est enveloppée par la base de la lèvre inférieure, dont les deux palpes sont toujours développées, et qui se prolonge en deux supports latéraux et ordinairement solides. Le corps de la trompe se prolonge en une gaine, terminée par des lèvres membraneuses dues à des trachées très développées, et par des palpes qui peuvent être solides. Elle renferme deux filets allongés qui forment le sucoir et qui représentent les mandibules. La pièce plus ou moins solides qui se prolonge sur la rainure de la trompe est le labre ou la lèvre supérieure.—*Desvoidy*.

<sup>e</sup> Les *Scarabées* qui ont des mandibules, et qui n'ont point de lèvre supérieure.—*Olivier*.

<sup>f</sup> *Scarabæites* and *Lucanites*.

<sup>g</sup> In water beetles the *clypeus* is never distinct.

<sup>h</sup> La labre demi-circulaire vouté; deux mandibules écailleuses, très fortes et très dentées; des mâchoires terminées par une pièce de la même consistance, dentée, épineuse et ciliée au côté intérieur, avec une palpe d'un seul article, appliqué sur le dos, et imitant la galète des Orthoptères, une lèvre grande, voutée, à trois feuillettes, et dont les latéraux sont des palpes; une sorte d'épiglotte ou de langue vésiculaire et longitudinale dans l'intérieur de leur bouche.—*Latreille*.



their peculiarities. To describe a single order would be merely to mislead; to describe all would be extending my letter to an unreasonable length.

The LABIUM or lower lip corresponds with the upper lip. It occupies the same situation below the jaws that the upper lip holds above them. The upper and lower lips therefore close the mouth vertically. There is no part of the mouth concerning which writers are so little agreed as this. The difficulty has arisen in two ways;—first, from the number of its parts; secondly, from the propinquity of similar parts. The lower lip is a compound and somewhat complicated organ. Every one has seen this; and every one has been desirous of applying some name to each of its parts. The next organ above it is the *tongue*; the next part below it is the *mentum*. It is not much to be wondered at that entomologists finding these three names—finding three very distinct parts in the lip—and moreover, very frequently finding no distinct tongue or *mentum*, should have applied the three names, *tongue*, *lip*, and *mentum* to the three most conspicuous and manifest divisions of the lip. The name *mentum* was given by Réaumur. Now the names of Réaumur impose no law: did they, half our present nomenclature must be abandoned. Latreille has, however, decided on retaining the name, and has applied it to the part of the throat immediately adjoining the mouth. The lower lip is divisible into four portions:—the *Insertio* or *insertion*; the *Labium* of Fabricius, or *true lip*; the *Palpiger* or *feeler-bearer*; and the *Ligula* of Fabricius, or *limb*. Of these, the *palpiger* appears to be now noticed for the first time. The *insertion* is precisely what the name implies; it is, in fact, the root by which the lip holds. It is always, in a greater or less degree, concealed by the *mentum*. Savigny has called it *support* and *insertion*. MacLeay, it will be seen, has named it *stipes*;—a name not inapplicable to the particular instances in which he figures it. The true *labium* is the second part: it is thus named by Fabricius, and has since been erroneously termed the *mentum* by most modern entomologists. The *palpiger*, or feeler-bearer, is situated above the disk, and is very often confounded with it. It seems generally to be a mere fleshy fold, between the lip and the *ligula*, but is occasionally thrust out far beyond the lip, and assumes the appearance of a *ligula*. In these instances it is easily detected by the feelers which it bears on its summit.

The feeler-bearer is seldom elongated without a similar elongation of the *ligula*. The *ligula*, or limb, is the fourth and terminal portion of the lip; its names have been most numerous. Its variations in form are very striking, and afford excellent generic characters. The two lips are united at their base. The nearer we can approach to a perfect tetrapterous hexapod, the more clearly will this be demonstrated. The type<sup>i</sup> of a tetrapterous hexapod we may yet be unacquainted with. Such a type must exhibit each organ fully developed. Our large dragon-flies are the nearest approach we know of to full and equal development of principal primary organs; in these we clearly perceive that the two lips are but a single piece, of which the central portion is flexible and fleshy, and perforated by a circular aperture, known as the *pharynx*. Let us now trace the variations of the lower lip.

In *Lepidoptera*, the lower lip is usually a triangular piece, the base of which is closely united to the inferior region of the skull.<sup>k</sup> Its surface is uniform, and its divisions obscure. Its apex is generally acute, and terminated by a single point: yet sometimes, as in *Amaryssus*,<sup>l</sup> it is bidentate. The labial-feelers arise from it in nearly an erect position, one on each side of the feeler-jaws, which form a small ring between them. Although obscure, the divisions of the lip are manifest under a good glass. The genus *Ino*, of Leach, exhibits very evident lines across it, which show with sufficient accuracy the limits of each division. The margin of the *insertion* rises to a level with the anterior margin of the *mentum*. The *labium* is a narrow arcuate piece, situated above this, and bordering the insertion of the feelers. The *feeler-bearer* is another narrow piece, whose margins, centrally, are nearly connate, laterally dilated for the reception of the feeler. The *ligula* is very considerably larger than the other divisions of the lip: it is triangular, with a very acute apex. The *feelers* in this genus, as figured by Savigny, exhibit a basal joint, in addition

<sup>i</sup> By the word *type* I would imply the perfection of a peculiar kind. Hexapods, approaching spiders, or *Ametobola*, for instance, would be departures from types.

<sup>k</sup> Je dirai peu de choses de la lèvre inférieure: elle consiste en un simple plaque triangulaire, ordinairement écaillée, unie par une membrane aux deux tiges des mâchoires, et supportant à sa base les deux palpes que tout le monde connaît.—*Savigny*.

<sup>l</sup> *Papilio Machaon*.—*Lin.*

to the two usually described. The apex of the *ligula*, and the form of the articulations of the feeler, seem to be the only portions of the lip in this class that are likely to be available for generic distinctions.

In *Diptera*, the lower lip is the largest and most conspicuous portion of the mouth. It is the organ known to every one, with which the busy house-fly attacks our sweets. It is not unfrequently termed the *proboscis* of the fly, a term, however, applied by Meigen to the united mouth of *Culex*.<sup>m</sup> Desvoidy, as already stated, has another idea about the anatomy of this organ. The *ligula* of *Hymenoptera*, shortly to be noticed, appears to have a precise analogue in the incrassated bilobed termination of the lip of *Diptera*. Immediately below this, in the genus *Tabanus* and some neighbouring groups, may be seen on each side of the lip a pilose excrescence. Savigny considers this the labial-feeler. It is the very situation in which analogy will lead us to look for this organ; and the idea that it is such is, consequently, far from improbable. I have, with great pains, sought for some character, whereby I might with confidence confirm Savigny's opinion, but have been unsuccessful: there appears no trace of articulation. By a careful examination, and frequently turning the object in the light while the eye is fixed on it, a nearly direct line will be seen crossing the lip immediately below these excrescences, thus separating, as I conjecture, the feeler-bearer from the true *labium*. The *insertion* is distinct; it has been noticed and figured by Savigny and others. The divisions of the lip are more prominent in *Empis*, *Stomyxis*, *Rhingia*, &c. than in *Tabanus*; yet still sufficiently indistinct, and scarcely to be recorded with certainty. The conspicuous presence of four divisions in the lip of *Hymenoptera*, *Coleoptera*, *Orthoptera*, and *Hemiptera*, led me to expect them in *Lepidoptera* and *Diptera*. Let me not influence the judgment of others. I have satisfied myself by patient investigation: I hope my fellow-labourers will do the same. With the exception of the *ligula*, the lip of *Diptera* affords but few characters for generic descriptions.

We now arrive at the *Hymenoptera*. Here the lower lip reaches its maximum. Let us examine the mouth of *Bombus*, the humble-bee. This mouth, if neatly spread out, presents

<sup>m</sup> *Culex*. Proboscis porrecta, longitudine thoracis.—Meigen.

us with the branching appearance of a little tree. Let us part off the outer branches, right and left: these branches are the feeler-jaws, to be noticed presently. After the removal of these, we find a long stalk or stem. At its base is a portion, very distinct, of a triangular form, with the apex pointing downwards. To the interior of this triangle the feeler-jaws are very firmly attached, and are with difficulty removed without carrying it with them. From the base of this triangle, which you will recollect is looking upwards, rises the true lip, a long slender piece with nearly parallel sides: near its summit a distinct and tolerably direct line crosses it; this line terminates the true lip: above it is the feeler-bearer. From each side of the feeler-bearer spring the feelers; throughout this order very elongate and conspicuous. From the summit of the feeler-bearer rises the *ligula*,<sup>n</sup> trilobed; each lobe is distinct to the very base; the lateral ones are called *paraglossæ*, a name that appears redundant, unless it could be carried through all the orders of this and the two following classes. In *Nomada* the lip is broad, the central lobe of the *ligula* large and moderately long; the lateral lobes small, and very acute. The labial-feelers are distinctly quadriarticulate, and longer than the central lobe of the *ligula*. In *Saropoda* the lip is similar, the feelers indistinctly articulated; and these, together with the central lobe of the *ligula*, much more elongate. In *Bombus* the central lobe of the *ligula* is much longer than the feelers. In *Melecta* the lip is longer than the *ligula*. In *Cælixys rufescens*<sup>o</sup> the *ligula*, in its central lobe, is much shorter than the feelers; its lateral lobes are rudimental. In *Osmia* the central lobe of the *ligula* is nearly three times the length of the lip, and twice the length of the feelers; still the lateral lobes are very minute. In *Anthidium manicatum* the central lobe of the *ligula* and the feelers are exactly of a length; the lateral lobes of the *ligula* are thin, short, and scale-like. In *Andrena*, *Halictus*, *Dasygoda*, *Colletes*, *Hylæus*, and *Sphecodes*,<sup>p</sup> the *ligula* is not a quarter of the length of the lip.

<sup>n</sup> *Ligula*. This is the part considered by many authors as the lower lip.—*Samouelle*.

<sup>o</sup> An insect common in the south of England, but one which I think has not found its way into our British lists.

<sup>p</sup> *Sphecodes monilicornis* excepted; which will probably form a new genus, or be removed from this.

In these instances it is quadrifid. Leaving the bees, we shall find the *ligula* in *Odynerus*, *Eumenes*, and *Epipone*, elongate and quadrifid; the feelers also differ essentially from those of the bees, in being situated considerably below the union of the lobes of the *ligula*. The lips of fossorial *Hymenoptera* are shorter than those of the foregoing; the *ligula* is usually short, obtuse, and bifid; the feeler-bearer variously developed, and the feelers much longer in proportion. The *Ichneumonites*, and other parasites, are very similar; the tongue being generally bifid and much shorter than the feelers. Lastly, in the *Tenthredinites*, we find distinctly trilobed *ligulæ*, short lip, and long feelers.

In *Coleoptera* the lip is reduced in length, but in all other respects it is very close to that of *Hymenoptera*. Latreille gives the name of *labium* to the whole lower lip in *Coleoptera*. MacLeay calls the same part *mentum*; but, reluctant to relinquish the Fabrician term, *labium*, has applied it to the *ligula*. Kirby<sup>q</sup> calls the whole lip, *labium*, but follows MacLeay in the nomenclature of its parts. Curtis, whose beautiful work, entitled "British Entomology," is known to every entomologist in this country, follows the nomenclature<sup>r</sup> of MacLeay. The labial feelers of *Coleoptera* are four-jointed. The basal joint is very various in its development. This circumstance is a fruitful source of confusion. The *ligula* originates at or near the *pharynx*. It extends along the inner surface of the lip, to which it is closely attached, and stretches beyond it. The produced portion being in the nomenclature of Fabricius, the limb of the lip, and sometimes the *ligula*, is the only part available for characters. The feeler-bearer in the lip of *Coleoptera* is soft and fleshy, and is remarkable for the variety of its development; and the feelers are attached to it by a loose and flexible articulation. Now, this being the case, you will observe, that the elongation of the *ligula* is very likely to affect the position of organs so situated. Let us examine this. In *Cicindela* the lip has three lobes; the central acute, the lateral ones obtuse. In the spaces between these are situated the feelers; there is no produced feeler-bearer, nor *ligula*. We will next

<sup>q</sup> In the *Coleoptera* only I speak of. The *labium* of *Coleoptera* is, in Kirby's nomenclature, the *lingua* of *Hymenoptera*. In *Orthoptera* and *Neuroptera* I am not competent to offer any explanation of this author's nomenclature of these parts.

<sup>r</sup> In the majority of the *Coleoptera*. In the other classes there is but little uniformity in the nomenclature of parts.



examine *Cychrus*. The middle lobe of the lip seems to be completely cut away; and the feeler-bearer appears in its place, with a pair of closely-approximating feelers rising from its summit. Turn the other surface of the lip, and apply a good lens: you will find the trilobed *ligula*, minute indeed, but beautifully distinct; the lateral lobes being rather longer than the central lobe, and termed by Latreille *paraglossæ*. *Blethisa* and *Nebria* present a very similar structure, except in the central lobe of the *ligula*, which in these is large and somewhat rounded. In *Helobia* the central lobe has a central tooth. In the *Harpalidæ* and *Scaritidæ*, the *ligula* is generally more produced; and the feeler-bearer and feelers are carried with it. In *Licinus*, the lip and its appendages are similar to those of *Cychrus*. You will find the same similarity in the feeler-jaw and its appendages. In the *Dytiscites* no great difference appears; the lateral lobes of the *ligula* are however mostly obsolete. In the *Hydrophilites* the lip is less indented than in predaceous beetles; the *ligula* is frequently bilobed, and the feelers appear to lose one joint by the second being received into a cup formed by the first. In *Hydroüs*, the feeler-bearer appears obsolete; and the insertion of the feelers behind the lip actually swells out the portions of its margin, behind which it enters. In *Parnus*, supposed to be nearly related to *Hydroüs*, the feeler-bearer and feelers project far beyond the lip. In *Tetratoma*, and *Cis*, the feeler-bearer is raised, but the *ligula* is concealed. In *Leiodes* all the four parts are distinctly developed. In *Trox*, the insertion is peculiarly prominent; and still more remarkably so in *Acanthocerus*.<sup>s</sup> In the vast order, *Curculionites*, I find the feeler-bearer very prominent and elongate; yet the *ligula* is mostly obsolete or concealed. In Curtis's figure of *Mononychus* there appears to be a distinct *ligula*;—I have never investigated the mouth of this genus. It seems a general character of the order, that the feeler-bearer should be prominent and elongate, the feelers approximate, placed at its summit, and occupying the usual situation of the *ligula*. In the *Cerambycites*, the four parts of the lip are very distinct: in *Saperda*, and *Hematecherus*, particularly so. The remaining

<sup>s</sup> Mentum quasi e duplici parte formatum, aliâ apiculi cordatâ ad basin, truncatâ, carinatâ, margine antico emarginato, lateribus rotundatis, elevatis; alterâ prioris stipite transversâ, concavâ, margine antico recto, lineari.—*MacLeay*.

orders of *Coleoptera* exhibit many variations in the parts of this organ, but mostly analogous to those described.

In *Orthoptera*, the lip has the same development as in *Coleoptera*, but the *ligula* is much more produced. It is divided into four lobes, somewhat palpiform. The common cock-roach presents an instance of this. The feelers are four-jointed; the basal joint occasionally amalgamating with the feeler-bearer.

In *Hemiptera* the lower lip wraps itself round the mandibles, &c., forming a sheath for them. It is four-jointed. Savigny considers the basal joint to be the true lip,<sup>t</sup> if I comprehend rightly his meaning. Latreille, in his last work, still treats of the lower lip as a quadri-articulate sucker, assigning no names to the articulations. I suppose the four joints to be analogous to the insertion, *labium*, feeler-bearer, and limb, observable in *Hymenoptera*, *Coleoptera*, and *Orthoptera*. Savigny has figured what he considers the feelers of *Hemiptera*, on the part which I have called the feeler-bearer. Willing as I must be to prove the correctness of this idea, I am compelled in fairness to admit that I have never made them out to my own satisfaction. The lower lip in *Hemiptera* varies scarcely at all, except in length. In the Linnæan genus, *Aphis*, several instances occur of its being twice as long as the body, passing beneath it, and projecting beyond it, like a tail.

In the larvæ of the *Libellulites* the lower lip has a most wonderful development, and all its parts are very conspicuous; the insertion is short, but distinct; the *labium* is long, stout, and incrassated externally; the feeler-bearer is still more developed, in *Æschna*, it is full half an inch in length, and divided into two lobes; the feelers are prehensile and mandibuliform; in fact, much resembling the mandibles of *Cicindela*; the *ligula* is a thin plate spread over the interior surface of the feeler-bearer, and filling up the space which occurs between its lobes. The most remarkable character of this extraordinary lip is its articulation. The *labium* is so freely articulated to the insertion that it is capable of being bent under the body of the insect reaching to the *metacoxæ*. The articulation of the feeler-bearer to the *labium* is of the same kind; while the latter is bent below the insect, the former is directed forwards, and reaches to the front of the mouth;

<sup>t</sup> Elle (la lèvre inférieure) est composée de quatre articulations, dont la première représente la ganache des *Coléoptères* et des *Orthoptères*.—Savigny.



the two joints thus reposing in parallel lines. The lower lip is the organ with which this ferocious larva seizes its prey. The perfect dragon-fly has also a singular development of the labial feelers: the lip itself is however little different from that of *Lepidoptera*; but the broad mandibuliform feelers are evidently used as organs of prehension and detention of their living prey, as I have often observed on feeding these insatiable creatures with flies whilst holding them by the wings. *Raphidia* displays the three lower parts of the lip in equal development; the *ligula* is concealed behind the feeler-bearer.

Next in order come the MAXILLÆ, or *feeler-jaws*; they are situated in the lower part of the mouth, one on each side, immediately above the lower lip, and below the mandibles, from which they may be instantly distinguished by constantly bearing the *maxipalpi*, or maxillary feelers. This distinction is so evident and unvarying, that I hope I shall be pardoned for applying to them the term, *feeler-jaws*; a term rather uncouth, I admit, yet I think also very distinctive and descriptive. The word *maxillæ* appears to offer no other translation than simply *jaws*, which would not sufficiently distinguish these organs from the mandibles. The feeler-jaws are less liable to variation than any other part of the mouth.<sup>u</sup> Their variations are therefore most important. Fabricius, Latreille, MacLeay, &c., have borne testimony to their value in affording distinguishing characters. Each feeler-jaw is divisible into four parts, the *insertio*, *maxilla* or disk, *palpifer*,<sup>v</sup> and *lacinia*. Straus-Dürckheim has the merit of first distinguishing these.<sup>x</sup>

<sup>u</sup> Maxillam constantissimum invenimus, vix in congeneribus aberrat. — Fabricius.

*Pièce palpifère* of Straus-Dürckheim.

<sup>x</sup> Chez les *Melolontha* le corps de la mâchoire est formé de quatre pièces, mobiles les unes sur les autres, mais qui n'ont point encore été décrites. L'une d'entre elles fixe la mâchoire sur la basilare: c'est une pièce à peu près trapezoïde, portant à son petit côté parallèle un condyle articulaire, qui pénètre dans la cavité cotyloïde interne qu'on remarque sur l'apophyse antérieure de la basilare. De ce point d'articulation cette première pièce se porte transversalement en dehors, et va s'unir par son bord opposé aux autres pièces du corps de la mâchoire, d'où je lui donne le nom de *Branche transverse*. — La pièce *Dorsale* des mâchoires est chez tous les coléoptères une plaque presque plane, en triangle isocèle; elle est unie par son petit côté à la branche transverse, et de cette articulation elle se porte en avant et détermine la direction de la partie principale du corps de la mâchoire, dont elle occupe la face externe. Par son bord interne cette seconde pièce s'articule linéairement avec une troisième, placée à la face inférieure de la mâchoire, et que je nomme l'*Intermaxillaire*, et son bord externe

The *insertion* is almost invariably concealed. Savigny has called it also *support*. Kirby, if I understand him rightly, has denominated it the *cardo*, or *hinge*.<sup>y</sup> The *disk* and *feeler-bearer* are commonly two pieces running nearly parallel with each other; the former occupying the front, the latter the back of the jaws. It has unfortunately happened, that Straus-Dürckheim has selected for his dissections an insect, in which the situation and proportions of these two parts are very unusual, whence, in different formations, his names appear rather defective. The *palpifer* bears on its back the *maxipalpus*, or maxillary feeler. The fourth part is the *lacinia*, or *blade*. It is called by Savigny, *lâme*; by Straus-Dürckheim, *intermaxillaire*; by Latreille, *internal lobe*; by MacLeay, *lacinia*. It is certainly the *lacinia* of Fabricius, as applied to a butterfly. United to the back of the blade, is the *galea* or *lobe*, a part exceedingly variable; sometimes bearing the appearance of a true feeler, and sometimes being wholly obsolete. It has been called, in the *Carabites*, the internal feeler; in the *Scarabæites*, the outer lobe of the feeler-jaw.<sup>z</sup> The name *galea* was given to it by Fabricius. This writer also treated of it as an inner *maxipalpus*. In *Lepidoptera*, the insertion of the feeler-jaws offers nothing

s'articule avec la quatrième, que j'appelle la pièce *Palpifère*. L'*Intermaxillaire* occupe comme nous venons de le dire la face inférieure de la mâchoire, et forme en même temps son bord interne: elle se prolonge peu au-delà de la pièce dorsale, et forme en dessous une large plaque allongée, qui s'étend vers le milieu de son bord interne en une longue apophyse dentiforme, dirigée obliquement en avant et en dedans. L'*intermaxillaire* s'articule en dehors avec la dorsale; à côté de son apophyse, avec l'angle interne de la pièce palpifère; à son bord interne elle est liée par un espèce membraneux avec la galea; enfin, son bord postérieur se continue avec le pharynx. La pièce *Palpifère* occupe la face supérieure de la mâchoire, et se trouve contiguë à la mandibule. C'est une grande plaque, à peu près triangulaire, articulée par son bord externe avec la pièce dorsale; par l'antérieur avec la galea; par l'angle interne avec l'*intermaxillaire*; et enfin son bord postérieur se continue avec le pharynx. Cette pièce forme ainsi avec la dorsale et l'*intermaxillaire* une chambre ouverte, d'une part, du côté de la branche transverse, par où elle communique avec la cavité de la tête, et, d'une autre, avec le galea. Sur l'angle antéro-externe de cette pièce est articulé le palpe, qui forme le principal appendice de la mâchoire.—*Straus-Dürckheim*.

<sup>y</sup> At their base they articulate with a piece more or less triangular, which I call the hinge (*cardo*.) This, on its inner side, is often elongated towards the interior of the base of the *labium*, to which it is probably attached. This elongate process of the hinge in *Apis*, *Bombus*, &c., appears a separate articulation: and the two together form an angle upon which the *mentum* sits, and by this the *maxilla* acts upon the labial apparatus.—*Kirby*.

<sup>z</sup> C'est une assez grosse pièce mobile qui termine la mâchoire.—*Straus-Dürckheim*.

worthy of remark. The disk and feeler-bearer are closely connected, the suture uniting them being obliquely longitudinal. In treating of these parts, I believe it will be better to consider them but as one. Their distinctness is more clearly to be discerned from actual examination of the objects themselves, and from the accurate plates of Straus-Dürckheim, Savigny, &c., than from any verbal description. The blade is long, slender, pliable, and capable of rolling up like an Ionic volute, or the main-spring of a watch. This is a principal character of the class. When at rest, the blade appears to be a small ring, and is situated between the labial feelers. Each blade, when examined, is found to be externally convex, internally concave; so that the two, united together in front, form a tube. Through this tube, the honey of flowers is drawn. Each blade is also in itself a tube. The organ formed by the union of the two is very elastic; and, if artificially drawn out to its full length, will, on being loosed, instantly return to its natural position. The maxillary feelers are by no means a prominent portion in the mouths of *Lepidoptera*. They are situated one on the feeler-bearer of each feeler-jaw. Réaumur, a hundred years ago, noticed the maxillary feelers of *Lepidoptera*,<sup>a</sup> and figured them very accurately; but Savigny appears to have been the first scientifically to ascertain their identity. Though not prominent, they afford the best characters for dividing this class that we at present possess. The *galea*, or *helmet*, is still undiscovered. In the *Sphingites* I find no feeler: I conclude, therefore, it is nearly obsolete. In *Zygæna*, *Ino*, *Glaucopis*, *Pyrausta*, and all the *Pyralites* and *Crambites*, it is distinctly visible, generally without a glass, and appears to be typically three-jointed. In the *Tortricites* and *Tineites* the maxillary feelers are less distinct, but always present. In the *Noctuites* they are small and two-jointed. In the *Geometrites* they are still less conspicuous. In the *Papilionites*, less still: in *Amaryssus Machaon*, obsolete.<sup>b</sup>

<sup>a</sup> Dans la figure on peut remarquer deux barbes plus écartées l'une de l'autre que ne le sont communément celles des autres papillons: deux filets placés entre les barbes, et dirigés dans un sens contraire à celui où les barbes le sont.—Réaumur.

<sup>b</sup> Savigny's figure of the maxillary feeler in *Amaryssus Machaon* represents rather the site of the feeler, than the feeler itself. I have hunted for it in vain in the specimens I have dissected.

The blade of the feeler-jaw, in the class *Lepidoptera*, appears to vary only in length.

In *Diptera*, the feeler-jaws are generally of about equal length with the upper lip and mandibles, but are shorter than the lower lip. They are straight, sharp-pointed, and lancet-like. It does not appear that they are generally tubular. The insertion of the feeler-jaws in *Diptera* presents little worthy of notice. The disk and feeler-bearer are two small pieces, placed above each other; from the latter proceeds a feeler with from two to five articulations. The blade is the long sharp-pointed part. The helmet is apparently obsolete. The feeler-jaws fluctuate greatly in their development in the various orders and families of *Diptera*. Curtis, in the work already alluded to, denies their existence in many genera, yet figures the maxillary feelers. This is not reconcilable with the idea of the feelers being secondary parts, or with their name, *maxillary*. The existence of the hand presupposes the existence of the arm. The existence of the feeler presupposes the existence of the part that bears it. I refer you to the genera *Oxycera*,<sup>c</sup> *Scatophaga*, *Drapetis*, *Helcomyza*, *Sepsis*, *Tyrophaga*, *Medeterus*, &c. &c. In two of these genera, *Scatophaga* and *Helcomyza*, I find that the feeler springs from a short and nearly quadrate piece, on which it is not placed quite perpendicularly, but leans a little outwards, and to which it is joined by a very evident suture. Is not this smaller basal joint of the feeler the true feeler-jaw? The blade of the feeler-jaws varies little excepting in length. The feelers vary in many particulars: the variation in the number of their joints is worthy of notice. In the *Culicites* they are long and five-jointed, the central joint being the longest. In the *Tipulites* they are short, and have five joints, all the joints being nearly equal in length. In *Bibio*, and its congeners, nearly the same. In the *Tabanites*, *Asilites*, *Muscites*, &c., they appear to be three-jointed; the basal joint short and indistinct; the second more slender, and rather longer; the third stouter and longer than either.

In *Hymenoptera* we find a considerable change takes place in the feeler-jaws. The bees appear to be the nearest

<sup>c</sup> *Oxycera*. Maxillæ and mandibles none. Palpi short, linear, membranous and compressed; thickened, opaque and pubescent at the apex.—Curtis.

approach to *Diptera*; and on this account the examination of their mouth is not unimportant. The insertion is a small triangular piece, on which the disk and feeler-bearer are seated. Their union is usually by a distinct longitudinal suture. The feeler is slender, five or six-jointed, and situated close to the base of the blade. The blade is long, slender, flexible, and elastic; it unites with the *ligula*, and labial-feelers in forming a honey-sucking tube. In all these respects, excepting the union with the *ligula*, the feeler-jaws of the bees very closely resemble those of *Lepidoptera*. In *Nomada* the feeler and the blade are of equal length. In *Saropoda* the feeler is about one-fifth as long as the blade. In *Bombus* it is scarcely one-fifteenth the length. In *Melecta* the disk and blade are of nearly equal length: the feeler is about one-third their length. In *Andrena*, *Halictus*, *Dasy-poda*, *Colletes*, *Hylæus*, and *Sphecodes*,<sup>d</sup> the length of the blade is much diminished. The division of the other parts is in these genera much more manifest. *Vespa*, *Odynerus*, &c. display a greater change: in these the feeler is much longer than the blade. In *Hedycrum* the feeler-bearer is longer than the insertion and stalk together: the *galea*, or helmet, also reappears in a large oval form; the blade is short; the feeler is long.<sup>e</sup> Passing through the *Fossores*, the *Pupivora*, and the *Tenthredinites*, we arrive very nearly at the mouth of *Coleoptera*. In all these the helmet of the feeler-jaw is present under some of its various modifications: it is the terminal portion, and its variations are of the greatest importance as distinguishing characters.

In *Coleoptera*, the feeler-jaws have assumed much more the appearance of the mandibles, than in any class through which we have traced them. Still it is far from certain whether they are, even in this class, employed for mastication. Kirby has excellently suggested that, under their present form, they are the holders or retainers of the food, while the mandibles are employed in masticating it. Their form and situation certainly favour this idea. Dumeril supposes they also assist in mastication.<sup>f</sup> The insertion of the feeler-jaw in this class is but

<sup>d</sup> With the exception of *S. monilicornis*, before noticed.

<sup>e</sup> The description is from the dissections of *Hedychrum* in Curtis's British Entomology.

<sup>f</sup> C'est avec les mandibules que l'insecte coupe, arrache ou retient les alimens;



little conspicuous: the disk is an important and considerable part; the feeler-bearer, usually a small lobe, something resembling a basal joint; and the blade long and large, frequently with a sharp-pointed incurved apex, and a ciliated internal margin. The maxillary feelers in this class are constant and conspicuous.<sup>g</sup> They are usually composed of four distinct joints,<sup>h</sup> and possess great freedom of motion. Geoffroy not unaptly compares the feelers to hands.<sup>i</sup> The helmet is also present; and in some of the carnivorous beetles is many-jointed, and wears completely the appearance of a true feeler.<sup>k</sup> Fabricius considered it a true feeler in the carnivorous beetles. Latreille, even in his latest work, disapproves of the general application now made of the term to the same part, however different its form.<sup>l</sup> It seems strange that one who theorises so boldly and successfully as Latreille has done, should hesitate in acknowledging the obvious identity of the part in question.<sup>m</sup> In the *Cicindelites* the feelers are long, four-jointed, and placed on a round compact feeler-bearer, which precisely resembles a fifth joint. The helmet is two-jointed, and longer than the blade, which is incurved and very sharp. In the *Carabites*, the helmet is usually shorter than the blade. In the *Dytiscites* there is no essential difference. In *Parnus*, the helmet

tandis que les mâchoires recourent, broient ou écrasent la partie qui se trouve comprise entre leur efforts.—*Dumeril*.

<sup>g</sup> Les palpes paroissent destinées à palper, à tâtonner l'aliment, à le toucher en tous sens, pour reconnaître ses qualités: aussi les voit-on continuellement en action lorsque l'insecte mange. Dans beaucoup d'espèces ils servent évidemment à redresser l'aliment, afin qu'il soient mieux saisi par les mandibules, dont l'office est d'agir comme les dents incisives et laniaires chez les mammifères.—*Dumeril*.

<sup>h</sup> There is, in all probability, a uniform number of articulations in the feelers of the insects of every class. It is worthy of remark, that every new discovery in natural history tends to harmonize phenomena previously at variance; and adds to, rather than subtracts from, the symmetry of the whole.

<sup>i</sup> Leur usage paroît être de servir comme d'espèce de mains, pour retenir les matières que mange l'insecte et qu'il tient à sa bouche.—*Geoffroy*.

<sup>k</sup> La galea prend quelquefois la forme des palpes, ce qui a fait dire que certains *Coléoptères*, tels que les *Cicindela*, avaient six palpes à la bouche: dans ce même genre il est formé de deux articles arrondis et fort allongés; dans d'autres il n'en a qu'un seul: il est souvent terminé par une grosse masse membraneuse, couverts de poils touffus, et quelquefois il est entièrement nu; enfin les *Cetonia* sont entièrement dépourvus.—*Straus-Dürckheim*.

<sup>l</sup> Je ne saurais approuver M. Straus qui n'ayant pas égard à ces modifications, donne au galea une acception trop générale.—*Latreille*.

<sup>m</sup> See Plate V., and trace the helmet (*ö*) in Hymenopterous, Coleopterous, and Orthopterous insects.

is a large, obtuse, exarticulate terminal lobe. In the *Hydrophilites*, the maxillary feelers are used as *antennæ*; they are consequently very long: the helmet is a distinct obtuse lobe. In the *Scarabæites*, the feeler-jaws are soft, membranaceous, and hairy; the helmet is extremely pilose and indistinct. In *Lucanus* the helmet is remarkable; it is employed to draw up sap into the mouth, and thus performs the office of a tongue. In the *Cerambycites*, *Curculionites*, &c. all the parts are obvious; their variations are very valuable in generic descriptions. In *Orthoptera*, the parts and appendages of the feeler-jaws are very fully developed. The helmet in this class appears to have reached its maximum; it is frequently, as in *Acridium*, three-jointed: in *Acheta*, the common cricket, it consists of two joints, the basal being the shorter. In *Hemiptera*,<sup>n</sup> the feeler-jaws undergo a complete change. Their appendages are obsolete. Their blade is a slender hair, encased in the under lip, already described;<sup>o</sup> the pair being united, serrated, and linguiform.

The MANDIBULÆ or *mandibules* constitute the fourth section of the head. They are not situated, in tetrapterous hexapods, more in front or further from the *prothorax* than the feeler-jaws; but in the apterous octopods they retain their position in front, while the feeler-jaws, with their appendages, take up their station immediately behind. The mandibles are situated above the feeler-jaws and below the upper lip, one on each side the mouth. It is worthy of remark, that the mandibles form a striking exception to the rule which assigns to an insect, longitudinally divided down the centre, two equal halves alike in all their parts. The mandibles in those classes, in which they possess the horizontal motion before alluded to, are almost invariably different in the structure of their inner surface. My attention was called to this in the first instance, by finding that

<sup>n</sup> In first dissecting the mouth of *Hemiptera*, I had concluded, with the early entomologists, that the long lances were never more than three in number. The central filament, which I then supposed to be the tongue, is certainly, in some *Cimicites*, divisible into two *lacinie*, which I presume correspond with the *maxilla* of other insects.

<sup>o</sup> Tous les auteurs ont écrit que le bec des Hemiptères contenait un sucoir formé par trois soies. Le fait n'est pas exact; le sucoir des Hemiptères se compose toujours de quatre soies, bien distinctes, c'est-à-dire, de deux mandibules et de deux mâchoires. Ces quatre pièces sont cornées, renflées à la base, comprimées et armées de cils ou de dents très aiguës, lorsque les espèces sont carnassières.—*Savigny*.



the outlines occasionally given to illustrate genera, frequently differed from my own dissections. Latreille, and several other entomologists, have been fully aware of this discrepancy, which is occasionally so great, that a figure, however accurate, of a single mandible, will by no means characterise a genus. Every description, therefore, taken from a single mandible, is faulty. I am aware this will be found a sweeping censure; but it appears to me nevertheless a sound one. The mandibles in all these classes have denticulations or teeth more or less developed on their interior margins. It is to be observed, that the mandibles are the *maxillæ* by Linnæus.<sup>p</sup> In *Lepidoptera* the mandibles are of a substance and size corresponding with that of the upper lip.<sup>q</sup> It does not appear that they perform any office, or are possessed of any motion.<sup>r</sup> In *Diptera* the mandibles are elongate, pointed and lancet-like, and in most respects, excepting the want of feelers, resemble the feeler-jaws. They are now possessed of a decided motion, essentially different however from that of the mandibles of masticating insects. Their motion is more of a vertical jerk, by which the insect stabs them into the skin of the object which it attacks. The precise character of the motion has not, however, been satisfactorily ascertained. The variations of the mandibles in *Diptera* are chiefly in size. In *Hymenoptera* the mandibles are abbreviated, osseous, and masticatory. They now have a distinct, free, and powerful horizontal motion, and, with the feeler-jaws, close the mouth laterally. They are subject to little variation throughout the class. In *Coleoptera*, the mandibles are still more developed, forming by far the most conspicuous part of the mouth. They do not so completely

<sup>p</sup> *Lucanus scutellatus* : maxillis exsertis apice bifurcatis latera unidentatis.—  
*Linnæus*.

<sup>q</sup> Les mandibules sont d'une exigüeté proportionée à celle de la lèvre supérieure. Dans la plupart des espèces elles paraissent à la loupe beaucoup moins grandes que les écailles qui couvrent le chaperon : elles sont appuyées sur les deux côtés de la trompe, et trop écartées pour pourvoir se toucher par leur sommet. Leur mouvement est assez obscur et dans certains genres, comme dans les *Sphinx* elles paroissent plutôt soudées au chaperon qu'articulées; d'autrefois elles font corps avec la base de la lèvre supérieure : elles sont d'ailleurs cornées, très lisses dessus et dessous, vides au dedans, tantôt applaties, tantôt renflées, plus ou moins coniques; divergentes, parallèles ou convergentes; pointues ou obtuses, suivant les genres, mais dans tous bordées de cils très-épais sur leur tranchant intérieur.—*Savigny*.

<sup>r</sup> See Plate VI. figs 1, 2, 3, 4, *i*.

close the mouth as in *Hymenoptera*; in some instances not even uniting, except in defence.<sup>s</sup> In others, as the beautiful *Cicindelites*, the mandibles cross each other in front of the mouth. In others, the mandibles are at their edges soft and flexible. This is particularly the case with those beetles whose food is the pollen of flowers, as the *Cetoniidæ*.<sup>t</sup> Another family, *Aphodiidæ*,<sup>u</sup> whose food is the recent excrement of cattle, has a similar peculiarity. In *Orthoptera*, particularly the locust tribes, the mandibles are osseous, large, and powerful. Marcel de Serres discovers, as he imagines, an analogy between the teeth which arm the mandibles of *Orthoptera*, and those possessed by the mammiferous animals. He accordingly names them *incisive*, *canine* and *molar*. Your readers will be pleased by a reference to his paper.<sup>x</sup> Though speculative in ideas, it is rigidly accurate in facts. I am not disposed to apply to annulose animals the anatomical terms employed for the vertebrates, unless their propriety be at once manifest.<sup>y</sup> In the present instance, moreover, the nomenclature of these parts is not applicable to generic or other characters, and therefore comes not within the compass of this essay. In *Hemiptera*, they undergo a complete alteration; and here, as in *Diptera*, they are elongate, pointed, flexible, lancet-like, and without the horizontal motion.

LINGUA, or *tongue*. The tongue of insects is an organ but little known. This arises, in some measure, from its being generally inconspicuous: and partly from the application of the names *Ligula*, *Lingua*, *Languette*, *Langue*, *Tongue*, &c. to a part, which

<sup>s</sup> In *Lucanus*, the great Stag Beetle, more particularly; this insect also employs his immense mandibles to pierce the tender bark of young trees. He applies his *antennæ* to the wound he has made, and if he finds that the sap flows, he inserts the helmets of his feeler-jaws in the wound. He sucks up the sap as it flows.

<sup>t</sup> Mandibulæ compressæ, tenues, lanceolatæ, membrana subquadrata intus auctæ, hujus latere externo producto et basi vix corneis vel corneis.—*MacLeay*.

<sup>u</sup> Mandibulæ clypeo obtutæ, ad basin corneæ, deinde in laminam brevem, compressam, dilatatam, coriaceam aut vix membranaceam productæ.—*MacLeay*.

<sup>x</sup> Annales du Muséum, No. XIV. p. 56. Les dents des ulonates peuvent se diviser comme celle des quadrupèdes en incisives, en laniaires ou canines, et en molaires.—*Marcel de Serres*.

<sup>y</sup> Such terms as *nose*, *ears*, and *hands* have been applied to beetles; do they not tend rather to excite a smile, than convey a scientific idea? I do not mention this out of disrespect to the authors of such names, but to shew how very widely fancy may lead us, if we determine on *providing* analogies.

is in reality nothing more than the limb, or elongate process of the under lip. The true tongue is the *hypopharynx* or *lingua* of Savigny. I cannot find it mentioned by Fabricius, except as a *seta* in the mouth of *Diptera*. Cuvier first notices it as a tongue in *Orthoptera*. Savigny clearly points it out in *Diptera*, *Hymenoptera*, *Orthoptera* and *Hemiptera*. Our illustrious countryman, Kirby, applies the term *lingua* to the right part in *Orthoptera*, *Hemiptera*, and *Neuroptera*: but in *Hymenoptera* and *Coleoptera*, he has given this name to the process of the lower lip, already described as the *ligula*. In *Diptera* he has declined naming it.<sup>z</sup> Latreille, in his earlier works, calls this part by various names; but in his *Cours d'Entomologie*, he clearly points out the true tongue, and laudably proposes that the last name should be restricted to it. My ideas on the subject have somewhat altered since I gave a cursory sketch of the mouth on a former occasion. I am happy in being able thus to point out my own error before the unthankful task has devolved on another. Beautifully has De Geer observed, that the evil is not very great, if further observation prove our old ideas to be untenable; we have then merely to remodel those ideas by the result of the later observation.<sup>a</sup> It ever has been, and may it still continue to be, my endeavour to amend an error as soon as I am aware of it. In *Lepidoptera* the tongue has never yet been noticed. Latreille fancied, if I comprehend him rightly, that it existed in the suture, uniting the feeler-jaws.<sup>b</sup> I have observed, very near the pharynx, but a little below it in *Sphinx Ligustri*, a small mammiform protuberance. This is so exactly the site of the tongue in bees, that it seems wonderful that the accurate Savigny should have overlooked it. I can

<sup>z</sup> See Plate VII. fig. 5, in the Introduction to Entomology.

<sup>a</sup> Le mal n'est pas même fort grand si par des nouvelles observations on trouve s'être trompé dans ses idées; il n'y a lorsqu'à les changer selon le résultat de ces observations ultérieurs.—*De Geer*.

<sup>b</sup> Amongst these parts (of the mouth in *Lepidoptera*), there seems at first sight no representative of the tongue; but M. Latreille has advanced some very ingenious, and, I think, satisfactory arguments, which go to prove that this part, at least the tongue, in *Hymenoptera*, has its analogue in the intermediate tube or *fistula* formed by the union of the two *maxillæ*, and which conveys the fluid aliment of this order to the *pharynx*. As in *Diptera* the *maxillæ* sometimes merge in the *labium*, so here the tongue (as it were, divided longitudinally) merges in the *maxillæ*.—*Kirby*.

have no doubt that this is the true tongue. In *Diptera* it is elongate and sharp-pointed, and is the part so named in Curtis's figures of *Anopheles* and *Tabanus*. In *Hymenoptera* it is shorter, but still evident, particularly in the bees, as *Eucera*, &c. In *Coleoptera*, it is still less prominent, and assimilates to its Lepidopterous form already described. In *Orthoptera* it increases in size, and in the common cock-roach very nearly approaches the shape, appearance, and relative size of the human tongue. In *Locusta* it is very large. In *Hemiptera* the tongue is the central and generally the shortest organ of the mouth: it has not, however, escaped the lynx-eyed researches of Savigny and Leon-Dufour.

The next letter relates to the segments which bear the organs of locomotion.

I am, &c.

EDWARD NEWMAN.

Deptford, March 1, 1833.

P. S.—More than once, while this and the three remaining letters have been waiting for publication, have I resolved on suppressing them, and abandoning, to abler hands, the task I have so rashly undertaken. As often has the kind, but I fear ill-judged partiality of personal friends induced me to revise and reserve them for publication. I too have reflected, that these memoranda, trifling and imperfect as I know them to be, thrown thus piece-meal into the great mass of human knowledge, would not be altogether lost. The widow's mite was not unacceptable. If each of us then does his best, let not his fellow-labourers judge him too severely. Provided the continuation of this subject proves to be against the judgment of your readers, I sincerely hope they will express as much, and it shall be most cheerfully withdrawn.

My name stands alone as the author of these letters; their production, however, is a joint concern, and my part is by far the least meritorious. There is, I am sure, in human nature, a tendency to commend the effort to do well. Ours has been, and is, and—unless required to be suspended—shall be, an effort to do well. If then a kind approving thought occur to even one of your readers, let it be given exclusively

to my friend, whose skill as an engraver, aided by his intimate knowledge of the subject, has mainly contributed to render these pages intelligible. I may say with Marcel de Serres : In this work I have no merit but that of generalizing. <sup>c</sup>

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ART. VII.—*Essay on the Classification of Parasitic Hymenoptera, &c.* By A. H. HALIDAY, ESQ. M.A.

(Continued from Vol. I. page 491.)

*Of the Ichneumones of the Second Line, (Ichneumones adsciti, Essenbeck.)*

Subgen I.—APHIDIUS.

Aphidius. *Essenbeck.* Fam. II.

*Areola disci antica et cubitalis interior confluentes : stigma trigonum : abdomen lanceolatum petiolatum vel subpetiolatum : valvula ventralis inermis : antennarum articularum numerus varius mari auctus : palpi varii.*

Areola magna irregularis disci fere ut in *Ichneumonidibus genuinis* sita est, a cubitali exteriori sæpius equidem vix apice discreta ; mox etiam limites posticè sensim oblitterati evanescent in aliis, areolâ ut in *Trioxei* penitus effusâ : antennarum vero norma in singulis speciebus non adeo mutabilis ut ejus ratio prorsus negligenda sit, unius aut alterius articuli incrementum faciliè patitur, vel etiam plurium siquibus ille numerus viginti in universum superet : abdominis segmentum dorsale secundum impressione transversa bipartitum est, incisurâ ventrali secundâ ibidem pallido-perlucente ; inde fit quod abdomen nunquam totum nigrum extat. Quæ semel monuisse satis sit.

Species quum ingenti copia, tum characterum subtilitate vel etiam inconstantia implicitæ, discrimen curatius locorum atque victus ratione confirmatum postulant. Quæ modo ut attingam non tempus otium nec industria fiduciam præstitere. Satis habui nonnullas sectiones quarum ope forsitan ista multitudo commodius

<sup>c</sup> Dans ce travail je n'ai d'autre mérite qui d'avoir généralisé.—*Marcel de Serres.*

digeri possit, indiciis saltem levibus demonstrasse, exemplis perpaucis vel singulis tantum ubique subjectis: in quæ (opus sane jejunum atque mancum) solertiorum animadversiones et addita-  
menta sollicitè peto.

*Tabula Synoptica Sectionum.*

Aculeus	{	pallidus . . . . .	{	4-articu- lati, labiales	{	3-articulati, { thorace latius . . . FALCIGERI.
						caput { thoracis latitudine TRIVIALES.
						2-articulati, { dimidiatus . . . FAMILIARES.
						cubitus { brevissimus . . . EXAREOLATI.
						3-articulati, { completæ . . . SEROTINI.
alæ { nullæ . . . . . APTERI.						
						2-articulati . . . . . BREVIPALPES.

SECTIO I.—FALCIGERI.

Caput vix thoracis latitudine rotundatum, postice magis coarctatum: palpi maxillares 4-, labiales 3-articulati: mesothoracis scutum læve glabrum: stigma medioere, areola completa; abdomen *feminae* lanceolatum, *mari* brevius obovatum, petiolo lineari: aculeus pallidus cuspidatus nonnihil decurvus.

Sp. 21. A. *Crepidid*. Fem. *Petiolo valido ante medium dentato, aculeo decurvo inferne angulato, antennis 13-articulatis.* (Long. .09 — .12; alar. .16 — .20.)

*Fem.*—Luteo-ferrugineus, caput et thorax supra nigro-fusca: antennæ breviusculæ concolores scapo lutescentes: alæ fuscanae stigmatè in vivis luteo in exsiccatis piceo, radice et squamulis fusco-piceis: pedes posteriores, nonnunquam antici quoque, femorum et tibiarum latere externo tarsisque fuscis, tibiis basi luteis: petiolus ante medium valide dentatus, fere ut in subgeneribus *Trionnye* et *Monoctono*: segmenta intermedia abdominis lateribus vel dorso toto infusca: aculeus fere ut in *Monoctono* effictus dorso infuscatus.—*Mas*, niger, antennæ concolores 16-articulatae: os lutescens: pedes obscuriores quam *feminae*, coxis posticis nigris: abdomen piceum, petioli basi apiceque, segmento secundo medio lutescentibus.

*Variat.*—Femina rarius antennis basi latius, pedibusque totis lutescentibus.

*Habitat* in Aphidibus *Crepidid Tectorum*.<sup>a</sup>—(*Mus. Soc. Ent.*)

<sup>a</sup> The Pucerons, containing this parasite, may be found adhering to the calyx-scales of the Succory Hawk-weed.



Sp. 22. *A. constrictus*. Fem. *Petiolo gracili medio noduloso, aculeo conico apice perparum deflexo, antennis 16-articulatis*. (Long. .09—.12; alar. .16—.20.)

*Bracon constrictus*. *Ess. B. M. V. 28. Sp. 44. Tab. II. fig. 8.*

Statura gracilior quam præcedentis.—*Fem.* Pallide flavus, capite et thorace supra fuscis, postpectore nonnunquam infuscato: antennæ graciles fuscae basi flavescens, rarius 15-articulatæ: palpi prælongi: alæ hyalinæ nervis dilute piceis, stigmate flavo, in exsiccatis pallido, radice et squamulis stramineis: apex femorum et tibiæ posteriorum latere externo, tarsorum undique fuscens: petiolus gracilior, quam præcedenti haud dentatus: abdominis segmenta intermedia lateribus infuscata: aculeus longior et gracilior quam illi, apice summo tantum leviter decurvo.—*Mas*, caput et thorax nigra: palpi fusco-pallidi: antennæ 18-articulatæ nigræ: alarum stigma dilute piceum in vivis lutescens, radix et squamulæ piceæ: pedes luridi seu sordide lutescentes, posteriorum coxæ basi, femora, tibiæ medio tarsique apice infuscata; abdomen luridum fusco-nebulosum.

*Habitat in Aphidibus Aceris Pseudoplatani*,<sup>b</sup> &c.—(*Mus. Soc. Ent.*)

## SECTIO II.—PINICOLÆ.

Caput valde oblatum thorace latius, oculis extantibus, fronte et hypostomate latissimis: palpi maxillares 4-, labialis 3-articulati: antennæ *feminæ* circiter 20-articulatæ, *mari* 25-articulatæ (*A. adscitus* autem cujus *mares* soli adsunt hunc numerum non accedit): mesothoracis scutum sulculis binis ordinariis parum profundis, nonnunquam alio intermedio abbreviato et obsoletiore impressum: alæ latæ stigmate latissimo trigono, areola completa. Abomen *feminæ* oblongo-lanceolatum apice compressum, *mari* brevius lineari-clavatum, petiolo postice dilatato: aculeus niger haud decurvus.

Ova ponunt in Aphides lanigeras *Coniferarum*, autumno obviæ.

Sp. 23. *A. pictus*. Fem. *Petiolo sensim incrassato aculeo arcuatim ascendente*. (Long. .17—.20; alar. .27.)

*Fem.* Luteus: antennæ, oculi, macula verticis, margo occipitis, tempora, lituræ tres scuti cum scutello, metathorax et petiolus

<sup>b</sup> The Pucerons infested by it turn white, and among such winged individuals are occasionally found.



nigri: mesothoracis scutum nitidum subtilissimè punctulatum: alæ hyalinæ nervis fuscis, stigmatè fusco-ferrugineo, radice et squamulis lutescentibus: pedes antici immaculati, intermedii infuscati, postici fusci trochanteribus, femoribus subtus tibiisque basi et apice sordide luteis: petiolus granulatus opacus a basi inde fere æqualiter incrassatus, apice ipso vix latiore, tuberculis ante medium sitis inconspicuis: abdomen valde elongatum apice resupinatum, segmentis anterioribus dorsi infuscatis: aculeus gracilis arcuatus ascendens, metatarsi postici fere dimidiâ longitudine.—*Mas*, incognitus.

*Habitat in Pinu sylvestri rarissimè.*

Sp. 24. *A. pini*. Fem. *Petioli apice obconico-dilatato, stigmatè latissimo, aculeo brevi obtuso, antennis nigris.* (Long. .15—.18; alar. .27—.29.)

*Fem.* Niger, hypostomate et propectore luteo-pictis, mesothoracis scuto opaco punctulatissimo, vel luteo lituris tribus effusis nigris, vel limbo tantum lutescente: caput latissimum: stigma quoque adhuc latius quam in cæteris: alæ hyalinæ apice et substigmatè infumatæ, stigmatè nervisque fuscis, radice et squamulis stramineis: pedum colores obscuriores quam in præcedente, coxis intermediis insuper infuscatis: petiolus basi constrictus, medio tuberculatus, dehinc in apicem cito dilatatus inæqualis punctulatus: abdomen minus elongatum nigrum s. piceum, segmento secundo medio, nonnunquam incisuris anterioribus quoque pallidis: aculeus brevis latus obtusus, horizontalis aut suberectus.—*Mas*, niger segmenti secundi medio pallescente, pedum colore luteo minus effuso, coxis omnibus nigris: alæ candidæ stigmatè nervisque nigris, radice et squamulis piceo-stramineis: petiolus apice parum dilatatus.

*Habitat in Pinu sylvestri et Larice. (Mus. Soc. Ent.)*

Sp. 25. *A. infulatus*. Fem. *Petioli apice dilatato, aculeo brevi obtuso, antennis apice flavis.* (Long. .11—.16; alar. .21—.29.)

*Fem.* Caput luteum vertice et oculis nigris: antennæ nigræ scapo luteo, articulis extimis quinque aut sex flavis, ultimi apice fusco: thorax niger propectore luteo: mesothoracis scutum nitidum subtiliter vage punctulatum: alæ hyalinæ apice et substigmatè infumatæ, nervis fuscis, stigmatè fusco-ferrugineo, radice et squamulis stramineis: pedes lutei, posteriores late fusco-nebulosi,

coxæ posticæ fusco-maculatæ : abdomen luteum, segmentis anterioribus dorsi infuscatis, posticis immaculatis : petiolus fere qualis *A. pini*, apice tamen minus dilatatus, niger : aculeus ut in illo.—*Mas.* niger : antennæ quam in cognatis graciliores videntur, totæ nigræ : alæ hyalinæ stigmatate nervisque fuscis, radice et squamulis obscure stramineis : pedes antici straminei latere externo obscuriores, posteriores fuscii trochanteribus fere totis, tibiis basi et apice tarsisque basi stramineis ; coxæ omnes nigræ : abdomen piceum plagâ mediâ lutescente : petiolus apice vix dilatatus.

*Habitat in Larice rarius.*—(*Mus. Soc. Ent.*)

Sp. 26. *A. Laricis.* Fem. *Petioli apice perparum dilatato, aculeo brevi cuspidato.* (Long. .11—.15 ; alar. .19—.24.)

*Fem.*—Niger : mesothoracis scutum nitidum subtiliter vage punctulatum : alæ hyalinæ apice et substigmatate infumatæ, stigmatate nervisque nigro-fuscis, radice et squamulis piceo-stramineis : pedes antici lutescentes latere externo infuscati, tarsi fuscis, postici fuscii, trochanterum apice, tibiisque basi et apice sordide luteis ; coxæ omnes nigræ : abdominis segmentum secundum medio, rarius etiam incisuræ anteriores piceo-pallidæ : aculeus brevis erectus apice attenuatus.—*Mas.* alis candidis immaculatis et pedibus obscurioribus.

*Habitat in Larice e cujus Aphidibus prodiit mihi.*—(*Mus. Soc. Ent.*)

### SECTIO III.—TRIVIALES.

Palpi maxillares 4-, labiales 3-articulati : caput thoracis latitudine : mesothoracis scutum læve glabrum : stigma mediocre : areola completa : abdomen *femine* oblongo-lanceolatum, *mari* brevius lineari-clavatum, petiolo fere lineari inæquali : aculeus brevis obtusus horizontalis niger.

Ova ponunt in Aphides genuinas (e sectione A. *Steph. Cat.*)

Sp. 27. *A. Rosæ.* Fem. *Luteus antennis, vertice thoraceque nigris, propectore luteo, abdomine bifarium fusco-maculato, pedibus posterioribus infuscatis, antennis 17-articulatis.* (Long. .12—.14 ; alar. .20—.23.)

Ichn. Aphidum . *De Geer.* II. 866. Tab. XXX. fig. 4—13.

Id. *Schr. F. B.* II. 307. No. 2146.

Id. *Geoffr.* II. 322. 4.

*Fem.*—Alæ hyalinæ nervis fuscis, stigmatè luteo, in exsiccatis piceo, radice et squamulis stramineis: pedis intermediï fusco-nebulosi, postici coxis et femoribus, tibiis medio tarsisque fuscis: petiolus fuscus apice lutescens: abdominis segmenta anteriora utrinque fusco-maculata.—Color luteus in hac specie clarior fere in croceum transit. — *Mas*, niger ore luteo, palpis piceo-pallidis: antennæ 20-articulatæ: alarum radix et squamulæ picescentes: pedes antici lutei fusco-lineati, posteriores picei trochanteribus et tibi-  
 4 arum basi lutescentibus; coxæ omnes nigræ: abdomen piceum segmenti secundi medio et incisuris lutescentibus.

*Habitat* in Aphidibus, *Rosæ*.<sup>c</sup>—(*Mus. Soc. Ent.*)

<sup>c</sup> This is the species most frequently noticed by authors, being a familiar inhabitant of our gardens, where the male may be seen throughout the summer hovering over the rose-trees, or creeping under the leaves. His partner is of less roving habits, and will generally be found busy in providing for the establishment of her numerous progeny. Placed at her birth amid the myriads of Pucerons which encircle the young shoots of the rose, she has no dwelling to construct with artful industry, nor stores of food to collect by distant roving. With extended antennæ and wings, "shivering with desire," she paces leisurely among the defenceless herd, and as soon as she has selected one by a light touch of her antennæ, she stops short at about her own length from it, and rising on stiffened legs, bends her abdomen under her breast till the end of it projects beyond her mouth; then erecting her thorax by depressing the hinder-part, she simultaneously makes a lunge forward with the abdomen, which is then extraordinarily lengthened, and by a momentary touch, deposits an egg on the *under-side* of the Puceron, near its tail. The victim will sometimes kick and sprawl, so as to discompose her; but being anchored by its sucker plunged in the bark, can make no effectual attempt to elude the deadly weapon. Should it, however, be wandering at large and free to struggle, she shows great activity in traversing around it in the attitude of attack till she can take it in flank. The delicate sense of the antennæ seems to warn her where a germ has been already deposited, as she will pass by those which have been stung some days before; and I have never found more than a single grub in each individual. When all the interior of the Puceron is consumed, it will be found separate from its fellows, and motionless, usually on the upper side of a leaf, to which it is glued by some viscid exudation. It now appears distended, and of an opaque hazel or lighter tint. If opened, the full-fed grub of the *Aphidius* will be discovered doubled up, and filling the cavity, its head being next the tail of the Puceron. In a short time the parts of the perfect insect are developed in a quiescent state and in the same position, the integuments of the grub being shrivelled up below it in black grains. Like *Cynips* and *Callimome* it spins no cocoon for its transformation, being adequately protected by the indurated skin of its victim. A few days are sufficient to give consistence to its parts; and while the new risen sun is yet glistening in the early dews, the winged insect, by a push of its head, detaches the latter rings of its case, which separate in the form of a circular lid, often springing back to close the orifice after the inhabitant has gone forth, born in the maturity of her energies and instincts, to renew the circle of existence. Sometimes, indeed, a different occupant will issue from its dark chamber, as several still minuter parasites of the present order (*Megaspilus Carpenteri*, Curt. E. B. 249. *Cynips*

Sp. 28. *A. lutescens*. Fem. *Luteus oculis et antennis nigris, vertice, lituris tribus scuti, scutello, metathorace et petiolo fuscis.* (Long. .13; alar. .24.)

Fem.—Statura et magnitudo *A Rosæ*: antennarum scapus lutescens: alæ ut in illo: pedes immaculati: abdominis segmenta anteriora dorso transversim infuscata.<sup>d</sup>

Sp. 29. *A. Avenæ*. Fem. *Niger pedibus anticis et geniculis rufo-piceis, stigmatibus anoque ferrugineis, antennis 17-, 18-articulatis.* (Long. .12—.15; alar. .20—.24.)

*Bracon picipes* . *Ess. B. M. V.* 28. Sp. 42?

*Aphidius picipes* . *Ess. Act. Acad.?*

Fem.—Os lutescens, palpi subfusci: alæ hyalinæ stigmatibus rufoferrugineo, in exsiccatis piceo, nervis fuscis, radice et squamulis piceis: pedes nigro-picei, antici femoribus tibiisque rufo-piceis aut lutescentibus, latere externo fusco-lineatis, posteriores trochanterum apice tibiisque basi et apice concoloribus: abdomen nigro-piceum segmenti secundi medio pallescente, ano rufoferrugineo.—*Mas*, palpi nigro-picei: antennæ 20—22-articulatæ: pedes obscuriores: anus haud ferrugineus: *A Rosæ* ♂ simillimus.

*Habitat* in *Aphidibus Avenæ* passim omnium vulgatissimus.<sup>e</sup>—*(Mus. Soc. Ent.)*

*Aphidum*, Geoffr. II. 305. 26. *Cyrtogaster vulgaris*, Walker, Ent. Mag. I. 382, &c.) select for the nidus of their progeny those Pucerons within which the grub of the *Aphidius*, or of its fellow-devourer, *Cynips erythrocephala*, (Jur.) is silently gorging, and the destroyer becomes the destroyed in turn. Some of these last (*Coruna clavata*, Walk. Ent. Mag. I. p. 386), not content with the covering which protects the *Aphidius* to its final change, when they are full fed leave the cavity, and spin a white silky web between the belly of the Puceron and the leaf, and in this undergo their transformation. Max. Spinola has given occasion to some confusion, by appropriating to a species of *Microgaster*, synonyms and observations which belong to insects of the present genus. The accurate account of their habits, long since given by Frisch, Cestoni (in Vallisneri's works), and De Geer, might be supposed sufficient to have cleared up this mistake which has been pretty generally followed, the Linnæan *Ich. Aphidum* being, however, replaced in its proper station by Fallen and Curtis.—On this account, I have ventured to reiterate the detail from my own observations. The Pucerons, to which these relate, abound on almost every rose of our gardens, except the sweet-briar, which nourishes a distinct species, and its peculiar parasite.

<sup>d</sup> I should have been inclined to consider this as an immature variety of *A. Rosæ*; but that individuals of this last have assumed their characteristic tints before they are disclosed from the puparium.

<sup>e</sup> I have observed the proceedings of this species, which are precisely similar to those of *A. Rosæ*; the Pucerons pierced by it are found adhering to the grains of oats, the flower-heads of *Hypochaeris radicata*, &c.

Sp. 30. A. Ervi. Fem. *Capite thoraceque nigris, antennarum scapo, hypostomate, collo pedibusque luteis, antennis longis 20-articulatis.* (Long. .14—.17; alar. .22—.26.)

Statura gracilior quam præcedentibus, antennis, palpis et pedibus longioribus.—Fem. antennæ 19—21-articulatæ: palpi lutei: alæ hyalinæ seu fumato-hyalinæ, stigmatate luteo, in exsiccatis piceo, nervis fusco-ferrugineis, radice et squamulis piceo-stramineis: ungues antici et tarsi posteriores apice fusci, coxæ posticæ fusco maculatæ: abdomen piceum segmento secundo medio, reliquis margine, posticis sæpe totis lutescentibus: petiolus quam in præcedentibus gracilior et apice nonnihil latior.—Color luteus hujus in ferrugineum transit.—Mas, niger ore luteo, palpis fuscis: antennæ circiter 23-articulatæ nigræ: coxæ posteriores, femora intermedia basi tantum, postica cum tibiis latere externo tarsi que fere toti fusci: abdomen piceum segmenti secundi medio lutescente.

*Variat* femina multimodis, nonnunquam coloribus obscurioribus *mari* descripto similis; hic vero pedibus fere totis palpisque nigris.

*Habitat* in Aphidibus *Ervi* et *Trifolii* passim copiosè.—(Mus. Soc. Ent.)

Sp. 31. A. Urticæ. Fem. *Pallide flavus, capite thoraceque supra et abdominis vittâ dorsali interruptâ fuscis, antennis 18-articulatis.* (Long. .15; alar. .23.)

*Fem.*—Statura valde gracilis: antennæ graciles ferruginæ basi late flavicantes: thoracis dorsum fuscum aut ferrugineum scutello dilutiore: alæ hyalinæ stigmatate nervisque dilute fuscis, radice et squamulis pallide stramineis: abdomen elongatum, postice valde compressum et carinatum, segmentis anterioribus dorso transversim infuscatis: petiolus gracilis fuscescens.

*Habitat* in *Urticâ* rarius.—(Mus. Soc. Ent.)

#### SECTIO IV.—FAMILIARES.

Antennarum et palporum labialium articuli pauciores discrimen inter hanc et præcedentem sectionem ægrè præstant. Reliqui characteres in utramque satis conveniunt.

Sp. 32. A. Asteris. Fem. *Capite thoraceque nigris hypostomate, propectore, pedibus anticis et geniculis, abdominisque basi et apice luteis, antennis 15-articulatis.* (Long. .11; alar. .20.)

*Fem.*—Pictura fere qualis *A. Rosæ*, coloribus autem sordidioribus : palpi apice picescentes : antennæ graciliores quam in sequentibus, totæ nigræ : alæ hyalinæ stigmatè sordide flavo in exsiccatis piceo, nervis fuscis, radice et squamulis piceo-stramineis : pedes sordide flavi, femora latere supero, postica fere tota, tibiæ posteriores basi demtâ tarsique fere toti fusci : coxæ posteriores nigræ : abdomen sordidè flavum segmentis intermediis infuscatis, secundi medio flavescente.—*Mas*, niger ore sordide lutescente ; antennæ 18-articulatæ : pedes picei anticorum femoribus tibiisque subtus, trochanterum apice et geniculis omnibus ferrugineis : abdomen piceum petiolo flavo fuscoque, segmenti secundi medio flavescente.

*Habitat* in Aphidibus *Asteris Tripolii* copiosè.—(*Mus. Soc. Ent.*)

Sp. 33. *A. Ribis*. *Fem. Capite thoraceque fuscis, antennis basi, hypostomate, collo, pedibus, abdominisque basi et apice flavis, pedibus posterioribus indistincte annulatis, antennis 15-articulatis.* (Long. .07—1 ; alar. .14—19.)

*Fem.* Caput et thorax fusca aut nigro-fusca, pectus dilutius : antennæ fuscæ scapo et pedicello flavis : alæ hyalinæ stigmatè flavo, in exsiccatis picescente, nervis dilute fuscis, radice et squamulis piceo-stramineis : pedes flavi femorum apice supra, tibiis medio tarsisque apice subinfuscatis : abdomen flavum segmento secundo basi et apice, sequentibus dorso infuscatis, ano immaculato.

*Prodiit* mihi ex Aphidibus *Ribis rubræ*. †—(*Mus. Soc. Ent.*)

Sp. 34. *A. Cirsii*. *Fem. Capite thoraceque nigris aut nigro-fuscis, antennarum basi, collo, pedibus abdominisque basi flavo-ferrugineis, antennis circiter 15-articulatis.* (Long. .08—.11 ; alar. .16—19.)

*Ichneumon Aphidum*. *L. F. S.* 1643 ?

*Fem.*—Antennæ 15-, 16-, in unico tantum 17-articulatæ, basi obscure flavescentes : unguis fusci, coxæ posticæ quoque fusco-maculatæ : abdomen piceum apice obscurius, petiolo flavo-ferrugineo, segmento secundo basi et medio flavescente.

*Variat* quoque pedibus posterioribus et petiolo fusco-nebulosis.

*Habitat* in *Cirsio arvensi* non infrequens. ‡ (*Mus. Soc. Ent.*)

† The Pucerons, which inhabit the puckered leaves of the currant, when infested by this species, acquire a peculiar pearly gloss, as remarked by Réaumur, Tom. III. Mem. IX. p. 286.

‡ I have not obtained this species out of the Pucerons of the thistle which it



Sp. 35. A. Eglanteriæ. Fem. *Niger abdominis basi flavo-ferruginea, pedibus concoloribus fusco variis, antennis circiter 15-articulatis.* (Long. .07—.1; alar. .14—.18.)

*Fem.*—Os palpique piceæ: antennæ 14-, 15-articulatæ nigræ: collum ferrugineum aut thoraci concolor: femora latere externo, tibiæ medio, tarsi apice, plerunque etiam coxæ posticæ infuscatæ: abdomen piceum petiolo flavo-ferrugineo rarius infuscato, segmenti secundo medio et incisuris anterioribus flavescentibus.—*Mas*, niger pedibus fuscis, anticis subtus et geniculis omnibus lutescentibus: abdomen obscurius quam *femineæ*.

*Prodiit* mihi ex Aphidibus *Rosæ Eglanteriæ*.<sup>h</sup>—(*Mus. Soc. Ent.*)

Sp. 36. A. Salicis. Fem. *Niger, pedibus anticis et geniculis ferrugineis, abdominis liturâ pallescente, antennis 13-articulatis.* (Long. .08—.1; alar. .15—.18.)

*Fem.*—Os sordide lutescens: antennæ capite cum thorace parum longiores, apice subcrassiores: alæ hyalinæ stigmatate lutescente, in exsiccatis piceo, nervis dilutius fuscis: pedes anteriores obscure ferruginei, intermediorum femora basi, tibiæ medio tarsi que fuscæ, postici fuscæ trochanteribus et tibiis basi apiceque ferrugineis: coxæ omnes nigræ: abdomen segmenti secundi medio et incisuris, vel plagâ media effusa pallescente: petiolus fuscus aut piceus.—*Mas*, color pedum et abdominis sordidior: antennæ 15-, 16-, rarius etiam 17-articulatæ: alæ albicantes.

*Habitat* in *Salice* autumno exeunte frequens; e cujus Aphidibus quoque *prodiit* mihi, Junio mense.<sup>i</sup> (*Mus. Soc. Ent.*)

Adsunt individua minora in flosculis *Dauci Carotæ* copiosè lecta vix propriæ speciei.<sup>k</sup>

#### SECTIO V.—EXAREOLATI.

Palpi maxillares 4-, labiales 2-articulati: stigma latum: areola penitus effusa: cubitus abruptus, stigmati vix dimidiâ longi-

frequens; it would be remarkable that a species so closely resembling the preceding and the following, should be attached to such dissimilar Pucerons.

<sup>h</sup> These Pucerons become glossy white, fixing themselves on the under-side of the leaves.

<sup>i</sup> The wounded Pucerons of willows usually retire to the points of the leaves, and become hazel or light-brown. Of the multitudes thus infested, the majority fall victims not to the present insect, but to two minute species of *Cynips* (*C. fulviceps*, Curt. and another): the former of these, with some allied species, destroys also the Pucerons of cow-parsnip and other plants.

<sup>k</sup> There are several still smaller species closely allied to this, as *A. Faniculi*, *A. viminalis*, &c.



tudine: reliqui characteres cum proxime præcedentibus conveniunt; aculeo nonnihil difformi.

Sp. 37. *A. leucopterus*. Fem. *Ater nitidus alis albis, pedibus pallido-annulatis, antennis 15-articulatis*. (Long. .085; alar. .16.)

*Fem.*—Antennæ graciles nigræ: alæ albo-hyalinæ stigmatate flavo: pedes antici lutescentes, posteriores nigro-picei trochanteribus basi que tibi arum et tarsorum pallidis: abdomen nigro-piceum plagâ media dilutiore: aculeus basi supra angulatus, apice acuminatus.—*Mas*, antennæ 16-articulatæ: alæ candidæ: pedes omnes nigro-picei pallido-annulati: abdomen nigrum segmenti secundi medio obsolete pallescente.

*Habitat in Coniferis, autumno rarissimè.*

#### SECTIO VI.—SEROTINI.<sup>1</sup>

A congeneribus sectionis quartæ palporum structurâ præcipue discreti. Palpi breves maxillares 3-articulati articulo penultimo crassiore, labiales 2-articulati.—Species nonnullæ minores tam ex hac quam ex illa sectione antennis brevibus pauci-articulatis et capite crassiore se efferunt.—*A. ambiguus*, No. 42, propter formam petioli et aculei et areolam penitus effusam a reliquis discrepat.

Sp. 38. *A. Matricariæ*. Fem. *Niger pedibus anticis, geniculis abdominisque basi ferrugineis, antennis 14-articulatis*. (Long. .07—.09; alar. .14—.18.)

*Fem.*—Palpi fuscii: antennæ filiformes nigræ vel basi picescentes: alæ hyalinæ stigmatate dilute piceo, nervis fuscis: pedes ferruginei, antici supra fusco lineati, posteriorum coxæ, femora, tibiæ medio tarsique apice fuscii: abdomen nigro-fuscum petiolo ferrugineo, segmento secundo medio pallescente: aculeus brevis obtusus.

*Variat* collo ferrugineo aut nigro, pedum quoque fusciedine plus minusve effusâ.

*Habitat in Pyrethro inodoro et maritimo minus frequens. (Mus. Soc. Ent.)*

<sup>1</sup> To this section belong also *A. pallidinotus*, (Curt.) and several other species nearly allied to *A. Matricariæ* and *A. fumatus* respectively.

Sp. 39. A. Arundinis. Fem. *Niger aut fuscus antennis basi, ore, collo, pedibus et abdomine antice flavo-ferrugineis, antennis 14-articulatis.* (Long. .08; alar. .16.)

*Fem.*—Palpi flavo-ferruginei: antennæ nonnunquam 15-articulatæ: alæ hyalinæ stigmatè dilute piceo s. pallido, nervis plerisque decoloribus et areolâ vix designatâ, radice et squamulis stramineis: aculeus brevis obtusus:—*Adsunt* individua forsitan immatura nigredine in colorem rufo-piceum mutatâ, scutelloque rufescente, vix specie diversa.

*Habitat* in *Arundinetis* autumnò parum frequens. (*Mus. Soc. Ent.*)

Sp. 40. A. fumatus. Mas. *Piceo niger geniculis tarsisque pallidis, abdomine spathulato lurido, alis fuscanis, areola indistincta, antennis crassiusculis 16-articulatis.* (Long. .07; alar. .14.)

*Mas.*—*Monoctono Caricis* ♂ non dissimilis: palpi brevissimi: alæ obscuræ stigmatè angusto, cubito leniter arcuato, areola postice indistincta aut effusa: abdomen spathulato dilatatum, petiolo crasso lineari.

*Habitat* in pratis humidis *Ranunculo acris* obsitis frequens. (*Mus. Soc. Ent.*)

Sp. 41. A. exiguus. Fem. *Niger geniculis abdomineque antice pallidis, antennis brevibus 13-articulatis.* Long. .07; alar. .13.)

*Fem.*—Os ochreum: antennæ capite cum thorace parum longiores, apice subcrassiores: alæ obscure hyalinæ stigmatè piceo-pallido, areola indistincta: pedes picei geniculis pallidis: abdomen basi et medio pallescens, lateribus et postice piceum: petiolus fere linearis apice sensim paulo crassior, flavidus: aculeus obtusus. *Anne conjunx præcedentis?*

Sp. 42. A. ambiguus. Fem. *Niger abdominis basi pedibusque pallidis, posterioribus fusco-cingulatis, abdomine subsessili, aculeo cuspidato, areolâ effusâ antennis 13-articulatis.* (Long. .07; alar. .14.)

*Fem.*—Antennæ filiformes nigræ, palpique longiores quam præcedenti: alæ hyalinæ stigmatè piceo pallido: pedes flavo-pallidi unguiculis et coxis, posteriorum femoribus et tibiis medio, tarsisque summo apice fuscis: abdomen breviter ovato-lanceolatum,

antice pallescens postice piceum, segmento primo brevi cyathiformi lateribus angulato.

*Habitat* cum præcedentibus rarius.—(*Mus. Soc. Ent.*)

### SECTIO VII.—APTERI.

A præcedentibus illo caractere unicè distinguendi.

Sp. 43. A. Ehippium. Fem. *Flavo-ferrugineus capite, metathorace et abdomine posticè fuscis, antennis 14-articulatis.* (Long. .06—.08.)

*Fem.*—Antennæ fusæ basi flavescens: abdomen fuscum basi pallescens: petiolus gracilis linearis flavus aut ferrugineus: aculeus obtusus niger.—*Variat* coxis posterioribus, femoribus tibiisque medio subinfuscatis.

*Habitat* ——— rarius.—(*Mus. Soc. Ent.*)

### SECTIO VIII.—BREVIPALPES.

Palpi multo breviores quam in ceteris *Ichneumonibus*; maxillares 2-articulati subclavati, labiales ex-articulati: mesothoracis scutum læve glabrum: alæ angustæ stigmatè tenui, areolæ nervo postico-exteriore basi oblitterato, dehinc ad apicem areolæ perbreve spatio relecto; quæ nota satis singularis oculatissimum Neesium ab Essenbeck nequaquam effugerat.

Sp. 44. A. dissolutus. Fem. *Niger nitidus abdominis basi, pedibusque pallidis, posterioribus fusco variis, alis denigratis, antennis crassis 16-articulatis.* (Long. .07—.09; alar. .15—.18.)

*Bracon dissolutus* . *Ess. B. M. V. 29.* Sp. 46.

*Fem.*—Antennæ nigrae articulo tertio pallescente: alæ basi dilutiores: pedes antici fere toti, posteriorum coxæ, trochanteres, genua tarsique pallidè flavi: abdomen breviter ovato-lanceolatum, piceum antice pallescens, segmento primo brevi cyathiformi (seu basi constricto dehinc dilatato fere rectangulo): aculeus subexertus niger obtusus.—*Mas.* antennæ longiores totæ nigrae, articulis magis discretis (in unico illo quem vidi 16-articulatæ tantum): alæ dilutiores quam *feminae*: femora et tibiæ anticæ latere externo infuscatae: pedes posteriores fusci, genibus tarsis-

que lutescentibus: abdomen piceum basi sordidius lutescens, petiolo minus dilatato.

*Habitat* in pratis *Ranunculo acris* obsitis rarissimè.—(*Mus. Soc. Ent.*)

Restant adhuc quatuor species olim descriptæ,

A. Aparines . . . . *Ichn. Aphidiphagus*. *Schr. F. B.* II. 2147.

A. Dipsaci . . . . . *Schr. F. B.* II. 2149.

A. infirmus . . . . . *Ess. B. M.* V. 28. Sp. 43.

A. melanocephalus . *Ess. B. M.* V. 29. Sp. 45.

mihi incognitæ, de quarum loco propterea nil temere proferre placet.

*Note.*—As the variations of the palpi in this genus are not always indicated by any evident distinction in other external characters, I have sought, where an opportunity offered, to obtain a view of them in recent specimens; but in many cases have been obliged to content myself with relaxing the parts. As, however, such minute characters may be easily mistaken on a superficial view, I wish to enumerate the species whose trophi were submitted to actual dissection:—Nos. 3, 5, 7, 8, 9, 10, 11, 17, 21, 22, 24, 27, 29, 30, 32, 34, 36, 37, 39, 40, 43, and 44.

A. H. HALIDAY.

3, *New Cumberland-street, Dublin.*

Nov. 22, 1833.

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#### ART. VIII.—*Notice of Entomological Works.*

1. *British Entomology; by John Curtis, F. L. S. &c.*—Nos. 117—120.—Pl. 466. *Elophorus fennicus* (Coleoptera Helophoridae); 467. *Aspilates gilvaria*, (Lepidoptera Phalaenidae); 468. *Psithyrus rupestris*, (Hymenoptera Apidae). *Psithyrus* of Dahlbom and Curtis falls, because *Psithyrus* is a name applied by Hübner to a genus of *Sphingidae*. This genus of bees is of very singular economy; like the cuckoo, it lays its eggs in a nest not its own: a circumstance unusual among bees. The characters as laid down by Mr. Curtis do not, we think, sufficiently distinguish it from *Bombus*. Pl. 469. *Barborus hamatus*, (Diptera Muscidae); 470. *Hister 4-maculatus*, (Coleoptera Histeridae). This is the *Hister sinuatus* of

authors. *Hister 4-maculatus* is very distinct. Pl. 471. *Adactylus Bennetii*, (Lepidoptera Tineidæ). This belongs to the genus *Agdistes* of Hübner; and his *Agdistes adactylus* is *Adactylus Hübneri* of Curtis. Pl. 472. *Smiera Macleanii*, (Hymenoptera Chalcididæ). This is the *Chalcis melanaris* of Dalman. Pl. 473. *Drosophila cameraria*, (Diptera Muscidæ); 474. *Hallomenus flexuosus*, (Coleoptera Helopiidæ); 475. *Ophiusa lusoria*, (Lepidoptera Noctuidæ); 476. *Leiopliron apicalis*, (Hymenoptera Ichneumonidæ); 477. *Tachydromia arrogans*, (Diptera Tachydromiidæ); 478. *Synodendron cylindricum*, (Coleoptera Lucanidæ); 479. *Gracillaria anastomosis*, (Lepidoptera Tineidæ); 480. *Oxybelus argentatus*, (Hymenoptera Larridæ); 481. *Lygæus equestris*, (Hemiptera Coreidæ).

We may remark, that some of his figures are much too highly coloured.

2. *Stephens's British Entomology*. No. 59. — This Number is devoted to the *Staphylinidæ*, and has two Plates, one of Coleoptera, the other of Diptera.

3. *Magazine of Natural History*. No. 35.—“ A Notice of the Ravages of the Cane-fly, a small-winged Insect, including some Facts on its Habits; by a Subscriber in Grenada: with additional Observations by J. O. Westwood, Esq. F.L.S.” &c. Mr. Westwood gives it the name of *Delphax Saccharivora*, and compiles from Kirby, Spence, &c., an account of some of the Insects supposed to be injurious to the sugar-cane.—“ An interesting Account of the Economy of a Species of *Ichneumon*, by Mr. E. W. Lewis; communicated by Mr. Westwood:” also, “ Descriptions of Genera of Parasitic Hymenoptera, by Mr. Westwood:”—*Epicopterus*, *Smaragdites*, *Closterocerus*, *Cephalonomia*, and *Epimeces*.

No. 36. Mr. Westwood on the *Cynipidæ*, with descriptions of some Hymenopterous genera: three new—*Cerapterocerus*, *Derostenus*, and *Myrmecomorphus*. We are acquainted with no essay, by Mr. Haliday, in which he uses the terms *propes*, or *metapes*, or *metala*. In our Magazine, and in the Zoological Journal, he always writes *pes-anticus*, or *posticus*, and *ala postica*, or *inferior*:—like Meigen, he uses *metatarsus anticus* or *posticus* for the basal joint of the anterior or posterior tarsi.

Mr. Westwood proposes to term the anterior wings *mesalæ*!—and to substitute *medi-* and *post-thorax* for *meso-* and *metathorax*!

4. *Recherches Anatomiques et Physiologiques sur les Hémiptères, accompagnées de Considérations relatives à l'Histoire Naturelle et à la Classification de ces Insectes; par M. Léon Dufour. Paris, 1833.*—An elaborate essay on the internal anatomy of the Hemiptera, accompanied by a great many figures: we have no room for details.

5. *Annulosa Javanica, ou Description des Insectes de Java, par M. W. S. MacLeay, Esq.; précédés d'un Extrait des Horæ Entomologicæ du même Auteur. Paris, 1833.*—MacLeay's *Annulosa Javanica*, and the systematic part of his *Horæ Entomologicæ*, together with several of the plates in both works, are republished in this volume.

6. *Genera et Species Curculionidum, cum Synonymia hujus familiæ; a C. J. Schoenherr. Species novæ aut hactenus minus cognitæ, Descriptionibus a Dom. Leonardo Gyllenhal, C. H. Boheman, et Entomologis aliis illustratæ. Tomus 1<sup>us</sup>. Pars 1<sup>ma</sup>. et 2<sup>da</sup>. Parisiis, 1833.*—Most entomologists must be acquainted with Schoenherr's Classification of the Curculionidæ, published some years back. We observe very few alterations in the systematic arrangement of this new edition; however, the number of species is considerably increased, and many subgenera are raised to the rank of genera. About three hundred genera, besides subgenera, which he terms *Greges*, are classified; and the species ranged under these genera amount to upwards of three thousand. They are divided into two great groups; the *Orthoceri*, with straight antennæ; and the *Gonatoceri*, with bent antennæ. The characters of some of the species extend nearly over a page, and are too long.

7. *Annales de la Société Entomologique de France. Tome II., Trimestre III., Paris, 1833.*—This number contains several valuable papers: among others,—1. “On the Mouth of *Libellulidæ*, by M. Aug. Brullé.” The author remarks, that, in predacious insects, the palpi attain their greatest development; and he considers them to be organs of prehension.



The *Libellulidæ* have their labial palpi very much developed; the maxillary are almost obsolete. 2. "Physiological Considerations on the Development of Instinct in *Invertebrata*, by M. Fray."—Insects are placed by this writer in a much higher rank among beings than they are generally considered to occupy; and he allows them to possess the faculty of thinking. 3. "On the Habits of the *Papilionidæ* of French Guiana, by M. Th. Lacordaire."—In this interesting paper are described the various flights of those charming creatures: the *Morphos* soaring majestically above the summits of the loftiest trees; other *Morphos*, flying by irregular and rapid bounds of eight or ten paces each; the immense *Pavoniæ*, half-nocturnal, flapping their wings heavily during their short flight, &c. &c. 4. "Mémoire sur une Nouvelle Classification des Aranéïdes, par M. le Baron de Walckenaer."—His works on this tribe are well known; and to him alone are we indebted for almost all we know of their systematic arrangement. His systematic table is excellent: the genera are placed in the middle; on the one side, he divides them according to their external structure; on the other, according to their natural habits.

8. *Révue Entomologique, publiée par Gustave Silbermann. Strasbourg. Tome I., Livraisons 1—5.*

9. *Magasin de Zoologie; par F. E. Guérin.*—The principal essays published in this work since we last noticed it, are:—1. "On the Exterior Organization of *Phyllosoma*, with a Monograph of that Genus, by F. E. Guérin."—This is an elegant genus of *Crustacea*, found in all the tropical seas; the species are transparent like glass; and when swimming can only be distinguished by their beautiful blue eyes. 2. "A Monograph on the Genus *Raphidia*, with Figures of the Larva and Pupa, by M. Percheron."—In their metamorphose they resemble the Coleoptera; and the pupa is quiescent, not active, as it has been generally supposed to be.

10. *Iconographie du Règne Animal de M. le B<sup>on</sup>. Cuvier; par M. F. E. Guérin. Livraisons 31—33.*—These contain seven entomological plates; five of Coleoptera, and two of Hymenoptera.



11. *Iconographie, &c. des Coléoptères d'Europe; par M. le Comte Dejean, et M. le Docteur J. A. Boisduval. Tome III., Livraisons 6 et 7.*—Containing the genera *Stomis*, *Abaris*, *Rathymus*, *Pelor*, *Zabrus*, and part of *Amara*.

12. *Die Arachniden. Getreu nach der Natur abgebildet und beschrieben von D. Carl. Wilh. Hahn.; Erster Band. Fünftes Heft. 1833.*

13. *Icones Historique des Lépidoptères d'Europe, nouveaux ou peu connus; par le Docteur Boisduval. Livraisons 1—18. Paris.*—Each number (of which there will be about twenty-five when the work is finished) contains two plates, and the figures are true to nature, and very highly finished.

14. *Collection Iconographique et Historique des Chenilles d'Europe, avec l'Histoire de leurs Metamorphoses, et des Applications à l'Agriculture; par le Docteur Boisduval, P. Rambur, D. M., et A. Graslin. Livraisons 1—18. Paris.*—All the caterpillars (figured with the plants on which they are found) are designed with much spirit and elegance.—Works like this should be encouraged, as they show how the study of entomology may be rendered useful to agriculture and the manufactures.

15. *Iconographie et Histoire des Lépidoptères et des Chenilles de l'Amérique Septentrionale; par Boisduval et Leconte, &c. Livraisons 1—10. Paris.*

16. *Brasilien's vorzüglich lästige Insecten, von Dr. I. Pohl und V. Kollar, &c. Wien, 1832.*—In this work are described and figured, many of the noxious and venomous insects of Brazil, such as scorpions, termites, ants, mosquitos, &c.

17. *List of Hübner's Works:—*

(1.) *Histoire des Papillons d'Europe (les Chenilles); recueillis par J. Hübner, à Augsbourg, 1806.*

(2.) *Collection de Papillons d'Europe, &c. 1805.*

(3.) *Collection de Papillons Exotiques, 1806.*

(4.) *Supplément à la Collection de Papillons Exotiques, &c. 1818.*

(5.) *Catalogue des Papillons connus.*

(6.) *Catalogue Alphabétique et Systématique des Papillons formant la Collection d'Europe.*

The four first are still publishing. They may be had on application to Charles Geyer, the continuer and editor of Hübner's works.

18. *Osservazioni sopra la Sphinx Atropos o farfalla a testa di morto del Dottore Carlo Passerini. Pisa, 1828.*

19. *Osservazioni e Notizie relative alle Larve pregiudice voli alla punta del gran Turco del Dottore Carlo Passerini.*

20. *Osservazioni sub baco danneggiatore delle ulive e sulla mosca in cui si transforma del Dottore Carlo Passerini.*

21. *Osservazioni sopra alcune Larve e tignole dell' ulivo del Dottore Carlo Passerini.*

22. *Nova Acta Physico-Medica, &c. 1832, cont.*

*Monographia generis Meloës, auctoribus Bradt et Erichson.*

*Über Entwicklung der fusslosen Hymenopteren Larven, mit besonderer Rücksicht auf die Gattung Formica. F. D. C. Ratzeburg.*

23. *Neuere Beiträge zur Schmetterlingskunde mit Abbildungen nack der Natur. Herausgegeben von C. F. Freyer. Mit 6 illuminirten Kupfertafeln. 1—16 Hefte. Augsburg. 1831—1833.*

The observations at page 450, line 25 of Vol I. in our review of Vol. XVI. Part III. of the Linnæan Transactions, are erroneous on our part: we could explain how it occurred, but prefer merely apologizing to our readers for having misrepresented a fact, and assuring them, that it was quite unintentional. We are liable as others to make mistakes, but we are ever ready to acknowledge them when pointed out. A commendatory observation on this article has reached us, by which we feel highly flattered.

Twenty-seven written communications have reached us, directly or indirectly, on the subject of our review of British Entomology,—twenty-five are commendatory; two condemnatory: one of these, complaining of the severity of the review, but admitting the strength of our ground; the other from Mr. Dale, disapproving of the manner and matter.

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ART. IX.—*Varieties.*

1. *Note on Dryophilus Anobioides.*—In the first part of M. Guérin's *Magasin de Zoologie*, a small Ptinideous beetle is figured and described by M. Chevrolat, under the name of *Dryophilus anobioides*, nearly allied to *Anobium*; but which, as to its generic characters, differs from that genus in the great elongation and slenderness of the three terminal joints of the antennæ. In this figure I recognized an insect which I had captured ten years ago in the neighbourhood of London, and had presented to Mr. Haworth, in whose collection it remained unnoticed, and which that gentleman and myself had deemed to be a new genus, distinct from *Anobium*.

In the spring of the present year, the Rev. G. T. Rudd was fortunate enough to capture this species again upon the Broom at Coombe Wood; and having been so kind as to give me a specimen, I carefully examined it with the original specimen, with which it was found exactly to correspond, except in the terminal joints of the antennæ; whence it was evident that the two individuals were of opposite sexes, and that M. Chevrolat's figure and description were taken from a male, the female being unknown to him. It was evident, also, from these specimens perfectly agreeing in form, sculpture, and with M. Chevrolat's, that his figure of the antennæ (for want of comparison of the length of these organs in the sexes) represented them rather too long in the terminal joints.

In the English specimens, the ninth joint of the antennæ in the males is at least as long as all the eight preceding; the tenth, a little shorter; and the terminal joint, still rather shorter. These three joints, instead of being dilated at the tips on the inside, are of equal breadth throughout, the base only of each being slightly narrowed. In the female, on the

contrary, the ninth joint is not longer than the five preceding joints together; the tenth is shorter, but the eleventh is as long as the ninth.

The *Anobium pusillum* of Gyllenhal seems to be very nearly allied to the preceding species, appearing to differ in its small size, ("Cryptophago cellari fere minus, angustius,") black colour; (the legs and antennæ being however obscurely ferrugineous, as in the English specimens;) and habitat "in frondibus Abietis."

From what has been observed respecting the variation in the length of the terminal joints of the antennæ in the sexes, taken in connexion with the peculiarities observable in the antennæ of other species, it is evident, either that the genus *Dryophilus* (established chiefly upon the great length of these terminal joints) must sink into *Anobium*, or that some other species of the latter genus must be introduced into it, or must be formed into sectional divisions of at least equal value with it.

In the *typical species* of *Anobium*, the last three joints of the antennæ are comparatively short, compressed, and gradually widened towards the tip, scarcely any difference being observable in the sexes. In *Anob. castaneum* they are less incrassated; in *Anob. abietinum*, the antennæ of the males are "*longitudine corporis*" with *the intermediate joints gradually elongated, so that the ninth joint is scarcely longer than the eighth*; the two terminal joints are however longer, but scarcely thickened. In the female these organs are shorter, and the three last joints broader, than in the males; the intermediate ones being also longer than in the other species; whilst, in *Anob. molle*, the males have antennæ about half the length of the body, very slender, the intermedial joints longer than in the true *Anobia*; the three last joints not thicker than the preceding, and occupying about half the entire length of the whole antennæ. In the females, the last three joints are shorter and more thickened.

*P.S. to the Notice of Dryophilus.*—Since the above observations were written, Dejean has published the second part of his *Catal. des Coléopt.*, second edition; in which he gives *Dryoph. anobioides* as an *anobium*, considering it at the same time as synonymous with the *Anobium pusillum*, noticed above.

J. O. WESTWOOD.

2. *Note on Clytus Arietis*.—SIR, On the 22d of this present month, (May 1833), I observed three specimens of *Clytus Arietis* crawling about in one of the cases of birds in our museum, which appeared to have just emerged from the pupa. I examined the case narrowly, and the oak-branches upon which the birds are placed, but could not perceive any aperture from which they had made their escape, although it is evident they have passed through their metamorphosis in some of the stumps. The cases have been put up nearly five years, and the last branches I put in were procured in May 1830; and, to prevent the appearance of any insects, I had them all well dried over a stove, and in a drying-house attached to a stuff-presser's shop.

Whether *Clytus* is always three years in arriving at maturity, I am not aware; if such is the case, then my discovery is of *little moment*, except the proof of their surviving the high temperature to which they were exposed.

I am, dear Sir, Yours truly,

A. H. DAVIS, Esq.

HENRY DENNY.

3. *Note on Cynthia Cardui*. — Every entomologist is aware of the irregular appearance of the above-named insect; some seasons scarcely a specimen is to be met with, and at others they abound over the greater part of the country; but on Tuesday, October 8th, their numbers in the neighbourhood of Tooting by far surpassed any thing of the kind I ever witnessed, particularly in the nursery of Messrs. Rollison and Sons: it was highly delightful to behold those lovely insects, sporting from flower to flower, in every part of the garden,—but the *Dahlia* seemed to be their favourite plant. I cannot but suspect those insects to have migrated from some other part of the country; for, previous to that day, I had not seen a single specimen in the neighbourhood, and but a very few since:—again, it was evident, they must have been “winging their way” for some time, as most of them were in a faded condition.

Oct. 18, 1333.

C. WOOD.

4. *Editorial Criticisms*.—SIR, It is with feelings of regret and mortification, that I perceive, from a late prospectus, that your admirable Magazine has not met with that success it so

highly deserves. If what has been asserted by Professor Babbage, and repeated by myself, on the state of science in this country, required any additional proof, a more convincing one than this fact could not be adduced. I need hardly advert to those numerous papers in the volume before us, which demand the attention of all who wish to extend the present boundaries of our charming science; while the tone of high and manly feeling, alike free from intemperate abuse or caustic censure,—yet independent and uncompromising,—*must be congenial to every honest and honourable mind*. Could we bring men but to govern themselves by such feelings as pervade the editorial notes to which I more particularly allude, the regions of science would be the fabled Utopia. But, alas, naturalists are but men!—and he who affects surprise, that perfect unity of sentiment and congeniality of feeling does not pervade among its votaries, has yet to learn that unworthy passions can never coalesce with those that are good. Judgment, temperance, and moderation, joined with inflexible firmness and impartiality, in the defence or assertion of truth, are more particularly expected from editors; and these essential qualifications, in my judgment, are eminently conspicuous in the *Entomological Journal*. I beg you will, in future, consider me as an annual subscriber for five copies; and I feel confident that many others will use their utmost endeavours to render the continuation of the journal a matter of *certainty*. I should be happy, indeed, if any contributions from my pen, during the short intervals of leisure I possess, might be thought acceptable:—but my views on the natural arrangement of the *Annulosa*, (and consequently of *all* the subordinate divisions,) are so totally different from all the modern-received notions on this subject, that I cannot suppose they would, *at present*, be listened to with patience, much less with approbation; and I should have neither time nor inclination to defend them.

I am yours, &c.

WILLIAM SWAINSON.

[We feel highly gratified by Mr. Swainson's good opinion. Alas, that plain, honest, impartial criticism, should be of so rare occurrence as to call forth such lavish praise!—ED.]

5. *On Cheiropachus pulchellus*.—SIR, Being professionally engaged in the neighbourhood of Newmarket during the



month of June 1832, I now and then indulged in a little of my favourite pursuit—Entomology. On one occasion, I found a fir-pole much perforated by some *Xylophagous* insect: on the surface of this pole were several specimens of *Cheiopachus pulchellus* (Walker's MS.), busily employed in examining, and occasionally inserting their abdomens into these perforations. The *Cheiopachus* I first secured, and then immediately commenced stripping this pole of its bark; under which I found *Hylurgus piniperda* in all stages of existence, from the larvæ, some of which were very small, to the perfect insect.

I therefore have reason to believe, from these circumstances, and observations I made some time back on another species (*Quadrum*) of this genus, that they are parasites on the genus *Hylurgus*.

It is singular that, on examination, I found all my specimens of the *Cheiopachus* males, except one; though, from the way in which they were employed, I should have suspected they would have proved to be the opposite sex.

A. COOPER.

Nov. 27, 1833.

6. *Capture of Sphinx Nerii*. — SIR, Having read in your valuable Magazine for last October a communication from Mr. Stephens of the capture of the *Sphinx Nerii* at Dover, last autumn, I have much pleasure in being able to inform you, that it most decidedly is a British insect. A fine larva of that moth was taken in a lady's garden at Teignmouth, Devon, in August 1832, and communicated to me by Mrs. Tayleur, an entomological friend of mine there, accompanied by a highly-finished coloured drawing of the same, taken from life. But unfortunately it died in a few days after its capture, from the injuries it received from the person who brought it to my friend under the erroneous impression of its being venomous. The perriwinkle is abundant in the garden where the larva was found: it is therefore a natural supposition, (as expressed by a writer in the Natural History Magazine for March 1832), "that it may resort to the *Vinca major* and *minor*, or some species of that tribe, as a substitute for the *Oleander*, which requires protection from the severity of the winter in many



parts of the continent, where the *S. verii* is found, and therefore cannot be the *constant* food of that insect.

I remain, &c.

Yours, truly, CHARLES BLOMER.

24, *Burton Crescent*, October, 1833.

[We are much obliged for the beautiful drawing which accompanied this communication: we hope to obtain the loan of the perfect insect; if so, we purpose giving a plate of them together.—ED.]

7. *List of a few Insects observed in Devonshire and Cornwall during the Month of September, 1833.*—*Drypta emarginata*; under a stone on the lias, near Lyme Regis, Dorsetshire.—*Cicindela Germanica*; in the same situation.—*Cafius fuciola*; near Plymouth, under sea-weed, with *Cafius lateralis*, in the proportion of one to about fifty.—*Methoca ichneumonoides*; on chalk-marl, and green sand, near Lyme Regis.—*Pentatoma pusillum*, Schäffer; Cornwall.—*Chironomus æstivus*; in a wood near Linton, Devonshire.—*Orphenephila devia*; on damp herbage, growing at the base of the cliffs by the sea-shore at Teignmouth and Sidmouth.—*Drapetis aterrima*; on *fuci* near Penzance, Cornwall.—*Miltogramma punctata*; near the Lizard Point, Cornwall.—*Testanocera marginata*; near Penzance, Cornwall.—*Agonum micans*; near Exeter.—*Tachydromia arenaria* was very abundant near Plymouth and Torquay, running with great rapidity over the rocks, a little above high-water-mark; its wings are very short; and its flight resembles a succession of leaps, each not exceeding two or three inches;—some (perhaps a distinct species) have ample wings; it forms a new genus, nearly allied to *Drapetis*, as Mr. Haliday remarked.—*Platymischus dilatatus* swarms on the rocks, and among the sea-weed, near Plymouth; I found it also near Torquay, but there it was much less common. It moves slowly, like the *Psili*, and varies very much in size. At Torquay it was accompanied by a *Psilus*<sup>a</sup> and a *Figites*.<sup>b</sup> The former was rather scarce; the

<sup>a</sup> *Psilus fucicola*. Mas et Fem. *Ater, nitidus*: antennæ articulo 1<sup>o</sup>. basi rufo; maris moniliformes, nod pilosæ; fem. clavata: pedes picei, tibiis tarsisque basi rufis: alæ angustæ, subfuscæ, apice ciliatæ. (Corp. long.  $\frac{3}{4}$ —1 lin.; alar.  $\frac{3}{4}$ —1 $\frac{1}{2}$  lin.)

<sup>b</sup> *Figites subapterus*. Mas et Fem. *Ater, nitidus*: maris antennæ filiformes, corpore longiores; fem. multò breviores, subclavata: pedes castanei; femora fuscæ; protibiæ apice spina armata: alæ perbreves. (Corp. long.  $\frac{2}{3}$ —1 lin.)

latter, which was more abundant than the *Platymischus*, runs very fast; and, when touched, contracts its antennæ and legs, and lets itself fall from the rocks. At Plymouth it was much rarer; I saw only one or two specimens.

F. WALKER.

8. *Chrysomela graminis*.—SIR, This insect appears to be double-brooded: I find it in a wet place near this city (Bath), upon the *Mentha hirsuta*, to which plant it appears very strictly to confine itself, in the middle of June and the beginning of September. It is in great plenty at both the above times; but I do not remember finding a single individual during the intervening months. My friend, the Rev. F. Lockey, observes, that in the autumn it feeds upon the flowers of the *Mentha* in preference to the leaves.

C. C. BABINGTON.

9. *Cardiapus Mathewsii*.—I found this insect in great plenty (taking more than forty specimens,) on the *Cistus Helianthemum*, at the top of the Gogmagog Hills, near Cambridge, on the 4th of last July, and also on the same plant, but in smaller quantity, at the Devil's Ditch, Newmarket Heath, on the 2d of that month; at both these places many other specimens were also taken.

Yours, &c.

C. C. BABINGTON.

Bath, Nov. 5, 1833.

10. *Ignis Fatuus*.—The *supposition*, that the *Ignis fatuus* is caused by the light emitted by some *insect* has, I believe, among scientific men, long yielded to the *known fact*, that it is merely the combustion of gaseous matter. In a very interesting paper upon this subject in a former number of your Magazine, the facts and experiments related prove this latter theory beyond doubt; but the writer leaves us in the dark as to the nature of the gas to which the phenomenon is attributable.

This gas, however, I believe, is generally supposed to be phosphuretted hydrogen, a combination of phosphorus and hydrogen gas, which spontaneously ignites upon coming in contact with atmospheric air. Should any of your readers feel inclined to illustrate this by actual experiment, or to view

the phenomenon of the Will o' the Wisp by their own fire-sides, it may be easily done by the following method:—Into a tumbler or any other vessel filled with water, drop a few small pieces of phosphuret of lime; the water will be in part decomposed; and the phosphorus combining with the hydrogen, will form phosphuretted hydrogen gas; bubbles of which will be seen rising to the surface, where they will immediately inflame upon coming in contact with the air, and exhibit a pale and somewhat ghastly flame; should an inverted jar of oxygen be held over the water, the bubbles will in like manner inflame, but with a light which is most dazzlingly brilliant. The intensity of the light of the flame, therefore, it would appear, depends upon the quantity of oxygen contained in the atmosphere to which it is exposed; and it would of course follow that in bogs, and other damp places, where the air is impure and its comparative quantity of oxygen but small, the flame would be so faint as to be scarcely visible in day-light, though perfectly apparent at night.

Phosphorus forming one of the component parts of all animal and vegetable matter, it is obvious, that in the course of the decomposition of such matter it must be set at liberty in considerable quantities, when, combining with the hydrogen of the water of the surrounding soil, it forms the gas, which, making its way to the surface of the earth or water, as the case may be, ignites immediately it comes in contact with the atmospheric air, and thus forms in church-yards, morasses, and other damp places, the phenomenon which has caused the heart of many a stout yeoman to beat with superstitious awe.

R. A. OGILVIE.

11. *Aleyrodes Phillyreæ*.—About the end of May I found the different species of *Phillyrea*, particularly the *media* and *latifolia*, in gardens near Dublin, swarming with this pretty species. They covered the under sides of the new leaves, from four to a dozen sitting under each; and the leaves of the former year were equally loaded with their puparia, from which they seemed to have just emerged. The lower surface of the young leaves was whitened with their powder and strewed with eggs, scattered irregularly, and not in patches: these are transparent when laid, soon become wax-coloured, and in a few days opaque, glossy, pearl-grey. They are much longer in the

hatching than those of *A. Chelidonii*, as recorded by Réaumur, for not a tenth of them had produced the scale-like larvæ when I examined the trees nearly a month later. Having left that part of the country soon after, I did not ascertain whether there is more than one brood in the year. The perfect insect measures about  $1\frac{1}{2}$  line across the wings expanded; the body is pale yellow, but the head, thorax, antennæ and legs covered with white powder; the tip of the sucker dusky, the eyes black; the hinder segments of the abdomen above, and the borer of the female, are greyish. The wings pearly-white, and covered with white powder: in old specimens only there is a duller reflection in the usual places near the base and end of the principal nervure; but even there it is very obscure, and disappears if the light is dispersed by a lens of moderate power. <sup>a</sup>

A. H. HALIDAY.

12. *Insects attracted by the offensive Smell of a Flower.*—In July 1832, I had four very luxuriant blossoms on a plant of *Arum Dracunculus*, the Dragon Arum, the smell of which is, perhaps, the most offensive of any plant with which we are acquainted; in the present instance, it was so much so as to attract numbers of those insects whose food consists of putrid substances; these must certainly have been deceived by the scent, which they mistook for that of their natural food, for in no instance did they eat any part of the flower, but, falling down the smooth sides of the corolla, slipt into the cup, and there perished. On examining the cups after the flowers had faded, they contained the following insects:—*Staphylinus maxillosus*, *Philonthus*, six species; *Hister*, three species; *Nitidula bipunctata*, *grisea*, and two others; *Scatophaga*, three species; *Musca vomitoria*, *Cæsar*, *thalassina*, *Lanio*, *maculata*, and three others; *Anthomyia lardaria*; and *Helophorus griseus*.

EDWARD NEWMAN.

<sup>a</sup> I examined *Chelidonium majus* in several gardens of the neighbourhood, but did not meet with *Al. Chelidonii*. The other, flying round the Phillyrea trees, lights on the passers by and on the neighbouring shrubs, but I did not find either egg or puparium on trees of any other genus.

THE  
ENTOMOLOGICAL MAGAZINE.

APRIL, 1834.

ART. X. — *Abstract of M. Straus-Dürckheim's "Considerations Générales sur l'Anatomie Comparée des Animaux Articulés."* By EDWARD DOUBLEDAY, ESQ. M. E. S.

(Continued from Vol. I. page 479.)

"Non eram nescius ut hic noster labor in varias reprehensiones incurreret, . . . . si delectamur cum scribimus, quis est tam invidus qui ab eâ nos abducat?; sin autem laboramus, quis est qui alienæ modum statuat industriæ?"—  
CICERO.

PART II.—MUSCULAR SYSTEM.

*Muscles in General.*

IN the *Annulosa* and *Annelida*, the muscles are composed, like those of vertebrated animals, of two parts; the one, the muscle properly so called, which is contractile; the other, the tendon, not contractile. But, as we cannot separate these parts without destroying the muscle, it becomes necessary to describe them together: some general remarks may nevertheless first be made upon each separately.

*Tendons.*

The tendons of *articulated* animals possess a greater degree of solidity than those of *Vertebrata*. This is owing to the presence of a larger proportion of calcareous matter: they differ but little from the internal *apophyses* of the integuments, except in the direction of their fibres, which is always either longitudinal or radiating, according to the form of the tendon; they are also of a closer texture.

In general, they augment in thickness a little before their insertion; but as, notwithstanding their solidity, they require to be moveable upon the piece they put in motion, the larger ones offer, near their extremity, a small flexible narrowed portion, resembling an articulation. They are generally simple at their extremity, but sometimes bifurcate, as the *flexor tibiæ* in the genus *Limulus*.

### *Muscles.*

The muscles of insects, and in general of all the *Annulosa* and *Annelida*, differ from those of *Vertebrata*, in being of a less firm consistence. Indeed, they are sometimes in a gelatinous and almost transparent state; and it is only by being steeped in alcohol, or some other liquid,<sup>a</sup> that they acquire a sufficient degree of opacity and firmness to enable us to distinguish their form; yet their power surpasses that of the muscles of larger animals.

They are composed of a multitude of fibres, in which the power of contraction resides, and which are mostly straight, and separate one from another, but are sometimes united in bundles which rarely are connected.

The fibres are composed of small, nearly triangular plates, placed obliquely one upon another. These plates are nearly flat; but one of the sides is produced so as to form an angular fold in the middle of the plate, which gradually diminishes until it ceases, just before reaching the opposite margin.

In the *Vertebrata* the muscles often have a tendinous origin, or offer a tendinous portion in the middle (as the *digastricus*, &c. in man). This is very rarely the case in the articulated animals.

The solid cupules, to which the extremities of some muscles are attached, appear to be the analogues of the *aponeuroses*<sup>b</sup> of *Vertebrata*; they are generally found at the origin of the long tendons, but sometimes both ends of a muscle are furnished with them.

<sup>a</sup> I have always found alcohol, mixed with a small portion of acetic acid, the best mixture for giving firmness to the internal parts of insects. They should, however, be well washed with pure alcohol afterwards, or the acid will ruin the knives or scissors used in dissecting.—E. D.

<sup>b</sup> *Aponeuroses* are the expanded parts of the tendons which cover the muscles, give insertion to their fibres, strengthen their action, and restrain them in their proper places.—E. D.



Those muscles which pass directly from one part to another without the intervention of tendons, are mostly pyramidal or cylindrical, according to the form of the parts to which they are attached. Those which have tendons are either *conical*, *pyramidal*, *pseudo-penniform*; that is, flat, triangular, with the fibres arising from the same line, and attached to one or both sides of a flat tendon,—*penniform*, where the fibres, not arising from the same line, give the muscle a wedge-shaped and notched appearance,—or *compound*, that is, formed of several heads, which are each furnished with a tendon, these tendons before their insertion uniting into one.

One remarkable circumstance in the organization of insects is, that many muscles have their origin from, and are inserted into, two perfectly moveable parts of a quite different nature. These are not merely muscles, which move parts forming a series, as the *vertebræ* of the higher animals, or the segments of the *abdomen* in insects; *these* are muscles which move certain parts with relation to *one another*; but those to which we refer move the parts in relation to the *trunk*, the fixed part of the body, yet arise from parts equally moveable, and of a quite different function. In the *Coleoptera*, and also in not a few other insects, many very powerful muscles are thus situated. Such is the *extensor posticus alæ*, which is at the same time the *extensor coxæ metapedis*.

Observation proves that, in the *Articulata*, the presence, volume, and even the form of the muscles, depend solely on the function of the part they move. Hence it arises, that when, in any species, a part loses its power of motion, without undergoing any other change, the muscles usually inserted thereto disappear to yield place to more important organs; and when a part changes its form or function, we find the muscles inserted into it equally vary in volume, and even in their disposition to accommodate themselves to the new function: a simple modification in the articulation of the moveable part sometimes varying its motions very considerably, the muscles inserted into it are modified in consequence of this change. Lastly; it may happen, that the piece to be put in motion varies its functions; the muscles also change theirs.

Moreover, observation proves, that the parts from which the muscles *arise*, may vary much in form and size without the muscles being at all influenced thereby; and that analogous



muscles do not always arise in different species from the same part.

From these facts it may be inferred, that although the tegumentary and muscular systems are mutually dependent one upon the other, there may exist a considerable difference between the modifications which these systems undergo as compared with one another. This difference is often very considerable; for it is hardly possible to recognize the analogous muscles in two species taken even from neighbouring families, unless we trace them through the greater proportion of the intermediate genera; and as no species can be looked upon as a type for the whole division, it is impossible to refer the muscles of one species to their analogues in another, taken from a different division.

Notwithstanding these variations, it is possible, by avoiding details, to lay down a few general rules.

In the *Annelida*, *Myriapoda*, and the *larvæ* of insects, we mostly find two principal orders of muscles, forming, the one, a double series along the upper, the other, a like series along the lower, part of the segments, passing from one of these to another. We find these same series more or less modified in the perfect insect: the lower series have become the muscles which move the *labium*, the depressors of the head, the retractors of the jugular pieces, the inferior retractors of the *prothorax*, the prætractors of the posterior episternal *apophysis*, the inferior prætractors of the segments of the *abdomen*; but those muscles which move the head, and three thoracic segments, are changed considerably as to form, volume, and disposition, whilst those which move the segments of the *abdomen*, disappear whenever these segments become fixed. In like manner the longitudinal dorsal series form the elevators of the *labrum* and head, the superior retractors of the *prothorax*, the retractors of the wings and *scutellum*, the depressors and prætractors of the wings, and the superior prætractors of the abdominal segments. The upper part of the segment to which the jugulars belong having disappeared, the muscles, which would otherwise be inserted therein, proceed direct from the *scutellum* to the head, forming the second heads of its elevators. We find also in perfect insects some of those muscles, which, in the *larvæ* of insects as well as in the *Scolopendræ*, pass from the *tergum* of the *prothorax* to the *sternum*; but, in

many cases, these muscles disappear. The muscles contained in the *femur* and *tibia* differ but little in all the articulated animals with solid integuments. In Insects, the muscles placed in the joints of the *tarsi* disappear, and they are all moved by one muscle placed in the *femur* or *tibia*; the tendon of which traverses the *tarsus* to be inserted in the claw. Where the articulation of the parts of the legs is ginglymoidal, they are commonly moved by only one pair of muscles; where the articulation allows the parts to *roll*, they are generally furnished with more. But the muscles which move the *coxa* and *trochanter* vary much in form, number, composition, and insertion. The *flexors* of the *trochanters* are generally simple and penniform, whilst the *extensors* are mostly formed by several heads, one at least of which has its origin in one of the thoracic segments, the others generally in the *coxa*.

### PART. III.—DIGESTIVE ORGANS.

#### *Organs of Manducation and Alimentary Canal.*

The digestive organs bear a constant relation to the quality of the food destined for the support of the animal, or at least are not incompatible therewith in form or disposition. But the food being so much modified in its properties by the action of the parts of the mouth, the intestinal canal is liable to be acted on by so few of these, that their influence is scarcely felt by it. Hence it follows, that the form of the parts of the mouth must depend more particularly on the quality of the food, and be more precisely in relation with organs which (as the feet) concur indirectly to the function of digestion. This is confirmed by observation: but the intestinal canal is found to offer a much less uniform relationship with the food and with the other organs.

That the parts of the mouth are less subordinate to the quality of the food in the *Annulosa* than in the *Vertebrata* has already been pointed out: they differ considerably in their form where the food scarcely varies, and *vice versâ*. Nature, always so admirable in all that she produces, shows us here, as often elsewhere, that she is not constrained servilely to confine herself to the use of one sole means; but, on the

contrary, how great are her resources, and what profound wisdom does she exhibit in varying and combining them without ever creating any thing which is not in the most perfect harmony!

The differences which we have been remarking are principally due to the gradation in structure of the digestive organs, and the anomalies they present, which are often only apparent, depend on causes unconnected with the digestive system, as, for instance, the self-defence or industry of the animal.

The food influencing most powerfully the parts of the mouth, these must be considered as governing all the other parts of the digestive system, and, consequently, they become highly important for the purposes of classification, especially as relates to genera and families. It may be added, that the gradation to which the parts of the mouth are subjected, proceeds nearly *pari passu* with that of the other organs to which we can attach importance in classification, although their reciprocal dependence is often very slight: such is the gradation to which the wings are subject in insects.

The skeleton of the *Vertebrata* being replaced in the *Annulosa* and *Annelida* by the integuments, the masticatory organs of the former have also disappeared, and are replaced by parts belonging to the tegumentary system.

In the genus *Lumbricus*, where the integuments are membranaceous, the mouth is a simple orifice of the intestinal canal, scarcely differing from the *anus*; hence these animals can merely swallow their food without masticating it. In the leech (*Hirudo*), which is higher in its organization than the earth-worm, we find three fleshy jaws furnished with corneous teeth, which form a sort of saw enabling them to cut the skin of animals. This form of mouth, of which we find the first trace in this genus, becomes more developed in the still more perfectly formed genus *Eunice*, where we find four pair of jaws, of a different form and very strong, fixed in the mucous membrane of the *pharynx*. In the *Annulosa*, as we have already remarked, the *trophæ* are but the anterior feet transformed, and serving more directly for the purposes of digestion than the others. The jaws analogous to those of *Eunice* appear to be wanting, but most probably they are represented by the gastric teeth of *Crustacea*. In tracing the development of

these organs in the *Annelida*, we find their situation gradually becoming lower down in the alimentary canal, to acquire that disposition they present in *Crustacea* and Insects. In *Nephtys* and other genera, the jaws are placed at the lower part of the *œsophagus*, which reverses itself in the form of a *proboscis* when the animal wishes to feed. In comparing the jaws of the *Annelida* to the organs of the mouth and stomach of the *Annulosa*, we find them, both as to form and disposition, more analogous to the gastric than the oral jaws of the latter.

The transformation of the first pair of feet into maxillæ is very evident in the *Scolopendræ*, but it is not so with respect to the *labium* and mandibles: perhaps there exists some species as yet unknown, which may afford us a proof of a similar change in these also.

The *Crustacea* have from two to six pairs of jaws, the posterior pairs in many closely resembling the feet, proving indubitably that the organs of the mouth are but these last modified. The strength of the mandibles, and the size and number of the maxillæ, show that these animals subsist on solid food; but the nature of this is not always clearly marked by the form of the jaws, though in general the carnivorous species have them toothed, the herbivorous merely incisive. In the parasitical *Crustacea* (*Nymphon*, *Phoxichilus*, &c.) the mouth, though formed on the same plan as that of the other *Crustacea*, is smaller and much less developed; hence these animals subsist by sucking the blood of other animals (generally the *Cetacea*) instead of solid food. All the *Arachnida* (*Arachnida* and *Acaridea*) are very rapacious, but the parts of the mouth offer a striking difference in form, the larger species (the *Arachnida*, MacLeay), which prey on insects, having them very robust, but suited more to their habits of sucking their prey than to the purposes of mastication, whilst in the smaller (*Acaridea*, MacLeay), which are mostly parasitical, they are commonly formed into a simple *haustellum*. Some however of these, as the *Acari*, which feed on dry animal and vegetable substances, are masticators.

The development of the mouth attains its greatest degree of perfection in the *Coleoptera*, and we can, with some few exceptions, determine the nature of their food from the form of the *trophi*. Those which prey on living animals have the mandibles slender, and projecting beyond the *labrum* about

one-third of their length; they have no molar surface or incisive edge, but are furnished with a few rounded teeth, and terminate in a sharp incurved point; moreover, they are very moveable. The *maxillæ* are elongate, but shorter than the mandibles, and their lobes are not furnished with a dense covering of hair. The *labium* is small and moveable. The *Dytici*, however, have the mandibles short, terminated, as in the omnivorous *Coleoptera*, by two strong teeth, but they have no molar surface. The *labium* is large, and not very moveable; the *maxillæ* resemble those of the *Carabi*. L. This is nearly the form of the mouth in those *Coleoptera* which live on *decaying* flesh; perhaps the *Dytici* feed not on living prey, but on dead animals.<sup>c</sup>

Those which feed on *dry* animal matter, have the mandibles and *maxillæ* scarcely projecting beyond the *labrum*; the former are broad, strong, terminated by a short, but very sharp point, behind which is a single small incisive tooth: their inner surface is furnished with an elongate brush of hair, but has no molar surface.

The *maxillæ*, which terminate in a sharp incurved point, have also a considerable tuft of hair, and the *galea* is broad, short, and hairy. Those *Coleoptera* which feed on the pollen of flowers have the mandibles very short, hid by the *clypeus*, furnished with a large molar surface, but their extremity is but little developed. The *maxillæ* are very large, furnished with long tufts of hair. Where they feed on plants, we find the mandibles of *Coleoptera* hid by the *clypeus* and *labrum*, the terminal point blunt, or wanting; the inner edge incisive, and either entire, or divided into several teeth meeting one another; they have a large molar surface. The *maxillæ* are short, but present no other general character.

Such are the principal relations we find in *Coleoptera* between the food and the form of the mouth. The study of the habits of insects has been so much neglected that we know but little of their food, and our notions on this subject are the more indistinct, because we often trust to imperfect observations, or have happened only to observe the exceptions

<sup>c</sup> Though I believe M. Straus to be wrong in supposing the *Dytici* not to prey on living animals, yet I have had clear proof of their feeding upon dead animals; having taken *D. marginalis* devouring a large frog, which evidently had been killed, not by the *Dyticus*, but by other means. See also *Erichson*, p. 12.—E. D.

to the general rule. *Clerus apiarius* is generally met with in flowers, hence we might conclude that it fed on honey or pollen; it however is only hunting there for small insects.

In the *Orthoptera* it is difficult to determine the food of any species from the form of the *trophæ*; the herbivorous and carnivorous ones are alike furnished with a molar surface, and the *maxillæ* and *labium* afford no distinguishing character between these. This also applies to the *Neuroptera*. In the *Hymenoptera* the structure of the mouth has undergone much change, but its variations, caused by the nature of the food, are much the same as those of the mouth of *Coleoptera*. In the *Hemiptera* the mouth is still more changed, so that the whole of the species are suctorious. Those which feed on the fluids of animals, differ only in the *general* structure of the mouth from plant-sucking tribes, in having its parts more firm. The mouth of *Diptera* resembles in some respects that of *Hymenoptera*, the parts having undergone less degradation in structure than in the *Hemiptera*. It offers no general character which distinguishes the blood-sucking species from the other. The genus *Pulex*, forming a separate order placed near the *Diptera*, to which it approaches by the form of its *rostrulum*, as well as by its complete *metamorphosis*, seems to place itself at their head immediately after the *Hymenoptera*, its *labium* being furnished with *palpi* and covered by the *maxillæ*.

The food of the *Lepidoptera* being invariable, there can be no change of form in the parts of the mouth arising from this cause.

The intestinal canal has always its two orifices distinct one from the other;<sup>d</sup> the mouth in the *Annelida*, *Arachnida*, and in Insects, is always placed at the anterior extremity of the head; in the *Crustacea* it is mostly situated in the under surface of the trunk; the *anus*, however, is constantly placed at the posterior extremity.

The intestinal canal varies much, as well as to its disposition as in its form and length; its variations are not rigorously in relation with those of the parts upon which we rest our classifications, hence we can only lay down very general

<sup>d</sup> Many *Zoophytes* have but one orifice to the intestinal canal; the excrements pass through the mouth. In insects the *anus* is sometimes wanting, and some perfect insects have no mouth.



laws of relation, and even these are subject to considerable exceptions.

The food which reaches the intestinal canal retains only its chemical properties, the influence of these is sometimes very sensible; but two kinds of food which influence much the oral organs, may be reduced to very nearly the same state when they reach the stomach.

We may consider the *Annulosa* and *Annelida* as being divided into two divisions according to the form of the alimentary canal: the first division contains those which have all the segments nearly alike in form; the second, those where the segments are dissimilar. In the former, the intestinal canal makes very slight, if any folds, and mostly stretches in a nearly straight line from the mouth to the *anus*; whilst, on the contrary, in the others it makes a number of convolutions, which are more or less considerable according to the nature of the food; that is to say, they are numerous in the herbivorous, and few in the carnivorous. This rule has, however, some remarkable exceptions, the shortness of the canal being sometimes compensated by an increase in breadth. In both divisions it presents more or less distinct dilatations which mark out a distinction of parts, to which we may give the names of *œsophagus*, *ingluvies*, (*jabot*), *ventriculus*, (*jabot succenturié*), *ventriculus bulbosus* (*gésier*), and the Intestine, divided into *duodenum*, *colon*, *cæcum*, and *rectum*, but some of these are often wanting, or have their functions performed by the others.

The relation existing between the alimentary canal and the external form of the body, is a consequence naturally arising from the proportion which must exist between the intestines and the mass of the body. Where the segments are all nearly similar, as in the *Annelida* and *Myriapoda*, the body is generally very elongate, and the alimentary canal has sufficient length when extending from the mouth to the *anus*. Where the segments are dissimilar, the body is mostly short, and inflated in certain parts only, so that the intestine, in order to preserve a length proportioned to the bulk of the body, is of necessity expanded in certain parts, and folded upon itself, that it may be confined in a shorter space. From this it follows that the principal expansions of the alimentary canal are found in the most dilated part of the body. In the *Crustacea* this



is the trunk, and, therefore, it usually contains the gizzard (*ventriculus bulbosus*), the sole expanded part of their alimentary canal; the intestine makes no convolutions in the *abdomen*. In *Arachnida* and Insects the *abdomen*, on the contrary, is the most voluminous part, and this contains the principal expanded portions of the canal, though in *Aranea* the *ingluvies*, or crop, is contained in the trunk. The intestinal canal of carnivorous species, whether they feed on living prey, on blood, or on decaying flesh, is uniformly shorter than that of the herbivorous species, but these last are influenced by the quality of their food, as leaves, fruit, honey, &c., which is not the case with the former.

The gizzard (*ventriculus bulbosus*) is the expansion most constantly present, and where the crop is wanting is very large. It mostly contains certain more or less complicated masticatory organs, which appear to be analogous to the jaws of *Annelida*; they vary much in different genera.

In the *Staphylini*, they consist of from five to ten, or even more longitudinal ridges, placed in the circumference of the gizzard, extending from the *cardia* to the *pylorus*. In *Gryllotalpa*, &c., they are replaced by chains of small differently formed pieces. These, as the longitudinal ridges, are sometimes all similar, but more often alternately so. In many species (*Lepisma saccharina*, &c.), these ridges are each replaced by a very hard angular piece. When the *cardia* and *pylorus* are not diametrically opposed, these organs are found on one side of its inner surface alone, as in *Squilla mantis*, or around the *cardia* and *pylorus*, as in *Cancer* and *Astacus*. Sometimes they are altogether wanting.

The name *æsofagus* is commonly given to that part of the alimentary canal which extends from the *pharynx* to the gizzard or stomach. In Man and *Mammalia*, a single name suffices for this part; but in *Annulosa* and *Annelida* it is distinguished into two or more parts, to which separate names must be given, as has been done in Birds. Sometimes we find a crop (*ingluvies*), as in Birds, opening laterally into the *æsofagus*; below this, a part of the *æsofagus* sometimes performs the functions of the crop: this is the *ventriculus*, which, in the herbivorous species, often occupies two-thirds of the length of the alimentary canal. The name of *æsofagus* should be confined to that part which conducts the food to the

crop, or ventricule; and where these do not exist, to the gizzard.

The part which follows the gizzard constitutes the intestine, and is divided into three parts, the *duodenum*, *colon*, and *rectum*. The two latter often differ only in size; sometimes, however, the *rectum* is dilated so as to form a *cæcum*, as in *Aranea*, *Nepa*, *Dyticus*, &c. But in the *Myriapoda* and *Crustacea* we find no difference in these two parts. The *duodenum* is not always distinct, though its limits are mostly marked by the insertion of the biliary vessels.

### *Intimate Structure of the Alimentary Canal.*

The alimentary canal consists of three tunics, or coats; the most internal is a *mucous membrane*, analogous to the villous coat of *Vertebrata*; it is merely a prolongation of the integuments; is very distinct in the *æso-phagus*, *ventriculus bulbosus*, and *rectum*; less so in the *ventriculus*; and is very distinct in those species where the integuments are solid. The second tunic (*membrane propre*) is every where easily distinguishable: generally it is white, and very thin; sometimes, however, it is thick, and of a spongy texture. It presents excessively small granulations, which have been considered as the mouths of the absorbents; but it is more probable that they are gastric glands. The third is the muscular coat, which only clothes certain parts, as the intestines and gizzard, sometimes the *æso-phagus*, and yet more rarely the *ingluvies* and *ventriculus*.

We find in the articulated animals no true *peritoneum*; but the *viscera* of the *Arachnida* are retained in place by transverse fibrous septa, of a loose texture, which pass perpendicularly from the intervals of the segments, being, as it were, so many diaphragms. The *viscera* of *Crustacea* are connected by a loose cellular tissue; those of Insects and *Myriapoda* are retained in place by the *tracheæ*.

### *Secretory Glands dependent upon the Alimentary Canal.*

The difference of form and structure which we find in the glands of different species, is due principally to the difference in the mode of circulation of the blood in different classes.

In the *Annelida* and *Crustacea*, where the blood circulates in vessels, we find more or less voluminous conglomerate glands, the largest of which, in the *Crustacea*, has been considered as the analogue of the liver of *Vertebrata*; the second in size, that of the *pancreas*, or of the kidneys, according as the point of their insertion is near to the gizzard or *anus*. Those canals whose excretory ducts open into the mouth, or *pharynx*, may be called salivary glands.

In Insects, *Myriapoda*, and the Trachean *Arachnida*, from the difference of the circulatory system, the blood would not, in such glands, be renewed with sufficient quickness; the glands, therefore, in these, take the form of long thread-like vessels, which, from their floating in the blood, are easily penetrated by it. This form is not incompatible with a complete circulation, for we meet with it in *Limulus*, and the Pulmonary *Arachnida*.

There are from one to five kinds of these, but they are never all present in one species, or at least they are never all apparent.

The salivary glands are two or four vessels, of varying length, simple or ramose, sometimes having their extremities expanded.

The glands, to which term biliary vessels is commonly given, are two, four, or six slender, and very long vessels, inserted in different genera, into various parts of the intestinal canal, sometimes above, sometimes below the gizzard. These two extremities sometimes both open into the canal at the same point, sometimes at very distant points. Sometimes their number is very considerable; they are then either placed in a whorl round a certain part of the canal, or united upon two or more tubercles, placed around one point of the intestine; sometimes, before their insertion, they all unite into one common duct.

A third sort of glands, secreting a digestive fluid, may be called *gastric* glands: these have been mentioned above. When present, they always cover that part of the intestinal canal above the biliary vessels. In the *Silphæ*, the posterior part of the intestines is likewise covered with granulations; these may be called the *intestinal glands*.

In many insects, particularly the carnivorous, there exists a fifth kind of gland, the products of which are poured into the

intestinal canal near the *anus*. These are the urinary vessels, and they have sometimes, near their insertion, a reservoir, which performs the functions of a bladder. In all insects we find at least *one kind* of these glands, inserted sometimes above, sometimes below the gizzard. From the experiments of M. Rengger, it appears that these organs are urinary organs. The analysis of their contents confirms this, they being composed of ammonia, potass, and uric acid, existing probably in the form of a suburate of potass and ammonia.

#### PART IV.—GENERATION.

In the *Myriapoda*, *Arachnida*, and in Insects, the sexes are invariably separate; and it appears doubtful whether any of the *Crustacea* are really hermaphrodites, though as yet no individuals of some genera, as *Cypris* and *Apus*, have been found unfurnished with eggs. In the *Annelida*, most of the genera are imperfectly hermaphrodite. In *Crustacea* and Insects we find some species which, though not hermaphrodites, are capable of producing young without fecundation for several generations. Jurine observed that the Crustaceous genus, *Daphnia*, possessed this faculty to the sixth generation. The first genus of Insects in which this power was observed, is *Aphis*, and here it is very striking. Mr. Coulter, an Irish naturalist, relates, that *Smerinthus Populi* can produce several generations without fecundation.<sup>e</sup>

All the *Annulosa*, and most of the *Annelida*, are exclusively oviparous, or ovo-viviparous; but some of the latter, as *Nais*, &c., besides being oviparous, multiply almost after the manner of the *Zoophytes*, the posterior part separating, and becoming a perfect individual.

Here we may notice the power possessed by some animals, of renewing parts of their bodies which may have been broken off. In Insects and the *Scolopendræ* this never takes place; and, moreover, a simple wound never heals, it only dries over. In *Crustacea* and *Arachnida*, the feet are capable of being reproduced exactly in their original form. But does this faculty

<sup>e</sup> Who is Mr. Coulter? and will he favour the world with some further particulars with regard to this extraordinary fact, which M. Straus relates on the authority of a statement made by Mr. C. to him?

continue during the whole of the animal's life, or does it cease as soon as it becomes adult? Perhaps the latter is the correct opinion; for the Rev. Lansdown Guilding has observed, that the *larva* of *Phasma cornutum* can reproduce the feet it may have lost, though the *imago* cannot.

In *Nais*, and some other *Annelida*, the body, if divided, becomes two perfect individuals.

Most of the *Crustacea* carry their eggs attached to the body, not to assist in hatching them, but to protect them. Some, however, abandon them as soon as they are laid.

The *Araneidæ* in general envelop their eggs in a silken cocoon, where they remain until the young appear. The *Epeiræ* merely attach them to some solid body, and then leave them; others, *Theridion*, *Pholcus*, &c. (*araignées filandières*), watch over the cocoon in some sheltered place, where they have fixed it, to aid the escape of their young; others, the *Lycosæ*, carry the cocoon with them, to give to their offspring the same maternal care.

Insects, with the exception of the genus *Termes*, and most of the *Hymenoptera*, simply deposit their eggs, and leave them, without giving themselves any further trouble; but the care bestowed by the Insects forming the exceptions to this rule is very remarkable.

The eggs of some *Orthoptera*, as *Mantis* and *Blatta*, are excluded, enveloped in a case, where each has its separate compartment.

The most singular fact in the generation of Insects is, that no species, when hatched, has exactly the same form as the parent, and only acquires it by two transformations, called its *metamorphoses*.

Among the *Myriapoda*, the *Juli* alone undergo *metamorphosis*.

The *Scolopendræ*, the *Thysanoura*, the Pulmonary *Arachnida* and *Phalangium*, appear not to undergo any change; but the *Acari* and some of the *Crustacea* do.

#### PART V.—RESPIRATORY SYSTEM.

No where do we find the respiratory system carried to so high a degree of development as in Insects; yet its functions

are far less energetic than in the warm-blooded *Vertebrata*, for they can endure long a highly rarefied atmosphere, or even irrespirable gases, without perishing.

In Insects, the circulation having reached such a degree of simplicity and imperfection, that the blood cannot be brought to one special respiratory organ, this inconvenience has to be remedied by replacing the circulation of blood by that of air. In *Vertebrata* it is the blood which goes to meet the air; in Insects the air seeks the blood.

This circulation of air takes place by means of vessels called *tracheæ*, which are distributed throughout the body, after the manner of the arteries of the higher animals. These *tracheæ* communicate with the external air by means of certain openings called *stigmata*, which never exceed eighteen in number, placed one on each side of the *prothorax*, the *mesothorax*, and the seven anterior segments of the *abdomen*. Each of these *stigmata* communicates with one large, and mostly very short, *trachea*, commonly called the primary *trachea* (*trachée d'origine*), from which numerous branches spread throughout the body. In some species there arise, from each primary *trachea* from one to five branches, the longitudinal *tracheæ* (*trachées de communication longitudinale au trachées longitudinales*), which run to the other *stigmata* of the same side, to establish a communication between them. Other branches arise more or less directly from the primary *tracheæ*, to anastomose with the *tracheæ* on the opposite side; these may be called transverse *tracheæ* (*trachées de communication transversales, ou trachées transversales*.) Besides these, every primary *trachea* sends off innumerable branches, which, with the other branches arising from the larger trunks, penetrate every part of the body. Such is the distribution of the *tracheæ* in the *Coleoptera* and *Scolopendræ*.

In other insects, as *Blatta*, *Locusta*, &c., each primary segment sends off several trunks, some of which follow the sides of the segment to which they belong, directing their course towards its median line, where they open into a longitudinal *trachea*, which is continued throughout the whole length of the body, as well above as below. At each segment these longitudinal trunks send off a branch which anastomoses with the opposite longitudinal *trachea*. From these different trunks the smaller branches are distributed over the body.



Lastly: there exist some families, as Trachean *Arachnida*, and the *Chilognatha*, where the *stigmata* do not communicate, the *tracheæ* ramifying directly from them to be spread over the body.<sup>f</sup>

The branches of the *tracheæ* are in general slightly tapering, as the arteries of higher animals; but sometimes, especially in the Lamellicron *Coleoptera*,<sup>g</sup> they form, from space to space, vesicles of different sizes, from which small branches are sent off to the neighbouring organs.

It appears that *ammoniacal* gas is that which most quickly destroys insects. In azote they can live several days; and though a *Melolontha vulgaris* was observed to fall motionless when immersed in pure hydrogen for fifteen minutes, yet it returned to life after remaining fifty hours in that gas.

Respiration, it seems, can only be carried on by moistened surfaces; hence the lungs of the higher animals are always moistened by their own transpiration, whilst aquatic animals have often exterior *branchiæ* moistened by the water. Some *Annelida*, as the earth-worm and leech, which breathe by the skin, have this always moist: in the former, from the effect of the damp earth, which they inhabit; in the latter, by a viscous matter, which covers the skin. But in this respect, the *Onisci* offer the last degree of possibility, as they breathe air by means of *branchiæ*; yet, as the respiratory surfaces of their *branchiæ* are not entirely exposed, but covered by *laminæ*, parts of the organs themselves, it is possible that they may never be entirely dry.

In following the scale of gradation of the respiratory system in the articulated animals, we find it almost disappear in the *Annelida abbranchia*, where the respiration is performed by the whole surface of the body. By degrees we see it reappear, either as *branchiæ*, lungs, or lastly, as *tracheæ*; and this difference depends, on the one hand, upon the medium which these animals inhabit, and, on the other, upon the gradation which the respiratory and circulatory systems follow.

In the *Crustacea* these organs are external, at least are

<sup>f</sup> This is the case also with some Lepidopterous larvæ, in which I have observed the *tracheæ* to ramify directly from the *stigmata*. This might naturally be expected, when we consider that the progressive development of individuals resembles that which we find as we trace the gradation of organs from one group to another.—E. D.

<sup>g</sup> And the *Buprestidæ*, but not the *Elateriidæ*.—E. D.



only covered by the *carapon*; they may then be considered as *becoming* internal; but whatever may be their situation, they are constantly in dependence upon the feet.

In the Pulmonary *Arachnida*, the organs of respiration become really internal, forming more or less numerous sacs which do not ramify, placed in corresponding groups in the lower part of the body, communicating with the air by one *stigma* for each group.

In the Trachean *Arachnida*, and the *Chilognatha*, these sacs are prolonged into long branching vessels, disposed in tufts around the *stigmata* without communicating one with another.

In Insects, and the *Chilopoda*, the trachean system has reached its highest development, the *tracheæ* arising from each *stigma* all communicating with one another.

The larvæ of *Ephemera*, which live in water yet breathe only air, have the *stigmata* furnished with long foliaceous appendages, containing air, which absorbs the oxygen from the water, and enables it thus to be conveyed throughout the system.

The *tracheæ* of insects, *Myriapoda* and *Arachnida*, consist of three tunics, of which the external is an extremely thin colourless membrane, not fibrous in its texture. The second is a thread of a stiff corneous texture, wound in a spiral. This thread is commonly round, but sometimes flat; when round, its whorls are in general less regular than when flat, being mostly separated by a void of double the width of the thread. The same thread is continued throughout one branch; and when this sends off a lateral branch, the turns of the spire simply separate to give room for its insertion. When the *tracheæ* bifurcate, the original thread ceases, and each branch has its peculiar one.

The third tunic is a very thin, white, mucous membrane, a mere prolongation of the integuments.

[I shall not enter into any abstract of the Circulatory System; the incorrectness of the view taken of it by M. Straus being fully proved by the observations of Mr. Bowerbank; nevertheless, it is but justice to M. Straus to say, that his remarks on this subject well merit attentive perusal; and had I not felt that I have already occupied too much space with a subject that is not perhaps likely to be of general interest, I should have given an abstract of this part as well as of the others.]

## PART VII.—NERVOUS SYSTEM.

Of all the invertebrated animals, the *Articulata* are those which present the most developed nervous system. In them, as in the *Mollusca*, this system of organs differs chiefly from that of *Vertebrata*, in being placed, with the exception of the first pair of *ganglia*, below the alimentary canal; whilst in the *Vertebrata* it is always above: and although some of the lowest *Vertebrata* approach so near to the *Annelida* in other respects, we find no approach in the form of the nervous system.

Some have supposed the nervous system in the *Annulosa* to be the analogue of the only great sympathetic nerves of higher animals; but this can hardly be the case; for these furnish nerves almost solely to the vital organs, whilst the spinal marrow of the *Annulosa* furnishes nerves to nearly the whole of the body.

By comparing the nervous system to the other systems of organs with which it is in relation, we arrive at the conclusion, on which we can establish the following laws:—

FIRST LAW.—When the body is composed of similar segments, the spinal marrow has as many *ganglia* as there are *sterna* (*sterna* with the muscles which are repeated with them), varying in size according to the mass of organs of animal life which each segment contains, and the greater or less degree of activity of these organs.

The *ganglia* are commonly placed in the middle of the sternal pieces, at the intersection of the axes of the *coxæ*.

The length of the chords of the spinal marrow, being determined by the distances of the *ganglia*, is here equal in all the segments.

The terminal part of the chords placed beyond the last *ganglia* are distributed, after the manner of the principal nerves, to the posterior part of the body. When the body is composed, commonly of two, or, rarely of three parts, besides the head, distinguished by the form of the segments of which they are composed, one of these parts, which may be called the trunk, and which is always the anterior, retains the principal organs of animal life, as the feet; whilst in the posterior, those organs subject to the will are more or less reduced,

owing principally to the absence of the feet. The nervous system is variously influenced by this change in the segments; and we may distinguish two forms of animals in this condition: first, those where the mass of the *viscera* is contained in the trunk; secondly, those where it is contained in the *abdomen*. In the former, the nervous system obeys the following laws.

SECOND LAW.—Where the trunk is composed of segments, either moveable, immoveable, or anchylosed, but distinct in the sternal region, whilst the *abdomen* is formed of perfectly moveable segments; the pairs of *ganglia* are repeated in each segment of each part, their size being proportioned to that of the organs of animal life contained in each segment; and the length of the chords of the spinal marrow is subject to the same conditions as in the preceding law.

THIRD LAW.—When the trunk is composed of segments, either moveable, immoveable, or anchylosed, but distinct in the sternal part, whilst the segments of the *abdomen* are immoveable, and, whether anchylosed or not inferiorly, without muscles to move them; the *ganglia* are repeated, only in the segments of the trunk, in the manner of the former case; but the *abdomen* contains none, and receives its nerves from the last pair of *ganglia* of the trunk, which is then larger than the others. The terminal part of the chords of the spinal marrow is prolonged nearly to the extremity of the *abdomen*, where they distribute themselves.

FOURTH LAW.—Where the trunk is composed of several segments entirely united into one, or anchylosed so completely that we cannot perceive any traces of the sutures of the different sternal pieces (the feet then radiating round a common *sternum*), and the *abdomen* also is formed of segments entirely anchylosed, be they otherwise distinct or not; we find only one pair of *ganglia* furnishing all the nerves of this part of the body. This pair of *ganglia* is placed at the centre from which the feet radiate, (it is formed by the union of all the *ganglia* of the segments which compose the trunk). In the *abdomen* there is no *ganglion*, (this part containing only vital organs,) and the nerves arise either from the *ganglion* of the trunk, or from the chords of the spinal marrow, which are prolonged to the extremity of the *abdomen*; but when this part contains mixed muscles, (serving for respiration,) the chords present a few extremely small *ganglia*.

Where the mass of the *viscera* is contained in the *abdomen*, the nervous system follows the subsequent laws.

FIFTH LAW.—When the trunk is composed of segments, either moveable, immoveable, or anchylosed, but distinct in the sternal region, whilst those which form the *abdomen* are perfectly moveable; the *ganglia* are repeated in each part, but with this difference, that those of the trunk are always very large, and each segment has its own peculiar pair, whilst in the *abdomen* they are much smaller, often less numerous than the segments, and their situation is not always constant.

SIXTH LAW.—If the trunk is composed of distinct segments, whether these be moveable or anchylosed, and the segments of the *abdomen* are very little moveable, or anchylosed, even if this is the case only in their inferior arches, the *ganglia* are repeated in the trunk, as in the preceding case, but not in the *abdomen*; and the segments of this latter receive their nerves from a large pair of *ganglia* placed in the anterior part of the visceral cavity, or in the trunk itself. The chords of the spinal marrow are prolonged nearly to the extremity of the *abdomen*.

SEVENTH LAW.—When, on the one hand, the segments of the trunk are entirely confounded, so as to leave no trace of suture, especially on their lower part, (the feet then radiating round a common *sternum*,) and, on the other hand, the segments of the *abdomen* are immoveable, whether confounded in one or not, there exists in the trunk only one pair of *ganglia*, as in the species which come under the fourth law; and in the *abdomen* there is but one single pair of *ganglia*, as in the species which come under the sixth law.

EIGHTH LAW.—The brain, which exists in all the articulated animals, is always placed above the alimentary canal, and its size varies according to the number and nature of the organs to which it furnishes nerves.

The *Encephalon* being found where the head has entirely disappeared, seems to indicate that it is not subject to the same changes as the latter.

As it may happen, that in two neighbouring genera the segments of the *abdomen* are moveable in the one, and fixed in the other; according to the second, third, fifth, and sixth laws, the nervous system of these two genera ought to differ

strikingly, and observation confirms this. In *Lucanus* the abdominal *ganglia* exist, but not in *Melolontha*.

These laws, which we have pointed out as governing the nervous system, are but the consequence of others more general. These general laws shew us that the number and size of the different nervous trunks depend always on the functions of the organs to which they are distributed; that is to say, the largest are destined to the organs of the senses: the next in size to the muscles, and the smallest to the vital organs; but the size of the nerves seems also to depend on other causes, so that the first general rule we have pointed out offers several exceptions.

In the organs of the senses the size of the nerves appears to be in an inverse ratio to the density of the agent to be perceived: and as light is the most subtle of these, the eyes are, *cæteris paribus*, the organs which receive the largest nerves. Next in size are the antennal nerves, which may possess the power of hearing; then the nerves of the *palpi*. The mandibular nerves, which, perhaps, enjoy the perception of taste, are still smaller. The feet, as the organs of feeling, properly so called, possess pretty considerable nerves; lastly, the skin, as the organ of the general sense of feeling, receives only very small branches.

In the second place, the size of the nerves is always in proportion to the bulk of the organ to which they are directed, and their thickness is also proportionate to the greater or less complication of the organ, compared to its analogues in other species. Lastly, the size of the nerve is always in relation to the degree of sensibility of the organ in one species, as compared with another.

In the muscles, the nerves are, on one hand, proportioned to their size, on the other to their activity. The vital organs, which are not subject to the will, receive very small nerves in proportion to their bulk.

The *tracheæ* receive no nerves, but the respiratory muscles, which are in part subject to the will, receive nerves less strong than those of the organs of animal life, but more so than those of vegetable life.

The nervous trunks of the second size are distributed to the vital organs; those of the third size, to the secretory organs.

Amongst a great number of observations made upon the nervous system of the articulated animals, which have led to the discovery and verification of the laws of relation given above, the genus *Blaps* is the only one that has formed an exception. The segments of the *abdomen* are here anchylosed inferiorly, and above are so encased by the *elytra*, which are connate, as to be incapable of motion; yet we find the *ganglia* repeated in the *abdomen*, as they would be did it enjoy the power of motion. Probably this is owing to some secondary cause, which modifies the result of the primary causes.

The nerves are covered, as in *Vertebrata*, with a *neurilema* which can easily be separated. This coat is thick upon the *ganglia* and spinal chords, much thinner on the nerves. The nervous substance appears scarcely to differ from that of *Vertebrata*, being formed of two parts, the one, the cortical, is brown, the other, the medullary substance, white.

In concluding this article, I cannot but express the regret I feel at my utter inability to do justice to M. Straus; first, from not possessing a sufficient degree of knowledge of anatomy in general, and secondly, from a want of sufficient leisure to give to this paper that care which it required. This last must also be my excuse for omitting much interesting matter, especially that which relates to the senses and instinct of these animals. I may here make one remark on the subject of the antennæ. M. Straus regards these as the organs of hearing; and this conjecture certainly receives some support from the fact, that the nerve, supposed to be the auditory nerve of *Crustacea*, is a branch of the antennal. But surely this is but a slight foundation to build upon; with equal reason might we assert that the antennal nerve cannot be the auditory nerve, because in the higher animals it always arises from the posterior part of the brain. One thing, however, may be said on this subject. It has been clearly proved that the sense of hearing does not solely depend on the ear, or at least the *brain* itself is capable of hearing sounds. When the ears were hermetically closed, a patient upon whom the operation of trepanning had been performed, could distinctly hear the ticking of a watch, and even understand conversation at some distance; but on the aperture of the skull being closed, by placing the hand over it, no sounds could be heard. I will



now bid your readers good bye, perhaps for a long time, assuring them that if they have found aught in this paper pleasing to them, they must give all the credit thereof to our author, not to me.

Yours,

E. DOUBLEDAY.

ART. XI.—*The other End of a Trip to the Isle of Wight.*  
By RUSTICUS, of Godalming.

[The first portion of this narrative was published in Mr. Loudon's Magazine of Natural History, Vol. VI. p. 25; to which we beg to refer our readers.—ED.]

SIR,—The following day was spent in a repetition of the cruise under the cliff, with pretty much the same success; and the next morning we started on foot for the southerly point of the island. The wind had been sinking during the whole of the previous day and night, and what air remained blew light as zephyr off shore. The sea was without a ripple; and the chalk cliffs, the two rocks in the bay, and the distant St. Catherine's, were mirrored on the bosom of the ocean so completely, that every straggling sheep, browsing the turf above the cliffs, was as distinctly to be seen in the reflection as the reality. I shall never forget the quiet beauty of the scene:—there was nothing wild or grand in nature; nothing wonderful in art; there was neither church, house, tree, nor shrub, nor aught to excite the beholder to exclamation;—quiet sea—unromantic, unvariegated, perpendicular, white cliff—monotonous downs. Nature seemed to be at rest; man seemed to be a stranger; he was no where disturbing her repose; he had no where distorted her figure;—the distant tower of St. Catherine's was the only visible proof that he had existed.

The tide being out, we walked below the cliff, and amused ourselves with the vagaries of the little crabs, which, like the generality of mankind, appear to be looking one way while they go another; the smooth sand was curiously mapped out by the infinity of their tracks. We established a crab-race; and gallantly did the little urchins perform. A little direction was required now and then to keep them from bolting off the course; but in the main they behaved very well, and

temperately ; and their sideling gait had the air of circumspection and calculation. You smile, good Sir, at our childishness ;—you are welcome. We laughed outright. Under the sea-wrack were shoals of that little jumping shrimp<sup>a</sup> with a large head, which is found on nearly every coast. On lifting up a handful of sea-wrack, they swarmed and leaped about like fleas—some of them being scarcely bigger. These little fellows are the best anatomists in the world : in a single night they will turn a small animal into a more beautifully white, and clean, and perfect skeleton, than can be obtained by any other means. They are of all sizes, from half an inch long to no size at all.

Our double-barrels had been laying idle in the hollow of our arms for some hours, when a flock of ring-dotterels and pures started up before us, and, taking a circuit over the sea, settled again, farther on, at the very edge of the rising tide :—here, they boldly ran into the water for any floating food they might spy, sometimes allowing each little swell to take them almost off their legs. We put them up again and again, and succeeded in bringing down three of them ; but they always fell in the sea, and were lost to us. At last, they altered their minds, and, instead of going our way any farther, took a wider sweep over the sea, and settled behind us. One bird, which it was our particular object to obtain in this journey, we did not even get a glimpse of,—the red-legged crow. We had been told by an Ornithologist of great accuracy, that it breeds in several parts of these cliffs every year ; but of this there seems to be great doubt ;—its chief resort appears to be the Cornish coast.

Near Black-Gang Chine I had the good fortune to meet with an insect I never saw before or since. The soil was a kind of loose sand, with a good many short blades of withered grass sticking up out of it, the runners of which crawled along the top, or just below the top, as the case might be, and now and then shooting down a root to hold fast by ; looking altogether something as though an old tanned fishing-net had been thrown over the soil to keep it from blowing away, and had shot out and taken root at the knots, just for its own amusement, or as a hold, in case the sea-breezes should be too much for it. In this place, stopping to pick up a feather, I saw something move in the sand, but as soon as I could fix my eye on it, all was still, and I could

<sup>a</sup> *Talitrus Locusta*. Ed.

only find a little hole, as round as though some one had stuck a common lead pencil into the sand and taken it out again. There was a neat and perfect roundness in the hole, which told me at once it was a tenement of some kind; and sundry cases of beetles, legs of gnats, and dried dew-moths, scattered round it, signified, moreover, that it was inhabited by some inhuman Polyphemus. I was soon down on my knees, and had my knife out ready for digging, when, within a foot of the first, I saw another stir—and another round hole instantly appeared. It now occurred to me that I might, with quietness and patience, get a sight of one of these hermits while he was sunning himself; I therefore lay as still as a cat watching at a mouse-hole, and was soon rewarded by seeing the gentleman make his appearance almost close under my nose. Unluckily, like Alexander, I had placed myself between the sun and my Diogenes, and this seemed to make him very fidgetty and uneasy, so I obliged him by moving quietly out of the way, and letting the sun shine on him, by the same movement bringing my eye within about fifteen inches of him. Nothing appeared but a broad flat head, which fitted very accurately the mouth of the hole, and which was furnished with bright shining eyes, and a pair of horrible jaws, held wide apart: these shears had doubtless cut the thread of existence for many a poor wanderer, whose luckless star had led him to the abode of this child of Erebus.

I cut off the gentleman's retreat by passing a stick into the sand, sideways, so as to cross his burrow, and then with a bit of a jerk unearthed him and laid him sprawling. O, such a beauty! the *Parcæ*, sweet creatures, the *Eumenides*, gentle turtle-doves, were lovely in comparison: I'll describe the animal with an eye to science.—Aspect, vicious; temper, ferocious; eyes, infernal; jaws, diabolical, stuck on the wrong way, like a figure-head shipped looking aft; head, big; back, humped, the hump adorned with two hooks;—there, Mr. Editor, there's a description! it only wants putting into cat-Latin to be perfect! When first unearthed, he was monstrous sulky, and lay twisted in a kind of half-kink, for all the world like a pot-hook: but he soon found the inconvenience of this, and set to work to make another hole, for which he used his feet and jaws, loosening the sand with his feet, and fetching it out with his jaws; in this way he got down about half an inch,

and then adroitly hanging himself to the edge of the hole by the hook in his back, he continued his labours in this droll position: at last he got quite out of sight, and as he did not come up again, I concluded he was taking a nap after his labour, and so I would not again disturb him.

This ugly grub, as my friend ——— tells me, is the larva of *Cicindela campestris*,—a beautiful green beetle, which is common in all sandy places in the summer, and pursues the whole insect race with unceasing ferocity. The gentleman runs and flies so fast as to puzzle the hunter, and, most commonly, to get away from him; and when you do get hold of him, he fights, and bites, and struggles, to the last. ——— told me of another larva, which he said he had himself met with near Marseilles, called the *Fourmilion*, or Ant-lion; whose operations, if you will have them as an episode, are on this wise:—

A loose light sand is the favourite soil of the Ant-lion. In this he makes his snare, and passes the first part of his life. His snare is a round hole, about two inches wide at top, and with sloping sides, gradually lessening to a point at the bottom, where the tenant lays in wait, his jaws only being visible, and the rest of his body hidden beneath the sand. The sides of this trap are made of the finest and driest sand, which, when an insect of any kind gets into it, gives way beneath its feet, and so conducts it, in the most amiable and natural manner, into the very jaws of its devourer. It sometimes happens, that a shower has made the sand more solid, and better footing, than when quite loose; and then the luckless mortal, who has inadvertently dropped or flown into it, begins to remount the side with ease and fancied safety; but, alas, the safety is only fancied! Mark the deepness of the rogue, in hiding: he dips his jaws into the sand, and, being a capital marksman, jerks it, with certain aim, on the back of the intruder, not once only, but again, and again, and again; and thus keeps up such a constant and well-directed fire, that the poor creature is at last tired out, and slides into the power of its enemy. The ant-lion is about the size of a large garden-spider, and something like it in shape; after it has fed for five weeks on all the stragglers that were unfortunate enough to get in its way, it spins itself a white silky covering, and changes to a chrysalis, and afterwards

to a beautiful lace-winged fly, which emerges from the sand like a spirit escaping from a tomb.

It was night before the three weary travellers reached Sand-Rock Hotel. Beauteous spot!—Undercliff, never to be forgotten;—when first I saw thy bewitching face, the full-moon was riding triumphantly over the ocean, silvering the multitudinous ripples with her reflected image, and making a broad and glorious track of ever-varying light—and thou wast bathed in more than ordinary splendour by the brightness of her beams! After roughing it on the ocean, and among the cliffs of Fresh-water and the Needles, the quietude and luxury of this spot seemed to invite repose; we tarried there many days; and then, walking through Appeldurcombe and Newport, arrived at Cowes;—and there, taking ship, sailed to Portsmouth, and so returned.

I am, Sir, Your's, &c.

RUSTICUS.

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ART. XII. — *Monographia Chalciditum.* By FRANCIS WALKER, Esq. F. L. S.

(Continued from p. 39.)

“ ————— the green myriads in the peopled grass.”

GENUS CEROCEPHALA, *Westwood.*

Theocolax . . *Westwood.*

Læsthia . . *Haliday.*

Epimacrus . . *Walker.*

Caput anticè tridentatum: *maris* antennæ 10-articulatæ, moniliformes; *fem.* 9-articulatæ, breviores, tenuiores, subclavatæ: thoracis segmenta alifera in apteris minima, in alatis majora: petiolus brevis aut elongatus: alæ nunc minimæ, nunc amplæ: nervi soliti pars humeralis<sup>a</sup> brevis; pars ulnaris longior, basi spinam erectam brevem latam gerens; a *Spalangia* quoque radio brevior et cubito longiore differt: metalæ nervo simplici ultra costæ medium producto.

<sup>a</sup> See Ent. Mag. Vol. 1. p. 334. Note.

The other characters of this genus are noticed in Mr. Haliday's description of *Læsthia*, Vol. I. pp. 335 & 336 of this Magazine.

Sp. 1. *Cero. cornigera*. Mas. et fem. *Rufa aut ferruginea, nigro plus minusve variegata, alis albis fuscofasciatis.*

*Cerophala cornigera*. Westwood. *Guerin. Magasin de Zoologie*. 1ère. Livraison, Pl. 4.

*Epimacrus rufus* . Walker, *Ent. Magazine*, Vol. I. p. 369.

*Mas.*—Nigro-fuscus, nitens, ferè glaber, pubescens: caput magnum, thorace latius, ferrugineum: oculi ocellique fusci: antennæ nigro-fuscæ, pubescentes, corporis dimidio longiores, basi obscurè ferrugineæ: prothorax anticè, utrinque et subtus ferrugineus; squamulæ concolores: metathorax scaber, obscurus, apice ferrugineus: petiolus abdominis dimidio vix brevior, linearis, ferrugineus, obscurus: abdomen nigrum, thorace latius, brevi-ovatum, convexum, glabrum; segmentum 1<sup>um</sup>. fusco ferrugineum, maximum; sequentia parva: pedes fusci, subtus et tarsi omninò fulvi: alæ albæ, ciliatæ; proalæ sub ulnæ basi fusco-maculatæ, sub cubito fusco-fasciatæ: nervus solitus fuscus; ulna basi et cubitus nigra, crassa. (Corp. long. 1—1½ lin.; alar. 1¼—1½ lin.)

Var.  $\beta$ .—*Fem.* ferrugineo-ænea: caput ferrugineum; vertex ferrugineo-æneus: antennæ ferrugineæ, apice fuscæ: thoracis latera et pectus abdominisque basis subtus ferruginea; pedes concolores, subtus et tarsi omninò fulvi.

Taken by Mr. Stephens, near Ripley, in Surrey; by Mr. E. Doubleday, near Epping, and by Mr. Lewis, near London.

Sp. 2. *Cero. formiciformis*. Mas. et fem. *Ferruginea, alis vix ullis.*

*Theocolax formiciformis*. Westwood, *Lond. and Edin. Phil. Mag. Third Series*. Vol. I. No. II. p. 127.

*Læsthia vespertina* . . Haliday, *Ent. Mag.* Vol. I. pp. 335, 336.

Taken near Paris, by M. F. de Laporte. I have found it crawling on paper, once near London; and once, in September, near Linton, North Devon.



GENUS MACROGLENES, *Westwood.*

Caput transversum, anticè depressum et subproductum, *maris* magnum thorace latius, *fem.* mediocre thorace vix latius : *maris* oculi maximi, posticè ferè conjuncti, capitis partem majorem occupantes : *fem.* oculi mediocres, laterales : ocelli 3 supra verticem trigonè dispositi, *maris* postici vix conspicui : mandibulæ paullò arcuatæ, apice dentibus 4 acutis armatæ : maxillæ elongatæ : palpi maxillares triarticulati, mediocres, filiformes ; articulus 3<sup>us</sup>. longus : mentum ovatum : labium parvum, anticè ciliatum : palpi labiales minimi, biarticulati : *maris* antennæ 10-articulatæ, clavatæ, breves, capite paullò longiores ; articulus 1<sup>us</sup>. gracilis ; 2<sup>us</sup>. mediocris, ovatus ; 3<sup>us</sup>., 4<sup>us</sup>., et 5<sup>us</sup>., minimi ; 6<sup>us</sup>. et 7<sup>us</sup>. magni, lati ; clava ovata, apice acuminata, articulis 2 præcedentibus longior et latior : *fem.* antennæ 9-articulatæ ; articuli 3<sup>us</sup>. et 4<sup>us</sup>., minimi ; 5<sup>us</sup>. et 6<sup>us</sup>. magni, lati : thorax ovatus : prothorax minimus, supra vix conspicuus : mesothoracis scutum magnum ; parapsides optimè determinatæ, convexæ ; paraptera et scutellum magna, hoc angustum : metathorax sat magnus : *maris* abdomen sessile, valdè compressum, laminæ similis, thorace vix brevius ; segmentum 1<sup>um</sup>. longum, sequentia breviora : *fem.* abdomen compressum, thorace paullò longius : oviductus subexertus : pedes simplices, breves ; coxæ parvæ ; tibiæ rectæ, apice spinis armatæ ; tarsi graciles, articuli 1<sup>o</sup>. ad 4<sup>um</sup>. longitudine decrescentes, 5<sup>us</sup>. 4<sup>o</sup>. longior ; ungues et pulvilli parvi : alæ breves ; nervus solitus ubi costam attingit quasi discerptus, ultra costæ medium ramulum brevem emittens stigmatate rotundo terminatum ; et mox abruptus ; metalæ nervo unico simplici costæ medium non attingente, stigmate punctiformi terminato.

Sp. 1. *Macr. oculatus.* Mas. et fem. *Viridis aut cyaneus, plus minusve æneo variegatus, antennis pedibusque nigris, alis hyalinis.*

*Macroglenes oculatus.* *Westwood, Lond. and Edinb. Phil. Mag. Third Series. Vol. I. No. II. p. 127.*

*Mas.*—Caput nigrum, obscurum : oculi ocellique rufi : antennæ nigræ, pubescentes ; articulus 1<sup>us</sup>. nigro-viridis, glaber : thorax æneo-viridis, nitens, ferè glaber, vix pubescens : abdomen viride, nitens, glabrum, supra æneum, apice pubescens : pedes nigri, non pubescentes ; trochanteres fuscii ; tarsi rufi, apice nigro-fuscii :

alæ albo-hyalinæ, iridescentes, ciliatæ ; nervi fuscii ; stigma obscurius, parvum.

*Fem.*—Nigro-viridis : abdomen cyaneo-viride. (Corp. long.  $\frac{2}{3}$ — $\frac{3}{4}$  lin. ; alar.  $1-1\frac{1}{6}$  lin.)

*Var. β.*—*Mas*, thorax viridis : mesothoracis scutellum, metathorax et abdomen cyanea.

June and August ; on grass in fields ; near London. June ; Windsor Forest.

*Note.*—This genus is allied to *Pirene*, and probably connects the *Spalangiidæ* and the *Ormoceridæ*.

### GENUS ASAPHES.<sup>b</sup> *Walker.*

Caput mediocre, thorace vix latius, transversum, non anticè productum, inter oculos subimpressum : oculi mediocres, laterales : ocelli supra verticem trigonè dispositi : mandibulæ arcuatæ, bidentatæ ; dentes longi, acuminati : maxillæ elongatæ, internè apicem versus in lobum productæ : palpi maxillares biarticulati, mediocres : mentum ovatum : labium sat longum, anticè impressum : palpi labiales breves, crassi, biarticulati ; *maris* antennæ 12-articulatæ, clavatæ, thorace breviores ; articulus 1<sup>us</sup>. gracilis, flagelli dimidio longior ; 2<sup>us</sup>. mediocris, elongato-cyathiformis ; 3<sup>us</sup>. minimus ; 4<sup>us</sup>. et 5 sequentes breves, cyathiformes ; clava ovata, acuminata, articulos 2 præcedentes longitudine adequans : *fem.* antennæ paullò breviores ; clava paullò brevior et obtusior : thorax ovatus, convexus : prothoracis scutellum magnum, subquadratum : mesothoracis scutum maximum ; parapsides benè determinatæ ; paraptera et scutum magna, hoc conicum : metathorax mediocris : *maris* abdomen ovatum, convexum ; segmenta 1<sup>um</sup>. et 2<sup>um</sup>. maxima, 4 sequentia minima ; segmenta 5 ventralia subtus conspicua : *fem.* abdomen paullò longius, subtus carinatum, apice elevatum ; segmenta 5 dorsalia subtus basin versus retracta, et ventralia nisi ad basin tegentia : oviductus subexertus : pedes simplices ; coxæ parvæ ; tibiæ rectæ, apice spinis armatæ ; tarsi graciles ; articuli 1<sup>mo</sup>. ad 4<sup>um</sup>. longitudine decrescentes, 5<sup>us</sup>. 4<sup>o</sup>. longior : unguis et pulvilli parvi : alæ angustæ ; nervus solitus ramulum sat longum emittens ; stigma ramulum emittens brevissimum.

<sup>b</sup> ἀσάφης, obscurus.

Sp. 1. Asa. vulgaris. Mas et Fem. *Viridis aut æneus, abdomine antennisque nigris, maris antennis fuscis, pedibus fuscis aut rufis, alis subfuscis aut hyalinis.*

*Mas.* Viridis, subnitens, subtilissimè punctatus, pubescens: oculi ocellique rufo-fusci: antennæ nigro-fuscæ, pubescentes; articulus 1<sup>us</sup>. nigro-viridis, nitens: squamulæ nigro-fuscæ: petiolus ater, obscurus, striatus: abdomen nigrum, nitidum, glabrum: pedes rufi, vix pubescentes; coxæ nigræ; trochanteres fusci; femora nigro-fusca, apice rufa; meso- et metatarsi pallidè rufi, apice necnon ungues et pulvilli omnes fusci: alæ subhyalinæ; nervi pallidè fusci; stigma parvum.

*Fem.* Caput et thorax ænea: antennæ nigræ; articulus 1<sup>us</sup>. æneo-ater: petiolus æneus: abdomen apice pubescens: pedes fusci; coxæ nigræ; femora nigro-fusca; tibiæ subtus et protibiæ omninò rufæ; tarsi rufi, apice fusci: alæ subfuscæ; nervi fusci. (Corp. long.  $\frac{1}{2}$ — $1\frac{1}{4}$  lin.; alar.  $\frac{2}{3}$ — $1\frac{2}{3}$  lin.)

*Var. β.*—*Mas.* metatibiæ fusco fasciatæ.

*Var. γ.*—*Mas.* thorax viridi-æneus.

*Var. δ.*—*Mas.* caput et thorax ænea.

*Var. ε.*—*Mas.* profemora rufa.

*Var. ζ.*—*Mas.* antennæ rufo-fuscæ; articulus 1<sup>us</sup>. nigro-viridis; clava rufa: pedes rufi; coxæ nigræ; meso- et metatarsi flavi: alæ fulvo-hyalinæ; nervi fulvi.

*Var. η.*—*Fem.* petiolus ater.

*Var. θ.*—*Fem.* caput et thorax viridia.

*Var. ι.*—*Fem.* meso- et metapedum tibiæ nigræ, tarsi nigro-fusci, apice nigri.

*Var. κ.*—*Fem.* caput et thorax viridi-ænea: protibiæ supra fusca: alæ subhyalinæ; nervi pallidè fusci.

*Var. λ.*—*Fem.* meso- et metatibiæ rufæ, fusco fasciatæ.

*Var. μ.*—*Fem.* femora et tibiæ obscurè rufa; meso- et metatarsi pallidiores, apice fusci.

*Var. ν.*—*Fem.* caput et thorax viridia: petiolus obscurè viridis: femora et tibiæ pallidè rufa; meso- et metatarsi flavi, apice fusci: alæ hyalinæ; nervi fulvi.

Common near London during the greater part of the year, on box-trees, in the spring. September; Isle of Wight. New Lanark.

GENUS, ISOSOMA, *Walker.*

Sp. 24. *Isos. flavicolle.* Fem. *Nigrum, prothorace pedibusque flavis, his nigro variegatis, alis subhyalinis.*

*Isos. fulvicolli* similis, differt abdomine alisque longioribus. Nigrum, obscurum, punctatum, pubescens: caput thorace latius: oculi ocellique obscurè rufi: mandibulæ rufo-fuscae: antennæ nigrae, pubescentes, thorace breviores; articulus 1<sup>us</sup>. rufus; 2<sup>us</sup>. apice fuscus: thorax elongatus, angustus: prothorax flavus, utrinque anticè pallidior, posticè nigro-fuscus, supra fusco vittatus: squamulæ nigro-fuscae: petiolus brevis: abdomen angustum, glabrum, nitidissimum, thorace vix brevius, apice elevatum et supra planum: oviductus subexertus, rufus: pedes rufi; coxæ fuscae; procoxæ flavæ, supra fusco maculatæ; profemora supra ad basin nigra; mesofemora nigra, metafemora fusca, ambæ apice rufa; mesotibiæ nigro-fusco, metatibiæ fulvo latè fasciatæ; meso- et metatarsi pallidè rufi, apice fusci: alæ subhyalinæ, pallidè flavescentes; nervi flavi; stigma parvum. (Corp. long.  $1\frac{1}{2}$ — $1\frac{3}{4}$  lin.; alar.  $2\frac{1}{4}$ — $2\frac{1}{2}$  lin.)

*Var. β.*—Antennæ articulo 1<sup>o</sup>. fusco: trochanteres fusci; femora omnia basi nigra; meso- et metatarsi flavi, apice fusci: alæ vix flavescentes.

July; on grass beneath trees; near London.

GENUS SYSTOLE, *Walker.*

Sp. 2. *Syst. platyptera.* Fem. *Nigra, alis subhyalinis.*

Lata, nigra, obscura, punctata, pubescens: caput thorace latius: oculi ocellique obscurè rufi: antennæ nigrae, pubescentes, thorace paullò breviores: thorax crassus, ferè gibbus; squamulæ nigrae, nitidæ: petiolus brevissimus: abdomen ovatum, glabrum, nitidissimum, thorace brevius et angustius: oviductus rufus, subexertus: pedes nigri, pubescentes; genua flava; protarsi rufi; meso- et metatarsi flavi, apice fusci: alæ latae, subhyalinæ; nervus solitus fuscus, ubi costam percurrit crassus; stigma parvum. (Corp. long.  $\frac{3}{4}$  lin.; alar.  $1\frac{1}{4}$  lin.)

July; on grass in fields; near London.

GENUS EURYTOMA, *Illiger*.

Sp. 12. Eur. acuminata. Fem. *Nigra, tarsis flavis, alis hyalinis. Plerisque hujus generis longior; E. nitida duplo major; E. longipenni et gracili alarum nervis pallidioribus, E. collari capite thoraceque latioribus distincta.*

Nigra, punctata, obscura, pubescens: caput thorace paullò latius: mandibulæ rufo-fuscæ: oculi ocellique rufi: antennæ nigrae, thorace breviores, fusco pubescentes; articulus 1<sup>us</sup>. basi, 2<sup>us</sup>. apice, 3<sup>us</sup>. 4<sup>us</sup>. que omninò fuscæ: squamulæ rufo-fuscæ: petiolus brevis, gracilis: abdomen ferè glabrum, nitidissimum, thoracem longitudine adequans, apice sparsè pubescens; segmentorum margines subtus abdomen fuscæ: oviductus rufus, subexertus; tegmina nigro-fusca, apice rufa: pedes nigri, pubescentes; trochanteres fuscæ; genua rufa; tibiæ apice tarsisque flavescens: alæ hyalinae, iridescentes; nervi pallidè fuscæ; stigma parvum. (Corp. long.  $1\frac{3}{4}$ —2 lin.; alar.  $2\frac{1}{4}$ — $2\frac{1}{2}$  lin.)

Taken near Paris, by M. F. de Laporte; and sent to me, as well as many of the following species, with manuscript names, which I have adopted.

Sp. 13. Eur. squamea. Fem. *Nigra, tarsis pallidè flavis, alis hyalinis. Præcedenti similis sed paullò crassior; E. verticillata et curta longior.*

Nigra, obscura, punctata, pubescens: caput thorace paullò latius: mandibulæ rufo-fuscæ: oculi ocellique obscurè rufi: antennæ nigrae, thorace breviores, fusco pubescentes; articulus 1<sup>us</sup>. basi rufo-fuscus: squamulæ rufo-fuscæ: petiolus brevis, gracilis: abdomen ferè glabrum, nitidissimum, thorace brevius, apice sparsè pubescens: oviductus rufus, subexertus; tegmina nigro-fusca, apice rufa: pedes nigri, pubescentes; trochanteres rufo-fuscæ; genua flava; tibiæ nigro-fuscæ, subtus pallidiores, apice basique rufæ; protibiæ rufæ, supra fusco vittatæ; tarsi pallidè flavi: alæ hyalinae, subiridescentes; nervi fulvi; stigma parvum. (Corp. long.  $1\frac{3}{4}$  lin.; alar.  $2\frac{1}{4}$  lin.)

*Var. β.*—Meso- et metatibiæ nigrae, apice basique rufæ.

Taken near Paris, by M. F. de Laporte.

Sp. 14. Eur. rufitarsus. Mas et Fem. *Statura præcedentis, tarsis rufis.*

*Mas.*—Nigra, obscura, punctata, pubescens: caput thorace paullò latius: mandibulæ rufo-fuscæ: oculi ocellique obscurè rufi: antennæ nigræ, fusco-pilosæ, thoracem longitudine adequantes; articulus 1<sup>us</sup>. basi rufo-fuscus: squamulæ rufo-fuscæ: petiolus mediocris: abdomen thoracis dimidio non longius, glabrum, nitidissimum: pedes nigri, pubescentes; trochanteres et genua rufo-fusca; tibiæ nigro-fuscæ, apice basique protibiæ subtus quoque rufæ; tarsi rufi: alæ hyalinæ, subiridescentes; nervi fulvi; stigma parvum.

*Fem.*—Antennæ breviores: petiolus brevis, gracilis: abdomen thorace paullò brevius, apice sparsè pubescens: oviductus rufus, subexertus; tegmina nigro-fusca, apice rufa: tibiæ nigræ, subtus fuscæ, apice basique rufæ. (Corp. long. 1½ lin.; alar. 2 lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 15. Eur. Salicis. Fem. *Nigra, tarsi flavis, alis hyalinis. Præcedentibus oviductu longiore distincta.*

Nigra, obscura, punctata, pubescens: caput thorace paullò latius: mandibulæ rufo-fuscæ: oculi ocellique obscurè rufi: antennæ nigræ, pubescentes, thorace breviores; articulus 1<sup>us</sup>. basi rufo-fuscus: squamulæ rufo-fuscæ: petiolus brevis: abdomen thorace vix brevius, ferè glabrum, nitidissimum, apice pubescens; segmentorum margines subtus fuscii: oviductus rufus, abdominis trientem longitudine adequans; tegmina nigro-fusca, apice rufa: pedes nigri, pubescentes; trochanteres fuscii; femora apice rufa; tibiæ fuscæ, subtus apice basique rufæ; tarsi flavii: alæ hyalinæ, subiridescentes; nervi fulvi; stigma parvum. (Corp. long. 1¾ lin.; alar. 2 lin.)

Reared by M. F. de Laporte, from galls on willows, near Paris.

Sp. 16. Eur. flavipes. Mas et Fem. *Nigra, pedibus flavis, alis hyalinis. Statura E. acuminatæ.*

*Mas.*—Nigra, punctata, obscura, pubescens: caput thorace paullò latius: mandibulæ rufo-fuscæ: oculi ocellique obscurè rufi: antennæ nigræ, pilosæ, apice rufo-fuscæ, thoracem longitudine adequantes; articulus 1<sup>us</sup>. basi rufus: thorax abdomine ferè duplò longior; squamulæ rufo-fuscæ: petiolus mediocris: abdomen ferè glabrum, nitidissimum: pedes pallidè rufi, pubescentes; coxæ nigræ; pro- et mesofemora basi fusca; metafemora et metatibiæ fusco cingulata; tarsi pallidè flavii: alæ hyalinæ, iridescentes; nervi pallidè fulvi; stigma parvum.



*Fem.*—Antennæ breviores, pubescentes, apice fuscae: petiolus brevis: abdomen thoracem longitudine adequans, apice sparsè pubescens; segmentorum margines subtus fusci: oviductus rufus, subexertus; tegmina nigro-fusca, apice rufa: pro- et mesotibiæ supra fusco vittata: metapedes nigri; femora et tibiæ apice basique, nec non tarsi omninò rufa. (Corp. long.  $1\frac{1}{2}$ — $1\frac{3}{4}$  lin.; alar.  $2\frac{1}{4}$  lin.)

Taken near Paris, by M. F. de Laporte.

### GENUS DECATOMA, *Spinola*.

\* *Macula stigmatalis sublunaris*.

Sp. 11. Dec. semifasciata. *Fem. Nigra, prothorace flavo bimaculato, antennis fuscis, pedibus flavo cingulatis, alis hyalinis.*

Nigra, obscura, punctata, sparsè pubescens: caput mesothorace paullò angustius: mandibulæ fuscae: oculi rufo-fusci, fulvo plus minusve cingulati: ocelli lætè rufi: antennæ fuscae, subtus flavæ, thoracis dimidio vix longiores; articuli 1<sup>us</sup>. 2<sup>us</sup>. et nonnunquam 3<sup>us</sup>. supra nigro-fusci: prothoracis scutelli latera anticè fulvo maculata: squamulæ rufo-fulvæ: petiolus brevis, gracilis: abdomen thorace brevius, glabrum, nitidissimum, immaculatum, basi rufo-fuscum, subtus et apice sparsè pubescens: oviductus subexertus, omninò rufus: pedes nigri, pubescentes; trochanteres flavi; pro- et mesofemora fusca, subtus et metafemora quoque apice flava; pro- et mesotibiæ flavæ, supra fusco vittata; metatibiæ nigro-fuscae, apice basique flavæ; tarsi flavi: alæ hyalinæ, iridescentes; macula in proalis prope stigma fusca, abbreviata, sublunaris, ad costam nigra; nervi fulvi; stigma parvum. (Corp. long.  $1\frac{1}{3}$ — $1\frac{1}{2}$  lin.; alar.  $2\frac{1}{4}$ — $2\frac{1}{2}$  lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 12. Dec. flavicollis. *Fem. Nigra, flavo variegata, antennis fuscis, prothorace pedibusque flavis, his nigro variegatis, alis hyalinis.*

Nigra, obscura, punctata, vix pubescens: caput thorace latius, subtus flavescens: oculi ocellique rufi: antennæ fuscae, pubescentes, thorace breviores; clava flava: prothorax omninò flavus: mesothorax anticè flavo 4-maculatus: squamulæ fuscae: petiolus mediocris: abdomen thorace vix brevius, glabrum, nitidissimum,

immaculatum: oviductus rufus, subexertus: pedes flavi; metacoxæ, pro- et mesofemora et protibiæ fusco maculata; metafemora apice nigra; meso- et metatibiæ fuscæ, apice basique flavæ; ungues et pulvilli fusci: alæ hyalinæ; macula in proalis prope stigma fusca, abbreviata, sublunaris, ad costam nigro-fusca; nervi fusci; stigma minimum. (Corp. long.  $\frac{2}{3}$  lin.; alar.  $\frac{3}{4}$  lin.)

July; on grass in woods; near London.

### Family TORYMIDÆ.

#### GENUS TORYMUS, *Dalman.*

A French species, at least thrice the size of *T. obscurus*, has the sutures between the scutum, and the parapsides of the mesothorax quite distinct.

#### GENUS MONODONTOMERUS, *Westwood.*

*Fem.*—Caput mediocre, thorace paullò latius: oculi mediocres: mandibulæ ferè rectæ, intùs emarginatæ, apice dentibus 3 vix acutis armatæ: maxillæ elongatæ, intùs apicem versus in lobum productæ: palpi maxillares ferè filiformes; articuli 1<sup>us</sup>. et 3<sup>us</sup>. breves, æquales; 2<sup>us</sup>. 1<sup>o</sup>. paullò longior et crassior; 4<sup>us</sup>. longus, subfusiformis: mentum conicum, basi subquadratum: labium latum, integrum, <sup>c</sup> anticè rotundatum et ciliatum: palpi labiales breves; articulus 1<sup>us</sup>. mediocris; 2<sup>us</sup>. parvus; 3<sup>us</sup>. 1<sup>o</sup>. æqualis, ovatus, apice acuminatus: antennæ 13-articulatæ, clavatæ, thorace breviores; articulus 1<sup>us</sup>. gracilis; 2<sup>us</sup>. cyathiformis, mediocris; 3<sup>us</sup>. minimus; 4<sup>us</sup>. et 6 sequentes æquales, subquadrati, approximati, clava ovata, articulis 2 præcedentibus brevior: thorax elongatus, convexus: prothoracis scutellum magnum, subquadratum: mesothoracis scutum et parapsides maxima, hæ benè determinatæ; scutellum magnum, elongato-ovatum: metathorax mediocris: abdomen sessile, compressum, thorace vix brevius: segmentum 1<sup>um</sup>. magnum, sequentia breviora: oviductus exertus: metapedes coxis femoribusque magnis, his subtus apicem versus unidentatis.

<sup>c</sup> The description of the labium of the *Torymidæ*, in page 115. Vol. I. of the Ent. Mag. is erroneous; it is short and undivided, both in this genus and in *Callimome*. *Perilampus* will form another family.

Sp. 1. Mon. stigma.

Diplolepis stigma . . *Fabr. &c.*

Callimome stigma . . *Ent. Mag.* Vol. I. p. 139. 61.

Sp. 2. Mon. pubescens.

Callimome pubescens . . . *Ent. Mag.* Vol. I. p. 138. 60.

Monodontomerus obscurus . *West. Lond. and Edinb. Phil.*  
*Mag.* Third Series. Vol. II.  
p. 443.

Sp. 3. Mon. obsoletus. Fem. *Nigro-viridis, oviductu abdomine brevior, antennis nigris, tibiis tarsis alisque fuscis.*

Ichneumon obsoletus . . *Fabr. Ent. Syst. Suppl.* 230. 218;  
*Coqueb. Illustr. Icon.* 1. Tab. 5.  
fig. 2.

Diplolepis obsoleta . . . *Fabr. Syst. Piezat.* 150. 10.

*Nigro-viridis*, obscurus, quasi squameus, pubescens: caput viride: mandibulæ rufo-fuscae: oculi ocellique rufi: antennæ nigrae, pubescentes; articulus 1<sup>us</sup>. viridi-æneus: prothorax viridis: squamulæ fuscae: abdomen nitens, ferè glabrum, thorace non longius, segmenta basi quasi squamea, apice pubescentia: oviductus rufus, abdomine paullò brevior; tegmina nigra, pubescentia: pedes fuscii, pubescentes; coxæ et femora obscurè viridia; tarsi pallidè fuscii, apice obscuriores: alæ fuscae; proalæ sub costam obscuriores; nervi fuscii; stigma mediocre. (Corp. long.  $1\frac{3}{4}$ — $1\frac{1}{2}$  lin.; alar.  $2\frac{1}{2}$ — $2\frac{3}{4}$  lin.)

Taken near Paris by M. F. de Laporte.

Sp. 4. Mon. æreus. Fem. *Æneo-viridis, oviductu abdomine multò brevior, antennis nigris, tibiis tarsisque rufo-fuscis, alis hyalinis.*

*Æneus*, parùm nitens, quasi squameus, pubescens: mandibulæ rufo-fuscae: oculi ocellique rufi: antennæ nigrae, pubescentes; articulus 1<sup>us</sup>. æneus: squamulæ rufo-fuscae: abdomen æneo-viride, ferè glabrum, apice sparsè pubescens, thorace non longius; segmenta apice ænea: oviductus rufus, abdominis dimidio vix longior; tegmina nigra, pubescentia: pedes rufo-fuscii, pubescentes; coxæ et femora obscurè viridi-ænea; tarsi rufi, subtus basi pallidiores, apice obscuriores; alæ hyalinae, iridescentes; nervi

fusci; stigma mediocre. (Corp. long.  $1\frac{1}{2}$ — $1\frac{2}{3}$  lin.; alar.  $2\frac{1}{4}$ — $2\frac{1}{2}$  lin.)

Var.  $\beta$ .—Caput et prothorax anticè viridi-ænea.

Taken near Paris, by M. F. de Laporte.

### GENUS DIOMORUS,<sup>d</sup> *Walker*.

Caput transversum, mediocre: oculi mediocres: antennæ 13-articulatæ, subfiliformes, medio frontis insertæ; articulus 1<sup>us</sup>. gracilis; 2<sup>us</sup>. parvus, cyathiformis; 3<sup>us</sup>. minimus; 4<sup>us</sup>. et 6 sequentes approximati, subæquales; clava conica, articulis 2 præcedentibus brevior: thorax elongato-ovatus, convexus: prothorax mediocris, anticè angustus: mesothoracis scutum magnum; parapsides conspicuæ, suturis distinctis; scutellum, paraptera et epimera benè determinata: metathorax parvus: abdomen elongato-ovatum, sessile, subcompressum, thorace non longius; segmentum 1<sup>um</sup>. longum, apice librum: oviductus exertus: pedes graciles, subæquales; coxæ mediocres; metafemora subtus apicem versus unidentata; tibiæ apice spinis armatæ; ungues et pulvilli parvi: nervus solitus ramulum emittens perbreve, apice subfurcatum.

Sp. 1. Dio. nobilis. Fem. *Æneo-viridis, antennis nigris, pedibus rufis, alis hyalinis.*

Viridis, nitens, quasi squameus, sparse pubescens: caput anticè viridi-æneum: oculi ocellique obscurè rufi: antennæ nigrae, pubescentes; articulus 1<sup>us</sup>. subtus et basi rufus: mandibulæ flavæ: thoracis segmentorum margines ænei: abdomen subtus fulvescens; latera ænea, cupreo maculata: oviductus corpore brevior: pedes rufi, pubescentes; coxæ virides; metafemora viridia, apice basi-que rufa: alæ subhyalinæ, prope costam paullò obscuriores; nervi fusci; stigma parvum. (Corp. long.  $1\frac{3}{4}$  lin.; alar.  $2\frac{3}{4}$  lin.)

Taken in Birchwood, by Mr. Davis, the end of July.

### GENUS CALLIMOME, *Spinola*.

Sp. 62. Callim inconstans. Fem. *Lætè viridis, oviductu corpore multò longiore, antennis nigro-fuscis, pedibus stramineis, alis hyalinis.*

Evania Bedeguaris? *Cuvier, Silbermann. Revue Ent. I. 154.*

Lætè viridis, nitens, quasi squameus, pubescens: caput thorace vix angustius: mandibulæ rufo-fuscæ: oculi ocellique obscurè rufi:

<sup>d</sup> δὲ bis, ὄμοιος affinis.

antennæ nigro-fuscæ, pubescentes; articulus 1<sup>us</sup>. flavus: caput anticè thoracisque latera æneo-viridia; squamulæ fulvæ: abdomen thorace longius, pubescens, ferè glabrum, apice basique æneo-viride, subtus rufo-fuscum et carinatum; segmenta dorsalia posticè purpureo-cyanea: oviductus corpore multò longior, rufus; tegmina fusca, pubescentia: pedes straminei, pubescentes; coxæ virides, apice flavæ; metafemora flavo cingulata; ungues et pulvilli fusi: alæ hyalinæ; nervi pallidè fusi; stigma minimum. (Corp. long.  $1\frac{1}{2}$ — $1\frac{2}{3}$  lin.; alar.  $2\frac{1}{2}$ —3 lin.)

*Var. β.*—Abdominis apex subtus cupreo-æneus.

*Var. γ.*—Abdomen apice basique viride.

*Var. δ.*—Metafemora viridi-flavo cingulata.

Taken near Paris, by M. F. de Laporte.

Sp. 63. Callim. lateralis. Fem. *Viridis, oviductu corpore longiore, antennis nigris, pedibus rufis, alis hyalinis.*

Viridis, nitens, quasi squameus, ferè glaber, sparsè pubescens: caput thorace vix angustius: mandibulæ rufo-fuscæ: oculi ocellique obscurè rufi: antennæ nigræ, pubescentes; articulus 1<sup>us</sup>. flavus: thoracis latera viridi-ænea: squamulæ rufæ: abdomen thoracè paullò longius, cupreo-æneum, subtus æneo-viride; segmentum 1<sup>um</sup>. viride: oviductus rufus, corpore longior; tegmina nigro-fusca, pubescentia: pedes pallidè rufi, pubescentes; coxæ æneo-virides; tarsi pallidè straminei; ungues et pulvilli fusi: alæ hyalinæ, paullò iridescentes; nervi fusi; stigma minimum. (Corp. long.  $1\frac{1}{3}$  lin.; alar.  $2\frac{1}{3}$  lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 64. Callim. rufipes. Fem. *Viridis, oviductu abdomine longiore, antennis nigris, pedibus rufis, alis subhyalinis.*

Viridis, nitens, quasi squameus, pubescens: caput thorace paullò latius: mandibulæ rufo-fuscæ: oculi ocellique obscurè rufi: antennæ nigræ, pubescentes; articulus 1<sup>us</sup>. nigro-viridis, subtus flavus; 2<sup>us</sup>. æneus: thoracis segmenta æneo submicantia; squamulæ rufæ: abdomen thorace paullò longius, ferè glabrum, cyaneo cupreoque micans, supra et apice æneum, vix pubescens: oviductus rufus, abdomine longior; tegmina nigra, pubescentia: pedes rufi, pubescentes; coxæ virides; tarsi pallidi, apice fusi: alæ subhyalinæ, iridescentes; nervi fusi; stigma parvum. (Corp. long.  $1\frac{1}{4}$  lin.; alar. 2 lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 65. Callim. compactus. Mas et Fem. *Viridis, oviductu corpore vix longiore, antennis fuscis (mas), aut nigris (fem.), pedibus flavis, femoribus viridibus, alis hyalinis.*

*Mas.*—Brevis, viridis, nitens, quasi squameus, pubescens: caput thorace vix latius, anticè cupreo-æneum: mandibulæ rufo-fuscæ: oculi ocellique rufi: antennæ fuscæ, pubescentes; articulus 1<sup>us</sup>. et 2<sup>us</sup>. viridi-ænei: thoracis latera cupreo-ænea: metathorax splendidè cupreus: abdomen thorace brevius, ferè glabrum, cupreo-æneum, supra viridescens: pedes flavi, pubescentes; coxæ et femora nisi ad apices viridia; trochanteres, tarsi apice, ungues et pulvilli fuscii: alæ hyalinæ, iridescentes; nervi fulvi; stigma minimum.

*Fem.*—Antennæ nigræ, graciliores; articuli 1<sup>us</sup>. et 2<sup>us</sup>. viridi-ænei: thoracis latera et metathorax æneo-viridia: abdomen thoracem longitudine adequans, æneo-viride, apice sparsè pubescens: oviductus corpore vix brevior, rufus; tegmina nigro-fusca, pubescentia. (Corp. long.  $\frac{3}{4}$ —1 lin.; alar. 1 $\frac{2}{3}$  lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 66. Callim. confusus. Mas. *Cyaneus, abdomine æneo, antennis nigris, tibiis tarsisque fuscis, alis subhyalinis.*

Viridi-cyaneus, nitens, quasi squameus, pubescens, caput mesothorace angustius, anticè viride; vertex purpureo-cyaneus: mandibulæ rufo-fuscæ: oculi ocellique obscurè rufi: antennæ nigræ, pubescentes; articulus 1<sup>us</sup>. viridis: thoracis latera viridia; mesothoracis scutum purpureo-cyaneum; squamulæ rufæ: abdomen thorace brevius, cupreo-æneum, ferè glabrum, apice pubescens; segmentum 1<sup>um</sup>. viride; pedes fuscii, pubescentes; coxæ et femora viridia; metacoxæ purpureo-cyaneæ; pro- et mesofemora apice basique fulva; tarsi pallidè fuscii, apice obscuriores: alæ subhyalinæ, iridescentes; nervi fuscii; stigma parvum. (Corp. long. 1 $\frac{1}{4}$  lin.; alar. 2 lin.)

Taken near Paris, by M. F. de Laporte.

#### GENUS ORMYRUS, *Westwood.*

Sp. 3. Orm. tubulosus. Mas et Fem. *Cyaneus, purpureo et cupreo variegatus, abdomine basi nitente, antennis nigris, pedibus plus minusve fuscis, alis subhyalinis.*

Cinips tubulosa. *Fonscol. Ann. Sci. Nat. XXVI. 290. 18.*



*Mas.*—Cyaneus, parùm nitens, quasi squameus, pubescens : caput thorace non latius, viride, anticè viridi-æneum : mandibulæ rufo-fuscae : oculi ocellique obscurè rufi : antennæ nigræ, pubescentes, apice fuscae, thorace breviores ; articulus 1<sup>us</sup>. æneus : thorax subtus glaber, nitidus : mesothoracis latera posticè et metathorax omninò viridia : squamulæ rufo-fuscae : abdomen thorace paullò longius, nigro-cyaneum, obscurum, punctis magnis confertim sparsum ; segmenta apice ænea, læviora ; segmentum 1<sup>um</sup>. viride, apice æneum, nitens, quasi squameum : pedes cyanei, pubescentes ; trochanteres fusci ; protibiæ fuscae, subtus rufæ ; meso- et metatibiæ nigro-fuscae ; tarsi rufo-fusci, apice fusci ; meso- et metatarsi basi pallidè rufi : alæ griseo-hyalinæ ; nervi fusci ; stigma parvum.

*Fem.* — Caput viride, anticè aureum : thorax viridis, nitens : prothorax posticè, mesothoracis dorsum et metathoracis latera purpurea : abdomen æneo-cupreum, parùm nitens, quasi squameum, thorace multò longius, apice productum, tubuliforme, acuminatum ; segmentum 1<sup>um</sup>. nitens, basi glabrum nitidissimum, apice aureum ; 4 sequentia utrinque basi et nonnunquam ferè ad apices cyaneo-viridia, punctata et quasi denticulata : oviductus rufus, non exertus : tibiæ rufæ, supra ad apices fuscae ; tarsi 4 postici basi straminei. (Corp. long. 1—2½ lin. ; alar. 1½—3¼ lin.)

*Var. β.*—*Mas*, prothorax viridis.

*Var. γ.*—*Mas*, mesothoracis scutum cyaneo-purpureum.

*Var. δ.*—*Mas*, thoracis dorsum et abdomen nisi ad basin purpurea.

*Var. ε.*—*Mas*, caput anticè et metathorax aurea : prothorax viridis : abdominis segmentum 1<sup>um</sup>. æneum.

*Var. ζ.*—*Mas*, caput viride, nitens, quò insident antennæ cyaneum : pro- et mesothoracis dorsum et latera ferè omninò purpurea.

*Var. η.*—*Mas*, caput et thorace viridia : mesothorax nisi ad scutelli apicem purpureus.

*Var. θ.*—*Fem.* abdominis segmentum 1<sup>um</sup>. cupreum, basi æneo-viride.

*Var. ι.*—*Fem.* prothorax supra cyaneus.

*Var. κ.*—*Fem.* tibiæ fuscae, protibiæ apice rufæ.

*Var. λ.*—*Fem.* oculi ocellique lætè rufi : abdomen obscurè cupreum ; segmentum 1<sup>um</sup>. viride ; 4 sequentia utrinque basi purpureo-cyanea ; meso- et metatibiæ nigro-fuscae.

Reared by M. F. de Laporte, from galls attached to the bark of oak trees near Paris.—A smaller gall found in the

same situations, has produced *O. punctiger*, which is probably parasitic upon *Cynips megaptera*, (Pz.) an inhabitant of the same galls, during its larva and pupa state.

GENUS PERILAMPUS, *Latreille*.

Sp. 7. Peril. nitens. Fem. *Cyaneo-viridis, antennis nigris, tarsis rufis, proalis latè fusco fasciatis.*

Cyaneo-viridis, nitens, scaberrimus, pubescens : caput anticè et utrinque ferè glabrum ; latera striata : mandibulæ rufæ : oculi fusci : ocelli rufo-fusci : antennæ nigræ, subtus nigro-fuscæ, fusco pubescentes ; articulus 1<sup>us</sup>. nigro-viridis, nitidus, apice basique rufo-fuscus : prothoracis latera, mesothoracis paraptera et epimera mesothoracisque scutum et scutellum æneo-viridia : mesothoracis scutellum tuberculatum : squamulæ rufo-fuscæ : abdomen glabrum, nitidissimum, subtus viridi-æneum et pubescens : pedes cyaneo-virides, pubescentes ; genua fusca ; protibiæ subtus rufo-fuscæ ; tarsi rufi ; ungues et pulvilli fusci : alæ hyalinæ ; proalæ medio fuscæ ; nervi nigro-fusci ; stigma parvum. (Corp. long. 2¼ lin. ; alar. 3½ lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 8. Peril. antennatus. Mas. *Viridis, abdomine nigro-æneo, antennis nigris crassis, alis subfuscis.*

Obscurè viridis, nitens, scaberrimus, pubescens ; caput anticè et utrinque ferè glabrum ; latera striata : mandibulæ rufæ : oculi fusci : ocelli rufo-fusci : antennæ maximæ, nigræ, pubescentes ; articulus 1<sup>us</sup>. nigro-viridis, nitidus : capitis thoracisque latera mesothoracisque scutellum æneo-viridia, hoc tuberculatum : squamulæ rufo-fuscæ : abdomen cupreo-æneum, glabrum, parùm nitidum, sparsè pubescens, apice lætè æneum et nitidissimum : pedes virides, pubescentes ; genua rufo-fusca ; protibiæ subtus rufæ ; tarsi rufi : alæ sub-fuscæ ; proalæ sub-costam obscuriores ; nervi nigro-fusci ; stigma parvum. (Corp. long. 1¾ lin. ; alar. 3 lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 9. Peril. violaceus. Fem. *Viridi-æneus, abdomine cyaneo, antennis<sup>e</sup> protibiisque tarsisque rufis, alis hyalinis.*

*Réaum. Mém. Insect. II. Pl. 37.*

fig. 11, 12. ?

\* *Maris* antennæ nigro-fuscæ.

- Chalcis violacea . . . . *Panz. Faun. Insect.* 88. 15.  
 Diplolepis violacea . . *Fabr. Syst. Piezat.* 149. 4.  
 Cynips violacea . . . . *Latr. Hist. Nat. des Insect.* XIII.  
                                   222. 3.  
 Cinipsillum violaceum . *Lam. Anim. sans Vertèbr.* IV. 157.  
 Perilampus violaceus . *Lat. Gén. Crust. et Insect.* IV. 30.;  
                                   *Dalm. Stockh. Trans.* 1822. 398.;  
                                   *Encycl. Méthod.* X. 66.; *Fonscol.*  
                                   *Ann. Sci. Nat.* XXVI. 300. 2.  
 Diplolepis ruficornis . *Fabr. Syst. Piezat.* 149. 1.; *Coqueb.*  
                                   *Illustr. Icon.* I. Tab. 1. fig. 8.  
 Cynips ruficornis . . . *Latr. Hist. Nat. des Insect.* XIII.  
                                   222. 2.  
 Perilampus ruficornis . *Latr. Gén. Crust. et Insect.* IV. 30.;  
                                   *Fonscol. Ann. Sci. Nat.* XXVI.  
                                   300. 3.

*Obs.*—*P. nigricornis* and *P. pallipes* are probably only varieties of the male and female of this species.

Obscurè æneo-viridis, parùm nitens, scaberrimus, pubescens: caput anticè et utrinque ferè glabrum; latera striata; frons nigro-viridis: mandibulæ rufo-fuscae: oculi fusci: ocelli obscurè rufi: antennæ rufæ, pubescentes, apice fuscae; articulus 1<sup>us</sup>. ater, nitidus; 2<sup>us</sup>. fuscus: squamulæ rufo-fuscae: mesothoracis scutellum tuberculatum: metathorax nigro-viridis: abdomen cyaneum, glabrum, nitidissimum: pedes cyanei, pubescentes; genua rufo-fusca; tibiæ subtus apice fuscae; tarsi rufi: alæ subhyalinæ; proalæ sub-costam obscuriores; nervi fusci; stigma parvum. (Corp. long. 1½—2 lin.; alar. 2½—3½ lin.)

*Var β.*—Mesothoracis scutellum nigro-viride: abdominis latera cupreo maculata; protibiæ supra apice et subtus omninò fuscae.

*Var. γ.*—Caput supra thoracisque dorsum ænea.

Taken near Paris, by M. F. de Laporte.

Sp. 10. *Peril. auratus.* Fem. *Lætè aureus, thorace pedibusque cyaneis, antennis tarsisque rufis, alis albis.*

*Cynips aurata* . . . *Pans. Faun. Insect.* 51. 1.

*Perilampus auratus* . *Dalm. Stockh. Trans.* 1822. 397.

*Perilampus chrysis* . *Fonscol. Ann. Sci. Nat.* XXVI. 301. 4.

*Auratus*, nitens, scaberrimus, sparsè pubescens: caput ferè glabrum, anticè et utrinque cupreo-auratum; latera striata: mandibulæ

rufo-fuscæ: oculi fusci: ocelli obscurè rufi: antennæ rufæ, vix pubescentes; articulus 1<sup>us</sup>. viridis, nitidus; 2<sup>us</sup>. fuscus: thorax cyaneus: pro- et mesothorax viridi, hic quoque purpureo variegati: squamulæ rufo-fuscæ: mesothoracis scutellum tuberculatum, apice bidentatum: abdomen glabrum, nitidissimum, apice aureo-viride: pedes cyanei, pubescentes; femora purpureo notata; genua rufo-fusca; tibiæ æneo-fuscæ, apice et subtus pallidiores; tarsi rufi: alæ albo-hyalinæ; nervi pallidè fusci; stigma parvum. (Corp. long. 1½ lin.; alar. 2½ lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 11. Peril. splendidus. Mas et Fem. *Cyaneo-viridis, thorace cupreo, antennis nigris, tarsis flavis, alis subhyalinis.*

Dipolepis Italicus . . . *Panz. Faun. Insect.* 100. 16.

Perilampus splendidus . . . *Dalm. Stockh. Trans.* 1822. 397.

Perilampus Italicus . . . *Fonscol. Ann. Sci. Nat.* XXVI. 300.

Evania cocorum . . . *Cuvier. Silbermann, Revue Ent.* I. 153.

*P. Italico* simillimus, cyaneus, nitens, scaberrimus, pubescens: caput viridi-cyaneum, anticè et utrinque ferè glabrum; latera striata; frons viridis: mandibulæ rufo-fuscæ: oculi fusci: ocelli obscurè rufi: antennæ nigræ, pubescentes; articuli 1<sup>us</sup>. et 2<sup>us</sup>. virides, glabri: thorax splendidè cupreus, subtus obscurior; squamulæ rufo-fuscæ: mesothoracis scutellum tuberculatum, apice bidentatum; metathorax viridis: abdomen glabrum, nitidissimum, subtus æneo-viride, apice cyaneo-viride et pubescens, *maris* basi nigro-cyaneum: pedes viridi-cyanei, pubescentes; genua fusca; tibiæ nigro-virides, subtus et apice rufo-fuscæ; tarsi rufi: alæ subhyalinæ; proalæ sub-costam obscuriores; nervi fusci; stigma parvum. (Corp. long. 1¾—2 lin.; alar. 2¾—3¼ lin.)

Var. *β.*—*Fem.* caput viride, anticè cupreum: abdomen viride, subtus cupreum: femora æneo-viridia.

Taken near Paris, by M. F. Laporte.

Sp. 12. Peril. lævifrons. Mas et Fem. *Nigro-æneus, antennis nigro-fuscis, tarsis rufis, alis hyalinis.*

Perilampus lævifrons . . . *Dalm. Stockh. Trans.* 1822. 399.

Nigro-æneus, parùm nitens, scaber, sparsè pubescens: caput nigrum, anticè nigro-æneum glabrum nitidissimum: mandibulæ rufo-fuscæ: oculi ocellique obscurè fusci: antennæ graciles, pubescentes, nigro-fuscæ, apice subtus pallidiores; articulus 1<sup>us</sup>. nigro-æneus.

nitidus: squamulæ rufo-fuscæ: mesothoracis scutellum tuberculatum: abdomen glabrum, nitidissimum: pedes nigro-virides; trochanteres fuscæ; tibiæ apice et subtus rufo-fuscæ; tarsi rufi: alæ hyalinæ: nervi fuscæ: stigma parvum. (Corp. long.  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.; alar.  $2$ — $2\frac{1}{2}$  lin.)

Taken near Paris, by M. F. de Laporte.

Family MISCOGASTERIDÆ.<sup>f</sup>

GENUS DIPARA, Walker.

Nervus solitus costam per omnem per ejus longitudinem percurrrens non ut *Chalciditum* plerisque basi subcostalis.

Sp. 2. Dip. cinetoïdes. Mas. *Atra, antennis nigro-fuscis, petiolo pedibusque flavis, alis pallidè fulvis.*

*D. petiolato* nimis affinis; statura multò majore, abdomine longiore differt: ater, parùm nitens, subtiliter punctatus: oculi ocellique obscurè rufi: antennæ nigro-fuscæ; articulus 1<sup>us</sup>. omninò, 2<sup>us</sup>. apice, 3<sup>us</sup>. que basi subtus flavi: mesothoracis paraptera magna: metathorax scaber, non canaliculatus: petiolus flavus, apice crassior, abdominis dimidio paullò longior: abdomen ovatum, nitidum, glabrum; segmentum basale maximum, ejus dimidium occupans; sequentia parva, subæqualia: pedes omninò flavæ; metacoxæ elongatæ: alæ pallidè fulvæ, ciliatæ; nervi fulvi; stigma parvum. (Corp. long. 1 lin.; alar.  $1\frac{2}{3}$  lin.)

Taken near Darlington, in Durham, by the Rev. G. T. Rudd, who observed to me that the abdomen was formed as in *Cinetus*, which it also resembles in some other characters, but has most affinity to the *Chalcidites*.

GENUS MERISUS,<sup>g</sup> Walker.

*Fem.*—Caput magnum, thorace latius: oculi mediocres: antennæ 12-articulatæ, subfusiformes, thorace breviores; articulus 1<sup>us</sup>. gracilis; 2<sup>us</sup>. brevi-cyathiformis; 3<sup>us</sup>. et sequentes ad 9<sup>um</sup>. paulatim graciliores; clava acuminata, articulis 2 præcedentibus paullò longior: thorax elongatus: prothoracis scutellum magnum, subquadratum: mesothoracis scutum magnum; parapsidum suturæ vix conspicuæ; scutellum convexum, ovatum: meta-

<sup>f</sup> The name *Miscogaster* (Ent. Mag. Vol. I. p. 458.) must fall; the genus had already been described by Mr. Westwood (Magazine of Nat. Hist. No. XXXII. p. 121.) under the name of *Lamprotatus*.

<sup>g</sup> μέγος pars, ισος æqualis.

thoracis scutellum magnum: petiolus brevissimus, latus: abdomen elongato-ovatum, convexum; segmentum 1<sup>um</sup>. mediocre; 2<sup>um</sup>. breve; 3<sup>o</sup> ad 5<sup>um</sup>. longitudine crescentia; 6<sup>um</sup>. 5<sup>o</sup>. paullo brevius: oviductus non exertus: pedes simplices; coxæ parvæ; femora subclavata; tibiæ rectæ; tarsi graciles; ungues et pulvilli parvi: alæ mediocres; nervus solitus simplex; stigma vix bifurcatum.

Sp. 1. Mer. splendidus. Fem. *Cyaneo-viridis, abdomine purpureo-æneo, antennis fuscis, pedibus stramineis, alis albis.*

Viridis, nitens, quasi squameus: caput cyaneo-viride: oculi ocellique obscure rufi; antennæ fuscæ, subtus et apice flavæ: squamulæ flavæ: abdomen purpureo-æneum, nitidum, glabrum, sparsè pubescens: segmentum 1<sup>um</sup>. viride; sequentia apice cyanea: pedes straminei; coxæ virides; trochanteres fusco maculati; femora viridi fasciata; tarsi apice fulvi; ungues et pulvilli fuscii: alæ albæ; nervi flavi; stigma parvum. (Corp. long. 1½ lin.; alar. 2 lin.)

July; south of France.

### Family ORMOCERIDÆ.

Corpus multiforme: caput transversum, nonnunquam anticè subproductum: oculi mediocres, laterales: ocelli supra verticem trigonè dispositi: os parvum: mandibulæ subquadratae, sæpe dissimiles: maxillæ elongatæ, graciles, subarcuatæ, intus apicem versus in lobum productæ: palpi maxillares articulis 4; 1<sup>us</sup>., 2<sup>us</sup>. et 3<sup>us</sup>. subæquales; 4<sup>us</sup>. longior: mentum obconicum, aut ferè rotundum: labium fissum; latera apice convenientia: palpi labiales 3-articulati, breves, lati; articulus 1<sup>us</sup>. mediocris; 2<sup>us</sup>. brevior; 3<sup>us</sup>. longior: antennæ 12- 13-articulatæ, frontis basi insertæ, plus minusve moniliformes; articulus 1<sup>us</sup>. longus, gracilis; 2<sup>us</sup>. brevis, cyathiformis; 3<sup>us</sup>. et 4<sup>us</sup>. minimi: thorax ovatus: pro- et metathorax parvi: pectus parvum: abdomen sessile, sæpe compressum, plerumque longius quàm latum, supra planum, fem. subtus carinatum; segmenta ventralia vix conspicua: pedes simplices, subæquales; coxæ parvæ; tibiæ rectæ, apice spinis armatæ; tarsi graciles, apice spinis armati, articuli 1<sup>o</sup>. ad 4<sup>um</sup>. longitudine decrescentes, 5<sup>us</sup>. 4<sup>o</sup>. longior; ungues et pulvilli parvi: alæ plerumque latæ; nervus solitus costam ante alæ medium attingens et mox ramulum stigmaticalem sat longum emittens: metalæ nervo unico, simplici, subcostali, costæ medium attingente.



*Obs.*—*Ormocerus*, *Glyphe*, and *Gastrancistrus*, are the only genera whose mouths I have examined. The labium is divided like that of *Perilampus*.

*Characteres Generum.*

Abdomen	} non compressum.	} compressum.	} Antennæ articulo ultimo	} trigono aut rotundato,	} elongato, acuminato.	} cornu ar- matum.	} inerme .	13. . . . . 1.ORMOCERUS.	
								12. . . . . 2.MICRADELUS.	
								} 3.GLYPHE.	
								} 4.GASTRANCISTRUS.	
} planus.	} convexus	} Antennæ articulo ultimo	} trigono aut rotundato,	} elongato, acuminato.	} Fem. abdomen apice brevi	} . . . . .	} . . . . .	5.MEROMALUS.	
								6.RHAPHITELUS.	
								7.PSILONOTUS.	

GENUS I. ORMOCERUS,<sup>h</sup> *Walker*.

Caput mediocre, thorace paullò latius: palpi maxillares graciles, apice paullò crassiores: antennæ 13-articulatæ, corpore multò breviores, submoniliformes, clavatæ aut subfiliformes, pubescentes; articuli 5<sup>o</sup> ad 10<sup>um</sup>. breves, subæquales; clava articulis 2 præcedentibus longior et paullò latior, apice acuminata: thorax supra convexus; mesothoracis scutum magnum; parapsides benè determinatæ, suturis distinctis; paraptera, epimera et scutellum magna, hoc semiovatum: abdomen ovatum, thorace paullò longius, apice acuminatum; segmentum 1<sup>um</sup>. longum; sequentia breviora, subæqualia; segmenta ventralia haud conspicua: oviductus non exertus: nervus solitus ante costam attingit nervulum rejiciens brevissimum; stigma nervulum brevissimum emittens.

Sp. 1. *Orm. latus*. Mas. *Viridis, abdomine cupreo, antennis nigro-fuscis, pedibus viridibus, alis subfuscis.*

Oculi ocellique obscurè rufi: antennæ nigro-fuscæ, subclavatæ, corporis dimidio vix longiores; articulus 1<sup>us</sup>. viridis: thorax nitidus, ferè glaber: mesothorax apice et metathorax æneo-virides: abdomen thorace brevius, cupreum, basi æneum: pedes virides; trochanteres fusci; genua flava; tarsi nigro-fusci: alæ subfuscæ; nervi fulvo-fusci; stigma parvum. (Corp. long.  $\frac{3}{8}$  lin.; alar. 1 lin.)

*Var. β.*—Abdomen basi æneo-viride: tarsi fusci.

June; on grass beneath trees; near London.

<sup>h</sup> ὄρμος monile, κέρασ cornu.

Sp. 2. Orm. simplex. Mas. *Viridis aut cyaneo-viridis, abdomine cupreo, antennis nigro-fuscis, pedibus viridibus, alis hyalinis.*

Cyaneo-viridis: oculi ocellique obscurè rufi: antennæ subfiliformes, nigro-fuscæ; articuli 1<sup>us</sup>. et 2<sup>us</sup>. nigro-virides: thorax nitidus, ferè glaber; mesothoracis scutellum obscurè cupreum: abdomen cupreum, viridi marginatum: pedes virides; trochanteres, protibiæ et protarsi fusca; genua flava; meso- et metatarsi straminei, apice fusci: alæ hyalinæ; nervi fusci; stigma parvum. (Corp. long.  $\frac{3}{4}$  lin.; alar.  $\frac{3}{4}$  lin.)

Var.  $\beta$ .—Viridis: abdomen cupreum, basi viride.

June; on grass in woods; near London. New Forest, Hampshire.

Sp. 3. Orm. vernalis. Fem. *Viridis, thorace posticè abdomineque cupreis, antennis nigris, pedibus viridibus, alis subfuscis, proalis fusco maculatis.*

Viridis, nitens: oculi ocellique obscurè rufi: mandibulæ subarcuatæ, breves; una tridentata, dente externa arcuata acuta, interna lata obtusa; altera 4 dentata, dentibus omnibus acutis: antennæ nigræ, clavatæ, corporis dimidio breviores; articulus 1<sup>us</sup>. viridis: mesothoracis scutum et parapsides cupreo vittata; scutellum, paraptera, epimera et metathorax omninò cuprea: abdomen purpureo-cupreum, basi cupreo-viride: pedes virides; trochanteres et genua fusca; tarsi nigri: alæ subfuscæ; proalæ maculâ magna oblonga subcostali; nervi fusci; stigma parvum; metalæ nervo apicem versus crasso, pallido. (Corp. long.  $\frac{3}{4}$ —1 lin.; alar. 1—1 $\frac{1}{2}$  lin.)

Var.  $\beta$ .—Mesothoracis vittæ diffusæ, vix distinctæ.

Var.  $\gamma$ .—Proalarum maculæ bipartitæ.

Var.  $\delta$ .—Abdomen viridi-æneum.

Var.  $\epsilon$ .—Thorax omninò viridis: proalarum maculæ ferè obsoletæ.

Sp. 4. Orm. maritimus. Fem. *Viridi-cupreus, antennis nigris, pedibus nigro-fuscis, alis fuscis.*

Viridi-cupreus, punctatus, obscurus: oculi ocellique obscuri rufi: antennæ nigræ; articulus 1<sup>us</sup>. nigro-æneus: mandibulæ similes, subarcuatæ, apice dentibus 4 acutis armatæ: metathoracis scutellum tuberculatum: abdomen cupreum, glabrum, nitens, basi angustum; segmentum 1<sup>um</sup>. viridi fasciatum: pedes nigri, pubes-

centes; coxæ nigro-virides; femora rufo-fusca; tarsi fusci: alæ fuscæ, proalæ sub costa obscuriores; nervi fusci; stigma parvum. (Corp. long. 1—1½ lin.; alar. 1½—2 lin.)

*Var. β.*—Abdomen apice viride.

On plants by the sea-shore; June, near Lymington, in Hampshire; September, Isle of Wight.

## GENUS II.—MICRADELUS,<sup>i</sup> *Walker.*

Corpus triplò longius quam latum: caput mediocre, thorace non latius: antennæ 12-articulatæ, corporis dimidio paullò breviores, clavatæ, apice acuminatæ, pubescentes; articuli 5<sup>o</sup>. ad 9<sup>um</sup>. subcyathiformes; clava acuminata, articulis 2 præcedentibus longior et latior: thorax convexus: mesothoracis scutum magnum; parapsides benè determinatæ, suturis distinctis; paraptera et epimera magna; scutellum magnum, semi-ovatum: abdomen breve, ferè rotundum: oviductus non exertus: nervus solitus ante costam attingit nervulum rejiciens brevem; stigma nervulum brevem emittens.

Sp. 1. *Micr. rotundus.* Mas et Fem. *Ater, antennis pedibusque nigris, alis fuscis.*

*Ater*, nitidus, ferè glaber: oculi ocellique obscurè rufi: antennæ nigræ, *fem.* crassæ: abdomen *maris* brevi-ovatum, *fem.* subrotundum: pedes nigri; genua fusca; *fem.* progenua flava; tarsi *maris* nigro-fusci, *fem.* fusci apice obscuriores: alæ fuscæ; nervi obscuriores; stigma parvum. (Corp. long. ¼—½ lin.; alar. ½—¾ lin.)

September; Isle of Wight.

## GENUS III.—GLYPHE,<sup>k</sup> *Walker.*

*Fem.*—Caput mediocre, thorace vix latius: antennæ 12-articulatæ, corporis dimidio non longiores, subclavatæ, pubescentes, submoniliformes; articuli 5<sup>o</sup>. ad 9<sup>um</sup>. subæquales, discreti; clava articulis 2 præcedentibus longior et multò latior, ovata, apice acuminata: mandibulæ dissimiles; una arcuata, dentibus 4 acutis armata; altera ferè recta, inermis: pro- et metathorax minimi:

<sup>i</sup> μικρὸς parvus, ἄδηλος obscurus.

<sup>k</sup> γλυφῆ, sculptura.

mesothoracis scutum maximum; parapsides optimè determinatæ, valde convexæ; scutellum magnum, convexum: abdomen elongato-ovatum, subcompressum, apice acuminatum, inerme; segmenta subæqualia: oviductus non exertus: alæ amplæ; stigma nervulum brevissimum emittens.

Sp. 1. Gly. autumnalis. Fem. *Æneo-viridis*, *antennis fuscis*, *pedibus stramineis*, *alis hyalinis*.

*Æneo-viridis*, nitida, ferè glabra: oculi ocellique obscurè rufi: antennæ fuscæ, corporis dimidio non longiores; articulus 1<sup>us</sup>. rufus: thorax posticè cupreo-æneus: abdomen thorace longius et angustius: pedes straminei; coxæ æneo-virides; femora viridia, apice basique straminea; tarsi apice nigro-fusci: alæ hyalinæ; nervi fulvi; stigma parvum. (Corp. long.  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.; alar.  $1\frac{3}{4}$ —2 lin.)

October; on flowers of the ivy; near London.

#### GENUS IV.—GASTRANCISTRUS, *Westwood*.

Caput plerumque thorace latius, anticè subproductum: *maris* antennæ 13-articulatæ, corporis dimidio longiores, moniliformes, latæ, apice acuminatæ; articuli 6<sup>o</sup>. ad 10<sup>um</sup>. subæquales, discreti; clava valdè acuminata, articulis 2 præcedentibus vix longior: *fem.* antennæ paullò breviores, 12-articulatæ, subclavatæ, submoniliformes; articuli 5<sup>o</sup>. ad 9<sup>um</sup>. subæquales, vix discreti; clava conica, articulis 2 præcedentibus longior et latior: mandibulæ similes, subarcuatæ, apice dentibus 4 parvis acutis armatæ: thorax convexus; mesothoracis scutum magnum; parapsides optimè determinatæ; paraptera et epimera magna, trigona; scutellum magnum, angustum: *maris* abdomen subcompressum, thorace paullò brevius et angustius, sublineare, apice latius, supra basin versus canaliculatum; segmenta subæqualia: *fem.* abdomen thorace paullò longius, acuminatum, apice supra cornu minuto armatum; latera elevata: oviductus plus minusve exertus: alæ latæ; nervus solitus ante costam attingit nervulum rejiciens brevissimum; stigma nervulum brevissimum emittens.

Sp. 1. Gast. fuscicornis. Mas. *Ater*, *antennis fuscis*, *pedibus flavis fusco cingulatis*, *alis hyalinis*.

*Æneo-ater*, nitidus, ferè glaber: caput magnum: oculi ocellique obscurè rufi: antennæ fuscæ; articulus 1<sup>us</sup>. ater, basi apiceque

fuscus : metathorax obscurè viridis : abdomen subcompressum, basi obscurè viride : pedes flavi ; coxæ nigræ ; femora nigro-fusco fasciata ; metafemora nigro-fusca, basi apiceque flava ; metatibæ fusco fasciatae ; tarsi apice fusci : alæ hyalinæ ; nervi nigro-fusci ; stigma parvum. (Corp. long.  $\frac{1}{2}$ — $\frac{2}{3}$  lin. ; alar.  $\frac{2}{3}$ — $\frac{3}{4}$  lin.)

*Var. β.*—Femora omnia nigro-fusca, basi apiceque flava.

*Var. γ.*—Pro- et mesotibæ fulvæ, basi apiceque flavæ.

June and July ; on grass beneath trees ; near London.

Sp. 2. *Gast. compressus.* Mas. *Obscurè viridis, antennis fuscis, pedibus flavis, femoribus nigris, alis hyalinis.*

Obscurè viridis, nitidus, ferè glaber : caput magnum : oculi ocellique obscurè rufi : antennæ fuscæ ; articulus 1<sup>us</sup>. obscurè viridis : mesothoracis scutellum viridi-æneum : abdomen æneum, basi viride, valdè compressum : pedes flavi ; coxæ virides ; trochanteres fusci ; femora nigra, apice flava ; protarsi fulvi ; meso- et metatarsi straminei, apice fulvi : alæ hyalinæ ; nervus solitus fuscus, ubi costam percurrit latus ; stigma parvum. (Corp. long.  $\frac{2}{3}$ — $\frac{3}{4}$  lin. ; alar.  $\frac{3}{4}$ —1 lin.)

*Var. β.*—Mesothoracis scutellum cupreo-æneum.

*Var. γ.*—Pro- et mesofemora flava, subtus per longum nigro maculata.

*Var. δ.*—Abdomen basi cyaneo-viride.

June ; on grass beneath trees ; near London.

Sp. 3. *Gast. tenuicornis.* Mas et Fem. *Æneo-viridis, antennis fuscis, pedibus flavis fusco cingulatis, alis subfuscis.*

*Mas.*—Obscurè æneo-viridis : oculi ocellique rufi : antennæ fuscæ, subtus flavæ ; articulus 1<sup>us</sup>. nigro-viridis ; 2<sup>us</sup>. nigro-fuscus : pedes flavi ; coxæ nigro-virides ; femora fusca, apice basique flava ; metatibæ fuscæ ; tarsi apice fusci : alæ subfuscæ ; nervi fusci ; stigma mediocre.

*Fem.*—Obscurè viridis ; metathorax nitidior : abdomen obscurè æneum, basi viride : antennæ nigro-fuscæ ; articulus 1<sup>us</sup>. niger : oviductus brevis. (Corp. long.  $\frac{1}{2}$  lin. ; alar.  $\frac{2}{3}$  lin.)

*Vr. β.*—*Mas*, caput mesothoracisque latera viridia : pro- et mesotibæ fusco-fulvæ.

May ; on grass beneath trees ; near London.

Sp. 4. Gast. vagans. Fem. *Æneo-viridis, antennis pedibusque fuscis, his viridi flavoque variegatis, alis subhyalinis.*

Gastrancistrus vagans. *Westwood, Lond. and Edinb. Phil. Mag. Third Series. Vol. II. No. XII. p. 444.*

Caput viride, mediocre, thorace vix latius: oculi ocellique rufi: antennæ fuscae; articulus 1<sup>us</sup>. viridis aut viridi-fuscus; 5<sup>us</sup>. et 4 sequentes breves, cyathiformes; clava articulis 2 præcedentibus paulò longior et multò latior: mesothoracis scutellum obscurè cupreum: abdomen compressum, cupreo-æneum, nitens, basi æneo-viride, apice cornu brevi setigero armatum: oviductus abdominis dimidio longior, fulvus; tegmina nigro-fusca: pedes fusci; coxæ virides; femora viridi latè cingulata; pro- et mesotibiæ flavæ; tarsi flavi, apice fusci: alæ subhyalinæ; nervi pallidè fusci; stigma parvum. (Corp. cum ovid. long.  $\frac{3}{4}$ —1 lin.; alar.  $\frac{3}{4}$ —1 lin.)

*Var. β.*—Meso- et rariùs protibiæ fusco-cingulatæ.

*Var. γ.*—Thorax anticè viridis: abdomen viride, apice æneum.

*Var. δ.*—Thorax æneus; mesothoracis scutellum obscurè cupreum.

May; on grass in woods; near London.

Sp. 5. Gast. viridis. Fem. *Viridis, antennis nigro-fuscis, pedibus flavis viridi fuscoque variegatis, alis subhyalinis.*

Lætè viridis; oculi ocellique rufi: antennæ nigro-fuscae; articulus 1<sup>us</sup>. nigro-viridis: pedes fusci; coxæ virides; femora viridia, basi apiceque flava; tarsi flavi, apice fusci: abdomen compressum: oviductus abdominis dimidio longior: alæ subhyalinæ; nervi fusci; stigma mediocre. (Corp. long.  $\frac{3}{4}$  lin.; alar.  $\frac{3}{4}$  lin.)

*Var. β.*—Mesothoracis scutellum basi viridi-æneum.

Taken near Darlington, in Durham, by the Rev. G. T. Rudd.

May; on grass in woods; near London.

Sp. 6. Gast. atro-purpureus. Mas. *Atro-purpureus, antennis nigro-fuscis, pedibus fuscis, alis subhyalinis.*

Caput magnum, thorace latius: oculi ocellique obscurè rufi: antennæ nigro-fuscae; articulus 1<sup>us</sup>. ater: abdomen subcompressum: pedes nigro-fusci; coxæ nigrae; femora basi genuaque flava;



tarsi fusci : alæ subhyalinæ ; nervi fusci ; stigma mediocre. (Corp. long.  $\frac{2}{3}$  lin. ; alar.  $\frac{3}{4}$  lin.)

June ; on grass beneath trees ; near London.

Sp. 7. *Gast. laticornis*. Mas et Fem. *Cupreo-ater, viridi variegatus, antennis nigro-fuscis, pedibus fuscis, alis subfuscis.*

*Mas*.—Caput æneo-atrum : oculi ocellique obscurè rufi : antennæ nigro-fuscæ ; articulus 1<sup>us</sup>. ater : thorax obscurè viridis ; dorsum cupreo-atrum : abdomen nigro-æneum, basi obscurè viride : pedes fusci ; coxæ nigræ ; femora nigro-fusca, apice flava ; tarsi fusci, ante apices plus minusve flavi : alæ subfuscæ ; nervi fusci ; stigma parvum.

*Fem*.—Obscurè cupreo-ater : abdomen basi viride : oviductus abdomine triplò brevior : protibiæ flavo-fuscæ ; tarsi omninò fusci. (Corp. long.  $\frac{2}{3}$ — $\frac{3}{4}$  lin. ; alar.  $\frac{3}{4}$  lin.)

June : on grass beneath trees ; near London.

Sp. 8. *Gast. tenebricosus*. Mas. *Æneus, antennis nigris, pedibus alisque fuscis.*

Oculi ocellique obscurè rufi : antennæ nigræ ; articulus 1<sup>us</sup>. nigro-æneus ; mesothorax disco cupreo-æneo, anticè utrinque et metathorax virides : abdomen compressum, basi viride : pedes fusci ; coxæ et femora nigro-viridia ; genua flava, tarsi flavi, apice fusci : alæ fuscæ ; nervus solitus obscurior, ubi costam percurrit latus ; stigma mediocre. (Corp. long.  $\frac{2}{3}$  lin. ; alar.  $\frac{3}{4}$  lin.)

June ; on grass beneath trees ; near London.

Sp. 9. *Gast. fumipennis*. Mas et Fem. *Viridis, abdomine æneo, antennis nigris, pedibus plus minusve fuscis, alis fuscis.*

Viridis : oculi ocellique rufi : antennæ nigræ ; articulus 1<sup>us</sup>. viridis, basi fulvus : thoracis segmentorum margines æneo-virides : *maris* abdomen apice pilosum ; segmenta basi medioque omninò ænea ; latera basi cyaneo-viridia : *fem*. abdomen viride : oviductus subexertus : pedes fulvi ; coxæ virides ; *maris* femora nigro-fusco cingulata ; *fem*. femora nigro-viridi cingulata ; tarsi fusci, basi fulvi, apice nigri : alæ fuscæ ; nervi nigro-fusci ; stigma mediocre. (Corp. long.  $\frac{2}{3}$ — $\frac{3}{4}$  lin. ; alar.  $\frac{2}{3}$ —1 lin.)

*Var. β.* — *Mas*, lætè cyaneo-viridis : abdomen æneo fasciatum : femora viridi-fusco fasciata ; genua flava.

*Var. γ.* — *Mas*, lætè cyaneo-viridis ; mesothoracis scutellum et paraptera ænea : abdomen basi et apice æneo-viride.

*Var. δ.* — *Mas*, abdomen viridi-æneum, basi lateribusque cyaneo-viridibus ; tibiæ fusco-cingulatæ ; tarsi omninò fusci.

*Var. ε.* — *Mas*, viridis : capitis vertex thoracisque discus viridi-ænei : abdomen indistinctè æneo fasciatum : pedes fusci ; femora fulva, nigro-viridi fasciata.

June ; on grass beneath trees ; near London.

Sp. 10. *Gast. unicolor.* *Mas.* *Viridis, antennis nigris, pedibus flavis, alis subfuscis.*

*Viridis, unicolor* : oculi ocellique rufi : antennæ nigræ ; articulus 1<sup>us</sup>. fuscus, apice niger : mandibulæ flavæ : abdomen apice pilosum : pedes flavi ; coxæ virides ; ungues et pulvilli fusci : alæ subfuscæ ; nervi fusci ; stigma mediocre. (Corp. long.  $\frac{2}{3}$  — 1 lin. ; alar.  $\frac{3}{4}$  — 1  $\frac{1}{4}$  lin.)

June ; on grass beneath trees ; near London.

Sp. 11. *Gast. obscurellus.* *Mas.* *Viridis, æneo-variegatus, antennis nigris, pedibus fuscis, alis subfuscis.*

*Viridis* : oculi ocellique rufi : antennæ nigræ ; articulus 1<sup>us</sup>. nigro-viridis : capitis vertex thoracisque discus ænei : abdomen nigro-æneum, subcompressum : pedes fusci ; coxæ virides ; trochanteres et genua flava ; protibiæ flavæ, supra fuscæ ; tarsi fulvi, apice fusci : alæ subfuscæ ; nervi fusci ; stigma mediocre. (Corp. long.  $\frac{1}{2}$  lin. ; alar.  $\frac{2}{3}$  lin.)

June ; on grass beneath trees ; near London.

Sp. 12. *Gast. vulgaris.* *Mas et Fem.* *Viridis, antennis nigro-fuscis, pedibus flavis, alis subhyalinis.*

*Mas.* — *Viridis, nitens, ferè glaber* : oculi ocellique rufi : antennæ nigræ, apice nigro-fuscæ ; articulus 1<sup>us</sup>. nigro-viridis : mesothoracis scutellum æneo-viride : abdomen apice pilosum, æneum, basi apiceque viride : pedes flavi ; coxæ virides ; profemora fusco, mesofemora viridi-fusco, metafemora nigro-viridi cingulata ; metatibiæ fulvæ, basi apiceque flavæ ; tarsi apice fusci : alæ subhyalinæ ; nervi fusci ; stigma mediocre.

*Fem.*—Antennæ nigræ; articulus 1<sup>us</sup>. fulvus: mesothoracis discus æneo-viridis: abdomen viride, fasciis indistinctis maculisque lateralibus æneis: oviductus subexertus: pedes flavi; coxæ virides; femora fusco cingulata; ungues et pulvilli fusci. (Corp. long.  $\frac{2}{3}$ —1 lin.; alar.  $\frac{3}{4}$ —1 $\frac{1}{4}$  lin.)

*Var. β.*—*Mas*, mesothoracis scutellum viride: abdomen viride; discus æneus: femora omnia viridi-fusco cingulata.

*Var. γ.*—*Mas*, antennæ omninò nigræ: femora nigro cingulata; metafemora omninò nigra.

*Var. δ.*—*Mas*, capitis latera posticè ænea.

*Var. ε.*—*Mas*, mesothoracis dorsum æneum.

*Var. ζ.*—*Mas*, capitis vertex æneus.

*Var. η.*—*Mas*, tibiæ omnes concolores.

*Var. θ.*—*Fem.* antennæ nigro-fuscæ: thorax omninò viridis.

*Var. ι.*—*Fem.* abdomen viride, æneo per medium vittatum.

May; on grass beneath trees; near London.

Sp. 13. *Gast. terminalis. Mas et Fem. Æneo-viridis, antennis nigro-fuscis, pedibus flavis fusco-cingulatis, alis subhyalinis.*

*Mas.*—Viridis: oculi ocellique obscurè rufi: antennæ nigro-fuscæ; articulus 1<sup>us</sup>. nigro-viridis: mesothoracis scutum æneo-viride: abdomen subcompressum: pedes flavi; coxæ virides; femora fusco cingulata; tarsi apice fusci: alæ subhyalinæ; nervi fusci; stigma mediocre.

*Fem.*—Æneo-viridis: abdomen viride; discus cupreo-æneus: femora viridi-fusco cingulata: oviductus brevis. (Corp. long.  $\frac{2}{3}$ —1 lin.; alar.  $\frac{3}{4}$ —1 $\frac{1}{4}$  lin.)

*Var. β.*—*Fem.* meso-et metatibiæ fusco cingulatæ.

June; on grass beneath trees; Windsor Forest, and near London.

Sp. 14. *Gast. annulipes. Fem. Latè viridis, antennis nigris, pedibus viridibus, tarsis pallidis, alis subhyalinis.*

Oculi ocellique rufi: antennæ nigræ, corporis triente vix longiores; articulus 1<sup>us</sup>. viridis: oviductus subexertus: pedes virides; trochanteres fusci; genua straminea; tarsi straminei, apice fusci; propedum tibiæ et tarsi fusca: alæ subhyalinæ, quàm præcedentium angustiores; nervi fusci; stigma minimum. (Corp. long.  $\frac{1}{2}$ — $\frac{2}{3}$  long.; alar.  $\frac{3}{4}$  lin.)

June; on grass beneath trees; Windsor Forest.

Sp. 15. Gast. crassus. Mas. et Fem. *Viridis aut æneo-viridis, antennis nigris aut nigro-fuscis, pedibus flavis viridi et fusco cingulatis, alis hyalinis.*

*Mas.*—Obscurè cupreum, breve, crassum: caput viride: oculi ocellique obscurè rufi: antennæ nigro-fuscæ; articulus 1<sup>us</sup>. nigro-viridis: pedes flavi; coxæ virides; femora viridi-fusca, apice flava; metatibiæ fuscæ, apice basique flavæ; tarsi apice fusci: alæ subhyalinæ; nervi fusci; stigma parvum.

*Fem.*—Viridis: antennæ nigræ, corporis dimidio breviores; articulus 1<sup>us</sup>. nigro-viridis: abdomen cupreo-æneum, basi apiceque viride: oviductus corporis dimidio brevior: femora viridia, apice basique flava: meso-et metatarsi straminei, apice fusci. (Corp. long.  $\frac{1}{2}$ — $\frac{2}{3}$  lin.; alar.  $\frac{2}{3}$ — $\frac{3}{4}$  lin.)

*Var. β.*—*Mas*, æneo-viridis: antennæ fuscæ; articulus 1<sup>us</sup>. viridi-æneus: abdomen cupreo-æneum.

*Var. γ.* *Mas*, viridis: mesothoracis scutellum æneo-cupreum: abdomen æneo-cupreum, basi viride.

*Var. δ.*—*Fem.* antennæ nigro-fuscæ: alæ hyalinæ.

*Var. ε.*—*Fem.* tarsi omnes pallidè fusci, basi flavi.

*Var. ζ.*—*Fem.* pro- et metatarsi fulvi, apice fusci; mesotarsi straminei, apice fusci.

June to August; on grass in fields; near London.

Sp. 16. Gast. angulus. Fem. *Viridis, antennis nigris, pedibus fuscis, alis hyalinis.*

Viridis, brevis, crassus: oculi ocellique rufi: antennæ nigræ; articulus 1<sup>us</sup>. nigro-viridis: oviductus abdominis quaterno brevior: pedes fusci; coxæ virides; femora viridi-fusca; tibiæ apice basique flavæ; protibiæ pallidiores: alæ hyalinæ; nervi fusci; stigma mediocre. (Corp. long.  $\frac{1}{2}$  lin.; alar.  $\frac{2}{3}$  lin.)

June; on grass in fields; near London.

Sp. 17. Gast. acutus. Mas et Fem. *Viridis, antennis nigris, pedibus fuscis, alis subhyalinis.*

*Gracilis, elongatus. Mas.*—Cyaneo-viridis: oculi ocellique rufi: antennæ nigræ; articulus 1<sup>us</sup>. nigro-viridis, basi fuscus: abdomen subcompressum: pedes fusci; coxæ virides; femora viridia, apice flava: alæ subhyalinæ; nervi fusci; stigma mediocre.

*Fem.*—Viridis: antennæ clavatæ, corporis triente breviores: abdomen compressum, thorace multò longius: oviductus abdominis

triente brevior: pedes fusci; coxæ nigro-virides; femora apice flava; tibiæ apice basique flavæ; tarsi fusci, apice obscuriores. (Corp. long.  $\frac{3}{4}$ —1 lin.; alar.  $\frac{5}{4}$ —1 lin.)

*Var. β.*—*Fem.* Protibiæ subtus flavæ; pro- et mesotarsi basi flavi.

*Var. γ.*—*Fem.* Corpus æneo-viride.

*Var. δ.*—*Fem.* Pedes flavi; coxæ virides; femora viridi-fusca, apice flava; meso- et metatibiæ fuscæ; tarsi apice fusci.

June; on grass in woods; near London.

### GENUS V. MEROMALUS,<sup>1</sup> Walker.

*Mas.*—Caput mediocre, thorace paullò latius: antennæ 13-articulatæ, submoniliformes, corporis dimidio multò breviores; articuli 5<sup>o</sup>. ad 10<sup>um</sup>. subæquales, approximati; clava ovata, brevis, articulis 2 præcedentibus brevior et paullò latior: thorax valdè convexus: mesothoracis scutum, paraptera, epimera et scutellum magna, hoc angustum; parapsides optimè determinatæ: abdomen sublineare, subcompressum, thorace angustius sed vix longius; segmenta subæqualia: alæ mediocres; nervus solitus ante costam attingit nervulum rejiciens ferè obsoletum; stigma nervulum brevissimum emittens.

*Sp. I.* Mer. flavicornis. *Mas. Cyaneo-viridis, antennis pedibusque flavis, alis subhyalinis.*

Cyaneo-viridis, parùm nitens, punctatus: oculi ocellique obscure rufi: antennæ flavæ; articulus 1<sup>us</sup>. et 2<sup>us</sup>. supra pallidè fusci: abdomen cyaneo-nigrum, nitens, glabrum, basi cyaneo-viride: pedes flavi; coxæ cyaneo-virides; femora subtus fusco vittata; meso- et metatarsi straminei, apice fusci: alæ subhyalinæ; nervi fusci; stigma mediocre. (Corp. long.  $\frac{5}{4}$  lin.; alar. 1 lin.)

June; on grass in fields; near London.

### GENUS VI. RHAPHITELUS,<sup>m</sup> Walker.

*Mas.*—Corpus sublineare: caput mediocre, thorace paullò latius, vix anticè productum: antennæ 12-articulatæ, clavatæ, corporis dimidio breviores; articulus 1<sup>us</sup>. gracillimus; 5<sup>us</sup>. et 4 sequentes cyathiformes, lati, approximati; 10<sup>us</sup>. et 11<sup>us</sup>. brevissimi, circum articulo 9<sup>o</sup>. paullò longiorem et angustiozem fingentes; 12<sup>us</sup>. gracilis, setiformis: mesothoracis scutum latum, planum, maxi-

<sup>1</sup> μέρος pars, μαλὸς tener.

<sup>m</sup> ῥαφίς acus, τέλος finis.

num; parapsides scuto in unum confusæ; scutellum magnum, convexum: abdomen subcompressum, thorace paullò longius, apicem versus angustius; segmenta subæqualia: alæ mediocres; stigma nervulum vix conspicuum emittens.

Sp. 1. Rhap. maculatus. Mas. *Viridis, abdomine cyaneo cupreo, antennis nigris, pedibus pallidè fuscis, alis subhyalinis.*

Obscurus, subtiliter punctatus: caput obscurè viride; latera anticè lætè cupreo-iridia: oculi ocellique obscurè rufi: antennæ nigræ; articulus 1<sup>us</sup>. flavus, apice fuscus; 2<sup>us</sup>. fuscus: thorax obscurè viridis, posticè obscurè viridi-æneus; latera cyanea: abdomen cyaneo-cupreum, nitens, glabrum, basi æneo-iride: pedes pallidè fuscii; coxæ virides; trochanteres flavi; meso- et metatarsi straminei, apice fuscii: alæ subhyalinæ; proalæ subcosta, fusco maculatæ; nervus solitus fuscus, ubi costam percurrit incrassatus; stigma mediocre. (Corp. long.  $\frac{2}{3}$  lin.; alar.  $\frac{3}{4}$  lin.)

October; on grass beneath trees; near London.

#### GENUS VII. PSILONOTUS,<sup>n</sup> Walker

*Fem.*—Caput mediocre, thorace non latius, anticè planum et paullò productum: antennæ 12-articulatæ, subclavatæ, corporis triente non longiores, submoniliformes; articuli 5<sup>o</sup>. ad 9<sup>um</sup>. subæquales, parvi, approximati; clava ovata, articulis 2 præcedentibus paullò latior et longior: thorax planus, depressus: mesothoracis scutum et scutellum maxima, lata; parapsides scuto in unum confusæ; paraptera et epimera parva: abdomen valdè compressum, thorace longius; segmenta subæqualia: alæ mediocres.

Sp. 1. Psil. adamas. Fem. *Viridis, antennis pallidè fuscis, pedibus flavis, alis hyalinis.*

Lætè viridis, glaber, nitidissimus: oculi ocellique rufi: antennæ pallidè fusæ; articulus 1<sup>us</sup>. et 2<sup>us</sup>. flavi: caput posticè, mesothoracis scuti latera et metathoracis scutellum cupreo-iridia: abdomen æneo-iride: pedes flavi; coxæ virides; femora nigro-fusco cingulata; metatibiæ fusco cingulatæ; metatarsi apice fuscii: alæ hyalinæ; nervi flavi; stigma parvum. (Corp. long.  $\frac{2}{3}$ — $\frac{3}{4}$  lin.; alar.  $\frac{3}{4}$ —1 lin.)

*Var. β.*—Thorax omninò viridis.

June; near London. New Lanark, Scotland.

<sup>n</sup> ψιλός glaber, νῶτος dorsum.



ART. XIII.—*Observations on Hesperophilus arenarius and on Zabrus gibbus.* By the REV. G. T. RUDD, M. A. F. L. S.

SIR,—If the following observations are not too trifling for insertion in your valuable Magazine, allow me to beg a corner for them.

*Hesperophilus arenarius.*—In the summer of 1832, the estuary of the Tees was a favourite collecting locality of mine, as I captured many “good” Coleopterous insects from under the “rejectamenta” of its shores. The river here flows over many hundred acres at high water, but to an inconsiderable depth. On a beautiful day in September, I was enjoying a delightful ramble along the Yorkshire shore,—the breeze was blowing gently from the west: on my return, the tide had *begun* to flow,—it was the first of the spring tides. As I approached the sea, my route being due north, my attention was attracted by observing multitudes of small insects floating before the breeze, and dropping below, and just above, high-water mark—*Hesperophilus arenarius* was the insect. My track was continued for perhaps a mile, and below high-water mark; the flight of *Hesperophili* was also continued, and in such profusion were they, that, at one sweep of my net, I caught as many as filled a large pill-box!

The unusual flight of this burrowing and night-loving beetle, and in such immense numbers, excited my curiosity; I was therefore anxious to pry a little into the matter. Whence did they come? was the first question. To solve this, I changed my line of march, and went due west, towards the flowing tide. I soon walked beyond the point whence these tiny creatures had started; for, after I had proceeded about one hundred yards, not an *Hesperophilus* was to be seen, though, as I advanced, many were on the wing, or crawling from their sandy homes. The fact evidently was, that these insects had all taken flight from a space included between a point some distance below high-water mark and a line drawn at one hundred yards or more parallel to and below it. My curiosity was so far satisfied. But what would become of the multitudes that dropped many yards below

high-water mark, and burrowed into the sand? would they again take wing? or, would they perish, as the flood covered their hiding-place? I waited to see the event. The tide rolled on—covered the sands, with all their inhabitants—and again receded. I disturbed my friends from their retreat;—they were as lively as if they had been sporting in the sunshine, instead of having been under water for more than half an hour!

One point was clear, (confirmed by repeated observations subsequently,) that these Brachelytrous insects have the power of enduring submersion, and under salt water, for at least half an hour.

But why did they leave their burrows at a lower part of the sands? I had previously often collected on this spot, at different periods of the year, during the neap tides, and on the most brilliant days, without having seen a single *Hesperophilus* on the wing. It is fair, therefore, to suppose, either that the extraordinary flight I witnessed was a mere casual occurrence, or that, in some way or other, it is to be accounted for by the state of the tide. On this latter supposition, these insects must have been warned by some peculiar instinct to move higher up the sands, and thereby to avoid submersion for a period that probably would have exceeded their power of endurance. I have to regret that no opportunity of visiting the estuary at the commencement of spring tides has been since afforded me, and I hope that some of your readers will direct their attention to the subject, when they visit any of the larger estuaries, where, no doubt, they will find the insect in profusion. It betrays its lurking-place by the sand it elevates in its burrowing, which dries, and thus leaves a conspicuous mark.

Whilst investigating the habits of *Hesperophilus*, I was accidentally led to detect those of a large species of *Dyschirius*, which occurs in great abundance on the same locality, and which appears to be unnoticed by Dejean. On turning up the sandy tracks, or burrows, *above high-water mark*, to uncover the *Hesperophili*, I found their ferocious enemy, the aforesaid *Dyschirius*, pursuing his work of destruction. These *Dyschirii* burrow after, seize, shake, (as the *Cicindela campestris* does its prey,) and devour the luckless *Hesperophili*: so intent are they on their purpose, that I have

frequently observed them continuing to shake their victim after they were both brought to light.

*Zabrus gibbus*.—In Vol. I. Part I. pp. 140, 141, of Mr. Stephens's Illustrations of British Entomology, are some remarks "On the supposed Ravages of the Larvæ of *Zabrus gibbus*," and a question is raised as to the food of the perfect insect.

During my residence at Kimpton, near Andover, Hants, an excellent opportunity for investigating this question was afforded me. My curiosity being excited by my friend Mr. Stephens's observations, I gladly and most attentively directed my attention to the inquiry. *Zabrus gibbus* was in profusion at Kimpton, making its appearance generally as the corn came into ear. My brother, Mr. L. Rudd, an indefatigable collecting ally of mine, was on a visit to me in 1828. During one of our rambles, I observed several *Zabri* on the ears of barley, evidently feeding in that situation. I requested my brother to notice most carefully what the beetles were eating; I walked in advance of him some little distance, leaving him to watch the specimen before him. I soon found *Zabrus gibbus* on a barley-stem, eagerly engaged at his repast.

The insect first gnawed off the tip of the husk from the end of the grain, then gradually drew the milky grain out of its sheath, consuming it as it came forth, till the whole grain had disappeared. It repeated the operation, and successively consumed six or seven grains: I then killed, and on my return home, dissected it, when I was most fully satisfied, by this additional proof, that the beetle had fed on the immature corn. My brother knew nothing whatever of my motive for setting him to watch the proceedings of the *Zabrus*, nor even the name of the insect. *His report was minutely the same as mine.* We subsequently paid further and repeated attention to the subject, (without, however, killing the devourer,) and no doubt whatever remained on our minds, that the food of the imago of *Z. gibbus* is the juicy immature grain of barley, and probably also of other grain.

Yours, &c. G. T. RUDD.

Croft, near Darlington,  
Jan. 1834.

ART. XIV.—*Entomological Society.*

THIRD SITTING.—JANUARY 6.

THE SECRETARY read a paper by Mr. Lewis, on *Yponomeuta padella*. Mr. Lewis states that the *larvæ* are hatched in the autumn, but remain under the cover with which the eggs are enveloped, till the spring; that on first issuing from this they become mining *larvæ*, and do not spin their web till they have attained a considerable size.

THE SECRETARY read a paper by Mr. Waterhouse, descriptive of several *larvæ*. *Raphidia*, Mr. Waterhouse has ascertained, has an active pupa, as was formerly supposed, not quiescent, as has lately been stated by M. Percheron, in Guérin's *Magasin de Zoologie*, and as was repeated in our last number.

THE SECRETARY read a notice by Mr. Westwood, on the entomological affairs of the Linnæan Society.

MR. NEWMAN read a technical description of *Ripipteryx*, a new genus of Orthoptera. Mr. Newman continued:—The only insect with which I am at all acquainted, that is allied to *Ripipteryx*, is the genus *Tridactylus* of Latreille, but from this, however, it is sufficiently distinct. Of the economy and history of this latter genus, *Tridactylus*, M. Foudras, of Lyons, has lately furnished us with a most complete and interesting account. In the south of France it appears that the *Tridactyli* inhabit the sandy banks of large rivers, which in the summer have been left bare by the diminution of the water: as the water retreats they constantly follow it, always keeping within the limits of its moisture, and if grass, or any vegetable, begins to cover the sand with a coat of verdure, instantly quitting it. They form galleries in the sand, in the same manner as mole-crickets; but what appears most remarkable is, that their food consists of nothing but sand. M. Foudras captured and confined many specimens, and watched them whilst engaged in feeding. He killed and dissected many specimens, and found in the *æso-phagus*, and throughout the alimentary canal, no other substance but sand, which was moreover the only ingredient of the excrement..

THE REV. F. W. HOPE exhibited some specimens of *Termites*, or white ants, and *Xylocopæ*, or wood-boring bees,

together with various substances which had been perforated by the former. Mr. Hope also read a technical description of a new Cerambicideous insect, a beautiful drawing of which was exhibited.

Mr. WESTWOOD read some memoranda relating to Insects injurious to beds and books: he exhibited specimens, some of which were excessively minute, and also drawings of them and their ravages.

Mr. SKRIMSHIRE presented some insects.

Mr. HANSON begged to inquire whether it was the intention of the present council to resign their seats on the 27th of the present month, and that a new council should be elected, agreeably to the provision made for that purpose in the by-laws.

The PRESIDENT read a minute of council, by which it appeared that that body intended to sit during the ensuing year.

Mr. J. E. GRAY insisted on the necessity of the present council sitting for another year: the present council must be considered only provisional, until the actual commencement of the business of the Society, and that business was only now beginning: it was also distinctly understood that the subscription now paid was for the year 1834: no one would doubt that it was the first subscription, therefore 1834 must be considered the first year of the existence of the Society, and the first council must manage its affairs for that year.

Mr. DAVIS had heard that at the meeting at which the council was appointed, there were but seventeen or eighteen members present: when he considered that the council consisted of thirteen individuals, and these were appointed out of so small a number, he must look on it as in a good degree a self-elected council; (loud cries of Hear! hear!) that council had sat nine months; the Society now consisted of considerably upwards of one hundred members, and he thought it high time that another council should be elected.

Mr. VIGORS, M.P. said he did not think there was any distinct question before the meeting; he would ask, what was the question? and what was the exact position of the council now sitting? was it a provisional, or a *bonâ fide* council?

The PRESIDENT then read the Proceedings of the Society, by which it appeared the council was not provisional.

Mr. VIGORS then said, he must consider that the present being a *bonâ fide* council, it must resign on the 27th of the present month; and he accordingly moved, That a new council be elected on the 27th inst., in accordance with the spirit as well as the letter of the by-laws.

Mr. LETTS seconded the motion; he said, that from the abstract of the by-laws which he held in his hand, it was compulsory, not optional, for the Society to elect a new council on the 27th of January.

The PRESIDENT then put Mr. Vigors's motion, which was carried by a majority of three-fourths of the members present.

#### FOURTH SITTING.—JANUARY 27.

At this meeting no other business than the election of a council and officers was transacted. The following is the list:

BELL, THOMAS, Esq. F.R.S. &c.	SPENCE, W. B. Esq. <i>For. Secretary.</i>
CHILDREN, J. G. Esq. <i>Sec. Roy. Soc. &amp;c.</i>	STEPHENS, J. F. Esq. F.L.S. &c.
<i>Preside</i>	SYKES, LIEUT.-COL. F.L.S. &c.
GRAY, G. R. Esq.	WESTWOOD, J. O. Esq. F.L.S. &c.
HOPE, REV. F. W. M.A. F.L.S. &c.	<i>Secretary.</i>
<i>Treasurer.</i>	WALKER, F. Esq. F.L.S. &c.
NEWMAN, E. Esq., F.L.S., &c.	WATERHOUSE, G. R. Esq. <i>Curator.</i>
SHUCKARD, W. E. Esq.	YARRELL, W. Esq. F.L.S. &c.

The PRESIDENT, after announcing the result, returned thanks for the honour a second time conferred on him, and expressed his continued desire to serve the Society to the best of his abilities. The conclusion of his speech was warmly cheered.

#### FIFTH SITTING.—FEBRUARY 3.

The PRESIDENT nominated the Rev. F. W. Hope, Lieut. Col. Sykes, Mr. Stephens, and Mr. Bell, his Vice-presidents, passing an elaborate encomium on each.

The SECRETARY read an abstract of the entomological affairs of the Linnæan and Zoological Societies; at the latter, a paper by Mr. W. S. MacLeay had been read. It related to *Urania*, a genus of butterflies, remarkable for their graceful



and lofty flight; Mr. MacLeay had been successful in breeding this remarkable insect, and now detailed its economy, which proves all that has hitherto been written respecting it to have been incorrect.

The SECRETARY read a paper by Mr. W. Christy, jun., on a species of *Calandra*. Mr. Christy had found this insect in great abundance in the stones of tamarinds, sometimes forty in a single stone; he had in no instance found them alive, and was therefore unable to furnish any facts relating to their economy. He concluded they had perished in the boiling of the fruit, and hoped that some *Rusticus* might hereafter meet with them in their living state, and record their operations.

The SECRETARY read a paper by the Rev. F. W. Hope, technically describing some new genera of *Coleoptera*; drawings were exhibited.

The SECRETARY read a paper by himself, on the nidus, &c. of the gregarious *larva* of a Mexican butterfly; the nidus was exhibited; it was of a tough, leather-like substance, and somewhat bottle-shaped; it contained the pupa-cases of nearly a hundred of the butterflies, all attached by the tail. The Secretary also exhibited the nidus of a wasp, which frequently builds in the orange trees in Demerara.

The SECRETARY read a technical description of some Australian *Phasmata*, by Mr. G. R. Gray; the paper was intended as a supplement to Mr. Gray's splendid monograph of *Phasma*; the species described were exhibited.

The SECRETARY read a paper by Mr. Lewis, containing technical descriptions of some Homopterous *Hemiptera*.

The Rev. F. W. HOPE exhibited to the meeting some insects which had been extracted by Mr. Pettigrew from the skull of a mummy; the skull was now on the table: there were several species, principally of Coleopterous genera—*Dermestes Röëi*, *elongatus*, and *pollinctus*; *Necrobia mumiarum*; and a single elytron of *Pimelia spinulosa*, besides the *pupæ* and pupa-cases of two Dipterous insects. Mr. Hope observed, that the oldest specimens of insects with which he was acquainted, were in the museum at Leyden, and the age of these did not, he believed, exceed 150 years; but the specimens he was now exhibiting, had probably been in existence three thousand years. He would not, however, take upon himself to state



the precise age of the mummy from which they were taken, especially as Mr. Pettigrew was present, and would, he hoped, favour the meeting with his opinions on the subject.

Mr. PETTIGREW.—I don't know that I have any thing to say on the subject, in addition to what Mr. Hope has just told you; but as he has so pointedly called on me, I will just mention, that the date of the commencement and termination of the practice of embalming is involved in so much obscurity, and extends over so considerable a range of time, that I feel great difficulty in assigning an exact age to any individual mummy. I consider, however, the skull, from which the *Necrobæ* and *Dermestides* have been taken, to be Græco-Ægyptian, or Pharaonic; it was brought by Mr. Wilkinson, the celebrated Egyptian traveller, who is now present, from Thebes. I may observe, however, the practice of embalming was continued as late as the fifth century. As I have this opportunity, I will call your attention to a breast-plate, which I hold in my hand, with a representation of a *Copris*; it was purchased by Belzoni of an Arab who had taken it from the breast of a mummy; it is of basalt, and carved in alto-relievo. On one side of the *Copris* is a representation of Isis; on the other, of Osiris; and on the reverse are numerous hieroglyphics. Here is another of the same kind of breast-plate, but composed of common pottery instead of basalt; it was purchased by Mr. Rogers the poet; it bears, like the other, figures of Isis and Osiris, and has also hieroglyphics on the back. I have compared both these with a small tablet of basalt in the British Museum, and have found the figures in all respects the same. I may remark, that the insects exhibited to-night by Mr. Hope, were found in the occipital foramen of the skull. In a skull I have lately examined, there was not the slightest trace of insects, or even of brain; it was perfectly clean; the whole of the brain had been extracted through the left nostril. In another head I found the skull had been fractured; this was evidently the head of a priest. I do not pretend to say how he could come by such rough usage: he had survived this fracture for years; nature had performed a complete cure, by the formation of a layer, or ridge of new bone, along the edges of the fracture, which had firmly united the parts thus unnaturally separated. The cavity of this priest's skull, also, was perfectly clean; not

a vestige of the brain remaining. I have omitted to remark, that the hair of the female skull, now on the table, is in perfect preservation,—very long, and, as my daughter tells me, turned up behind in a manner which, "curiously enough, happens to be the fashion of the present day, and is called the "three-plait."

The SECRETARY. — I think, the insects being found dead proves that the eggs must have been deposited during the process of embalming.

#### SIXTH SITTING.—MARCH 3.

Among the visitors we observed Captains John and James Ross.

The SECRETARY read a letter from M. Gravenhorst, acknowledging the honour done him by the Society in electing him an honorary member. M. Gravenhorst took the opportunity of calling the attention of the Entomological Society to a work on which he was engaged, "Monographia Coleopterorum Micropterorum," (Genus *Staphylinus*, Linn.)—and of soliciting the loan of undescribed, rare or unique specimens.

[We heartily hope this appeal will not remain unanswered; we shall be happy to afford any assistance in our power to M. Gravenhorst, by charging ourselves with the care and transmission of any specimens that may be sent to us for that purpose.]

The FOREIGN SECRETARY read similar acknowledgments from M.M. De Hahn and Andouin.

The SECRETARY read an Abstract of the Entomological Affairs of the Linnæan and Zoological Societies;—at the latter, a paper, by Mr. W. S. MacLeay, had been read. It related to the genus *Mygale*. Mr. MacLeay has traced the economy of this large spider with great care and perseverance. It is a nocturnal and terrestrial animal, feeding on mole-crickets and other nocturnal insects: it never spins a web of any kind, but simply pursues its prey on foot;—it never catches birds, and will not touch them, even the smallest, if offered; so that the previous history of this creature is entirely fabulous. Mr. MacLeay has seen spiders' webs of considerable strength, but the birds never get entangled in them, nor do they evince any fear of them; on the contrary, the minute humming-birds are

frequently seen hovering about them, and picking out little flies which have been captured.

The SECRETARY read a paper by the Rev. F. W. Hope on Amber and Copal Insects. Mr. Hope remarked, that, notwithstanding the great age of the mummy-insects exhibited at the last meeting, he had now to submit some infinitely older;—they were at least antediluvian, and probably coëval with the world itself. The specimens found in amber and copal had evidently not been starved or injured, but had been enshrouded in a state of health, happiness, and vigour. Amber has been found in many parts of this kingdom, particularly, washed up by the tide on the sea-shore near Aldborough. The amber-tree is not now known, and is supposed to be extinct. The same fact held good with the insects; the forms to which they most nearly approached were entirely extra-European.

The REV. F. W. HOPE rose to make some further remarks on the same subject; he said he had about 150 genera of amber and copal insects in the tables which he had drawn up. The amber-insects he considered of intertropical, the copal, of oriental forms.

The SECRETARY read a paper by Mr. Waterhouse, being a technical description of *Picumus Hopei*, a large Coleopterous insect of the family *Prionidæ*. An exquisitely beautiful drawing of the insect, by Mr. Curtis, was exhibited.

The SECRETARY read a paper by Mr. Shuckard on Aculeate Hymenoptera. Mr. Shuckard lamented the almost total neglect of this tribe. He excepted however the Bees; on this subject he considered Mr. Kirby's "Monographia Apum Angliæ" a complete model, and the most perfect work of the kind ever published. Mr. Shuckard attempted to distinguish between the parasitic and imparasitic aculeates. He considers both these characters to be found in nearly allied genera, and sometimes even in the same genus; of this he gave *Pemphredon* as an instance. He observed that the Parasitic Aculeate Hymenoptera differed from Parasitic *Ichneumones* in never being carnivorous; they merely feed on the provision stored up for other *larvæ*, not on *larvæ* themselves.

The PRESIDENT, in calling the attention of the meeting to some insects exhibited by Captain James Ross, must be allowed to make a comment on the presence of that distinguished gentleman, and his uncle, Captain John Ross. These

illustrious men, braving and overcoming every difficulty, had rendered the most important services to commerce, navigation, and science:—they had shown how the whale was to be pursued and captured amid fields of ice, where hitherto he had been secure;—they had fixed the site of the Magnetic Pole, and had added treasures to every branch of natural history.

[The insects were, four butterflies; two of the genus *Colias*, and two *Melitæa*; two bees of the genus *Bombus*, and one Lepidopterous larva.]

The SECRETARY announced that the insects brought by Captain Lyon, from the North Pole, were also on the table for exhibition.

The SECRETARY read a paper by himself on the genus *Arcturus* of Latreille, giving opinions of its affinities. He exhibited several pen-and-ink drawings, and some specimens, in illustration of his views.

The REV. F. W. HOPE exhibited a large *Scarabæus*, from Venezuela, which he believed to be new. He proposed dedicating it to Sir Robert Kerr Porter.

The SECRETARY announced that Mr. Hope was preparing a paper on Monstrosities in Insects; and solicited facts, loan of specimens, &c.

[Any thing sent us by our correspondents for this purpose shall be carefully and immediately forwarded.]

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ART. XV.—*Hints relative to the present Plans, and future Prospects, of the Entomological Society.* By WILLIAM SWAINSON, Esq. F.R.S. L.S. &c.

THE experience of ages has sanctioned the aphorism of the wisest of men, that “in a multitude of counsellors there is wisdom;” for, as in the natural world a beautiful landscape must be contemplated from different stations before the painter decides on that which is the most picturesque, and most suited to employ his pencil; so, in the world of mind, great undertakings can never be successfully accomplished, until we have a diversity of opinions, from which we can calmly and dispassionately frame that plan of operations most conducive to the object which all have in view. It is under the influence

of these convictions that I venture to offer to the Entomological Society, and more especially to the consideration of its newly-elected Council, the following hints, as appearing to me well deserving their consideration; and I do this the more readily, since the nature of my scientific occupations, no less than my distance from the metropolis, prevents me from taking that active part in the concerns of our Society which the partiality of several of its members have wished me to do. Nor can I conceive a more fit channel for giving publicity to these hints, than through the *Entomological Magazine*; a publication which has happily concentrated all the floating records of our fascinating science, dissipated, in their details, over the numerous periodicals of the day; and has thus given a strength and impetus to it, which has eventually led to the formation of a Society exclusively devoted to the natural history of annulose animals.

All the advantages resulting from a society or combination of individuals, for the accomplishment of any specific object, may be arranged under three heads:—1st, The facility of union; 2dly, The general advantages to the science; 3dly, The particular advantages resulting to individuals.

1. Under the term *facility of union* is not only comprised those qualifications that are to be possessed by such as desire to become members, but the expense attendant thereon. In both these respects our Society is unexceptionable. There are, indeed, few entomologists to whom the annual payment of one guinea is inconvenient; and by fixing the contribution at so moderate a rate, we, at least, have avoided the reproach cast upon the scientific institutions of this country by foreigners—that they are made only for the wealthy, and are, essentially, composed alone of the aristocracy. Yet small as this sum may be, it is well known that there are very many humble devotees to entomology, particularly in and about the metropolis, to whom, in these times, *any* payment would be inconvenient. Are we, therefore, to hold ourselves aloof from these our poorer brethren, merely because their station in society is inferior to our own? and are we to debar them the advantages of acquiring a taste for scientific entomology, and of an occasional personal intercourse with their more accomplished brethren in the science, merely because their calling in life is below ours, and their pecuniary resources more scanty?

Certainly not. They are fellow-labourers with ourselves in the same vineyard; and on their exertions, in the *practical* part of entomology, will frequently depend the solution of some of the most important questions regarding the higher departments of the science. I cannot but think, therefore, that, following the excellent example of the Linnæan Society, we should open the door of fellowship to these meritorious persons; and, by the institution of ASSOCIATES, enable *every* entomologist, in his respective sphere of life, to become a member of the same scientific body. Associates should be proposed by members, and regularly balloted for. This measure would guard the Society from the obtrusion of improper persons; mutual benefit would result to all parties; and we should concede to them the use of our library and museum, without allowing them to possess any voice in the administration of our affairs.

Another point connected with this division of our subject is, the place and times of meeting,—both involving questions of expense to the Society, and of convenience to its members. From the nature of our union, and the smallness of our annual subscription, we can never hope to possess those pecuniary resources enjoyed by the more wealthy societies of the metropolis. I indulge a confident expectation, therefore, now that our little association has assumed a permanent form, that, through the representation and exertions of our esteemed and liberal-minded President, Government will be induced to extend to us the same indulgence that has been granted to other societies, by assigning to us the use of one of the numerous rooms in Somerset House,—a central situation, admirably adapted, as I should imagine, to the majority of our members; and by which concession our scanty funds would be disburthened from a heavy annual expense. I cannot but be sanguine, that if a proper representation on this subject was made by our excellent President to His Royal Highness, the Duke of Sussex, the latter, as the representative and *protector* of the science of this country, would exert his influence in our behalf.

We come now to the second subject of inquiry, namely, What are the means by which the science, in general, can be *best* promoted by the Entomological Society. Here, as in all similar questions, the means to be employed do not so much



depend upon their abstract nature, as upon the funds we possess for carrying them into execution, and by which we should, as a matter of course, regulate our operations. Science is encouraged, 1st, By the publication of original information; 2dly, By instituting premiums for the best essays upon any given theme; 3dly, By the employment of collectors to gather materials for the investigation of the members; in other words, by the establishment of a museum; 4thly, By the formation of a library; and, 5thly, By devoting funds to the prosecution of such works as, from their nature, cannot be expected to receive encouragement from the public. All these points deserve consideration, inasmuch as each possesses some peculiar advantage. It may be useful, therefore, to make a few observations upon each, first premising, that all parties will assent to the undeniable wisdom of this principle, that if the same object can be accomplished as effectually *without* expense, as it can be done, by a different method, *with* expense, it is our bounden duty to prefer the former; for by so doing, we enable the Society to accomplish much more, by the judicious employment of the funds so saved, than it otherwise could do.

1. The publication of the most valuable essays or papers, sent to a scientific society, is unquestionably one of the best means for promoting its objects; because such a collection may be viewed as the aggregate wisdom of its chief members, although circumstances, hereafter to be adverted to, have very much tended, of late years, to shew that the latter supposition is more visionary than real. Be that, however, as it may, it is plain to all those who know any thing about the matter, that the publication of its Transactions is the most constant and draining expense which can be entailed upon a society; and that even in the case of those who enjoy annual funds to the amount of *thousands*, it absorbs so much, that nothing can be spared for other and equally beneficial objects. In proof of this, I need only cite the present state of the pecuniary affairs of the Royal Society of London, the parent from which nearly all others have sprang; and of the Linnæan Society, the oldest and the best of those more especially devoted to zoological science. The plan of the former has hitherto been to publish a very considerable portion of their communications in a form and style suited (as some imagined) to the *dignity* of the association, as if *that* was dependent upon wire-wove paper,

Bulmer's types, and wide margins. The consequence has been, that this expensive system has exhausted nearly the whole of their funds, to the virtual exclusion of many other objects equally important. Their library, exclusive of presents, is proverbially poor, being deficient in the standard works of modern science: and they are obliged to rely chiefly upon the liberality of the Government for the means of bestowing the annual premiums. I advert to these facts for the purpose, not of disparaging the Society, but to shew the actual working of an old, but injudicious system; a system, moreover, which, if my information be correct, the Society itself is now about to revise and amend, simply from the enormous annual expenditure it entails. If we turn to the Linnæan Society, the same effects are perceptible. Their Transactions, however valuable, completely absorb their funds, and take from them the means of prosecuting, with the least degree of vigour, any one of the objects we shall presently advert to. It might reasonably have been expected, that from so large an income, an annual proportion might have been set aside for the purchase of the Linnæan treasures. By such timely foresight a fund would have been created without the necessity of applying to the members for a large subscription, highly inconvenient to the majority, who, nevertheless, felt, under existing circumstances, the wisdom and urgency of the measure. While speaking of this Society, I must advert to a subject of deep regret to its entomological members, as a disadvantage which more particularly affects them. I allude to the resolution, adopted of late years, by the Council, of not publishing *coloured* plates of insects, solely, as it is understood, from the great expense that attended those immutable figures contained in the twelfth volume. It is not likely that such erudite and invaluable papers will be of frequent occurrence, and the extra expense they would entail might, therefore, well be granted. And, in the next place, the Society, by this ill-judged measure of economy, have raised an insuperable bar to receiving from those few persons capable of furnishing such essays any more of the same description.

Seeing, therefore, that the publication of *Transactions* actually absorbs the greatest portion of the funds enjoyed by our chief scientific bodies, yet, knowing also the great good that results from such publicity and dissemination of modern

discoveries, it remains for us to consider whether, by adopting any other means, we can secure the same advantages, without entailing upon ourselves those evils which are inseparable from the plan just mentioned. And here it is with sincere pleasure that I am enabled to mention the Zoological Society of London in those terms of praise, which, upon every occasion, I should have been most willing to concede to it. Its Council saw the rock upon which others were splitting, and had the prudence and wisdom to avoid it. Far from thinking that the reputation of the Society would be raised in the estimation of the scientific world, or of the public, by the sending forth of an imposing hot-pressed quarto volume of TRANSACTIONS, they made use of one of the best of our scientific journals as the channel for communicating, in a condensed form, all that was essential of their scientific labours: and these abstracts, subsequently printed in a detached form, are sold for a mere trifle, and thus become accessible to the poorest student. It is only very lately, at a time, as we may fairly suppose, when the Society have accumulated funds for such an additional expense, that they have commenced a regular volume of *Transactions*, which every one will hail with pleasure, if the alteration does not supersede the admirable plan at first adopted.

It is to this particular subject, more, perhaps, than to any other, that I venture to call the unprejudiced attention of the Society at large, and of the Council in particular, because it appears to me, and to several with whom I have conversed, the only plan which will enable us to act up to the principle we set out with considering as an axiom, namely, that if the same object can be accomplished as effectually *without* expense, as it can be done, by a different method, *with* expense, *it is our bounden duty to prefer the former.*

Let us, however, upon such an important and interesting question, go a little deeper into the matter, and putting aside both theory and general experience, come to calculations, estimates, and figures. Suppose, then, we decided upon publishing our *Transactions*, and that they appeared in octavo parts (for we could hardly aspire to a quarto) every three months. We could not bring out a *thinner* pamphlet, or at a *higher* price, than one of the numbers of this magazine; nor could a less number be printed than 250 copies. Having had some

experience in these matters, I shall now lay before the reader an estimate of the cost of such a number.

	<i>£</i>	<i>s.</i>	<i>d.</i>
Cost of paper and printing, correcting and advertising, 250 copies, size of <i>Entomological Magazine</i> , about . . . . .	27	0	0
Cost of three plates, (drawing, engraving and colouring), five figures in each . . . . .	31	15	0
	<hr style="width: 100%;"/>		
Sale of 250 copies, at 2 <i>s.</i> 9 <i>d.</i> . . . . .	34	7	6
	<hr style="width: 100%;"/>		
Net loss per number . . . . .	24	7	6
	<hr style="width: 100%;"/>		
Or on four quarterly numbers . . . . .	97	10	0
	<hr style="width: 100%;"/>		

This estimate, be it observed, is a most favourable one; for it is made on the supposition that every copy will be sold, which no one, at all acquainted with the present rage for the "penny press" would expect. And yet, on this shewing, the publication would entail upon the Society a loss of 97*l.* 10*s.* per annum,<sup>a</sup> its present income being 105*l.* I must confess, that, in my estimation, no folly is greater than that which we commit with our eyes open.

It may be said, indeed, by those who hold a different opinion from myself, that the estimated extent of sale is too small, or that the members would willingly make a trifling addition to their annual subscription, for the sake of seeing their own communications in the form of regular *Transactions*. To these, however, I would reply, in the first place, that they must be very ignorant of the present sale of purely scientific works, who would bring forward this objection; and, secondly, that any permanent increase of the annual subscription would be, in fact, a direct violation of those terms upon which the members consented to join the Society. That such a proposition would, consequently, be resisted very extensively, cannot be doubted, and the very existence of the Society would be endangered. It will be observed, moreover, that in this estimate we go upon the supposition, that the members

<sup>a</sup> At Mr. Swainson's request, we have entered minutely into the detail of the expenses, and find the statement above perfectly correct.—Ed.

will consent to *pay* for their copies, and not expect to receive them, like those of the Royal, Linnæan, and other societies, as a return, *gratis*, for their annual subscriptions. We have put the question, in short, in as favourable a point of view as the advocates of an opposite plan can possibly expect; and yet, with all this, we find we should entail upon ourselves a burthen of about 97*l.* 10*s.* per annum *dead loss*, for that which can be accomplished without any expense.

With these facts before us, I cannot entertain the least doubt that the delegated authorities of our Society will studiously abstain from plunging us into all the expense and uncertainty of publishing *upon our own account*. In truth, we ought to be most thankful to any of those,—whose profession it really is, — who will take this risk and trouble upon themselves. We come, then, to inquire which of the existing periodical publications is most suited to our purpose. And here, the avowed declaration of the Editor, that the *Entomological Magazine* will be certainly continued, comes at a most appropriate time; for no other periodical is devoted to this science; and no other, in consequence, is more adapted to become the record of the Society's proceedings. It cannot be supposed, that the sale of this Journal would be *materially* increased by such an accession of new matter,—valuable and interesting as we may confidently anticipate it would be,—and therefore no very great favour would be bestowed upon the spirited individuals who are now supporting the Magazine, to their own pecuniary loss. Yet, on the other hand, we might hope that such a measure would, at all events, enable the work to pay its own expenses; and if, after a time, any amount of profit, worth naming, were to arise, I am disposed to think that the proprietors would gladly devote a portion of that profit towards the other objects, hereafter mentioned, which come within the range of the Society. On these, as well as several other minor topics connected therewith, I shall not, however, dilate. If the truth and justice of the main principles I am advocating be admitted, these subordinate details can be very easily arranged. To the Council of the Society should be conceded the right of selecting such papers as they deem most fit for *official* publication: while, if the authors of the “rejected” desire it, and the Editors of the Magazine can find room, the rest may still find their way to the public.

Thus new theories, and new views, will never be kept back from the light merely because they do not happen to please, or are in opposition to the opinions of the *Publishing Committee*.<sup>b</sup>

But, if the Society are bent upon making to themselves a book, there is still a way of proceeding, which will at the same time accomplish *another* object, by which science can be effectually promoted. Let there be an annual prize awarded for the best essay on the natural arrangement of any one group of insects on sound philosophic principles; and let this essay, limited to a certain bulk, be then printed: the expense would be small; and the sale, throughout the entomological world, certain. The premium, or prize, should either be a sum of money, or a medal; in either case sufficiently valuable to make it worth contending for—not so large as to affect the funds of the Society. A thin pamphlet would contain the Essay of the year; and thus, in process of time, as “A Collection of Prize Entomological Essays,” the volume would indisputably become the most valuable collection of tracts on the science in our language.

<sup>b</sup> The same principle of impartial justice which has induced me to speak in praise of the Zoological Society in the preceding pages, imperatively demands a public record of the following anecdote, the truth of which can be substantiated by documents. A few months ago a well-known conchologist (not a member of the Society) addressed to it, through the Secretary, a long paper on the natural arrangement of the primary tribes of the Mollusca or Testaceous animals, pointing out their circular affinities, and their analogous representations to other large groups in different tribes of the animal kingdom. This paper was sent to the present Secretary, who thought it prudent to submit it to the judgment of some of the Publishing Committee, before it should come in an official form to the Society. In this he was, doubtless, influenced by the considerate wish that the author should have the power of withdrawing it, in case these learned gentlemen were adverse to the publication of his paper. The result proved the knowledge which the Secretary had of the views and feelings of the Publishing Committee. The author was politely informed that they (the committee) could not sanction the publication of such a paper, wherein characters for classification were employed, quite at variance with all received authorities! The paper, of course, was withdrawn. What would have become of *science* if we had always acted upon this narrow-minded principle? An absurd theory will die in the birth; while, if there is any thing *good* in a tolerable one, there are those who can extract that good, and throw the refuse away. So much for the necessary evil of Publishing Committees! I hope this example will deter all who venture beyond the description of species, from sending papers to a *Publishing Society*, unless the council for the current year are composed of their personal friends. For myself, I never have, and never will, trouble such societies with communications that may become “Rejected Addresses.”



Next to the publication of original papers, and the patronage of the higher departments of the science, the *materials for study* deserve consideration; being, in fact, the means by which the former are produced. These branch off, as already intimated, into two divisions:—1. The collecting, or acquiring of new objects, for the purpose of forming a general entomological cabinet; and, 2. The formation of a library. To both of these the members and associates should have free access; and should enjoy the unrestrained use, so far as might be consistent with the preservation and care of the specimens, and the convenience of that amiable and promising entomologist, who has so liberally and zealously taken upon himself the office of our *Curator*.

It is quite unnecessary, in addressing naturalists, to expatiate upon the vital importance of a *cabinet of specimens*, whether as a source of instruction to the young beginner, of authority to the nomenclator, or as a “magazine” of research to the theorist. On all this there can be but one opinion.

The only difficulty we have to encounter lies in the means of accomplishing an object so important. Much may be expected from the future liberality of the members, because much has been already done,—more especially by our generous President,—towards laying a good foundation. We may advance, indeed, in this way, to a certain point; but beyond that, if we merely depend upon *presents*, our progress will be very small, and totally inadequate to the wants of the Society. It cannot be expected, that the gifts of the members should be extended beyond the *duplicates* of their respective cabinets; and these, where foreign insects are concerned, excepting in very few instances, will soon cease to increase the number of species in our public collection. It may not be expedient, perhaps, in the present infancy of the Society, to devise any plans for an extensive and constant acquisition of new species; and the length to which this paper has already extended forbids me from saying more upon this subject at present: it is one, however, in which we are, or can be, so much interested, that I propose resuming it in the next number of the Magazine. I may, however, suggest the expediency of allowing the Curator to expend, at his own discretion, any sum, not exceeding five pounds, in the acquisition of any lot of insects which circumstances may enable him to procure for the Society,

provided they may be so purchased considerably below the average or usual prices of such specimens. These will, of course, be exhibited to the Council, and to the Society at large, whose approval, or disapproval would be a sufficient guide to any future purchases of this description. Purchases, to a larger amount, may be decided by the Council for the time being.

(To be continued.)

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ART. XVI.—*Entomological Notes.* By EDWARD NEWMAN,  
ESQ., F.L.S.

(Continued from Vol. I., page 514.)

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“In his tam parvis, tamque fere nullis,” &c.

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CLASS.—COLEOPTERA.

NATURAL ORDER.—NITIDULITES, *ined.*

GENUS.—MELIGETHES. *Kirby.*

Mel. nigra. *Nigra, punctatissima; antennis pedibusque piceis.*

Black, thickly punctured; antennæ pitchy black, the basal and apical joints being lighter than the intermediate ones; the legs are pitchy black, the fore, lighter than the middle and hind legs; the prothorax and elytra are very deeply punctured, and covered with a short, grey villosity; the elytra are very narrow posteriorly. (Length  $\frac{1}{2}$  lin.)

A single specimen of this insect is in the cabinet of Mr. Wailes.

GENUS.—CATHERETES. *Herbst.*

Cat. glabra. *Nigerrima, nitidissima; antennis pedibusque concoloribus.*

Very black and shining: antennæ black, the joints composing the club slightly downy; head, prothorax and elytra very black, shining, sparingly covered with a grey villosity; elytra short, and abruptly truncate; legs entirely black. (Length  $\frac{2}{3}$  lin.)

Taken in some abundance, by Mr. Davis, from nettles by the road side, between Ipswich and Woodbridge.

GENUS.—MICROPEPLUS. *Latreille*.

This genus is generally considered to be nearly allied to *Nitidula*, and if this is the case, it arranges properly with my MS. order, *Nitidulites*; I cannot, however, express myself confident on this point. No one can look for a moment on *Micropeplus*, without being struck with its resemblance to *Syntomium*, and other minute *Brachelytra*: in a natural arrangement, the union of the tribes of carnivorous and necrophagous beetles must take place by means of these or cognate genera.

Micro. obtusus. *Testaceus*; *capite anticè rotundato*.

Entirely pale brown; the head, instead of being pointed anteriorly, as in *M. Staphylinoides*, is obtuse and rounded.

The insects from which the above description was taken, are in the cabinet of Mr. Davis; they are less elongate, but rather broader than *M. Staphylinoides*; the lines on the elytra are rather more elevated than in that insect; they are perfectly formed, hard, and mature. Mr. Davis received them from Halifax.

NATURAL ORDER.—IPSITES? *ined.*

GENUS.—TRICHOPTERYX. *Kirby*.

Tric. Titan. *Nigra, pedibus albidis.*

Black, with very pale legs; head, above, and mouth black; throat pale testaceous; antennæ, with the incrassated basal joints, very pale, the following portion or shaft fuscous, the club rather paler, except the apical joint, which is dark brown, with the exception of the extreme point, which is paler: the prothorax and elytra are black, and extremely glabrous, reflecting, in some lights, a metallic hue; the under-surface of the prothorax and telum, together with the whole of the legs, including their coxæ and trochanters, are of a dirty white colour; the other portions of the insect, beneath, are nearly black. (Length  $\frac{1}{4}$  lin.)

Mr. Davis has taken several specimens of this insect out of moss; it is less than half the size of the insect I possess, named *T. minuta* of Stephens, being about the magnitude of the dot of this i.

GENUS.—ATOMARIA. *Kirby.*

*Atom. gutta.* *Picea; elytris nigris, gutta media suturali sanguinea; pedibus ferrugineis.*

Pitchy black; antennæ ferruginous, with the basal half of the apical, and the whole of the following joints, fuscous: prothorax and elytra black; the latter with a distinct red spot, like a small drop of blood, on the centre of the suture, being half on each elytron; the legs are ferruginous. (Length  $\frac{3}{4}$  lin.)

This remarkable insect is, I believe, unique in the cabinet of Mr. Davis; he found it in moss from Lincolnshire.

GENUS.—CRYPTOPHAGUS. *Herbst.*

*Cryp. scutellatus.* *Fuscus; metathoracis scutello nigro, elytris pedibusque testaceis.*

Head, prothorax, and under-side of the insect, dark brown; eyes and mesothoracic scutellum black; antennæ brown at the base, and testaceous at the apex; legs testaceous, with the exception of the femora, which are rather darker; elytra testaceous. (Length nearly 1 lin.)

This insect is, I believe, unique in the cabinet of Mr. Wailes, who kindly transmitted it for description, with others mentioned in this paper.

GENUS.—TETRATOMA. *Herbst.*

*Tetra. picta.* *Nigra; prothoracis marginibus, elytrorum maculis decem ferrugineis.*

Head, and exterior portion of the antennæ, fuscous; mouth, and basal portion of the antennæ, ferruginous; prothorax black, with all its margins ferruginous; elytra black, with ten ferruginous spots, one on each shoulder, one on the exterior margin of each elytron, one at the apex of the elytra and partly on each,

one on the centre of the sutural margin, also partly on each elytron; between this last and the humeral spots is one on the disk of each elytron, and, finally, between each exterior marginal spot and the apical one is another, on the disk of each elytron. Beneath, the insect is black, and very glossy, with the exception of the throat, which is pale: legs fusco-ferruginous, meso- and metafemora nearly black. (Length  $1\frac{1}{4}$  lin.)

This insect is, I believe, also unique in the cabinet of Mr. Wailes: in beauty it exceeds any of the tribe I have ever seen. Mr. Wailes transmitted it to me with a MS. name, *decem maculata*, a name I have somewhat uncourteously superseded, although I must allow it to be exceedingly appropriate and descriptive; my only objection to it was its length.

GENUS.—RHYZOPHAGUS. *Herbst.*

*Rhyz. collaris. Ferrugineus, thorace fusco.*

Entirely ferruginous, with the exception of the prothorax, which is fuscous. (Length  $1\frac{3}{4}$  lin.)

This species has been taken in considerable abundance by Dr. Howitt, and liberally distributed by that gentleman, with a MS. name, *R. cadaverinus* attached, a name which appears to me to convey rather an incorrect idea, Dr. Howitt having taken it from the *wood* of old coffins, and the genus being essentially wood feeders.

NATURAL ORDER.—BOSTRICITES, *ined.*

GENUS.—RHYZOPERTHA. *Stephens.*

*Rhyz. cincta. Nigra; prothoracis margine posteriori, elytrorumque disco testaceis.*

Head black; antennæ testaceous; prothorax black, with the posterior portion testaceous, giving the insect a belted appearance; elytra testaceous, with a wide exterior margin, black; legs testaceous. (Length  $1\frac{1}{4}$  lin.)

This insect is, I believe, unique in the cabinet of Mr. Wailes.

## CLASS.—ORTHOPTERA.

NATURAL ORDER.—LOCUSTITES, *ined.*GENUS.—RIPIPTERYX. *Newman.*

Caput cordatum, (Pl. VII., fig. 3.); oculis magnis ovatis ( $\alpha$ ); ocellis tribus, ( $\alpha$ ) lateralibus oculos, medio clypeum, fere attingentibus; clypeo subquadrato, elongato ( $\alpha$ ); antennis 10-articulatis, prope os insertis ( $\gamma$ ). Os (fig. 2) partibus omnibus distinctis; labrum conspicuum, quadratum, ( $a$ ) angulis rotundatis; labium divisiones quatuor perspicuè dispartens; insertione ( $u. 1$ ) elevato, labii magnitudine; labio proprio ( $u. 2$ ) lateribus, ante medium, productis, apice paullò angustiori, medio obsolete emarginato; palpigero ( $u. 3$ ) minori, angustiori, labipalpos quasi tri-articulatos ferenti; ligula ( $u. 4.$ ) in quatuor lobis palpiformibus quarum intermediis minutissimis, lateralibus manifestis, divisa; maxillæ validæ, lacinia ( $o. 4$ ) elongata, acuta; galea ( $\delta$ ) palpiformi, quasi biarticulata, articulo (anne articulus?) basali minimo, apicali elongato; maxipalpis ( $\delta$ ) articulis quatuor, quorum apicali robustiori, omninò majori; mandibulæ validæ, ( $i$ ) apice vix acutæ intus unidentatæ: lingua perspicua, linguiformis. Prothorax integer, supra obcordatus valdè convexus. Segmenta sequentia pariter patefacta. Telum (fig. 6) in laciniis quatuor divisum, appendicibus sex armatum; laciniis externis patefactis, internis minutis; appendicibus quatuor, externis minutissimis, duobus internis elongatis, obtusis. Proalæ brevissimæ, coriaceæ, contortæ. Metalæ maximæ, longitudinaliter plicatæ, quasi flabellum, nervuris 38 longitudinalibus directis, unica transversa undulata, costa coriacea: metalæ pulcherrimæ, maximè mirandæ. Propedum (fig. 5.) femoribus, tibiisque simplicibus, tarsis quasi bi-articulatis, articulo primo angustissimo, brevissimo, subtus in lobum producto, secundo elongato, attenuato extus crassiori unguibus duobus armato. Mesopedes propedum characteres habent. Metapedum (fig. 4.) femoribus dilatatis, marginibus attenuatis, intus concavis, extus convexis, alas quiescentis aliquatenus recipientibus; tibiis rectis attenuatis, apice limbo producto acuto; tarsorum loco, duobus appendicibus rectis, acutis, suppleto.

At a future time I hope to offer some opinions as to the affinities of this extraordinary genus; at present I must leave the proficient in entomology to draw his own conclusions from the description and accompanying figures.



*Ripip. marginatus.* *Niger; oculis prothoraceque albo marginatis.*

Black; margins of the eyes and prothorax clearly and beautifully white; the antennæ on several of the intermediate segments have a white spot; the fore wings are tipped with white, the hind wings are transparent, with a tinge of rich brown, and slightly iridescent; the metafemora are margined superiorly with white; the other parts are entirely black. (Expansion of the wings, 1 inch; length of the body, 4 lin.) See Pl. VII. fig. 1.

The only specimen I have seen of this beautiful and singular insect, is in the collection of Mr. Hanson. He received it from Para, in South America. The Rev. F. W. Hope informs me he possesses a second specimen.

(*To be continued.*)

ART. XVII.—*Capture of Nocturnal Lepidoptera on Yew Trees in Norbury Park.* By JOHN WALTON, Esq.

SIR,—I herewith send you some memoranda of the habitats and times of appearance of a few nocturnal *Lepidoptera*, together with a short account of the method which I practised, very successfully, in capturing them. If you consider my observations of sufficient interest to merit a place in the Entomological Magazine, it will afford me great pleasure to communicate them through so excellent a work.

On Sunday evening, the 19th of September, 1831, my friends, Mr. Bowerbank and Mr. Hoyer, and myself, were accidentally walking near some ancient yew-trees, on an eastern declivity on the skirts of a large beech wood in Norbury Park, immediately adjoining the charming village of Mickleham, situated about half-way between Leatherhead and Dorking, Surrey. The buzz of moths attracted our attention; and observing them to settle on the yew-trees, it was suggested by Mr. Hoyer that they were probably feeding upon the berries, which were then ripe, and hanging in the most beautiful profusion. On the following evening we determined to investigate

this opinion, and prepared ourselves with such lanterns as we could procure; the result was the capture of several species in the very act of feasting on the saccharine juices of the fruit. Having previously arranged to leave Mickleham the day after, we regretted we could not then examine further, what appeared to us, a novelty to entomologists. On our return to London, we prepared ourselves with three bull's-eye lanterns, forceps, &c. and determined to visit the yew-trees. On the nights of the 24th, 26th, and 27th of September, we captured the following moths—all as perfect and beautiful as bred specimens—except *Orthosia lunosa*, which was faded, and evidently going off:—

	Specimens.		Specimens.
Agrotis		Xylina	
suffusa . . . . .	2	semibrunnea . . . . .	1
nigricans . . . . .	1	rhizolitha . . . . .	4
Orthosia		Polia seladonia . . . . .	plentiful
litura . . . . .	sparing	Xanthia	
Pistacina . . . . .	abundant	flavago . . . . .	4
lunosa . . . . .	2	fulvago . . . . .	5
macilentia . . . . .	abundant	aurago . . . . .	6
Glæa		citrago . . . . .	3
spadicea . . . . .	1	rufina . . . . .	2
satellitica . . . . .	1	Phlogophora	
		meticulosa . . . . .	plentiful
		Euthalia Psitticata . . . . .	ditto

The following autumn (1832) I examined the same trees every other night, from the middle of September until the ninth of October, without seeing a single moth. The weather, about the latter end of September and the beginning of October, was cold, and very rainy, the wind high, and the yew-tree berries were not generally ripe, which indicated a late season. On the evening of the 10th the moths began to appear; and I continued my nocturnal visitations every night until the 16th, and afterwards three nights a-week, until the 5th of November. I captured the following seven species, which I had not seen the first year, and all the other species enumerated in the preceding list, except *Agrotis nigricans*, *Orthosia lunosa*, *Xylina semibrunnea*, *Xanthia flavago*, *X. fulvago*, *X. citrago*, and *X. rufina* —

	Specimens.		Specimens.
Orthosia		Oporabia dilutata . . . . .	plentiful
Lota . . . . .	6	Thera Juniperata . . . . .	1
flavilinea . . . . .	very abundant	Sarrothripus	
Xylina petrificata . . . . .	1	degeneranus . . . . .	sparing
Miselia Oxyacanthæ . . . . .	plentiful		

The result of this year disappointed my expectations. I had previously calculated upon a more bountiful harvest: however, sportsman-like, I attributed this to a bad breeding season,—to that mysterious Power which regulates and governs the number and irregular appearance of insects.

The long continuance of fine beautiful weather in the spring, summer, and autumn of 1833, induced me to expect a highly favourable season for autumnal moths, and for bringing the fruit of the yew-trees earlier to perfection. I determined once more to examine this interesting *habitat*, and commenced operations on the same night as in the preceding year (10th of October). I found abundance of moths enjoying, as usual, their favourite repast. The fruit was perfectly ripe, and the yew-trees beautifully adorned with fine large berries in the richest profusion; I lamented that I had not been enabled to arrive sooner, from an idea that several species of the early autumnal moths must have disappeared. I commenced by devoting, on an average, five hours every night for twenty-eight nights, from the 10th of October until the 14th of November. I was highly gratified, and amply repaid for my exertions, by the capture of upwards of two thousand moths. I *boxed*, on the average, eighty insects per night, of the following species:—

	Specimens.		Specimens.
Agrotis		Miselia Aprilina.	5
æqua . . . . .	1	Polia seladonia . . .	plentiful
suffusa . . . . .	plentiful	Xanthia	
Orthosia		aurago . . . . .	ditto
litura . . . . .	ditto	citrago . . . . .	1
Pistacina . . . . .	abundant	croceago . . . . .	2
Lota . . . . .	plentiful	rufina . . . . .	2
flavilinea . . . . .	very abundant	Phlogophora	
macilenta . . . . .	abundant	meticulosa . . . . .	abundant
Glæa			
rubiginea . . . . .	5	Hybernia connectaria ♂	plentiful
satellitica . . . . .	very abundant	Himera pennaria . . .	1
vaccinii . . . . .	ditto	Euthalia	
spadicea . . . . .	ditto	miata . . . . .	3
subnigra . . . . .	plentiful	Psittacata . . . . .	plentiful
polita . . . . .	abundant	Thera variata . . . . .	3
Xylina		Oporabia dilutata . . .	plentiful
semibrunnea . . . . .	3	Cheimatobia brumata .	ditto
rhizolitha . . . . .	plentiful	Margaritica ferrugalis .	1
Calocampa exoleta . . .	6	Sarothripus degeneranus .	6
Miselia			
Oxyacanthæ . . . . .	plentiful	Oncomera Podagrariæ . .	2

I think it may be inferred, from my observations, that insects, generally speaking, are not much under the influence of a backward or forward season in their appearance, but have their regular periods of flight: the great and sudden changes of temperature, combined with the variable state of our atmosphere, perhaps, may have some influence in diminishing or increasing the number of insects. *Agrotis suffusa* appears at the latter end of September, and continues on the wing during the whole of October; but specimens taken towards the latter end of the month are a good deal faded; though plentiful this year, they were very scarce the two preceding years. This insect is stated to appear in June, and is supposed to be double-brooded. I only met with one, *Agrotis aqua*, a beautiful female, on the 10th of November, 1833.

I have no doubt that *Orthosia litura*, *Pistacina*, and *macilentata*, usually begin to appear at the latter end of September,—as my specimens, captured on the 24th, 26th, and 27th of September, 1831, were all as fine as bred specimens; whereas, on the 10th of October, in the two following years, the said insects were more or less faded, and evidently going off. They continue on the wing several weeks. *O. Pistacina* is truly denominated a protean species. Out of an immense number, I picked many very singular and astonishing varieties.

*Orthosia lunosa*, *Agrotis nigricans*, *Xanthia flavago*, *X. fulvago*, *citrago*, and *rufina*, also appear at the latter end of September, except the first, which appears earlier. They seem to have a much shorter existence; for I never met with them in October, except the two latter, which were difficult to recognize, they were in such a wretched plight.

*Orthosia Lota*, and *O. flavilinea*, I think I may confidently state, appear about the 10th of October, independent of the variable state of the season, having captured many of the former, and several hundreds of the latter,—“ unquestionably,” as Mr. Stephens observes, “ a scarce insect near London;”—they continue, like their congeners, several weeks on the wing; but not one specimen in ten was worth setting of those which I captured towards the latter end of October and in November.

*Glæa vaccinii*, *G. spadicea*, *G. polita*, and *G. subnigra*, begin to appear at the latter end of September, and continue on the wing until the middle of November. I am inclined to think, from a careful examination and comparison of several

hundred specimens, that they all constitute but one variable species.

*Glæa satellitia* I captured in very great abundance on the evening of the 11th of November. It is a most hardy moth, as it was out in all weathers, cold or wet, even when the yew-trees were saturated with rain, and adorned most beautifully with globules of water. I left it still out, on the 14th of November.

*Glæa rubiginea*.—I was extremely fortunate in detecting the locality of this insect, as it is stated to be unknown. There were only two, reputed to be natives, one in the British Museum, and the other in the cabinet of Mr. Dale. I captured mine at intervals, from the 10th of October to the 6th of November, all equally perfect and beautiful.

*Xylina semibrunnea* has not been taken of late years, and specimens are only to be seen in old cabinets. From my captures, it begins to appear at the latter end of September, and continues at intervals until the latter end of October. The three specimens captured from the 10th of October, 1833, to the 25th of October, were all very fine ones.

*Xylina petrificata*.—Of this insect, I took one specimen, on the 21st of October, 1832, equally as good as several bred specimens now in the cabinet of Captain Blomer. I think it is certainly distinct from the *X. semibrunnea*, though it appears about the same time, and in the same habitat. Mr. Stephens gives the time of its appearance in June; it may be double-brooded.

*Calocampa exoleta*.—The six specimens of this insect I captured between the middle of October and the 10th of November, all equally fine and beautiful. An entomologist will not require spectacles to see them on the yew-trees.

*Xanthia croceago*.—The last of two beautiful specimens was captured on the 31st of October; the other, about the middle of the same month. Mr. Stephens states that this insect appears in September.

*Xylina rhizolitha* appears at the latter end of September, and continues until the beginning of November. I captured a very fine specimen on the 5th of November.

*Xanthia aurago*.—I found them in great perfection at the latter end of September; and I continued to capture them now

and then during the month of October, but the specimens were somewhat faded.

*Euthalia miata*,—middle of October.

*Euthalia Psitticata* begins to appear at the latter end of September, and continues on the wing until the middle of November; but is very susceptible of cold, particularly the female; and only appears in warm humid evenings. The males were all, more or less, faded; but the females invariably, to the 14th of November, retained their beautiful rich green appearance.

*Hybernia connectaria*,—beginning of November.

*Himera pennaria*,—20th of October.

*Thera variata*,—middle of October.

*Juniperata*,—one taken on the 22d of October, 1832, somewhat faded.

*Oporabia dilutata*,—latter end of October.

*Cheimatobia brumata*,—middle of November.

*Margaritia ferrugalis*.—I captured one beautiful specimen of this rare insect at the latter end of October.

*Sarrothripus degeneranus*,—appears in the middle of October, and continues until the beginning of November.

*Oncomera podagrariæ*,—latter end of October. I captured this Coleopterous insect feeding upon the yew-berries.

I have been induced to make the above observations upon the appearance of the autumnal moths, as some are not recorded, and others very incorrectly. I thought they might be useful to help to define the natural times of their appearance in the *imago* state. I think I may say, that very few persons have been out so many successive days and weeks for two years, or have captured so many insects as myself, at such an inclement period. I never lost a night; and was more generally successful in capturing the rarer species when the nights were warm and rainy.

I will now describe, in as few words as possible, consistent with clearness, the method of capturing the moths. I use a bull's-eye lantern, with a powerful lens,—the larger the better; a pair of forceps, such as are generally used by entomologists, having the sides and bottom covered with white gauze, and about six inches wide at the mouth when opened. Also I use a portable sliding rod, or one with two lengths, jointed like a fishing-rod,



from six to nine feet long, and a small round net, made of white gauze or muslin, screwed or fixed on at the end, of about five to six inches diameter, and the same in depth. I then direct the rays of light upon the insect. If it is within reach I use the forceps, and take it very deliberately; if out of reach, but within the length of the rod, they are easily jarred into the small bag at the end of your rod, lowered down, and transferred into the forceps. In this way they are captured with certainty, and the most surprising facility, principally in consequence of that singular instinctive faculty which many insects possess, in a greater or less degree, of feigning death when alarmed. For example, *Orthosia Pistacina*, and *O. litura*, contract their legs and wings, and fall into the bag-net, or forceps, immediately when touched, tumbling and rolling about without evincing the least signs of life; and so do many others. On the contrary, *O. macilenta* and *O. flavilinea*, and others, under the same circumstances, exhibit very little, if any, of that predisposition of feigning death. They will try to creep away when disturbed, having no inclination to use their wings, but are easily jarred off the berries or leaves into the bag-net, or induced to creep upon some part of it, until they are finally secured with the forceps. If they happen to miss the net in the act of falling, they invariably drop lightly to the ground, and may be taken from the grass with the forceps. The above observations only apply to the *Noctuidæ*, which carry their wings horizontally; the *Geometridæ*, which carry their wings erect, invariably fly away when touched or disturbed. It requires a little patience and address, when beyond the reach of the forceps, to secure any of this family; however, they affect death in some degree, and will fall a short distance as if shot, when the rays of light are directed upon them, and the small bag-net held just under them. It is necessary to wait patiently a few seconds, and gently to touch the twig with the ring of your net, until they feel inclined to exercise that shamming propensity; it must then be lowered with care, otherwise, if alarmed or disturbed, the insect will fly out of the bag before you can place over the top the flat side of your forceps. Take the bag-net to some convenient place, and the insect will be seen adhering to the bottom or sides with its wings erect. Then place the mouth of the forceps in a vertical position over the circle of the bag-

net, and lower it to the ground. This operation will raise up the bottom of the net, and with it the insect, which will fly up into the forceps, and these being closed at the sides, as before directed, it cannot escape. The yew-tree seems to flourish best in chalky districts. Few persons are aware of the great age and gigantic size of many of these magnificent trees in Norbury Park. They seem common in the woods and hedgerows on the chalk in Kent and Surrey. Those in Norbury Park are really a natural curiosity. I invite entomologists to examine them, more particularly, of course, when the fruit is ripe. I am convinced that they will be rewarded by new discoveries. Norbury Park is within the limits of the metropolitan district, as circumscribed by Mr. Stephens. I hope the London entomologists will be excited, by my success, to continue the investigation of this interesting *habitat*: I fear I shall never have another opportunity.

I am, Sir, yours, &c.

JOHN WALTON.

14, Canonbury Square,  
February, 1834.

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ART. XVIII.—*On Leucospis; a Genus of Hymenopterous Insects.* By J. O. WESTWOOD, F.L.S., &c.

As a supplement to Mr. Walker's detailed descriptions of the previously recorded species of the genus *Leucospis*, I beg leave to offer to the entomological student the following descriptions of new, and notes upon several of the old species, preceded by a few observations upon the genus in question.

As a genus, *Leucospis*<sup>a</sup> is especially interesting; firstly, from the circumstance that it comprises the largest known species of one of the most extensive families of insects—the *Chalcididæ*; secondly, from the extraordinary position of the *ovipositor*, which, when at rest, is laid along the back of the *abdomen*. It is difficult, at first sight, to imagine how this instrument

<sup>a</sup> I have not adopted Dumeril's derivation of this word, as the insects exhibit no character in conformity with it.

can be brought into action; when, however, we consider the extreme flexibility with which this organ in other insects is endowed, by means of the muscles attached to its base, the difficulty soon vanishes. A remarkable instance of this capability, of which I have often been witness, is recorded by Mr. Haliday, in the 98th page of the second volume of this Magazine, (No. VI.) From this account, it will moreover be seen, that the abdominal segments themselves are capable of great elongation, by means of the connecting membrane; and Jurine, who appears to have observed the motions of *Leucospis*, states, that “leur ventre jouit, dans l’articulation du premier et du second segment d’un mouvement particulier de flexion menu de demirotation.” It is, moreover, remarkable, that in the largest individuals belonging to another extensive family—the *Cynipidæ*, the females (genus *Ibalia*) carry the *ovipositor* in a similar situation,—these two genera being the only instances of so singular a peculiarity, throughout the vast order of Hymenoptera. A still further peculiarity exists also in these two genera, which has hitherto been unnoticed (at least in *Leucospis*) by entomologists; namely, the existence of a minute spiracle at the base of the fifth segment of the *abdomen*, in the females, on each side. Mr. Curtis is the only author who has noticed it in both sexes of *Ibalia*. (British Ent. Pl. 22.)

The wasp-like appearance of this genus, its *folded wings*, and elongated, cordate lower lip, establish a connexion with the *Vespidæ*, which, however, may not perhaps be deemed of a higher rank than one of mere analogical resemblance.

The character derived from the femoral teeth, as will be seen from my subsequent descriptions, can scarcely be considered sufficiently precise for the establishment of sectional divisions in the genus.

#### *Leucospis gigas*. Klug. Walk.

Varietatem *feminæ* a celeberrimo Latreille accepi, e typo specifico, (ut auctoribus predictis descripto) diversam, 1<sup>mo</sup>. maculis faciei flavis per marginem totum canaliculæ frontalis, utrinque currentibus usque ad antennarum insertionem; <sup>b</sup> — 2<sup>do</sup>. femoribus posticis internè piceo-nigris, apice flavis, externè flavis macula

<sup>b</sup> It will be seen from Klug’s character of *L. grandis*, that in this respect this variety approaches that species.

unica magna subquadrata infera nigra : oviductus abdominis segmenti 1<sup>mi</sup>. medium attingens. (Long. corp.  $6\frac{2}{3}$  lin.)

Coquebert's figure of the femoral spot, exhibits its precise form as in my insect.

It appears to me, from the Fabrician character of *L. gigas*, "*aculeo longitudine abdominis*," that Klug has misapplied the specific name ; that his *L. grandis*, "*aculeo abdominis longitudine*," is the Fabrician *L. gigas*, and that consequently a different name ought to be given to his *L. gigas*.

Leucospis. *Shuckardi*. Mas. *Nigra, collari bifasciato, scuto mesothoracico in medio maculis 2 oblongis, oviductu abdominis basin non attingente, femoribus posticis 6-dentatis*. (Long. corp.  $5\frac{3}{4}$  lin. ; expans. alar.  $9\frac{1}{2}$  lin.)

*L. gigantem* coloribus mentiens, sed magnitudine minori, statura graciliori notisque aliis distincta : caput nigrum maculis 2 rotundatis inter oculos, et partem superiorem canaliculæ frontalis flavis : mandibulæ basi rufescentes : antennæ nigræ, articulo 1<sup>mo</sup>. (nisi ad basin) fulvo, 2<sup>do</sup>. nigro, 3<sup>tio</sup>. et sequenti, etiam extremo apice rufescentibus : collare flavo-bifasciatum, fasciâ anticâ ad angulos anticos paullò dilatâtâ ; mesothoracis scutum in medio, maculis 2 parvis oblongis, et ad latera utrinque vitta subcuneiformi flavis ; mesothoracis scutellum lunula lata flava ; metathoracis præscutum<sup>c</sup> dentibus 2 parvis munitum : epimera metathoracica fere tota flava : abdomen thorace paullò longius, segmento 1<sup>mo</sup>. fascia lata, 2<sup>do</sup>. fascia angusta, 3<sup>tio</sup>. fascia subangusta flavis, omnibus in medio interruptis duabusque anticis ad latera abbreviatis, denique lunulis 2 (fascia 3<sup>tia</sup>. multo minoribus) apicalibus flavis : oviductus niger, abdominis segmenti 1<sup>mi</sup>. medium attingens : coxæ anticæ et intermediæ nigræ, posticæ nigræ, angulo supero apiceque subtus (at leviter) flavo notatis : pedes 4 antici fulvo-flavi, femoribus basi obscurioribus ; femoribus posticis internè piceo-nigris, apice fulvis, externè flavis, macula magna rotundata infera nigra, dentibus 6 nigris munitis, 1<sup>mo</sup>. brevi acuto, 2<sup>do</sup>. omnium longissimo acuto, reliquis longitudine decrescentibus obtusis ; tibiis et tarsis posticis fulvis, illis linea interna nigra : alæ fuscæ, costa saturatori.

I am indebted to W. H. Shuckard, Esq., a gentleman who has devoted much attention to the study of the

<sup>c</sup> According to the nomenclature of the thoracic segments of Mr. MacLeay, it is the metathoracic præscutum, (post dorsolum, *K. & S.* or metathoracic scutum, *And.*) which is toothed.

Hymenoptera, for my example of this species, which I have inscribed with his name. He believes it to be of American origin, as it came into his possession in company with various insects from that country, including *Pelecinus polycerator*, &c. It ought to form a distinct section in the genus, from the posterior femora having only six teeth, although, in certain positions, a minute rudiment of a seventh tooth is just visible.

*Leucospis subnotata*. Fem. *Nigra, colore albido-flavescenti parce notata, femoribus posticis 9-dentatis, coxis posticis immaculatis oviductu abdominis basin superante.* (Long. corp.  $4\frac{1}{4}$  lin.; expans. alar. 8 lin.)

Caput nigrum, punctatum, immaculatum, canaliculâ frontali sub-metallicâ: antennæ nigræ articulo 1<sup>mo</sup>. subtus albido, 2<sup>di</sup>. apice, 3, 4, et ultimo obscure rufescentibus: thorax niger, punctatus; collaris lateribus margineque postico toto, et antico abbreviato tenuiter flavidis; mesothoracis scutum lateribus flavido tenuiter vittatis, dorso immaculato; mesothoracis scutellum apice lunula angusta albida; metathoracis præsentum inerme; epimera metathoracica lineâ flavida notata: abdomen nigrum, punctatum, basi obscure rufescens, segmento 1<sup>mo</sup>. versus apicem flavido—(latè et in medio interruptè)—fasciato, segmento 2<sup>do</sup>. sequentibus multò angustiori ad latera linea tenui albida inferè notato, 3<sup>tio</sup>. apice flavido fasciato, (in medio supra angustiori et interrupto) lunulisque duabus minoribus apicalibus flavidis, oviductus piceus, abdominis basin superans: coxæ omnes nigræ, posticæ 2 apice rufescentes, internè albido vix notatæ, femora 4 antica nigra, apice, albida; tibiæ anticæ nigræ lineâ superâ fulvâ, intermediæ et posticæ flavida lineâ inferâ nigrâ, femora postica nigra, apice internè fulva, externè basi et apice maculâ parvâ albidâ notata, dentibus 9 brevibus nigris, 1<sup>mo</sup>. crassiori obtuso, 2<sup>do</sup>. parvo; reliquorum 4 et 5 longioribus acutis; tarsi omnes fulvi: alæ fuscæ, costa saturatiori.

*Habitat* in America Septentrionali, apud Halifax, Novæ Scotiæ; ubi rarè occurrit. Communicavit Dom. G. B. Sowerby.

I will only add, that in a genus like the present, in which the specific characters depend upon apparently trifling distinctions, it is almost an useless waste of labour to attempt to identify the species so concisely described by the old authors.

*Leucospis Hopei*. Mas. *Nigra, collari unifasciato, epimæris metathoracicis nigris, antennarum apice tibiis tarsisque rufis.* (Long. corp. 5 lin.; expans. alar.  $8\frac{1}{2}$  lin.)

Caput nigrum, immaculatum: antennæ rufæ, articulis 2 basalibus nigris: thorax niger, collare nigrum, margine postico flavo; mesothoracis præscutum lunulâ tenui flava; epimera metathoracica tota nigra: abdomen breve, convexum, flavo tenuè 3-fasciatum, fasciis 2, primis ad latera abbreviatis, 1<sup>ma</sup>. lunulata, coxæ posticæ flavo-vittatæ: pedes nigri, femoribus apice, tibiis tarsisque rufis, femoribus posticis (uno) 10-, (altero) 11-denticulatis: alæ subfusæ, costa saturatori.

*Habitat* in America Meridionali, apud Valparaiso. In Mus. Dom Hope, F.L.S. Z.S. E.S. &c.

Named in honour of the gentleman in whose extensive collection it is uniquely contained.

Leucospis Spinolæ. *Nigra, margine omni collaris (rel antice abbreviato in ♂) flavo, coxis posticis flavo latè fasciatis, tibiis anticis extus nigrescentibus, intermediis flavis, scuto mesothoracico ♀ ad latera flavo-lineato.*

Leucospis intermedia. *Spinola. Ins. Lig. Fasc. 4. p. 236, No. 283. (Nec. Fonscolombii, Ann. Sc. Nat. 26. 274.)—*  
(Long. corp. 3½ lin. ♂; ♀ 4½.)

*Habitat* in Liguriâ.

On comparing Spinola's detailed description of the species which he named *intermedia*, (and of which he had captured many specimens), with Mr. Walker's description of *L. dorsigera*, with which the latter has united it, sufficient differences<sup>d</sup> will be found to warrant their separation; and the name *L. intermedia* having been previously employed, I have named it in honour of the celebrated Italian Hymenopterist, by whom it was first described. M. Fonscolombe's description of the species which he named *L. intermedia*, and which is taken from a ♀ specimen, agrees with Mr. Walker's description of *L. dorsigera* ♀; but not with Spinola's *L. intermedia*, as used by Mr. Walker without any expression of doubt; although M. Fonscolombe gives the reference to Spinola with a query, and points out the differences between his own and Spinola's insect.

<sup>d</sup> The different colour of the basal joint of the male antennæ, the interrupted anterior yellow margin of the collar in both sexes, the want of the lateral lines at the base of the wings in the female, and the want of the broad fascia on the coxæ of *L. dorsigera*, are especially observable.



From Spinola's observations, the economy of this insect appears to be very different from that of the other species which have been observed. "*Fæminam* inveni in gallâ fungosâ coronatâ mespiliformi *Quercus ramulorum*, in montibus *Oreii*."

*Leucospis assimilis*. *Westw.* ♀ (nova species.) *Nigra*, abdomine thorace dimidio fere longiore, collare flavo-marginato, margine antico abbreviato, scuto mesothoracico toto nigro, abdomine utrinque macula minuta flava inter fascias 1 et 2, tibiis intermediis flavis. (Long. corp.  $3\frac{3}{4}$ —4 lin.; expans. alar.  $6\frac{3}{4}$ — $7\frac{1}{4}$  lin.)

*Leuc. dorsigeræ* affinis. Corpus gracile: caput nigrum, immaculatum: antennæ nigræ, articulo 1<sup>mo</sup>. in medio subtus flavescenti: collare nigrum, bifasciatum, fascia antica abbreviata, postica elongata, et per margines laterales collares paullò producta?: mesothoracis scutum totum immaculatum, ejusdem scutellum apice lineâ transversâ, integrâ, antice ferè rectâ: metathoracis præscutum obtusè bidentatum: epimera metathoracica flavo-notata: abdomen thorace dimidio ferè longius, subcompressum, ad secundum segmentum angustius, flavo 3-fasciatum (fasciis in medio supra interruptis) 1<sup>ma</sup>. utrinque abbreviata, inter fascias 1 et 2 utrinque macula minuta flava; fasciis 2 et 3 longitudine æqualibus: oviductus ad basin abdominis productus: coxæ 4 anticæ nigræ, femora 4 antica nigra apice pallida tibiæ anticæ flavescens extus nigrescens, tibiæ intermediæ flavæ: coxæ posticæ nigræ, apice subtus macula minuta flava notatæ; femora postica interne nigra, externe nigra, basi subtus margineque apicali supra flavis; dentibus 12-armata, 1<sup>mo</sup>. maximo, e dentibus reliquis in femore uno dentes 3 et 4, in altero dentes 5 et 6 sunt majores; tibiæ posticæ flavæ, intus nigræ; tarsi omnes flavidi: alæ subfuscæ, costa saturatiori.

*Var.* ♀.—Articulo 1<sup>mo</sup>. antennarum subtus flavido vix notato, collaris lateribus totis flavo tenuè marginatis, coloreque flavo femorum posticorum minus extenso, femoribus dentibus 16-armatis (dentes 2 et 4 in uno femore fere oblitterati), 1<sup>mo</sup>. maximo, 6, 7 et 8 reliquis majoribus: cæteris cum præcedenti ad punctum convenit.

*Habitat* in Europa—Germania? In Mus. Hope.

The remarkable difference in the denticulation of the posterior femora, in this species, is worthy of observation.

I think it not improbable, that the insect described by Mr. Walker as a doubtful variety of the male of *L. dorsigera* (*Ent. Mag.* Vol. II. p. 20) is the male of the above described species, regard being had to the circumstance, that in the species allied to *L. dorsigera* the females are distinguished by a greater share of yellow colour than the opposite sex.

*Leucospis Sicelis.* *Westw.* ♀ (nova species.) *Abdomine thorace dimidio longiori, collari flavo lineâ tenui centrali transversa nigra, tibiis 4 anticis totis flavis, coxis posticis apice subtus flavo-notatis, femoribusque posticis 15-dentatis.* (Long. corp.  $4\frac{3}{4}$  lin.; expans. alar. 8. lin.)

Corpus satis crassum, *L. intermediæ* (Spinola), et *dorsigeræ* affinis, e quibus colore pedum, &c. magnitudineque majori crassiori differt: caput latum, versus os vix attenuatum, nigrum, immaculatum: antennæ nigrae, articulo 1<sup>mo</sup>. flavo: collare flavum, fascia transversa centrali tenui nigra; mesothoracis scutum in medio immaculatum, ad latera lineolis 2 flavis obliquis prope alarum basin; mesothoracis scutellum apice linea transversa integra flava; metathoracis præscutum fere inerme; epimera metathoracica flavo notata: abdomen thorace dimidio fere longius, flavo latè 3-fasciatum, fasciis in medio interruptis, fasciis 1 et 2 latitudine æqualibus, illa ad latera abbreviata, hac late fere ad originem oviductus lateraliter producta, inter 1 et 2 utrinque macula lateralis minuta elongata (quasi rudimentum fasciæ 2<sup>dæ</sup>. oblitteratæ), fascia apicalis magnitudine mediocri: oviductus ad basin abdominis productus: pedes flavi, coxis anticis femorumque anticorum et intermediorum basi nigris: coxæ intermediæ nigrae, macula minuta flava: tibiæ 4 anticæ totæ flavæ immaculatæ: coxæ posticæ nigrae, apice subtus macula parva flava; femora postica internè nigra, apice fulva; externè flava, macula elongata infera apicali nigra; dentes 15 nigri, 1<sup>us</sup>. magnus, cæteri parvi; tibiæ posticæ latere interno nigrae: alæ fulvescentes, costa saturatiori.

*Habitat* in Sicilia. In Mus. nostr. a celeberr. Haworth, preceptore nostro Entomologo, heu valde deflendo! communicata.

*Note.*—*L. petiolata* and *atra* (Fab.) appear to belong to a subgenus distinct from the preceding.

ART. XIX.—*Notes on the Bethyli and on Dryinus pedestris.*  
By A. H. HALIDAY, ESQ. M.A.

1. *Bethylus*.—The insects of this genus seem fond of the flowers of *Syngenesia*, but their principal haunts are in dry sandy districts near the sea. The low tufts of *Rosa spinosissima*, flourishing among the sand-cliffs, support numerous larvæ of *Tineidæ*, which when full fed, often fall into the little pits of loose sand formed at the foot of the cliffs, by the gradual scaling of the bank and the eddies of wind. These pits are complete traps for various insects, to which *Myrmica rubra* and other predaceous species resort, and among these our *Bethylus* will be seen prowling. On the fifth of last June, I observed a female of the largest size occupied with one of those larvæ which was full fed, and, I should think, about six times its own weight. It had seized this by the mouth, and was with great perseverance endeavouring to transport it up the sliding sides of the pit. Perceiving that though apparently not discouraged after ten minutes' ineffectual exertion, it had no chance of succeeding, and wishing to trace its proceedings, I placed a fragment of straw in the hollow within its reach. The moment it had touched this railway the state of affairs was changed—taking a firm hold with its hind feet, it swung its prey round, and set off with it at a smart pace, walking backwards and dragging the body after it. From this time it was constantly endeavouring to ascend the face of the sand cliff, availing itself with admirable adroitness of the morsels of grass, twigs, &c., imbedded in it, not seeming to care how obliquely they lay, if they enabled it to gain a little elevation; so that its track was a zigzag. Frequently it chose stems which, rising nearly erect, receded from the bank above: I at first thought it was losing its labour, but it was at no loss how to act: after ascending a few inches with the whole weight suspended in the air from its mandibles, it would poise itself and its burden across the stem, with its head towards the bank, then throw itself off, at the same time extending its wings, which, though incapable of raising it from the ground, were able to give it some impulse towards the bank, on which

it thus alighted, at a spot someway above the springing of the stem. If, on ascending one of these twigs, it discovered that it was bent the wrong way, or receded too far from the cliff, it lost no time in hesitation, but stopping short of a sudden, commenced the descent again. It may be guessed that, dragging a gross, slimy body over twigs, &c., close to or half buried in the sand, frequent impediments would occur, which its extreme activity in walking indifferently, sideways or backwards, and main exertion of muscular force, generally enabled it to overcome; but sometimes it had drawn its burden under or between two twigs, which arrested its course: after a violent tug or two without effect, it would retrace its steps, dragging the *larva* in the opposite direction, till it was extricated, then disposing it so as to keep clear of the obstacles, start again. On every occasion when it had left its hold, it made for the same part, and spent some time in fastening its mandibles on the mouth of its prey beneath, so that the *larva* should be dragged on its back: once where this was not the case, it was impeded by the latter grappling with its feet the twigs over which it was drawn, and its captor quickly finding the error, let go and took a new hold in the usual position. When it had ascended about two feet, it came upon a fragment of reed partly imbedded in the sand, the stem of which was broken off and open below, a few dry elastic shreds of the leaf only remaining. Having reached the part where these grew, it by a strong pull drew its burden about half through, till its body was grasped between two of these as in a vice; then letting go, it began to explore the bank on each side to some distance, tapping with its antennæ the conspicuous objects: in a few minutes seeming to be satisfied, it hastily descended the reed, and entered its stem at the lower end; it did not remain long in the interior, and on its reappearance, set off for the spot where it had left the *larva*, which, after pulling it out of the holdfast, it seized by the mouth as usual, and began to descend the reed again; it did not complete the journey this time, but taking advantage of the same kind of security to detain its prey, it repeated the *reconnaissance*, then returning, dragged it to the opening, and leaving it there, plunged in itself, but immediately reappearing, drew in the *larva* head foremost, speedily

disappearing in the interior ; so that I could not observe its subsequent proceedings, and being obliged to turn homewards, I left them undisturbed. I think, however, it will seem probable that the bore of the reed was employed instead of an artificial funnel, for the cells which should contain the progeny of the *Bethylus*, with its store of provision. If these insects select only full grown caterpillars, I can scarcely imagine one of the smaller individuals<sup>a</sup> managing these unwieldy bodies.

2. *Dryinus pedestris*.—The first time I met with this species, it was in company with some *Myrmicæ*, (not *M. rubra*) under a stone, in a chalky lane, near Darentwood. In this island, its haunts are on the sand-hills of the coast, among which *Formica emarginata* swarms. The *Dryinus*, which is not dissimilar in form and colour, moves among them distinguished by its hitching gait, produced by the enormous length of the coxæ and trochanteres of its fore legs ; it can run pretty fast, however. What is the nature of its society with the ants ? I witnessed an occurrence which shews that it is not always quite amicable. Four ants were bearing off one of the *Dryini* quite alive and vigorous, though not able to struggle much in their gripe ; my approach disturbing them, three scampered off, but the fourth, more determined, held on ; the *Dryinus*, however, as soon as she got fair play, shewed fight, and though her small jaws seem ill calculated to match those of an ant, the battle was maintained without any visible advantage, the combatants rolling and tumbling over in the most approved Kentucky fashion. I have not yet detected the male of this insect, having only been able to visit the spot where it occurs, one morning this summer, and that a very unfavourable day, so that I still hope by a future search to obtain it.

A. H. HALIDAY.

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<sup>a</sup> The *Bethyli* vary exceedingly in size, the smaller individuals have the head narrower, and the wings usually very imperfect (*B. Syngenesiæ*, n.) ; but the varieties are so indefinite, that I am disposed to refer them all to one species, *B. punctatus*, Latr.

ART. XX.—*Notice of Entomological Works.*

1. *British Entomology*; by John Curtis, F.L.S., &c.—Nos. 121, 122.—Pl. 482. *Smerinthus ocellatus*, (Lepidoptera Sphingidæ); 483. *Mordella abdominalis*, (Coleoptera Mordellidæ); 484. *Baëtis dispar*, (Neuroptera Epheméridæ). This figure is too highly coloured. Pl. 485. *Cordylura livens*, (Diptera Muscidæ); 486. *Macrocnema unimaculata*, (Coleoptera Chrysomelidæ). This is certainly not a species; every individual of *M. Hyoscyami* has a light mark, more or less distinct, on the metafemora. Pl. 487. *Cochleophasia tessellea*, (Lepidoptera Tineidæ); 488. *Limnephilus elegans*, (Trichoptera Phryganidæ). *Opetia lonchopteroides*, (Diptera Empidæ). Mr. Curtis has placed it with the *Dolichopidæ*.

2. *Magazine of Natural History*. Nos. 37, 38.—We believe our good nature tints every thing *couleur de rose*. No. 37 of this Magazine appears to us the best number but one, and that one is No. 38. Mr. Loudon praises us, and we praise in return, some of our readers may observe; but we have a better motive,—we praise, because praise is due.

3. *Entomologia Ediniensis*; by James Wilson, F.R.S.E., and Rev. James Duncan.—This work has long been talked of, and we anticipated its appearance with some eagerness; it was to be “A Description and History of the Insects found in the neighbourhood of Edinburgh.” We opened it, and lo! instead of Edinburgh insects, we find none but the commonest London ones; scarcely a dozen that we have not taken in the well-besmoked cabbage gardens of Battersea; scarcely a dozen that Mr. Stephens has not already described as insects of the metropolitan district. There is, indeed, some interesting matter from Kirby and Spence, &c., here and there interwoven; and the descriptions of genera are sufficiently accurate.



4. *The London and Edinburgh Philosophical Magazine, and Journal of Science. Third Series. Vol. IV. Nos. 20, 21.*

(1.) *On the Zimb of Bruce, as connected with the Hieroglyphics of Egypt; by the Marquis di Spineto.*—Much has been published, but little is known of the *Zimb* or *Tsalsalya*, which is said to spread terror and death among men and beasts, wherever it is found. Its habitation is confined to the “black fat earth,” a soil in the marshy parts of the Nile. Latreille supposed it to be a *Tabanus*, but this can hardly be, if the account of its ravages is correct. Other authors have supposed it to be an *Æstrus*, but the form of its mouth seems very different. The Marquis observes, that it is figured on the Egyptian antiquities, and comments on the derivation of its name. He hopes to obtain specimens, therefore we expect that the nature of the insect will be soon satisfactorily ascertained.

(2.) *Descriptions of some hitherto Nondescript British Species of May-flies of Anglers; by John Curtis, Esq., F.L.S., &c.*—This paper comprises descriptions, in English, of several genera and species of the *Trichoptera* and the *Ephemeridæ*. The characters are short, and not very clear. The new genera established are *Brachycercus*, *Molanna*, *Mormonia*, *Brachycentrus*, *Thya*, *Glossosoma*, *Anticyra*, *Agapetus*, and *Agraylea*. Many of these are indicated in the second edition of Stephens’s Nomenclature of British Insects.

5. *Annales des Sciences Naturelles. Paris. Tome XXX.*  
—This volume contains several essays on Insects, among them,—1. “Observations on *Aphides*, by M. Dutrochet.” 2. “Description of some Dipterous Insects, observed in Spain, by M. Léon Dufour.”—Among these is *Myrmemorpha*, a new genus, of which he found one species, a very minute insect, with rudimentary wings. He considers it to be allied to *Scenopinus*, but its habits appear to be very different, and, as well as the form of its antennæ, agree better with those of *Borborus*, and of the *N. G. arenaria*, (Haliday). 3. “Abstract of some Observations on the Changes of Form, which the young *Crustacea* undergo, by M. Milne Edwards.” 4. “Abstract of a Monograph on the *Odyneri* of Belgium, by M. C. Wesmael.”

6. *Revue Entomologique, publiée par Gustave Silbermann. Strasbourg. Livraisons 6 et 7.*—Among the contents are,—

1. "Observations on the Habits of several Mexican *Coleoptera*," communicated to the Editor by M. Chevrolat, who is publishing a work on Mexican Insects. 2. "Description, accompanied by a figure, of *Dadoychus flavocinctus*, (Coleoptera Cerambycidæ) by M. Chevrolat."—This is an undescribed Insect, remarkable for its third and fourth abdominal segments, which are yellow, and apparently phosphorescent, a character not possessed by any other described *Cerambycidæ*. 3. "On the Natural Division of Terrestrial *Hemiptera*, considered especially in relation to the Structure of their *Antennæ*, by Dr. H. Burmeister." Three new genera are established,—viz. *Pseudaradus*, *Merocoris* and *Asopus*. 4. "On the *Cicindelidæ*; with the Characters of two New Genera, (*Odontocheila*, and *Procephalus*), by M. F. de Laporte." 5. "Descriptions and Figures of two new Insects, (*Thorictus castaneus*, and *Chirodica chalcoptera*) by M. Germar."

7. *Magasin de Zoologie; par F. E. Guérin.*—The Entomological papers are,—1. "On the Genus *Leucothyreus*, and its Affinities, by J. O. Westwood, Esq., F.L.S., &c." 2. "Commencement of a Monograph on the *Pselaphidæ*, by M. C. Aubé," &c.

8. *Iconographie, &c., des Coléoptères d'Europe; par M. le Comte Dejean, et M. le Docteur J. A. Boisduval. Tome III., Livraison 8. Tome IV., Livraison 1.*—The genus *Amara* is concluded, and figures are given of the genera *Lophidius*, *Antarctia*, *Masoreus*, *Pelecium*, *Eripus*, *Cratocerus*, *Somoplatus*, *Daptus*, *Cyclosomus*, *Promecoderus*, *Axinotoma*, *Cratacanthus*, *Paramecus*, *Cratagnathus*, *Agonoderus*, *Acinopus*, *Barysomus*, *Amblygnathus*, *Platymetopus*, *Gynandropus*, and *Selenophorus*.

THE  
ENTOMOLOGICAL MAGAZINE.

JULY, 1834.

ART. XXI.—*Essay on the Classification of Parasitic Hymenoptera, &c.* By A. H. HALIDAY, M. A.

(Continued from page 106.)

*Of the Ichneumones of the Second Line, (Ichneumones adsciti, Essenbeck.)*

THE species which have been referred to the genus *Aphidius* appear to compose a natural group, from the uniform way in which the characters, common to them all, correspond with the habits of those few whose history is known from actual observation. They are minute *Ichneumones*, each individual being nourished by a single puceron; the empty skin of this is substituted for a cocoon, the larva being provided with no secretion of silk, like the others of this family. Accordingly, we find it solitary, devouring all the interior of its victim, and attaining a proportionate bulk. The spherical figure of that case adapts itself to the inflected attitude of the full grown larva, and of the pupa developed from it.<sup>a</sup> The same position finally is subservient to the functions of the fly, which is thus enabled to bring the borer under the direction of her sight; for, being equal or superior in size to the objects of her attack,

<sup>a</sup> I presume that the pupæ of the Chrysidæ are similarly inflected. “J’ai vu le *Cleptes nitidule* allonger beaucoup son tuyau en passant auprès d’une larve de *Tenthrede*, et le pousser vivement contre elle. Quoiqu’il lui eût fallu pour cela recourber son abdomen et diriger ce tuyau entre ses pattes en avant de la tête, l’opération entière fut l’affaire d’une seconde.”—*Le P. St. Fargeau*. Some of the petiolate *Pteromali* (*Miscogasteridæ*, Walker) also have the pupa bent double, though less completely; but these do not inflect the abdomen in oviposition.

she can find no footing on them. As they are accessible, and not defended by hair or a tough coat, the borer itself is short and delicate. A summary of these particulars will afford the most comprehensive notion of the group.

An acquaintance, though imperfect, with the economy of the insects composing it, has afforded, in the relation which subsists between this and the form of the parts in the imago, some data for estimating the comparative importance of their several variations. In the general considerations we have, consequently, ventured to overlook distinctions such as elsewhere are of much significance, and to assemble species offering considerable diversity in the antennæ, wings, and feelers. Hence we may be prepared to find the influence of similar variations modified and subdued, to a certain extent, in contiguous groups; while, in pursuing the chain a little further, some or all of these organs may affect a determinate character, through a protracted series of affinities. In the present family, generally, the antennæ may be said to vary indefinitely with sex and species; and, where we detect the tendency to a typical number, there is room to suspect an approach to one or other of the remaining Parasitic families, which has (if I may express it so) communicated its character to such adjacent groups. These approaches are few and evanescent, and while they may serve to indicate the external relations of the family, do not seem applicable, in a primary degree, to the further subdivision of it. The cells of the wings, by their number, figure, and position, afford distinctions generally precise and easily apprehended, constant in the sexes, and whose variations may be referred to a limited number of types; but these are not so readily generalized, and, on account of the abrupt transitions between them, sometimes yield no clew to the connexion of the groups which they distinguish. At the same time they furnish most convenient characters for the separation of the minor groups; and, if carefully compared with the variations of other parts, will be often of the highest value as obvious indications of characters more influential, but also more difficult of investigation. The mouth, whose structure enters so largely into most systems, does not exhibit much variety of development among insects whose instruments of industry and weapons of defence are seated elsewhere, and which scarcely seem to require nourish-

ment in the perfect state. *Agathis* and *Alysia*, indeed, in their types, present remarkable modifications of the lips and jaws, but, after a few removes, these too subside into the prevailing monotony. Of all the parts of the mouth, the feelers seem to afford the most convenient means of methodical division; their differences, like most characters determined by number, being easily seized by the eye and expressed with certainty. Such a method comes recommended also by the weight of authority, almost every recent arrangement of the family resting principally on those organs. Analysis has shown their variations to be of minor consequence in determining relations between the subdivisions of *Aphidius*, while the separation of that genus has made their application to the rest more easy. The objections arising from the former consideration will be lessened if we regard these last as nearer in affinity to the genuine *Ichneumones*; for they, throughout their myriad species and multiplied gradations of form, adhere almost invariably to one number, the incipient tendency to change appearing only at one point.<sup>b</sup> And, indeed, in the single genus we have been considering, their extremes of variation are more distant than in all the remainder of the *Adsciti*. The figure and proportion of the joints are more constant in the maxillary feelers than in the labial, where the diminution of the penultimate joint makes the precise number sometimes difficult to determine, so that we shall gain in convenience by omitting the consideration of the latter at this stage. Following, in other respects, the arrangement of Von Essenbeck, let us place first those which have maxillary palpi of five joints, composing the family named by him *Bracones*. With respect to the nomenclature, it may be remarked, that he at first applied the generic name of *Bassus* to *Cryptus manducator* of Panzer, and from that type derived the appellation of his second family; more recently *Bassus* has ranked among the genuine *Ichneumones*, being appropriated, by Gravenhorst, to a group represented by *Anomalon lætatorium* of Panzer; to this Von Essenbeck has conformed, substituting the Latreillian genus *Alysia* in its place, yet,

<sup>b</sup> The genus *Porizon*, which betrays a departure from the type in other particulars; the predominant characters, however, are unchanged; and the subgenus *Odontomerus* may almost be described as a *Porizon* resuming in its mouth and lower wings the ordinary character of genuine *Ichneumones*;

either from inadvertence or on principle, he has retained his original but now ambiguous name for the family. It seems more correct to obviate this duplicity of terms by adopting, instead of it, *Alysiidæ*, as proposed by Mr. Stephens. I should be still better pleased to avoid giving any names to these sections; regarding their separation, for the present, simply as a convenient artifice, which may possibly interfere with the discernment of their true relations, as much as it facilitates their examination in detail.<sup>c</sup> It is never too soon to retrace an erroneous course, and I have to regret having hastily applied new-coined names to tribes so called, and similar subdivisions of the family: renouncing such innovations as, at least, premature, and retaining the name *Ichneumones*<sup>d</sup> for the family at large, we may speak of these, as

*Ichneumones which have no exterior cell of the disk in the upper wings, and do not inflect the abdomen completely, whose pupa is enclosed in a cocoon spun by the larva, and is not bent double;*

And first, of those with maxillary palpi of five joints;

*Fam.*—BRACONES, *Ess.* BRACONIDÆ, *Stephens.*

The native species, so far as they are known to me, may, I think, be all arranged by relation to the four genera, *Agathis*, *Microgaster*, *Bracon*, and *Leiophron*, as exemplified by *Agathis malvacearum*, Latreille; *Ichneumon globatus*, Linné; *Bracon denigrator*, Fabricius; and *Cryptus sticticus*, Fabricius.

Having assembled the species I possess according as the

<sup>c</sup> For the general characters with which Von Essenbeck has sought to corroborate this division seem vague and uncertain; but, from a cause alluded to before, they were drawn from a comparison of genera in some degree fortuitously assembled, so that no better result could be expected. If the families were sufficiently distinguished by external appearance, it is not likely that they would have eluded the tact and judgment of this distinguished author, to which our present subject is scarcely less indebted than a sister science. The contents of each family being reduced to more strict conformity with the principles of his method, I cannot discover any auxiliary distinctive characters of general application.

<sup>d</sup> Or rather *Ichneumonidæ*, as used by British authors, for the sake of general analogy and harmony of nomenclature.



resemblance of one or other of these predominates, I find the resulting groups may be separated in this manner:—

Second brachial cell of the lower wings bounded externally by	}	three angles . . . . .	AGATHIS, &c.				
		}	}	determinate and alike in the sexes . . . . .	MICROGASTER, &c.		
				}	}	varying with sex and species; cubital cells of the upper wings	{ three . . BRACON, &c. { two . . . LEIOPHRON, &c.
						number of joints in the antennæ	

These characters have the appearance of being taken arbitrarily, the table being calculated simply to distinguish the groups, without exhibiting their relative position or connexion; and other schemes might be drawn up which would attain the same object, as, indeed, any one devised from such scanty materials is likely to prove imperfect in a more extended application. I do not attach much importance to this, as the temporary fabric is easily reconstructed when further information has shown its defects. But, if the standards selected possess the requisite qualities, the entireness and relative proximity of the groups may remain unaffected by any addition to their contents. The first three are so obviously indicated by external appearance, that there is little difference of opinion to be apprehended as to their existence or extent; but the combination of the fourth group rests in great part on the similarity of the trophi, since there is less resemblance in other respects between the proposed type and some of the species here associated with it, than the latter bear to a section of the genus *Perilitus*. I believe, indeed, that we should attribute this resemblance to a real affinity, and that the supposed families meet at this point. Now as they appear to approach at the other extremity also, and as the series through each, from one point of contact to the other, exhibits no manifest interruption, we have in this way a complete circle formed, to the exclusion of *Aphidius*, which seems to be thrown into a separate group. The different habits of that genus have already prepared us for such a result; but it will demand a more detailed and rigorous examination of the remaining genera than I am competent to give them, before it can be conclusively admitted. For greater convenience in designating species, the generic denomination of the type may be extended

to the entire of each group; and as Von Essenbeck has long since shown the affinity which subsists between *Chelonus* among the *Bassi* and *Microgaster* in the present family, I commence the latter with that genus. Here, however, seems to be the most convenient place to introduce a genus anomalous in its palpi, but bearing, on the whole, more resemblance to *Microgaster* than to any others of the family, although the differences are sufficient to prevent my comprehending them under one generic name, and even to leave their affinity open in some degree to doubt. This may be owing, partly, to the want of sufficient materials, the genus being founded on the examination of a single ill-preserved specimen.

#### GEN. II.—MIRAX.

*Palpi maxillares 4-articulati, labiales 3-articulati: antennæ 14-articulatæ: occiput retusum: oculi glabri: mesothoracis scutum haud tripartitum: abdomen breve subsessile: aculeus subexertus.*

Sp. *M. rufilabris*. Fem. *Niger, pedibus flavo-ferrugineis: alæ hyalinæ: os, clypeus, squamulæ et stigma ferruginea: abdominis segmenta 2 anteriora flava.* (Long. corp. .08. alar. .2.)

Caput thoracis latitudine, transversum crassum; occiput retusum; vertex late rotundatus; ocelli in triangulum; oculi parvi glabri: antennæ corpore parum breviores, graciles, 14-articulatæ; scapo ovato-cylindrico, pedicello extricato ovato, articulo tertio longiore quam scapo, reliquis longitudine decrescentibus: labrum transversum lateribus rotundatum, epipharynga obtogens, hujus tantum ligulâ apicali attenuata prostante; mandibulæ trigonæ apice curvatæ et tenuè bidentes; maxillæ lobus latus obtusus; labium integrum obtusum; palpi maxillares 4-articulati, articulis 1<sup>mo</sup>. brevior, 2<sup>do</sup>. paulo crassior; labiales 3-articulati: thorax ovatus depressus; prothorax inconspicuus; mesothoracis scutum rotundatum, planiusculum, sulculis ordinariis omnino nullis; metathorax rotundatus: alæ anticæ—stigma crassum rotundato-trigonum;

\* This character has had some weight in inducing me to separate the genus from *Microgaster*; it should be remembered, however, that the eyes are hairy in one section of the genus *Chelonus* (*Ch. sulcatus*, &c.), while they are naked in the rest.

areola disci antica parum remota; cubitalis interior sub stigmate clausa ad originem cubiti, nervum recurrentem prope apicem excipiens; cubitus obsoletus; nervi omnes exteriores evanescentes; alæ posticæ, areolâ brachiali 2<sup>da</sup>. anterioris dimidiam longitudinem non æquante: pedes mediocres calcaribus parvis: abdomen thoracis longitudine, obovatum subdepressum, læve nitidum segmentis dorsi septem; <sup>f</sup> segmentum 1<sup>mum</sup>. gracile ascendens; posteriora lineari-transversa; sextum ventrale leviter carinatum, apice productum aculeum fulciens; aculeus apice subexertus.

### GENUS III.—MICROGASTER.

*Palpi maxillares 5-articulati, labiales 3-articulati: os breve: antennarum articulorum numerus determinatus mari feminaeque par: occiput concavum: oculi villosi: thorax depressus, scuto mesothoracis haud tripartito: pedes postici majores approximati: abdomen sessile aut subsessile brevissimum: valvula ventralis aculeum fulciens: corpus parvum, nigrum; modo flavo varium; rarius flavum: alæ diaphanæ.*

#### Subgen.—ACÆLIUS.

*Subgenus cum Chelono annectens.*

Antennæ 20-articulatæ, scapo longiore; *feminae* apice attenuatæ revolutæ.

Occiput concavum, definitum.

Abdomen 5-annulatum.

Tibiæ posticæ subclavatæ.

Alæ anticæ stigmate rotundato; areolâ radiali incompleta arcuata; areâ cubitali ubique lata.

#### Subgen.—MICROGASTER.

*Generis typum complectens.*

Antennæ 18-articulatæ scapo minuto.

Occiput retusum.

Abdomen 8-annulatum.

Tibiæ posticæ apice truncatæ.

Alæ anticæ stigmate trigono; areolâ radiali trigona; areâ cubitali medio valde coarctata.

Posticæ areolis radialibus 2, cubitalibus 2.

#### Subgen. I.—ACÆLIUS.

Adelius (lapsu calami). *Ent. Mag.* Vol. I. p. 262.

Corpus minimum: caput fere hemisphæricum, occipite contracto, concavo definito; vertice rotundato; ocelli in triangulum; oculi

<sup>f</sup> Probably eight would be seen in recent specimens, that being the typical number in the *Ichneumonidæ*.

parvi villosi cum genis æquati: trophi fere quales *Microgastri* sed labrum minus, lineari-transversum, epipharyngis limbum undique retegens: antennæ 20-articulatæ, scapo longiusculo incrassato; flagellum *maris* gracilius filiforme; *feminae* medio crassius compressum, apice attenuatum revolutum (ut in *Chelonis feminis*): thorax fere *Microgastri*; metathoracis (i. e. *propodei*) margo posticus utrinque denticulatus: alæ anticæ—stigma semiovatum; areola disci antica vix remota: cubitus arcuatus mox abruptus, areolam radialem ovatum inchoans: areolæ cubitales 2, interior sub stigmatate clausa ante originem cubiti; nervi exteriores sensim evanescent; nervus recurrens fere interstitialis: alæ posticæ, areola humeralis distincta; brachialis anterior basi sensim attenuata; posterior mediocris parum distincta; areolæ exteriores oblitteratæ: pedes postici crassi compressi, tibiis apice rotundatis, subclavatis (ut in *Chelonis* nonnullis): abdomen thorace brevius, ovatum subdepressum, segmentis dorsii 5; 1<sup>mo</sup>. maximo dimidium totum obtegente, lævi; 5<sup>to</sup>. minuto:—ventris 6; 6<sup>to</sup>. subcarinato: aculeus vix subexertus.

Sp. 1. M. A. Germanus. Mas et Fem. *Pedibus anterioribus testaceis*. (Long. corp. .08; alar. .17.)

*Fem.*—Niger: os et palpi testacea: antennæ corpore longiores, medio multo crassiores: pedes anteriores testacei, coxis, trochanteribus basi, et femoribus latere supero fuscis; postici fusci, tibiis basi testaceis: alæ albidæ; stigmatate fusco; medio latè infumatæ, lineolâ albida parum distincta sub basi stigmatis; squamulæ nigræ: thorax subtiliter punctulatus: abdomen læve nitidum.

*Variat* facie fere tota, pedibus anticis, coxis et trochanteribus testaceis.

*Mas.*—Antennis longioribus gracilioribus apice teretibus.

*Habitat* in *Salice Caprea* minus frequens.

Sp. 2. M. A. subfasciatus. Mas et Fem. *Pedibus nigris*. (Long. corp. .06; alar. .14.)

*Fem.*—Præcedente fere duplo minor: antennæ minus incrassatæ: palpi et tarsi anteriores fusci; trochanteres apice picei: alarum fasciæ 2 nigricantes manifestiores, lineolâ albidâ disjunctæ.—

*Mas.*—Antennæ longiores filiformes.

*Habitat* in *Salice argentea* littorum rarissimè.

## Subgen. II.—MICROGASTER.

Microgaster . . . . . *Latr. H. N. XIII. Gen. vi.*  
*Spinola. Ins. Lig. II. p.*  
*144. Essenb. Act. Acad.*  
*Tom. IX. A. D. 1818.*  
*Curtis E. B. 321.*

Ichneumon. (Sec. Leptogastr.) *Latr. H. N. III.*

Ichneumon. Fam. 2<sup>da</sup>. . . . . *Jurine. (Agathide et Microdo*  
*commixtis.)*

Vipio . . . . . *Fallen. Spec. Meth. Hyme-*  
*nopt.*

Caput oblatum, thorace angustius, antice orbiculatum; vertex arctus; occiput retusum, vix unquam definitum; ocelli fere in lineam curvam; oculi ovati parum prominuli, villosi; facies supra clypeum leviter bifoveolata: labrum transversum lateribus rotundatum, epipharynga obtegens, hujus tantum ligula apicali attenuata prostante; mandibulæ curvatæ, apice bidentes; maxillæ lobus rotundatus; labium integrum obtusum; palpi maxillares articulis 5, 1<sup>mo</sup>. brevior, 2<sup>do</sup>. crassior; labiales 3-articulati: antennæ 18-articulatæ corpore longiores vel breviores; *maris* sæpe incrassatæ apice attenuatæ; *femine* breviores et graciliores; scapus perbrevis ovatus; pedicellus fere retractus; articuli reliqui cylindrici, striati, medio cingulati quasi duplicati: thorax oblongus subdepressus; prothorax inconspicuus; mesothoracis scutum rotundatum planiusculum, absque sulculis ordinariis; scutellum trigonum planiusculum; metathoracis scutellum distinctum foveolatum; postscutellum (*Propodeon*) undique discretum, segmento 1<sup>mo</sup>. (*Metapodeo*) sæpius conforme et pariter exculptum: alæ anticæ latiusculæ; stigma trigonum; areola disci antica remota quinque angularis; cubitus fere rectangulatim flexus, areolam radialem trigonam paulo ante apicem alæ concludens; area cubitalis sub angulo cubiti valde coarctata, areolâ intermedia ibidem, trigona seu stapiæformi minuta, aut nulla; areola interior nervum recurrentem excipit; areola brachialis posterior ultra anteriorem elongata; posterior disci brevissima: alæ posticæ— areola brachialis anterior angusta, ante medium subito coarctata sub sinu nervi subcostalis, apice cum cubitali contigua; posterior illâ plus duplo brevior, vix longior quam latior; radiales 2, interior minor; cubitales 2, interior brevissima: pedes postici

approximati elongati et sæpius incrassati, femoribus compressis, coxis magnis, tibiis apice truncatis; calcaria plerisque elongata subulata: abdomen sessile aut subsessile thoracis longitudine vel eo brevius, segmentis dorsi octo, ventris sex: segmenta anteriora multimodis difformia, primi scutum dorsale plerisque angustatum, latera membranacea utrinque retgens ultimum minutissimum; ventris segmenta anteriora plerunque pallido pellucet, sextum carinatum aculeum fulciens nec libere mobile ut in *Agathide*: aculeus modo subexertus vel reconditus, modo abdominis longitudine et apice decurvus.

Lepidopterorum larvis genus maxime infestum. Mater erucam vix repugnantem insiliens, terebræ ictu repetito ova plurima cuti infigit (vel pilis agglutinat?):<sup>g</sup> larvæ hinc enatæ intra corpus erucæ degunt gregariæ adipem depastæ extis intactis; maturæ mox erucæ cute perforatâ undique prorumpunt, et statim metamorphosi se accingunt, folliculum subcylindricum e serico subtili sibi cuique nentes; quos modo annectunt ramulo, lateribus ad invicem agglutinatos et in modum alvearis laminæ dispositos; modo foliis, parietibus, arborum truncis, seriatim vel temere aggregatos, reticulo laxiore universis substrato; vel denique cunctos intra globum spissum bombacinum obtectos culmo graminis alligant. Metamorphosin peragunt intra paucas septimanas; alii hyemem in folliculis durant, pro anni tempore. Insectum in pupario latet corpore extenso, antennis et pedibus inflexis. Folliculi operculis pulsu capitis excussis, declaratis dant exitum. Ut hi erucas sic ipsos Crypti nonnulli minores enecant; saucii tamen folliculos ut integri conficiunt, at non sibi.<sup>h</sup>

<sup>g</sup> *Ichneumon necator*. Scharfenberg.

<sup>h</sup> The cocoons of this tribe are composed of a very fine glossy silk of one colour, which can be wound off like that of the silkworm, while in most of the remaining *Ichneumones* they are of a gummy texture and banded. They are arranged in various modes, examples of which, and a minute account of the process of construction, may be found in the second volume of Reaumur's Memoirs. The larvæ are generally supplied with a two-fold secretion of silk; that which comes out first being of a looser and coarser texture, and serving for a common envelope for the whole society. The sections into which the genus has been divided, do not appear to be characterised by a particular disposition of the cocoons, as this differs in species the most nearly related. Some are collected into a ball, and entirely concealed within a thick cottony mass attached to a stalk of grass (as *M. globatus*, *intricatus*, &c.); others are fastened round a twig, and arranged side by side, like the cells of a honeycomb (*M. alvearius*, *alvearifex*). In many they are scattered, or collected in an irregular heap, and covered with a loose web of open texture, but tough, as is the case with *M. glomeratus*, the most familiar species, which keeps down the numbers of the common white butterfly. A correspondent in Loudon's Magazine, Vol. III. p. 52, affirms that the caterpillar of the butterfly



## SECTIO A.

*Areolæ cubitales tres in alis anticis.* (Trichori.)

(A.) a.

Abdomen depressum rotundatum læve: aculeus reconditus: alæ coloratæ; anticæ areola radiali angustiore acuminata, cubitali intermedia distincta: pedes postici minus elongati: calcaria minuta: statura mediocris.

Sp. 3. *M. mediator.* Mas et Fem. *Abdomine antice pedibusque flavo-ferrugineis; segmenti primi vittâ nigrâ.* (Long. corp. .16; alar. .33.)

*Fem.*—Niger, capite et thorace granulato-opacis, pallido-pubescentibus: antennæ graciles corpore longiores: palpi flavi: pedes graciles flavo-ferruginei, posteriorum coxæ basi et tarsi nigro-fusca: alæ flavescentes aut ferrugineæ, stigmatibus fusco basi determinatè pallido; squamulæ flavo-ferrugineæ: metathorax rugulosus: abdomen obovatum planum, læve nitidum; segmenta 1<sup>mum</sup>, 2<sup>dum</sup>, et 3<sup>tum</sup>, basis plerunque flavo-ferruginea aut fulva; primi scutum lineare elevatum, punctatum, nigrum; 2<sup>di</sup>. latera arcuato-impressa.

*Variat*, segmenti primi lateribus membranaceis infra scutum lineare contractis, unde abdomen subpetiolatum evadat; his etiam segmenta intermedia obscuriora; tibiæ posticæ et tarsi intermediarii apice fusca.

*Variat*, antennis subtus et pedibus totis flavo-ferrugineis.

*Variat*, coxis omnibus, femoribus intermediis basi, posticis totis nigro-fuscis; alis fusco-ferrugineis; abdominis basi obscurius rufescente.

spins the outer web over its parasites, and Goedart has written the same. Madame Merian has a similar statement relative to the caterpillar of *Cynthia Cardui*, and its *Microgaster*. I am more inclined, however, to place my faith in the usual accuracy of Reaumur. It would be a singular fact, that the caterpillar of a butterfly which, for its own transformation, produces only a few threads, which fasten the tail and girt the middle of the chrysalis, should become provided with this superabundant supply in consequence of its interior being nearly devoured. In the case of those species, indeed, which infest the tribes of *Bombyces* and *Arctiæ*, it appears that the imperfect cocoon spun by the caterpillar may serve for the envelope of its parasites (see *M. consularis*, No. 15). In general they are found in Lepidopterous larvæ; but Mr. Curtis has obtained one species out of that of an aphidivorous fly.

*Mas.*—A *feminá* vix distinguendus antennis paullo longioribus.

*Habitat* in agris autumnò passim; varietates  $\alpha$ ,  $\beta$ , frequentes;  $\gamma$ ,  $\delta$ , rarissimè.—(*Mus. Soc. Ent.*)

Sp. 4. *M. spectabilis*. Fem. *Femoribus anticis, tibiis tarsisque testaceis; alis ferrugineis, fasciolá albidá; antennis brevissimis.* (Long. corp. .13; alar. .25.)

*Fem.*—Niger capite thoraceque granulato-opacis, pallido-pubescentibus: occiput lævissimum definitum: antennæ capite cum thorace paulo longiores: palpi ferruginei: femora media medio, postica tota, coxæque omnes nigro-fusca: alæ dilute ferrugineæ; stigma nigro-fuscum, basi determinate pallidum, excurrit hinc fascia linearis albida trans alam; areola radialis insuper medio pallescit; squamulæ fusco-ferrugineæ: metathorax brevior quam præcedenti, rotundato-declivis, rugulosus: abdomen ovatum planum, læve nitidum, lateribus baseos sordide flavis; segmentum primum ascendens, scuto oblongo elevato, punctulato, medio levigato: valvula ventralis apice hians etsi aculeus penitus sit absconditus: pedes breviores quam præcedenti, calcaribus paulo longioribus.

*Habitat* in Hibernia boreali rarissimè.

Sp. 5. *M. ingratus*. Fem. *Pedibus rufis; coxis nigris; alis fucis.* (Long. corp. .18; alar. .36.)

*Fem.*—Brevis crassus niger: antennæ corpore longiores crassiusculæ: palpi apice ferruginei: pedes validi, rufo-ferruginei; coxis et trochanteribus nigris; tibiis posticis apice et tarsis iisdem fuscis; calcaria minuta fusca: alæ fusca, costa latissimâ interne flavente; stigma basi flavescens; squamulæ obscure ferrugineæ: metathorax brevis rugulosus: abdomen breviter ovatum subdepressum; segmenti 1<sup>mi</sup>. ascendentis scutum convexum læve subquadratum, latera anguste lutescentia; anus rotundatus: aculeus (si revera *femina* sit) penitus absconditus.

*Habitat*——— (Mus. J. Curtis.)

### Sectio (A.) b.

Abdomen subtus compressum, dorso planum, segmentis anterioribus latis aciculatis: aculeus exertus, valvulis subclavatis: alæ ut præcedentibus: pedes postici crassi: calcaria longa: statura major.

1°. *Segmentis tribus aciculatis.*

Sp. 6. *M. infumatus*. Mas. *Pedibus rufis, coxis nigris.*  
(Long. corp. .2; alar. 42.)

*Microgaster deprimator.* *Curt. E. B. 321. No. 1.*

*Mas.*—*M. globato* duplo major; niger: mandibularum cuspis palpique obscure rufi: pedes rufi trochanteribus concoloribus, coxis et unguibus nigris: alæ fuscae, stigmatē toto intensius concolore: abdominis segmenta 4<sup>tum</sup>. et sequentia conjunctim vix longitudine primi, lævia.

*Habitat* “Prodiit e larvis *Acronyctæ Salicis*, mense Septembre.”  
*Curtis. l. l.*—(*Mus. J. Curtis.*)

Sp. 7. *M. russatus*. Mas et Fem. *Abdomine pedibusque rufis; ano nigro.*

*Fem.*—Niger: antennæ corpore parum longiores, subtus rufæ: mandibularum cuspis palpique rufi: pedes crassi rufi coxis concoloribus; postici apice summo tibiæ et tarsorum fuscis; ungues nigri: alæ fusco-ferrugineæ intus lutescentes; stigma subfuscum, basi flavum; squamulæ fuscae: areola minor quam præcedenti: thoracis scutum nitidum punctulatum, dorso medio depressum et obsoletiùs trilineatum; metathorax quadratus, magis angulatus quam in illo, rugulosus: abdomen segmentis tribus anterioribus rugulosis rufis; reliquis lævissimis dorso nigris; subtus totum rufum: aculeus segmento primo longior, valvulis nigris. (Long. corp. .2; alar. 42.)

*Mas.*—Præcedentis mare longior: antennæ corpore dimidio longiores, articulis singulis valde elongatis: abdomen solito longius. (Long. corp. .23.)

*Habitat* in littoribus limosis Hiberniæ borealis rarissimè.—(*Mus. Soc. Ent.*)

2°. *Segmentis duobus aciculatis.*

Sp. 8. *M. globatus*. Mas et Fem. *Pedibus rufis; coxis nigris.* Fem. *Aculeo abdominis dimidio brevior.* (Long. corp. .17; alar. 36.)

*Ichneumon globatus* . . . . . \**Linn. Fn. S. 1645.*

*gossypinus.* (*Retz.*) *De Geer. I. T. 29. F. 13, 14.*

*Geoffr. II. p. 320.*

*Cryptus globatus* . . . *Fabr. Syst. Piez.* 89. 88.

*Microgaster globatus* . *Spin. Ins. Lig.* II. p. 147. No. 1.

*Ichneumon globator* . *Thunb. Act. Petr.* IX. p. 349.

*Fem.*—*Niger* : mandibulæ apice rufæ ; palpi pallidiores : pedes rufi, coxis et trochanterum basi nigris : alæ flavescens apice fusciscentes ; stigma fuscum : venter antice rufo pellucens ; aculeus vix longitudine segmentorum 2 anteriorum.—*Mas.* similis, antennis longioribus, abdomina magis oblongo.

*Habitat* in agris æstate et autumnno passim frequens :—“ In graminum culmis circa autumnum in pratis non infrequens est folliculus sericeus magnitudine ovi columbini solitarius albus e quo prodeunt numerosi *Ichneumones*.” *Linné l. l.*—*Fabricius* adjicit “ in *Phalenarum* larvis.”—Synonyma vero a *Linneo* et *Fabricio* huc adscita cautius excutienda sunt, quum uterque potius folliculos conglobatos (quod pluribus et longe diversis speciebus commune accidit) quam auctorum descriptiones respexisse videtur.—(*Mus. Soc. Ent.*)

Sp. 9. *M. annulipes*. *Fem.* *Pedibus rufis, posticis fusco-annulatis ; coxis nigris ; aculeo abdomine parum brevior.*

*Microgaster annulipes.* *Curtis. E. B.* 321. No. 4.

*Fem.*—*M. globato* æqualis et simillimus : antennæ subtus rufescentes : pedum posticorum femora et tibiæ apice, digitique singuli fusco-annulata : abdominis segmentum 3<sup>tium</sup>. basi punctulatum ; venter totus rufescens.

*Habitat* “ in larvis *Bombycis* ejusdam : folliculi albi.” *Curtis. l. l.*  
—(*Mus. J. Curtis.*)

Sp. 10. *M. Spinolæ*. *Mas et Fem.* *Pedibus rufis, basi nigris ; alis apice denigratis.* *Fem.* *Aculeo brevi.*  
(*Long. corp.* .19 ; *alar.* .41.)

*Fem.*—*M. russato* brevior at robustior ; ater dense atro-pubescent : antennæ crassiores quam in præcedentibus : palpi rufi : pedes omnium longe validissimi, rufi coxis et trochanteribus totis nigris ; femora intermedia basi præsertim subtus, antica et postica perbrevispatio aut vix, nigricantia ; tibiæ posticæ basi ipsâ pallidiores, apice summo fuscæ ; tarsi postici et ungues omnes fuscæ : alæ

pallide flavescentes, nigredine apicis oblique definitâ ; stigma sub-fuscum basi sordide lutescens : segmentum tertium obsolete punctulatum ; aculeus segmentis 2 anterioribus conjunctim brevior.—*Mas.* antennis eximie incrassatis, apice attenuatis.

*Habitat* in littoribus limosi Hiberniæ borealis at infrequens.—(*Mus. Soc. Ent.*)

Sp. 11. *M. meridianus.* Mas et Fem. *Pedibus rufis, basi nigris ; alis infuscatis.* Fem. *Aculeo abdominis dimidio longiore.* (Long. corp. .16—.18 ; alar. .36—.40.)

*Fem.*—Palpi nigri aut fusci : femora antica basi, media latius aut fere tota nigra ; postica rufa lineolâ superâ et aliâ inferâ, vel puncto tantum nigricantibus ; tarsi apice fusci : alæ nebulosæ fuscæ, stigmatate fusco-ferrugineo : aculeus multo longior et crassior quam sequenti, pro cujus varietate aliter duxerim.—*Mas* similis.

*Habitat* cum sequente rarissime.

Sp. 12. *M. messorius.* Mas et Fem. *Tibiis testaceis ; alis denigratis.* Fem. *Aculeo abdominis dimidio brevior.* (Long. corp. .15—.18 ; alar. .30—.36.)

*Fem.*—*M. globato* plerunque minor, præsertim brevior, antennis brevioribus : niger pubescens : palpi nigri vel apice rufescentes : femora antica apice et tibiæ testacea, postica apice fusca ; tarsi anteriores testacei apice fusci : alæ dorso incumbentes fere carbonariæ videntur ; anticæ vel fusè infuscatae ut in præcedente ; vel basi pallidæ, apice nigricantes ; fasciis insuper duabus irregularibus fractis et vix distinctis (alterâ sub stigmatate, alterâ interiore), nigricantibus ; stigma fuscum : posticæ nigricantes, prope costam intus pallescentes : metathorax brevior quam *M. globato*, et abdomen medio latius : aculeus segmentis 2 anterioribus conjunctim fere brevior.—*Mas*, antennis incrassatis (minus tamen quam *M. Spiniolæ*), et apice attenuatis.

*Variat Fem.* rarius, femoribus rufis, anticis basi, posterioribus supra et subtus nigricantibus.

*Habitat* in pratis æstate et autumno passim frequens.—(*Mus. Soc. Ent.*)

Sp. 13. *M. luctuosus.* Mas. *Tibiis anterioribus rufescentibus ; alis infuscatis ; segmenti 1<sup>mi</sup>. punctis lateralibus apicis luteis.* (Long. corp. .18 ; alar. .36.)

*Mas.*—Niger pubescens : palpi nigri : genua, tibiæ tarsique antici et calcaria rufescentia ; tibiæ intermediæ apice fuscæ, posticæ vix basi summa rufescentes : alæ fuscæ nebulosæ, stigmatibus fuscis : abdomen subrotundatum segmentis 2 equidem rugulosis, sed primi scuto angustiore quam secundo, unde margines illius laterales membranacei lutei extant. *Hic itaque in sectionem A. a. quodammodo prodendet.*

*Habitat* in Anglia meridionali mihi semel captus.

### Sectio (A.) c.

Abdomen subcompressum segmento primo angustato : aculeus brevissimus : areola minutissima, fere imperfecta : alæ hyalinæ ; areola radialis latior in apicem rectâ excurrens : pedes postici elongati : calcaria longa : statura parva. *Patet itaque hos in sectionem B. transitum parare. Differunt autem constanter, areâ cubitali multo magis coarctata.*

Sp. 14. *M. alvearius.* Mas et Fem. *Flavus thorace postice abdominisque dorso nigris.* (Long. corp. .12 ; alar. .22.)

\* *Réaumur* II. T. 35. F. 7.  
Mem. 11. p. 432.

L'Ichneumon a coques en } *Geoffr.* II. p. 322. No. 2.  
forme de rayons de ruche . }

*Ichneumon alvearius* . . . . . *Fabr. Suppl.* 232. n. 232.

*Cryptus* . . . . . *Fabr. Syst. Piez.* 90. n. 91.

*Microgaster alvearius* . . . . . *Spin. I. L.* II. p. 149. n. 6.  
*Curtis. E. B.* 321. fig. *ibid.*  
No. 6.

*Fem.*—Flavo-ferrugineus : antennæ corpore parum longiores fuscæ, base subtus ferrugineæ : ocelli fusco-cincti : oculi fuscis : pedes pallidiores ; posticorum femora et tibiæ apice, tarsique fere toti fusciscentia : alæ hyalinæ, stigmatibus nervisque nonnullis dilute ferrugineis, plerisque decoloribus : metathorax supra nigricans, punctatus : segmentum 1<sup>mum</sup>. scuto angustiore aciculato, lateribus flavum ; 2<sup>dum</sup>. aciculatum, 3<sup>tio</sup>. non brevius ; reliqua lævia : venter antice flavus, postice niger : aculeus vix subexertus.—*Mas* similis.

*Habitat* "in *Phalencæ Crategatæ* larvis : folliculi albi, circa ramulum alvearis modo ordinati."—(*Mus. J. Curtis.*)



Sp. 15. *M. consularis*. Mas et Fem. *Antennis subtus pedibusque flavo-ferrugineis, posticorum geniculis fuscis.* (Long. corp. .14; alar. .3.)

*Fem.*—Niger: antennæ corpore longiores subtus latè rufescentes: os ferrugineum; palpi pallide flavi: pedes flavo-ferruginei; posticorum coxæ latere extero, femora et tibiæ apice, tarsique fere toti fuscescentia: alæ hyalinæ, stigmatate ferrugineo basi pallidiore; nervis disci medii ferrugineis, exterioribus decoloribus, interioribus flavicantibus; squamulæ ferrugineæ: thorax confertim punctulatus; metathorax subtiliter aciculatus: segmentum primum scuto oblongo aciculato, lateribus flavis; 2<sup>dum</sup>. breve apice bisinuatum, obsoletiùs aciculatum; reliqua fere lævia: venter flavescens postice niger.—*Mas*, antennæ subtus basi tantum rufescentes: stigma totum fuscum.

*Habitat* in larvâ pilosâ *Arctiæ*, quæ folliculos hujus conglobatos secum una reticulo laxo filorum pilis suis commixto involverat in folio *Rubi* prope Londinum. Folliculi candidi.—(*Mus. G. C. Hyndman.*)

Sp. 16. *M. flavipes*. Fem. *Antennis subtus pedibusque flavis; coxis posticis nigris.* (Long. corp. .1; alar. .22.)

*Fem.*—*M. alveario* gracilior: niger: antennæ breviores articulis apicis magis discretis; flavæ, supra fuscæ, scapo et apice toto concoloribus: os, palpi pedesque flavi; unguiculi tantum subfusi; coxæ posticæ totæ nigræ: alæ hyalinæ stigmatate dilute ferrugineo, nervis disci medii perpaucis pallidioribus, reliquis decoloribus; radix et squamulæ flavæ: thorax subtilissime punctulatus; metathorax sublævis: segmentum primum scuto angustiore oblongo aciculato; 2<sup>dum</sup>. 3<sup>tio</sup>. haud brevius, subtiliùs aciculatum; reliqua lævia: ventris latera pallide flava.

*Habitat* in *Corylo* Hiberniæ borealis rarissimè.

Sp. 17. *M. calceatus*. Fem. *Pedibus flavo-ferrugineis; posticis fusco variis, coxisque nigris; alis apice denigratis.* (Long. corp. .17; alar. .4.)

*Fem.*—Niger nitidus: antennæ corpore longiores, teretes, totæ nigræ: palpi flavescentes apice fusi: pedes anteriores flavo-ferruginei tarsis fuscescentibus; posticorum coxæ nigræ, femora ferruginea apice fusca, tibiæ pallidæ apice tarsisque fuscis: alæ limpidæ apice denigratæ, stigmatate nigro-piceo, nervis fuscis, squamulis piceo-stramineis: thorax subtilissime punctulatus;

metathorax rotundatus : segmentum primum brevius quam præcedentibus, scuto latiore elevato, apice rotundato, lateribus luteis ; 2<sup>dum</sup>. 3<sup>tio</sup>. æquale, bistriatum ; reliqua lævia : ventris latera antice sordide lutescentia.

*Habitat* Hiberniam borealem ; in gramine captus, semel.

## Sectio B.

### *Areolæ cubitales duæ.* (Dichori.)

Alæ hyalinæ ; areola radialis latior, in apicem recta excurrens ; posticarum areolæ radiales et cubitales propter nervos decolores minus conspicuæ, at luminis obliquo reflexu semper distinguendæ : calcaria longa : statura parva.

Incipit ordo a speciebus longè-aculeatis, abdominis dorso planiusculo, segmenti 1<sup>mi</sup>. scuto oblongo. Mediante *M. Umbellatarum* (No. 33.) attingimus species paucas (No. 34—38.) abdomine compresso, segmenti ejusdem scuto tenuissimo insignes : aculeus illis modo porrectus, modo brevissimus ; sequentibus semper brevissimus quarum proximæ propter scutum illud adhuc angustatum, *M. glomeratum* (No. 41.) mox inducunt : deinde reliquarum usque in calcem, segmenta anteriora fere æquilata aciculata Sectionem A. b. quodammodo referunt.

Sp. 18. *M. equestris. Squamulis et pedibus fulvis, coxis nigris.* Fem. *Valvulâ ventrali subtruncata ; aculeo elongato arcuato.* Mas. *Forcipe anali crasso exerto.* (Long. corp. .15—.17 ; alar. .34—.36.)

*M. globato* gracilior at vix minor ideoque maximus ex hac sectione.—*Fem.* antennæ corpore breviores : palpi picei : pedes fulvi ; tarsi posteriores fuscescentes ; coxæ nigræ intermediæ apice fulvæ : alæ flavescentes, stigmatè fusco-ferrugineo ; nervis fuscis, interioribus flavicantibus ; squamulæ fulvæ : thorax nitidus ; metathorax subtiliter punctulatus : segmenti 1<sup>mi</sup>. scutum angustum subtilissime punctulatum 2<sup>dum</sup>. breve tripartitum lateribus fulvescens : venter antice rufo pellucens, segmentis anterioribus brevissimis ; 6<sup>to</sup>. maximo oblique truncato, anum non attingente, nec acuminatâ ut in plerisque speciebus aculeo longo præditis : aculeus abdomine parum brevior deorsum curvatus.—*Mas.* antennæ corpore longiores graciles : femorum posteriorum linea supera, tibiæque eadem apice fuscescentes : forceps analis ingens penitus exertus.

*Habitat* in pratis herbidis æstate et autumnò passim frequens ; in floribus *Jacobææ* apriçans.—(*Mus. Soc. Ent.*)

Sp. 19. *M. albipennis*. *Thorace lævissimo ; tibiis basi ferrugineis ; alis albis, stigmatè flavo-piceo*. Fem. *Aculeo elongato arcuato*. Mas. *Forcipe anali exerto*. (Long. alar. .22.)

*Fem.*—*M. candidato* (No. 21) simillimus dimidio minor, statura longior: pedes graciliores picei, tibiis basi tantum ferrugineis: stigma flavo-piceum, cubiti basis et costa concolores, nervi reliqui albi: aculeus quam illi manifeste longior et crassior, arcuatus ut in præcedente fere, sed valvula ventralis cuspidata anum equans.

*Habitat* in arvis autumnò minus frequens.—(*Mus. Soc. Ent.*)

Sp. 20. *M. infimus*. Mas et Fem. *Thorace lævissimo ; tibiis basi fuscis ; alis obscuris*. Fem. *Aculeo dimidii abdominis longitudine*. (Long. alar. .20—.24.)

Parvus præcedente vix major: antennæ *femine* longiores: tibiæ in utroque sexu basi summa fusco-ferrugineæ: alæ obscuræ aut fere exalbidæ, stigmatè nervisque piceis: metathorax lateribus vage punctulatus: abdomen quam illi brevius; segmenta antica conformia: aculeus crassiusculus rectus valvulæ ventrali incumbens.

*Habitat* ad litora minus frequens.—(*Mus. Soc. Ent.*)

Sp. 21. *M. candidatus*. *Thorace lævissimo ; alis niveis stigmatè nigro*. Fem. *Tibiis basi, anticis totis flavo-ferrugineis ; aculeo abdomine parum breviorè*. Mas. *Tibiis basi ferrugineis ; segmenti primi scuto apice subrotundato*. (Long. corp. .13; alar. .27.)

*M. glomerato* æqualis: niger sericeus (i. e. subtilissimè albo-pubescentis).—*Fem.* antennæ corpore breviores planè filiformes: palpi fuscii: pedum anticorum genua, tibiæ tarsique, posteriorum tibiæ basi flavo-ferruginea: alæ niveæ, nervis nonnullis disci medii piceis, reliquis albis; stigma nigro-piceum, costa concolor basi flavescens: thorax lævissimus: segmenti 1<sup>mi</sup>. scutum oblongo-quadratum et reliqua lævissima: aculeus abdomine brevior gracilis, perparum curvatus: valvula ventralis cuspidata anum æquans ut in plerisque.—*Mas*, antennæ corpore longiores teretes; tibiæ anticæ medio infuscatæ: alarum costa latiùs, et nervi plures nigricantes: segmenti 1<sup>mi</sup>. scutum multo angustius, apice subrotundatum; 2<sup>dum</sup>. arcuato impressum.

*Habitat* in *Salice argentæa* arenarum, et alibi litorum satis frequens.—(*Mus. Soc. Ent.*)

Sp. 22. *M. Xanthostigma*. Mas. *Thorace lævissimo; tibiis basi, anticis totis flavis; alis candidis, stigmatè flavo.*

*Mas.*—Præcedenti æqualis et simillimus: palpi flavi, basi fusci: alæ candidæ; stigma flavum, nervo ambiente et subcostali nigricantibus; costali et cubiti basi stramineis; reliquis albis.

*Habitat* in gramine bis atque iterum lectus.

Sp. 23. *M. lacteipennis*. Mas. *Thorace lævissimo; tibiis basi flavo-ferrugineis; alis niveis, stigmatè nigro; segmenti 1<sup>mi</sup>. scuto apice æquilato.* (Long. corp. .15; alar. .32.)

*Curt. E. B.* 321. n. 10.

*Mas.*—*M. candidato* simillimus plusquam dimidio major: antennæ validiores: alarum costa et stigma nigro-picea; cubitus basi ferrugineus; nervi reliqui candidi: segmenti primi scutum quam illius *mari* latius, apice non attenuatum nec rotundatum; secundi lineola tantum lateralis impressa.

*Habitat* ————— (*Mus. J. Curtis.*)

Sp. 24. *M. annularis*. Mas et Fem. *Thorace lævissimo; pedibus anterioribus, posteriorum tibiis tarsisque basi et squamulis flavis; stigmatè bicolore.* Fem. *Aculeo abdomine breviorè.*

*Fem.*—*M. candidato* paullo minor brevior: niger sericeus: antennæ corpore parum breviores, graciles planè filiformes, articulis vix manifeste discretis: palpi flavi: pedes anteriores flavi; coxis nigris; femora media basi infuscata; posteriorum tibiæ et metatarsi basi flava: alæ limpidae aut stramineo-candidæ; stigma fuscum basi pallidum; nervi nonnulli disci mediî subfusci, reliqui decolores: costa interiûs, radix et squamulæ pallidè flavæ: abdomen paulo brevius quam *M. candidato*, lateribus ventris flavo-pellucidis: aculeus ut illi: valvula ventralis minus acuta.—*Mas* concolor; antennæ elongatæ gracillimæ apice teretes.

*Habitat* in *Corylo* minus frequens.

*Variat, Fem.*—Major, antennis paulo brevioribus: femora intermedia latiûs tibiæque eadem apice fusca: stigmatis punctum pallidum minutum: squamulæ basi et humeri fusca.

*Habitat* in *Salice Russelliana* mihi lectus rarissimè.—(*Mus. Soc. Ent.*)

*Variat, Mas.*—Palpi basi fusci: pedes antici basi nigri; posteriorum tibiæ basi, tarsi latiûs; mediorum femora insuper apice flava: alarum stigma dilutius, basi pallescens; squamulæ nigræ: annon distincta species?

*Habitat* adsunt exemplaria 4 nescio ubi capta.—(*Mus. Soc. Ent.*)

Sp. 25. *M. decorus*. Fem. *Thorace lævi; pedibus fulvis, coxis nigris; valvulâ ventrali acuminata; aculeo abdominis longitudine.* (Long. corp. .14; alar. .30.)

*Fem.*—*M. glomerato* major: antennæ corporis longitudine apice teretes: palpi pallide ferruginei basi fusci: pedes fulvi aut ferruginei; trochanteres antici sæpius concolores, postici et coxæ nigra; femora puncto infero baseos, postica lineolâ superâ fuscis; tibiæ posticæ summâ basi pallidiores, apice fuscae; tarsi iidem fere toti fusci: calcaria pallida: signaturæ pedum vero modo manifestiores extant modo obsoletissimæ: alæ amplæ hyalinæ, stigmatate fusco-ferrugineo; squamulis nigris: thorax lævis nitidus: segmento 1<sup>mi</sup>. scutum oblongum læve; venter rufo-pellucens.

*Variat, Fem.*—Pedes fusci, anticorum femora et tibiæ subtus, posteriorum femora lineolâ longitudinali tibiæque basi ferruginea.—*Mas.* concolor (huic varietati) *femine*: antennæ multo longiores.

*Habitat* in *Quercu, Larice* passim minus frequens.—(*Mus. Soc. Ent.*)

Sp. 26. *M. hilaris*. Fem. *Thorace subtilissime punctulato; squamulis et tibiis flavo-testaceis, posticis apice fuscis; stigmatate bicolore; aculeo abdominis longitudine.*

*Fem.*—Statura et magnitudo præcedentis: antennæ corpore longiores teretes: palpi flavi: femora antica basi nigra, intermedia summo apice; tarsi anteriores, basis summa posteriorum, et tibiæ flavo testacea; tibiæ posteriores apice fuscae: alæ amplæ hyalinæ, stigmatate fusco-ferrugineo basi flavo; nervis disci medii dilute ferrugineis, exterioribus decoloribus, interioribus flaventibus: squamulæ flavo-testaceæ: thorax nitidus dorso subtilissime punctulatus lineolâ longitudinali et scutelli medio lævigatis; metathorax et segmenti primi scutum punctulata.

Sp. 27. *M. contaminatus*. Fem. *Thorace punctulato; squamulis tibiis tarsisque testaceis; aculeo abdomine brevior.* (Long. alar. .32.)

*Fem.*—Præcedentibus æqualis, abdomine brevior obtuso: antennæ corpore fere longiores teretiusculæ: palpi, femora antica basi

nigra, posteriora summo apice, tibiæ tarsique flavo-testacea: alæ amplæ obscure flavescentes, stigmatè nervisque piceo-flavis; squamulæ flavo-testaceæ: thorax punctulatus; metathorax et segmenta 2 anteriora aciculata.

*Habitat* lectus in nemore sub-montibus Mourne, Hiberniæ borealis, mense Julio.

Sp. 28. *M. arenarius*. *Thorace punctatissimo; alis obscure-hyalinis*. Fem. *Tibiis ferrugineis, posticis apice fuscis; valvula ventrali anum longe superante pallida; aculeo abdomine brevior*. Mas. *Tibiis basi ferrugineis*. (Long. alar. .25—.28.)

*Fem.*—*M. glomerato* paullo major: antennæ corpore breviores: palpi ferruginei basi fusci: femora antica apice, tarsi iidem toti, intermedii basi, tibiæ et calcaria ferruginea; harum posticæ apice fuscæ: alæ obscure hyalinæ, stigmatè nervisque fusco-ferrugineis; squamulis nigris: thorax confertim punctatus, prope medium dorsi utrinque subdepressus; metathorax punctato reticulatus: segmenti 1<sup>mi</sup>. scutum paulo longius quam latius, apice nonnihil dilatatum punctato-reticulatum; 2<sup>dum</sup>. brevissimum subtilius aciculatum, lateribus læve: valvula ventralis pallida anum longè superans, compressa apice non acuminata: aculeus abdominis dimidio longior.—*Mas*, antennæ corpore multo longiores; tibiæ anticæ medio, et tarsi latius infuscata; tibiæ posteriores basi tantum ferrugineæ.

*Habitat* in *Salice argenteâ* arenarum æstate copiosè.—(*Mus. Soc. Ent.*)

Sp. 29. *M. sodalis*. Fem. *Thorace punctulato; tibiis basi, anticis totis flavo-testaceis; alis albidis, stigmatè stramineo; aculeo abdomine brevior*.

*Fem.*—Præcedenti æqualis et non dissimilis, sculpturâ multo subtiliore: antennæ longiores; color tiliarum et calcarium pallidior, illarum posteriores latius fuscæ: alæ albidæ aut fere hyalinæ, stigmatè obscure stramineo: thorax dorso non impressus: segmentum 1<sup>um</sup>. angustius; 2<sup>dum</sup>. longius quam illi: valvula ventralis anum æquans.

Sp. 30. *M. dilectus*. Fem. *Thorace granulato; pedibus flavo-testaceis, posterioribus fusco-ebulis; coxis nigris; stigmatè bicolore; aculeo dimidii abdominis longitudine*.



*Fem.*—*M. glomerato* fere brevior: antennæ corporis longitudine apice crassiusculæ: palpi pallidè flavi basi fusci: pedes flavo-testacei, coxis nigris; femora posteriora saturatiora, supra et subtus infuscata; tibiæ posticæ et tarsi summo apice fusciscentia: alæ hyalinæ; nervis pallide ferrugineis, interioribus flavicantibus, exterioribus decoloribus; stigma fusco-ferrugineum, basi flavescens; squamulæ nigræ: thorax confertim subtilissime punctulatus opacus: abdomen breve, segmenti 1<sup>mi</sup>. scuto oblongo punctulato.

*Habitat* in *Salice* rarius.

Sp. 31. *M. coniferæ*. Mas et Fem. *Squamulis, tibiis tarsisque flavo-testaceis; femoribus anticis concoloribus, posticis fuscis.* Fem. *Aculeo abdominis dimidio brevior.*

*Fem.*—*M. glomerato* æqualis: antennæ fere corporis longitudine teretiusculæ: palpi pallide flavi: pedes antici flavo-testacei coxis tantum nigris; femora intermedia lineolâ superâ et aliâ inferâ abbreviatis, postica latiûs fusca; vel hæc tota fusca relicta tantum lineola longitudinali testacea: alæ hyalinæ, stigmatibus nervisque disci dilute ferrugineis, exterioribus decoloribus; squamulæ flavo-testaceæ: thorax (ob pubescentiam confertam at subtilissimam) pruinosis, fere iridescens; metathorax et segmenti 1<sup>mi</sup>. scutum subtilissime aciculata; hoc angustum apice nonnihil attenuatum: aculeus anum non multum superans.—*Mas.* femora antica lineolâ superâ, posteriora fere tota fusca.

*Habitat* in *Laricetis* minus frequens.

Sp. 32. *M. exilis*. Fem. *Tibiis tarsisque testaceis; aculeo abdominis dimidio brevior.*

*Fem.*—Præcedenti quodammodo affinis; dimidio minor, antennis et pedibus gracilioribus; tibiis posterioribus versus apicem tarsisque latiûs obscurioribus: femora antica basi, intermedia apice demto, postica tota nigra: segmenti 1<sup>mi</sup>. scutum gracile equidem, sed postice non attenuatum ut insequentibus, confertim punctatum.

Sp. 33. *M. Umbellatarum*. Fem. *Abdominis subcompressi lateribus, squamulis pedibusque flavo-ferrugineis, posterioribus fusco nebulosis; coxis nigris; alis flavescens; aculeo dimidii abdominis longitudine.* (Long. alar. .92.)

*Fem.*—*M. coniferæ* dimidio minor: thorace pruinosis similis, sed abdomine subcompressa, metapodeo graciliore, etc. in sequentes propendet: antennæ graciles corporis longitudine: palpi pedesque

flavo-ferruginei; coxæ nigræ; pedes posteriores fusco-signati fere ut in *M. dilecto* (No. 30): alæ obscure flavescentes, stigmatate nervisque piceo-flavis; squamulis flavo-ferrugineis: thorax lævis; metathorax vage punctulatus: abdomen breve subcompressum, lateribus baseos ferrugineis; segmenti primi scutum paullo latius quam sequentibus, postice sensim attenuatum punctulatum.

*Habitat* in flosculis *Angelicæ sylvestris* autumno lectus.

Sp. 34. *M. lateralis*. Mas et Fem. *Abdominis compressi lateribus, squamulis pedibusque flavis; posticis fusco variis; coxis nigris; segmenti primi scuto gracillimo elevato.* Fem. *Aculeo dimidii abdominis longitudine.* (Long. corp. .12—.15; alar. .28—.34.)

*Fem.*—Antennæ corpore breviores fere filiformes: palpi pedesque flavi; posticorum coxæ nigræ, femora et tibiæ apice, tarsique fusca: alæ amplissimæ cærulescenti-hyalinæ, stigmatate fusco; nervis exterioribus haud profecto decoloribus; squamulæ flavæ: thorax lævis pallido-pubescens; metathorax vage punctulatus: abdomen breve, valde compressum dorso fornicatum; segmenti 1<sup>mi</sup>. scutum gracillimum elevatum, postice sensim attenuatum, punctulatum.—*Mas*, antennæ longiores crassiores apice teretes: abdomen minus.

*Variat, Mas.*—Sæpe femoribus posterioribus latere supero, tibiis intermediis apice, posticis usque ad medium infuscatis.

*Habitat* in gramine nemorum frequens.—(*Mus. Soc. Ent.*)

Sp. 35. *M. vitripennis*. Mas et Fem. *Abdominis compressi lateribus, squamulis pedibusque flavis; posticis fusco-variis, coxis nigris; segmenti 1<sup>mi</sup>. scuto gracillimo elevato.* Fem. *Aculeo brevissimo.* (Long. alar. .35.)

*Curt. E. B.* 321. n. 8.

*Fem.*—Præcedenti simillimus, sed metathorax lævis; segmenti 1<sup>mi</sup>. scutum adhuc gracilius læve; abdomen brevius; aculeus tantum subexertus: segmenta 2<sup>dum</sup>. et 3<sup>tium</sup>. modo flava puncto tantum dorsali communi nigro, a nigredine sequentium disjuncto.—*Mas*, abdomen minutissimum coxis posticis haud multo longius, generis *Evanicæ* habitum in animum revocans.

*Habitat* cum præcedente rarius.—(*Mus. Soc. Ent.*)

Sp. 36. *M. callidus*. Fem. *Abdominis compressi lateribus, squamulis pedibusque flavis; posticorum coxis basi, tibiis*

*apice tarsisque fuscis; segmenti primi scuto gracillimo elevato granulato; aculeo brevissimo.* (Long. corp. .12; alar. .26.)

*Fem.*—Proxime præcedentibus affinis; *M. lateralem* segmenti primi latitudine referens (etsi punctura tam hujus segmenti quam metathoracis multo confertior sit); *M. vitripennem* vero aculeo vix subexerto; sed abdomen adhuc brevius et minus compressum: alæ minores, obscure hyalinæ; squamulæ flavæ: pedes postici magis ferruginei, coxis apice concoloribus, femoribus apice vix obscurioribus: præterea, calcaria cum *M. fulvipede*, &c. potius quam illis conveniunt.

Sp. 37. *M. exiguus.* *Fem. Abdominis compressi lateribus pedibusque pallide ferrugineis, coxis nigris; posteriorum tibiis apice, femoribus tarsisque fuscis; segmenti 1<sup>mi</sup>. scuto gracillimo elevato; aculeo abdominis dimidio brevior.* (Long. alar. .22.)

*Fem.*—*M. vitripenni* affinis duplo minor, aculeo longiore, segmenti 1<sup>mi</sup>. scuto fere lineari, calcaribus ut in *M. fulvipede*: palpi pedesque pallide ferruginei, trochanteres omnes concolores; coxæ nigrae; femora intermedia basi, postica fere tota, tibiæ posteriores apice, tarsisque (metatarsi basi dentâ) fusca: alæ cærulescenti-hyalinæ stigmatate pallido; squamulis fuscis.

*Habitat in Umbelliferis rarius.*

Sp. 38. *M. fulvipes.* *Mas et Fem. Squamulis pedibusque fulvis; coxis posticis nigris; segmenti 1<sup>mi</sup>. scuto gracillimo elevato.* *Fem. Aculeo brevissimo.* (Long. corp. .11—.14; alar. .24—.28.)

*Microgaster glomeratus?* *Spin. Ins. Lig. II. 149. n. 5.*

*Fem.*—*M. glomerato* longior: antennæ gracillimæ corpore longiores: mandibulæ apice ferrugineæ; palpi flavo-ferruginei: pedes elongati graciles ferruginei aut flavo-ferruginei; coxæ posticæ nigrae apice ferrugineæ; calcaria postica metatarsi dimidio breviora, intermedia metatarso breviora recta, quæ in aliis præsertim vero *M. laterali* et *vitripenni* nonnihil curvata sunt metatarsi longitudinem attingentia: alæ quam illis minores glauco-hyalinæ, stigmatate sordide flavo, nervis dilute piceis; squamulis ferrugineis: thorax lævis; metathorax lateribus subtiliter punctulatus: abdomen subcompressum; segmento 1<sup>mi</sup>. scutum gracillimum elevatum,

postice sensim attenuatum, subtilissime aciculatum; 2<sup>dum</sup>. bi-striatum, medio obsoletius aciculatum, lateribus obscurè lutescens: aculeus vix subexertus.

*Mas.*—Antennæ corpore plusquam dimidio longiores gracillimæ: pedes paulo validiores; posticorum tibiæ apice et tarsi nonnunquam fuscescentia: abdomen gracilius basi coarctatum.

*Habitat* in gramine nemorum passim frequens, ab æquinoctio inde, cæteris præcocior.—(*Mus. Soc. Ent.*)

Sp. 39. *M. popularis*. *Mas.*: *Thorace lævi; tibiis flavis, posticis apice et subtus fuscis; alis albidis.*

*Mas.*—*M. glomerato* paulo major: niger: palpi flavescentes basi fuscis: femora antica basi nigra, tibiæ tarsique flava aut flavo-testacea; tibiæ posteriores apice, posticæ etiam subtus et tarsi iidem fusca: alæ candido-hyalinæ costa et stigmatate fusco-ferrugineis; nervis disci medii dilute fuscis, reliquis decoloribus: thorax lævis sericeus: segmentum 1<sup>mum</sup>. scuto longiore quam latiore, apice rotundato-attenuato, lævi nitido, 2<sup>dum</sup>. 3<sup>tio</sup>. non brevius utrinque oblique impressum, medio subtiliter punctulatum; reliqua lævia nitida: statura hujus solito validior: vix dubito quidem *feminæ* aculeum fere brevem ut sequenti.

*Hab.*—Prodiit e folliculis albis segregatis.—(*Mus. G. C. Hyndman.*)

Sp. 40. *M. immunis*. *Fem.* *Thorace lævi; femoribus tibiisque flavo-testaceis; posterioribus illorum utrinque, harum apice, fuscis; alis hyalinis; aculeo brevissimo.*

*Fem.*—*M. glomerato* æqualis: antennæ longiores: palpi fuscis apice pallidi: pedes flavo-testacei, coxis et trochanterum basi nigris; femora antica summa basi, intermedia lineolâ superâ et aliâ inferâ fuscis; postica fusca plaga longitudinali testaceâ; tibiæ posticæ et tarsi posteriores apice fuscescentia: alæ hyalinæ stigmatate costaque piceis: thorax lævis nitidus: segmentum 1<sup>mum</sup>. quam *M. glomerato* brevius scuto lateribus subrotundato medio latiore, subtilius aciculato; 2<sup>dum</sup>. arcuato-impressum medio subtilissimè aciculatum: aculeus subexertus.

Sp. 41. *M. glomeratus*. *Mas et Fem.* *Thorace subtiliter punctulato; pedibus flavo-ferrugineis, coxis nigris, genibus posticis infuscatis; alis limpidis. Fem. Aculeo brevissimo.* (Long. corp. .12—.14.; alar. .24—.28.)

Vermiculi e Crambide . . \*Wagner. *Helvet.* 226.

Musca Brassicariæ erucæ . Ray. *Ins.* 260. *Goedart.* p. 59,  
No. 11. *Reaumur.* II. T. 33.  
F. 2—13. T. 34. F. 1, 2.  
Mem. II. p. 419. *De Geer.* I.  
T. 16. F. 6. *Geoffroy.* II.  
331. 2.

Ichneumon glomeratus . *Linn. Fn. S.* 1646.

Cryptus . . . . . *Fabr. Syst. Piez.* 90. 89.

Ichneumon glomerator . . *Thunb. Act. Petr.* IX. 349.

Microgaster glomeratus . *Loudon, Mag.* V. 108. fig. a—h.

*Fem.*—Antennæ corpore breviores palpi pedesque flavo-ferruginei; coxæ nigræ; apex femorum posticorum supra fusco-lineatus; tarsi summo apice, postici latè infuscati: alæ limpidæ stigmatè fusco-ferrugineo; nervis disci nonnullis interruptè ferrugineis, plerisque flavescens, exterioribus planè decoloribus; squamulæ nigræ: alarum apex solito brevior et rotundior, cubiti basis sub stigmatè nonnihil obliquatus brevior: thoracis scutum punctulatum, scutellum parum convexum; metathorax brevis punctato-reticulatus, uti etiam segmenta 2 anteriora; quorum primi scutum secundo fere dimidio angustius, longius quam latius, lateribus flavis relectis; 2<sup>dum</sup>. transversum 3<sup>tio</sup>. brevius; intermedia solito longiora; ultima brevissima fornicato-deflexa: aculeus vix subextertus: venter antice flavo-pellucens.

*Mas.*—Antennæ corpore longiores: femora postica apice latiùs, tibiæ etiam apice infuscata; trochanteres basi nigri.

*Habitat* in larvis *Ponticæ Brassicæ* vulgatissimus: folliculi flavi aggregati.—(*Mus. Soc. Ent.*)

Sp. 42. *M. placidus.* *Mas. Thorace lævi; tibiis flavis, posticis apice fuscis; alis candidis; segmentis anterioribus latis aciculatis.* (Long. alar. .30.)

*Mas.*—Præcedente major: antennæ prælongæ teretes: palpi flavi basi fusci: femora antica pallide flava, basi summâ fusca; tibiæ tarsique flava; illarum posticæ apicæ, tarsique iidem fere toti fuscescentia: alæ candido-hyalinæ stigmatè fusco-ferrugineo; nervi disci medii dilute ferruginei; interiores flavescens; exteriores decolores: squamulæ nigræ: thorax dorso lævis nitidus: metathorax punctato-reticulatus: scutum segmenti primi vix

longius quam latius, (latius quidem quam *M. glomerato* sed paulo angustius quam sequentibus); segmenta 2 anteriora aciculata.

*Hab.*—————(*Mus. J. Curtis.*)

Sp. 43. *M. lineola*. Mas. *Thorace subtilissimè punctulato; femoribus tibiisque flavo-testaceis; posterioribus illorum utrinque, harum apice fuscis; alis albidis; segmentis tribus aciculatis.*

*Curtis. E. B. 321. n. 11.*

*Mas.*—*M. glomerato* æqualis: palpi flavi: pedum colores quales *M. immuni* (No. 40.) fere: alæ albidæ, stigmatate nervisque disci medii dilute ferrugineis, reliquis decoloribus; squamulæ nigræ: thorax confertim at subtilissime punctulatus; metathorax punctato-reticulatus: abdomen solito brevius et latius, segmentis 3 anterioribus punctato-reticulatis; primum breve latum angulis apicis vix flavo-marginatis.

*Hab.*—Prodiit e larvâ *Scævæ Pyrastræ*.—(*Mus. J. Curtis.*)

Sp. 44. *M. præpotens*. Fem. *Thorace subtilissime punctulato; tibiis ferrugineis, posticis apice fuscis; alis limpidis; aculeo perbrevis.*

*Fem.*—*M. glomerato* major et adhuc robustior, antennis brevibus crassioribus: palporum et pedum colores fere quales *M. intricato* (No. 45), lætiores modo: alæ latæ apice rotundatæ (uti *M. glomerato*), limpidæ, stigmatate crasso nigro-ferrugineo, nervis disci nonnullis ut in illo interrupte ferrugineis, reliquis decoloribus, costa interius flavicante; squamulæ nigræ: thorax nitidus subtilissimè punctulatus; scutellum læve; metathorax brevissimus punctato-reticulatus: segmenta 2 anteriora ut in sequentibus latitudine subæqualia, aciculata; aculeus magis exertus quam illis.

Sp. 45. *M. intricatus*. Fem. *Thorace punctatissimo; tibiis ferrugineis, posticis apice fuscis; alis obscure hyalinis; aculeo brevissimo.*

*Fem.*—*M. glomerato* fere æqualis: antennæ corporis longitudine: palpi ferruginei: femora antica basi nigra, tarsi anteriores et tibiæ ferruginea; harum posticæ apice (nonnunquam latiùs) fuscæ: alæ obscure hyalinæ stigmatate nervisque fuscis; squamulæ nigræ: thoracis dorsum opacum confertissimè, scutellum parciùs



punctatum; metathorax et segmenta duo antica punctato-reticulata aut rugulosa: aculeus vix subexertus.

*Hab.*—Folliculi latitabant intra globos spissos bombacinos stramineo-pallidos, graminum culmis appensos: prodiit ex his *Microgaster* parciûs, *Hemiteles fulvipes* vero copiosè.—(*Mus. G. C. Hyndman.*)

Sp. 46. *M. vestalis*. Mas et Fem. *Thorace punctatissimo; squamulis et tibiis ferrugineis, harum posticis apice fuscis; alis hyalinis.* Fem. *Aculeo brevissimo.*

*Fem.*—*M. intricato* simillimus: mesothoracis scutum et scutellum tota confertissime punctata opaca: alæ hyalinæ, stigmatè dilutius ferrugineo; squamulæ ferrugineæ.

Sp. 47. *M. ruficrus*. Mas et Fem. *Thorace punctatissimo; squamulis pedibusque flavo-ferrugineis; posticorum coxis nigris et genubus infuscatis.* Fem. *Aculeo brevissimo.* (Long. alar. .22.)

*Fem.*—*M. intricati* statura et sculptura, plusquam dimidio minor: palpi flavo-ferruginei; pedes concolores; posticorum coxæ nigræ, femorum apex fusco-notatus ut in *M. glomerato*: alæ obscure hyalinæ stigmatè ferrugineo.

Sp. 48. *M. gracilis*. Mas et Fem. *Thorace punctulato; tibiis flavo-ferrugineis; femoribus anticis concoloribus, posterioribus infuscatis.* Fem. *Aculeo brevissimo.*

*Curt. E. B. 321. n. 12.*

*Fem.*—Statura *M. intricati*, dimidio minor; thoracis punctura subtilior; antennæ longiores: pedes antichi flavo-ferruginei, coxis et trochanteribus nigris; posteriorum femora supra et subtus fusca; tibiæ posticæ apice et tarsi latiûs obsoletiûs fuscescentia: alæ hyalinæ stigmatè ferrugineo; squamulæ nigræ.

*Hab.*———(*Mus. J. Curtis.*)

Sp. 49. *M. rubripes*. Fem. *Thorace punctulato; antennis subtus, squamulis pedibusque rufis; coxis nigris; aculeo brevissimo.*

*M. glomeratus.* *Curt. E. B. 321. n. 7.*

*Fem.*—*M. glomerato* paulo major; statura fere præcedentium: antennæ corpore longiores, subtus rufescentes, basi clariûs: os

rufum, palpi pallidiores: pedes rufi, tarsi postici obscuriores; coxæ basi, posticæ totæ nigrae: alæ obscure hyalinæ stigmatè fusco-ferrugineo; squamulæ rufæ: thorax confertim subtiliter punctulatus; metathorax et segmenta 2 anteriora aciculata: venter rufescens: aculeus vix subexertus.

*Hab.*—Prodiit è folliculis flavis *Hipparchi papilionarii* larvæ agglutinatis.—(*Mus. J. Curtis.*)

Sp. 50. *M. prætextatus*. Fem. *Thorace punctulato; abdomine postice, squamulis pedibusque flavo-ferrugineis; aculeo brevissimo.*

*Fem.*—Præcedentium statura fere, *M. glomerato* æqualis: antennæ longæ graciles: palpi pedesque flavo-ferruginei; posticorum geniculi fusco-punctati et coxæ basi fusca: alæ obscure hyalinæ stigmatè ferrugineo; squamulæ flavo-ferrugineæ: thorax dorso subtiliter confertim punctulatus: abdomen flavo-ferrugineum, segmentis 1<sup>mo</sup>, 2<sup>do</sup>, et 3<sup>ti</sup>, basi dorso nigris; 7<sup>mo</sup>, fuscescente: aculeus subexertus.

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#### ADDENDUM.

Sp. 11. *M. meridianus*. (Long. corp. .18.; alar. .36.)

*Fem. Variat.*—Femora postica rufa apice nigra: alæ pallide flavæ, clarius pictæ, vix triangulum apicale nigricans vertice areolam attingit ibidem cum fascia transversa sinuata conjunctum; fascia interior magis obsoleta et interrupta; alarum posticarum nigredo occupat areolam cubitalem exteriorem et radialis apicem: aculeus abdominis dimidio paulo brevior. Patet itaque speciem 12<sup>mam</sup>, cum hac sensim collabi et e numero specierum dimittendam esse. Forsitan utraque cum *M. deprimatore* conjungi posset.

*Hab.*—Lectus in *Rosa spinosissima* arenarum die Maii 20<sup>mo</sup>.

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#### ADDENDA.

*Species mihi invisæ, vel non ritè determinatæ.*

Sp. 51. *M. auriculatus*.

\**Fabr. Syst. Piez.* 69, 82. “*Ichneumon auriculatus: ater capite abdominisque depressi segmento secundo tertioque rufis. Parvus:*

antennæ supra fuscae subtus rufæ: caput rufum vertice nigro: thorax ater immaculatus: abdomen depressum petiolatum, basi apiceque nigrum: pedes rufi tarsis posticis nigris."

*Spin. Ins. Lig. II. 147. 2.* "Microgaster auriculatus: *niger segmentis intermediis rufis.* Alæ hyalinæ superiores fasciis 2 fuscis: abdomen segmentis 3 anterioribus rugosis."

*Thunb. Act. Petr. VIII. p. 266.* "Ichneumon auriculator: *rufus abdominis basi ano tarsisque posticis nigris.*"

In sectionem A. referendus est.

Sp. 52. M. deprimator.

\**Panzer. Fn. Germ. 79. 11.*

*Fabr. E. S. Suppl. 227. 182.* "Ichneumon deprimator: *ater abdomine depresso plano, pedibus rufis.*"

*Spin. Ins. Lig. II. 148. 3.* "Microgaster deprimator: *niger pedibus rufis, alis hyalinis fasciis 2 fuscis.* Alæ ut in *M. auriculato*: abdomen omnino nigrum, segmento primo maximo rugoso: pedes toti rufi."

Pertinet hic etiam sectionem A.

Sp. 53. M. sessilis.

*Fabr. Ent. Syst. II. 194. 4.* Evania sessilis, &c.

*Coquebert. Ill. Dec. 1. T. 4. F. 8.*

*Fabr. Syst. Piez. 187. 8.* "Ceropales sessilis: *atra abdomine brevi cylindrico.*"

*Spin. Ins. Lig. II. 148. 4.* "Microgaster sessilis: *niger tibiis tarsisque rufis alis hyalinis.* Alæ profecto hyalinæ stigmatate nigro: abdomen neutiquam cylindricum, sed supra depressum et subtus fornicatum, triangulare ut in reliquis Microgastribus, segmentis 1<sup>mo</sup>. et 2<sup>do</sup>. basi supra rugosis: pedes rufi coxis femoribus tarsisque nigris."

Sp. 54. M. dorsalis.

*Spin. Ins. Lig. II. 151. 8.* "Microgaster dorsalis: *niger ventre pedibusque rufis.* (Long. 2 linearum; lat.  $\frac{1}{4}$ .) Antennæ nigrae corpore longiores: caput nigrum: thorax concolor: abdomen supra nigrum segmentis 3 anterioribus rugosis, ventre rufo pallidior: pedes rufi genibus nigris, tarsis nigro annulatis: alæ hyalinæ stigmatate nigro: *femina* terebram gerit abbreviatam vix conspicuam."

Sp. 55. *M. aphidum*.

*Spin. Ins. Lig.* II. 150. 7. “*Microgaster aphidum*: *niger abdominis basi pedibusque quatuor anticis testaceis alis hyalinis*. Alæ hyalinæ stigmatate nigro: pedes 4 antici rufi aut testacei, postici concolores coxis femoribus nigris: abdomen supra perfecte lævigatum segmento 1<sup>mo</sup>. testaceo ventre pallido.—*Var.* segmento 1<sup>mo</sup>. nigro utrinque testaceo.”

. N.B.—Synonyma a Spinola huc allata rejicienda sunt.

Sp. 56. *M. necator*.

*Scharfenberg.* p. 960. n. 14. “*Ichneumon necator*: *niger pedibus abdomineque flavicantibus hoc apice nigro*. (Long.  $1\frac{1}{4}$  linearum.) Antennæ nigræ setaceæ corpore longiores: caput et thorax nigri nitidi immaculati: alæ hyalinæ irideæ stigmatate nigro: pedes aurantiaci femoribus posticis nigris: abdomen flavum segmentis ultimis nigris: aculeus absconditus.—*Femina* agglutinat ova cuti et pilis larvarum *Bombycis chrysoorrhææ aurifluæ*, &c. Larvæ exclusæ albæ capite acuminato perforant cutem penetrantque in corpus illarum. Initio Junii ad mutationem subeundam e corpore exeunt, sibi que folliculos parvos conficiunt angustos albos  $1\frac{1}{2}$  lineas longos, socialiter aggregatos, e quibus decursu dierum 12—21, Ichneumones prorumpunt.”

Revocat auctor ad hanc speciem *Ichneumonem necatorem* Fabricii (qui a Gravenhorstio pro *Hemitele necatore* suo habetur); uterque laudavit *Ichneumonem*, Roesel. II. Vesp. T. 14. F. 3, 4. ab illorum descriptionibus tamen nonnihil discrepantem, quem Linneus ad *Ichn. glomeratum* jam antea adhibuerat, Scopolius autem ad *Ichn. globatum*. *Ichn. necatorem* Scharfenbergii, ut plures alios nimis leviter adumbratos, a cultoribus Lepidopterorum mox agnoscendum expectemus.

Sp. 57. *M. tortricis*.

*Schranck. Ins. Austr.* 763. *Ichneumon tortricis*: “*niger minutus abdomine ovato depresso sessili subtus pallidiore*. (Long.  $1\frac{1}{2}$ ; alarum anticar.  $1\frac{1}{2}$ ; aculei  $\frac{1}{2}$ ; antennarum 1 lin.)—*Hab.* in larva *tortricis fascianæ* larvulæ duæ apodes cylindricæ lunulato inflexæ, corpore rugoso molli capite retractili, unde natum præsens insectum.”

*Schr. Fn. Boica.* II. p. 2. 366. n. 2143. *Ichn. tortricis*: “*niger pedibus anticis et tibiis basi pallidis, abdomine sessili ovato-subdepresso*. Mas et fem. In larvis *tortricis* gregarius, Junio mense

evolat. Metamorphosin subit inter folia a Tortrice consuta in folliculis albis bombycinis aggregatis reticulo communi obductis."

Sp. 58. *M. Intercus*.

*Schranck. Ins. Aust.* 764. "Ichneumon *Intercus*: *minutus niger abdomine ovato depresso basi testaceo*. (Long. 2 lin.; antenn.  $\frac{2}{3}$ ; alar. ant. 1; aculei  $\frac{1}{5}$ .) Simillimus priori sed abdominis basi et tibiis rufis."

Sp. 59. *M. gregarius*.

*Schranck. Ins. Aust.* 766. "Ichneumon *gregarius*: *niger pedibus abdominisque lateribus ferrugineis*. (Long.  $1\frac{1}{2}$  lin.; alar. anticar.  $1\frac{1}{2}$ ; antenn.  $1\frac{2}{3}$ .) Antennæ nigræ articulis plurimis minutis: caput nigrum lingua flava: pedes ferruginei: abdomen nigrum brevi petiolo thoraci annexum lateribus tamen et subtus basi flavum: alæ incumbentes hyalinæ anticæ macula marginali nigra.—*Hab.* in larvis *Papilionum* gregarius. Exeuntes proprios folliculos singuli aggregatos nent; sed folliculus albus non flavus."

Discrimen ab *M. glomerato* quod ex anni tempore Auctor duxit, nos falsum esse comperimus; hic etenim sæpius hyemem in folliculis durat vere proditurus; quod Réaumurius jam docuerat.

Sp. 60. *M. alvearifex*.

*Schranck. Ins. Aust.* 767. "Ichneumon *alvearifex*: *niger petiolatus pedibus ferrugineis, abdomine subtus basi decolore*.—*Hab.* in folliculis albis in modum alvearis dispositis."

Laudat autem ad hanc auctor *Ichneumonem Geoffroy*, II. p. 322, qui a Fabricio ad *Ichn. alvearium* adhibetur.

Sp. 61. *M. tibialis*.

*Curt. E. B.* 321. No. 9. "Microgaster *tibialis*: *niger pedibus ochraceis, femoribus posterioribus et tarsis piceis, alis subfuscis*."

Sp. 62. *M. atrator*.

*Curt. ibid.* No. 13. "Microgaster *atrator*: *niger tibiis et tarsis ochreis, posticis fuscescentibus*."

Sp. 63. *M. Anomalon*.

*Curt. E. B.* 321. No. 15. "Microgaster anomalon: *niger corpore brevissimo compresso, femoribus anticis apice et tibiis ochreis.*"

Hic et proxime præcedentes ad sectionem B. pertinent.

Sp. 64. *Microgaster* —— ?

*Ray. Ins.* 255. No. 13. "Vespa Ichneumon parva Erucigena nullis in cauda setis, corpore antennis et pedibus nigris. Ad marginem exteriorem alarum notæ nigræ et vix conspicuæ sunt. Hæc viridis cujusdam erucæ lineolis albicantibus notatæ præcocis alumna est. Vermiculi hujus generis productrices omnes unam quamprimum ex erucæ corpore erepserunt nidum sibi texunt e lana tenuissima alba, rotundum seu globosum nucis Avellanæ magnitudine."

Sp. 65. *Microgaster* —— ?

*Réaum.* II. Mem. 11. p. 424. T. 35. F. 2. Ex erucis Phalenæ Aristolochiam, Urticam et Peucedanum depastis larvæ prodierunt. Hæ folliculos in globum communem bombacinum contexere.

Sp. 66. *Microgaster* —— ?

*Réaum.* II. Mem. 11. p. 424. T. 35. F. 5, 6. E globis similibus in culmis graminum vulgatissimis prodierunt Ichneumones minutissimi antennis longis, abdomine ferrugineo tenuissimè petiolato.

Sp. 67. *Microgaster* —— ?

*Réaum.* II. Mem. 11. p. 432. T. 33. F. 17. Larvæ hujus paulo majores quam *M. alvearii*, ex erucâ quercus folia depastâ prodierunt et ibidem folliculos albos in folio irregulariter aggregatos absque reticulo communi contexere.

Sp. 68. *Microgaster* —— ?

*Réaum. ibid.* F. 14, 15. Larvæ hujus magnitudine intermediæ inter larvas præcedentis et *M. alvearii*, folliculos albos sericeos in folio graminis absque ordine aggregatos contexere.

Sp. 69. *Microgaster* —— ?

*Loudon. Mag. Nat. Hist.* V. p. 768. *Microgaster glomeratus*; prodiit e larvis Phalenæ grossulariatæ.



Sp. 70. *Microgaster* —— ?

*Loudon. Mag. Nat. Hist.* V. p. 109. *Microgaster glomeratus*; prodierunt e larvis *Phalenæ Cajæ*. D<sup>nus</sup>. Newman. D<sup>nus</sup>. Westwood verò autumatur hunc diversum fore a *M. glomerato* vero (*ibid.* p. 301); quod verisimile videtur.

Sp. 71. *Microgaster* —— ?

*Merian. Ins.* I. 22. Ex eruca (*Tortricis*?) *Rosâ* victitante prodierunt quinque larvæ. Folliculos harum albos eruca contexebat, die 14<sup>ma</sup>, prodierunt *Ichneumones* parvi.

Sp. 72. *Microgaster* —— ?

*Merian. Ins.* II. 41. Ex eruca *Vanesse Atalantæ*. Folliculi aggregati reticulo communi obtecti. *Ichneumones nigri*.

Sp. 73. *Microgaster* —— ?

*Merian. Ins.* II. Ex eruca (*Noctuæ* ut videtur) viridi lineis tribus flavis maculisque nigricantibus ornata in foliis alni inventâ prodierunt larvæ quamplurimæ; harum folliculos aggregatos ut *M. glomerati* tabula exhibet. *Ichneumones parvi nigri*.

Sp. 74. *Microgaster* —— ?

*Merian. Ins.* III. 15. Ex eruca *Cynthiæ Cardui* prorupere larvæ quamplurimæ. Folliculos harum eruca contexebat in unum, reticulo gossipium referente. *Ichneumones nigri*, quorum aculeum abdominis longitudine tabula exhibet.

Sp. 75. *Microgaster?* —— ?

*Merian. Ins.* II. 38. Ex eruca (*Tortricis*) viridi, capite flavo, urticæ folia convolvente prodierunt larvæ quamplurimæ. Folliculi harum sparsim positi. *Ichneumones parvi nigricantes*.

Sp. 76. *Microgaster?* —— ?

*Merian. Ins.* II. 30. Ex eruca flava alni foliis enutrita proruperunt tres larvulæ quæ mox folliculos albicantes seorsim contexebant *Ichneumones* hinc enati flavi sunt pedibus concoloribus, capite nigro.

A. H. HALIDAY.

ART. XXII.—*Notes on Names.*—By E. N. D.

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 JULIET.—What's in a name?
 

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EVERY language consists of two classes of words; those which have been so long naturalized, as to be considered native; and those which have been so lately introduced, or are of such outlandish sound, that we at once detect their extraction, and which mix as well with our every-day discourse as a black sheep with white. Surely no one will hesitate to acknowledge, that in every language the native words are spoken with the greater ease, and heard with the greater pleasure. The English language consists of words of one, two, and three syllables. From the Greek and Latin we obtain others of four, five, and even six syllables; but it is a very small portion of these that ever thoroughly lose the traces of their extraction, or trip from an English tongue with perfect ease and smoothness. You must have found how much easier it is to *praise* than *eulogise*, much less *panegyris*, an author. The opposites of these terms I will not quote as examples; because your pen, ever flowing with the cream of human kindness, refuses to acknowledge them. In their native languages, on the contrary, high-sounding polysyllables are not only appropriate, but beautiful. I recollect, with pleasure, the many occasions in which you have delighted me with examples of this;—when the stored-up treasures of by-gone ages have overflowed in a tumult of quotation;—yet were your veneration for the ancients to induce you to transplant their sounding compounds into your native tongue, your discourse or writings would become encumbered and displeasing. On account of this paucity of polysyllables our language has been charged with poverty;—a charge from which our poets, in my opinion, fully exempt it: it is indeed simple, but has a sweetness and purity which often approach to an exceeding beauty.

Now I admit, that our technical names should be derived entirely from the dead languages; but if we expect them to be introduced in common parlance in a modern tongue, should we not pay some little respect to the character of that tongue? Names which we wish to see becoming familiar household words, should they not be adapted in some degree to our usual

mode of speaking? I have heard it gravely contended, that number of syllables and grandeur of sound gave importance to names;—alas, they simply proclaim the bad taste of the name-giver! Let me recommend to my fellow-travellers in this, the most humble path of the science, to limit their new names to as few syllables as possible; two will be found, in general, amply sufficient; three, however, may be considered perfectly allowable; and on rare occasions, when the name is minutely descriptive, four may be pardoned: but, in all instances, the name should be so compounded, that a child of seven years old, with an ordinary education, might read it with perfect ease.

Long, harsh, and ill-compounded names, are generally to be imputed to want of taste. There is, however, another frequent fault in the naming of species, which I attribute solely to poverty of resource. I refer to the practice of giving to an insect the name of its captor, with one or two i's appended by way of making a genitive:—thus we have *Davis-i*, *Hope-i*, and *Waterhouse-i*, the nominatives being *Davis-us*, *Hope-us*, and *Waterhouse-us*. Hundreds of names have lately been given in this elegant manner. This way of latinizing names is not, however, confined entirely to entomologists; as the letters W. R., standing for *Williamus Rex*, in divers and sundry places, abundantly testify.

A third complaint I have to make, is, that of taking the name of a species after it has been in use for years, and applying it to a genus or family, giving, at the same time, a new name to the species. This practice invariably creates confusion.

A fourth, and common fault in nomenclature, is that of giving to a species a name of distinct meaning, yet affording no possibility of our applying such meaning. I consider objectionable, on this ground, all names denoting size, as *major*, *medius*, *minor*, *minimus*, *minutus*, *minutissimus*; all names denoting a frequency of occurrence, as *communis*, *vulgaris*, *vulgatus*, *vulgatissimus*; all names denoting similarity, as *similis*, *assimilis*, *confinis*, *cognatus*, *congener*; all names denoting the plants on which insects are accidentally found, as *quercus*, *salicis*, *lapathi*. As instances of the faultiness of these, we have in one genus a *minor* larger than a *major*; in another, a *minutissimus* larger than a *minutus*; a *vulgatissimus*, of excessive rarity; a *quercus*, that feeds on every tree

except the *oak*; and many other departures from truth equally absurd.

As general rules, liable to but few exceptions, I would say, a generic name should be of Greek derivation, and descriptive of a character not possessed by neighbouring genera; that a specific name should be a Latin adjective decidedly descriptive of character, not possessed by neighbouring species, or a proper name derived from the Heathen Mythology, and conveying no idea excepting in connexion with some fable, which may perhaps serve to assist our memory; and that generic and specific names should be very easily pronounced or read, and should not exceed three syllables in length.

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ART. XXIII.—*Observations on the British Species of Pipunculidæ.* By FRANCIS WALKER, F. L. S.

THESE insects were first noticed by Latreille, in his *Hist. Nat. Insect. and Gen. Crust. et Insect.*, where he placed them at the end of the *Syrphidæ*, followed by the *Conopidæ*; remarking, however, that their situation is doubtful, and that they have the external appearance of the *Sargidæ*. Fallen also placed them with the *Syrphidæ*, and designated them by the characteristic name *Cephalops*. Meigen first allowed them the distinction of a family (*Megacephali*), which he placed between the *Platypesidæ* and the *Dolichopidæ*. In the first edition of the *Règne Animal*, Latreille observed that they have some resemblance to the *Stratiomydæ*, and especially to *Scenopinus*, but that the third joint of their antennæ is not annulated. In the second edition of this work he has partly followed Meigen's arrangement, by uniting *Callomyia*, *Platypesza*, *Pipunculus*, and *Scenopinus* into a family (*Cephalopsides*), placed between the *Dolichopidæ* and the *Tabanidæ*.

Family.—PIPUNCULIDÆ.

Musca . . . *Bosc.*

Pipunculus. *Latreille, Meigen, St. Fargeau and Serville, Haliday.*

Microcera . *Meigen.*

Cephalops . *Fallen.*

Corpus parvum, lineare aut sublineare: caput magnum, thorace latius, ferè hemisphæricum: oculi maximi, caput ferè totum occupantes: ocelli 3 mediocres, approximati, supra verticem trigonè dispositi: antennæ 4-articulatæ, parvæ, capite breviores; articulus 1<sup>us</sup>. minimus; 2<sup>us</sup>. mediocris, cyathiformis; 3<sup>us</sup>. longior, latus, compressus; 4<sup>us</sup>. setiformis, 3<sup>i</sup>. basi proximus: hypostoma angustum: os parvum, occultum; labium breve; maxipalpi longi, apice crassiores; mandibulæ brevissimæ: thorax convexus, longior quàm latus: prothorax minimus, supra vix conspicuus: mesothoracis scutum maximum, nonnunquam indistincte bilineatum; scutellum mediocre, semicirculum fingens: *maris* abdomen segmentis 6, thorace multò longius, plerumque sublineare, apice obtusum; segmenta 5 aut 6 subtus conspicua: *fem.* abdomen segmentis 7; apicale parvum, subtus abdomen recurvum, oviductu corneo acuminato terminatum: pedes breves, subæquales, spinis nigris brevissimis instructis armati; coxæ mediocres; femora subincrassata; tibiæ quasi contortæ, paullò arcuatæ, subclavatæ; tarsi lati; articulus 1<sup>us</sup>. longus; 2<sup>us</sup>. brevis; 3<sup>us</sup>. et 4<sup>us</sup>. brevissimi; 5<sup>us</sup>. 2<sup>o</sup>. paullò longior; ungues longi, graciles: alæ incumbentes parallelæ, plerumque angustæ et corpore longiores, pilis vix conspicuis densè vestitæ; nervus costalis pilosus, paullò ultra alæ apicem productus: nervus secundarius et nervus auxiliaris basi conjuncti, hic ultra, ille paullò ante costæ medium nervum costalem attingentes: nervus 2<sup>us</sup>. et 3<sup>us</sup>. nervo auxiliari orti, basi conjuncti, hic multò ante, ille prope alæ apicem nervum costalem attingentes: nervus 4<sup>us</sup>. aut perfectus, aut valdè abbreviatus; nervus 5<sup>us</sup>. alæ marginem posticum attingens; nervi 2 breves, incompleti, unus alæ basi, alter nervo 5<sup>o</sup>. emissus et nonnunquam obsoletus: nervulus transversus medius brevissimus: cellulæ costales et basales longæ, angustæ; marginales magnæ, irregulares, apicem versus plerumque latiores: halteres et squamæ parva.

In form they are very peculiar, and have but little resemblance to the other families of *Diptera*. They are nearest allied to the *Syrphites*, particularly to *Paragus* and *Sphegina*, but the structure of the mouth is more simple, and somewhat resembling that of *Scenopinus*, the *Platypesidæ*, and the *Muscites*. Like the *Syrphites*, they fly well, and are often seen hovering in the air, but they walk slowly, and have feet more adapted for climbing than for running. They slightly resemble the *Platypesidæ* externally, but have no affinity to the *Muscites*. The species may be found from spring to

autumn, in woods, and on the grass beneath trees. Their economy is unknown. The females have a curved and rather long ovipositor, apparently adapted to pierce the substances where they deposit their eggs. I have made a new genus of Meigen's third division, which differs very much from the first and second; however, the form and clothing of some of the latter species indicate an approach to it: *e. g.* *P. campestris* and others are distinguished by their cylindrical abdomens, which in *P. modestus* and *P. ruralis* are flat, and, in the females of the latter, pilose. They are pilose and flat in both sexes of *P. auctus* and of Meigen's third division.

GENUS I.—PIPUNCULUS, *Latreille*.

Pipunculus. (A. et B.) *Meigen*.

Corpus plerumque breve: *maris* oculi supra connecti: antennæ articulo 3<sup>o</sup>. apice curvo acuminato: metathorax mediocris: abdomen subarcuatum; *mari* segmento 1<sup>o</sup>. brevi; 2<sup>o</sup>. 3<sup>o</sup>. et 4<sup>o</sup>. subæqualibus; 5<sup>o</sup>. longiore; 6<sup>o</sup>. parvo; *fem.* segmentis 1<sup>o</sup>. ad 6<sup>um</sup>. subæqualibus: pulvilli magni: alæ iridescentes; nervus 3<sup>us</sup>. undulatus; nervus 4<sup>us</sup>. perfectus, undulatus, angulum ad nervum transversum ordinariū formans et nervi costalis apicem attingens; nervi 2 incompleti apice conjuncti; nervulus transversus ordinariū subarcuatus.

*Obs.*—*Maris* hypostoma angustius; antennæ articulo 3<sup>o</sup>. brevior et obtusior; tarsi angustiores; ungues et pulvilli parviores; alæ longiores et plerumque obscuriores.<sup>1</sup>

\* *Nervus* 4<sup>us</sup> longitudinalis simplex.

† *Abdomen* cylindricum, basi paulò angustius.

‡ *Alæ* immaculatæ.

Sp. 1. Pip. maculatus. Mas et Fem. *Æneo-ater, abdomine maculis rufis* (Mas) *aut fascia interrupta flava*, (Fem.) *pedibus flavis, alis fuscis*.

*Æneo-ater*, nitens, pubescens: caput atrum, anticè utrinque et subtus argenteo micans: oculi ocellique rufi: os flavum: antennæ fuscæ; articulus 3<sup>us</sup>. argenteo micans; 4<sup>us</sup>. niger: thorax glaber; anticè utrinque flavo tuberculatus: abdomen basi utrinque pilis albis vestitum; *mari* segmentis 2<sup>o</sup>. ad 4<sup>um</sup>. apice utrinque rufis;

<sup>1</sup> First observed by Mr. Haliday.



5<sup>o</sup>. et 6<sup>o</sup>. nigris scabris obscuris ; *fem.* segmento 2<sup>o</sup>. apice utrinque flavo, 3<sup>o</sup>. et 4<sup>o</sup>. flavis supra nigro vittatis : oviductus flavus : pedes flavi ; femora basi nigro maculata ; tarsi articulo 5<sup>o</sup>. supra plus minusve fusco ; ungues flavi, apice fusci ; pulvilli pallidè flavi : *maris* alæ obscurè fuscæ ; nervi nigri, basi fulvi : *fem.* alæ subfuscæ ; nervi fusci ; costa nigra ; squamulæ flavæ ; squamæ et halteres straminea, hi basi fulvi. (Corp. long.  $1\frac{1}{2}$ — $1\frac{3}{4}$  lin. ; alar.  $2\frac{3}{4}$ — $3\frac{1}{4}$  lin.)

*Var. β.*—*Mas*, meso- et rarius metafemora omninò flava.

July ; on furze and heath ; near London.

*Note.*—The male of this species resembles *P. rufipes* of Meigen, but he says that the abdomen and thighs are black ; the tips only of the latter red : in this species they are yellow, with only a small, and sometimes obsolete, black spot near the base.

Sp. 2. Pip. sylvaticus. *Mas* et *Fem.* *Nigroviridis, pedibus nigris, genubus tarsisque flavis, alis fuscis.*

Pipunculus sylvaticus. *Meigen, Dipt. Europ. IV. 20. 3.*

*Nigroviridis*, nitens, glaber : caput anticè utrinque et subtus argenteo micans : oculi ocellique rufi : os rufum : antennæ nigræ ; articulus 3<sup>us</sup>. fuscus, argenteo micans : thorax anticè utrinque stramineo tuberculatus ; scutellum non prominens : abdomen pubescens, basi utrinque pilis nigris vestitum, *maris* angustius ; segmentum 1<sup>um</sup>. griseum : oviductus flavus : pedes nigri ; femora apice, tibiæ basi et tarsi subtus flava ; tarsi supra fulvi, articulus 5<sup>us</sup>. fuscus ; ungues et pulvilli flavi, illi apice fusci : *maris* alæ obscurè fuscæ, *fem.* fuscæ ; nervi et squamulæ nigro-fusca, illi basi pallidiores : squamæ flavæ ; halteres straminei. (Corp. long.  $1\frac{1}{4}$ — $1\frac{1}{3}$  lin. ; alar. 2— $2\frac{1}{4}$  lin.)

July ; on grass beneath trees ; near London. June ; New Forest, Hampshire.

*Note.*—Meigen says that the *tibiæ* are fuscous, with yellow tips.

Sp. 3. Pip. geniculatus. *Mas.* *Ater, pedibus nigris, genubus flavis, alis subfuscis.*

Pipunculus geniculatus. *Meigen, Dipt. Europ. IV. 20. 2.*

*Ater*, nitens, glaber : caput anticè utrinque et subtus argenteo micans : oculi ocellique rufi : antennæ nigræ ; articulus 3<sup>us</sup>.

argenteo micans: thorax anticè utrinque fusco tuberculatus; scutellum non prominens: abdomen breve, latum, vix pubescens, basi utrinque pilis nonnullis albis vestitum, apice angustius: pedes nigri; tibiæ basi, genua, pulvilli et ungues flava; hi apice fusci: alæ subfuscæ, breves, corpore vix longiores; nervi nigri, basi fusci: squamulæ fuscæ; squamæ et halteres straminea. (Corp. long.  $1\frac{1}{2}$  lin.; alar. 2 lin.)

May; on grass beneath trees; near London.

‡‡ *Alæ sub costa inter nervum secundarium et nervum auxiliarem fusco maculatæ.*

Sp. 4. Pip. flavipes. Fem. *Ater, pedibus flavis fusco fasciatis, alis subfuscis latis.*

*Pipunculus flavipes. Meigen, Dipt. Europ. IV. 21. 5.*

*Ater, nitens, glaber: caput anticè subtus et utrinque argenteo micans: oculi ocellique rufi: antennæ fuscæ, articulus 3<sup>us</sup>. flavescens, argenteo micans: thorax anticè utrinque fusco tuberculatus; scutellum non prominens: oviductus flavus: pedes obscurè flavi; coxæ nigræ, apice flavæ; pro- et mesofemora fusco, metafemora nigro interruptè fasciata; tarsi articulo 5<sup>o</sup>. fusco; ungues et pulvilli flavi, illi apice fusci: alæ subfuscæ; nervi nigro-fusci, basi pallidiores; squamulæ et squamæ flavæ; halteres pallidè flavi, basi obscuri. (Corp. long.  $1\frac{1}{2}$  lin.; alar.  $2\frac{1}{2}$  lin.)*

October; on grass beneath trees; near London.

*Note.*—According to Meigen's description, the legs are entirely yellow.

Sp. 5. Pip. pratorum. Mas et Fem. *Griseus, pedibus flavis, fusco nigroque cingulatis, alis fuscis.*

*Cephalops pratorum. Fallen, Dipt. Suec. Syrph. 15. 1.*

*Pipunculus pratorum. Meigen, Dipt. Europ. IV. 22. 7.*

*Griseus, obscurus: caput utrinque, anticè et subtus argenteo micans: oculi ocellique rufi: antennæ nigræ; articulus 3<sup>us</sup>. nigro-fuscus, argenteo micans: thorax posticè et utrinque argenteus, anticè utrinque fusco tuberculatus; scutellum vix prominens: oviductus flavus: pedes flavi; coxæ basi nigræ; femora nigra, apice basique flava; tibiæ fusco ferè cingulatæ; tarsi articulo 5<sup>o</sup>. fusco, fem. pallidiorè; ungues et pulvilli flavi, ille apice fusci: *maris* alæ fuscæ; nervi nigri, basi fusci; squa-*

mulæ fuscæ ; squamæ flavæ ; halteres fuscî, basi pallidiores : fem. alæ subfuscæ ; nervi basi et squamulæ flava ; halteres flavî, basi fulvi. (Corp. long.  $1\frac{2}{3}$  lin. ; alar.  $2\frac{3}{4}$ —3 lin.)

May to July ; on grass beneath trees ; near London.

Sp. 6. Pip. campestris. *Griseus*, maris abdomine atro, pedibus nigris, alis fuscis, mas ; aut hyalinis, fem.

Musca cephalotes . . . *Bosc. Journ. d'Hist. Nat.* I. 53. Pl. 20. No. 5.

Pipunculus campestris. *Latr. Hist. Nat. des Crust. et des Insect.* XIV. 392 ; *Gen. Crust. et Insect.* IV. 332 ; *Meig. Dipt. Europ.* IV. 19. 1 ; *Leach, Edin. Encycl.* X. 130.

*Mas.*—Fuscus, obscurus, pubescens : caput nigrum, argenteo micans : oculi ocellique rufi : antennæ nigræ ; articulus 3<sup>us</sup>. argenteo micans : thorax apice, utrinque et subtus nigro-nitens ; scutellum non prominens : abdomen atrum, holosericeum, basi utrinque pilis nonnullis sordidè albis vestitum : segmentum 1<sup>um</sup>. griseo circumdatum ; sequentia apice nigro-ænea, nitentia : pedes nigri, nitidi ; trochanteres nigro-fuscî ; tibiæ basi et genua fulva ; tarsi nigro-fuscî, subtus pallidiores, articulus 5<sup>us</sup>. niger ; ungues et pulvilli flavî, illi apice fuscî : alæ fuscæ ; nervi nigri, basi fuscî ; squamulæ et squamæ fuscæ ; halteres obscurè rufi, basi fuscî.

*Fem.*—Nitens : thorax griseo-ater : abdomen pubescens : oviductus flavus : trochanteres et tibiæ fusca ; femora apice, tibiæ basi et genua flava ; tarsi fuscî, basi et subtus flavî : alæ hyalinæ ; nervi basi flavescentes ; halteres et squamæ flava, illi basi fuscî. (Corp. long.  $1\frac{1}{4}$ — $1\frac{5}{4}$  lin. ; alar.  $2\frac{1}{2}$ — $4\frac{1}{2}$  lin.)

*Var. β.*—*Fem.* propedes tibiis tarsisque pallidè fuscis ; meso- et metapedes tibiis tarsisque nigro-fuscis.

May to July ; on grass beneath trees ; near London.  
June ; Windsor ; New Forest, Hampshire.

†† *Abdomen planum. Alæ maculatæ.*

Sp. 7. Pip. modestus. Mas et Fem. *Ater*, griseo maculatus, pedibus nigris fusco flavoque cingulatis, alis fuscis, mas ; aut subhyalinis, fem.

Pipunculus modestus. *Haliday, Ent. Mag.* I. 162.

*Mas*.—Ater, opacus, lævis : caput anticè, utrinque et subtus argenteo micans : oculi ocellique rufi : antennæ nigræ : thorax anticè utrinque fusco tuberculatus ; latera et apex grisea : abdomen elongato-ovatum, pubescens ; latera grisea et basi pilis nonnullis nigris vestita : pedes nigri ; trochanteres fusci ; genua et tibiæ basi flava ; tibiæ nigro-fuscæ ; tarsi fusci, basi et subtus fulvi, articulus 5<sup>us</sup>. nigro-fuscus ; ungues et pulvilli pallidè flavi, illi apice fusci : alæ fuscæ ; squamulæ fuscæ ; nervi nigri, basi fusci ; squamæ flavæ ; halteres fusci.

*Fem*.—Nigro-æneus, pubescens : thorax anticè utrinque fulvo tuberculatus ; thoracis latera et apex, necnon abdominis maculæ laterales albo-grisea : oviductus niger, apice flavus : tarsi fusci ; articulus 5<sup>us</sup>. niger : alæ subfuscæ ; halteres fusci. (Corp. long.  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin. ; alar.  $2$ — $2\frac{2}{3}$  lin.)

*Var. β*.—*Mas*, tibiæ nigræ ; meso- et metatarsi nigro-fusci, basi fusci.

*Var. γ*.—*Mas*, tarsi fulvi, apice fusci.

*Var. δ*.—*Fem*. tarsi basi et subtus fulvi.

May and June ; on grass beneath trees ; near London.

Sp. 8. *Pip. ruralis*. *Mas* et *Fem*. *Fuscus, abdomine griseo maculato, pedibus nigris fusco flavoque cingulatis, alis subfuscis*.

*Pipunculus ruralis*. *Meigen, Dipt. Europ. IV. 22. 8.*

*Mas*.—Fuscus, pubescens : caput argenteo micans : oculi ocellique rufi : antennæ nigræ ; articulus 3<sup>us</sup>. apice argenteus : thorax anticè utrinque fusco tuberculatus ; latera et apex grisea : abdomen utrinque ad segmentorum apices griseo trigonè maculatum : pedes nigri ; genua et tibiæ basi flava, hæ subtus nigro-fuscæ ; tarsi fusci, subtus rufofusci, articulus 5<sup>us</sup>. nigro-fuscus ; ungues et pulvilli flavi, illi apice fusci : alæ subfuscæ ; squamulæ fuscæ ; nervi nigri, basi fusci ; squamæ flavæ ; halteres fusci, medio albi.

*Fem*.—Pilosus : scutellum prominentius, apice setosum : abdomen basi utrinque pilis albis vestitum ; maculæ medio connectæ : oviductus flavus : tibiæ fuscæ, basi flavæ ; tarsi pallidè fusci, basi et subtus flavi : alæ subhyalinæ ; nervi basi flavescentes ; halteres pallidè rufi, basi fusci. (Corp. long.  $1\frac{1}{2}$ — $1\frac{3}{4}$  lin. ; alar.  $3\frac{1}{4}$ — $3\frac{1}{2}$  lin.)

May to July; on grass beneath trees; near London. June; Windsor forest; New Forest.

\*\* *Nervus* 4<sup>us</sup>. *longitudinalis ramulum brevem emittens.*

Sp. 9. Pip. auctus. Mas et Fem. *Ater*, mas; *aut fuscus*, fem; *griseo maculatus*, *pedibus nigris fusco cingulatis*, *alis hyalinis.*

Cephalops auctus. *Fallen, Dipt. Suec. Syrph.* 61. 1. 2.

Pipunculus auctus. *Meigen, Dipt. Europ.* IV. 23. 10.

*Mas.*—*Ater*, obscurus, pilosus: caput argenteo micans: oculi ocellique rufi: antennæ nigræ; articulus 3<sup>us</sup>. argenteo micans: scutellum prominens: abdomen planum, apice angustius, subtus nigro-griseum; segmenta apice utrinque grisea: pedes nigro-grisei, pilosi; genua flava; tibiæ nigro-fuscæ, apice basique fuscæ; tarsi fusci, subtus fulvi; ungues et pulvilli albi, illi apice fusci: alæ hyalinæ; squamulæ nigro-fuscæ; nervi-nigri, basi fusci; squamæ et halteres fusca.

*Fem.*—Fuscus, pilosus: abdomen apice paullò angustius: thorax utrinque et apice abdominisque segmenta apice grisea: oviductus niger, nitidus, apice rufus: squamulæ fuscæ: squamæ et halteres rufa. (Corp. long.  $1\frac{1}{2}$ — $1\frac{2}{3}$  lin.; alar.  $2\frac{5}{4}$ —3 lin.)

July; on grass beneath trees; near London. May; Birchwood, Kent. June; Windsor. New Lanark, Scotland.

## GENUS II.—CHALARUS.\* *Walker.*

*Maris* oculi supra non connecti: antennarum articulus 3<sup>us</sup>. ovatus, 2<sup>o</sup>. non multò longior: *maris* et *fem.* ungues et pulvilli similes, mediocres: alarum nervus longitudinalis 3<sup>us</sup>. ferè rectus; 4<sup>us</sup>. apice, nervulus transversus ordinarius nervusque basalis incompletus omninò obsoleti.

Sp. 1. Cha. spurius. Mas et Fem. *Ater*, obscurus, *pedibus nigris*, *alis fuscis.*

Cephalops spurius. *Fallen, Dipt. Suec. Syrph.* 16. 3.

Pipunculus spurius. *Meigen, Dipt. Europ.* IV. 24. 11.

*Mas.*—*Ater*, holosericeus, obscurus, pilosus: oculi ocellique rufi: antennæ nigræ: thorax anticè utrinque nigro-fuscus: scutellum prominens, metathoracem obtegens: abdomen depressum, apice angustius; segmenta subæqualia: pedes atri, pilosi; tarsi subtus

\* Χαλαρός, languidus.

nigro-fusci; ungues nigri; pulvilli fusci: alæ obscurè fuscæ; nervi nigri; macula sub costam inter nervos secundarium et auxiliarem elongata, brunnea; squamulæ, squamæ et halteres nigro-fusca.

*Fem.*—Sparsè pilosus: abdomen nigro-fuscum: oviductus fuscus: tarsi nigro-fusci: alæ fuscæ; squamæ et halteres pallidè fusca. (Corp. long. 1—1 $\frac{1}{4}$  lin.; alar. 1 $\frac{1}{2}$ —2 $\frac{1}{4}$  lin.)

May to July; on grass beneath trees; near London.

Sp. 2. Cha. holosericeus. Mas et Fem. *Niger, pedibus nigro-fuscis flavo cingulatis, alis subfuscis.*

Pipunculus holosericeus. *Meigen, Dipt. Europ. IV. 24. 12.*

Pipunculus exiguus . . . *Haliday, Ent. Mag. I. 162.*

*Mas.*—Niger, obscurus, vix pilosus: oculi ocellique rufi: antennæ nigrae: thorax anticè utrinque nigro-fuscus: abdomen nigro-fuscum, pilis albis sparsè vestitum: pedes nigro-fusci, vix pilosi; genua, tibiæ apice et basi tarsisque fusca, propedum flava; ungues et pulvilli flavi, illi apice fusci: alæ fuscæ; nervi nigri, basi fusci; squamulæ nigro-fuscæ; squamæ et halteres fusca.

*Fem.*—Oviductus fuscus: pedes flavi; coxæ fuscæ; femora fusca, apice basique flava; protibiæ flavo, meso- et metatibiæ fusco cingulatæ: alæ subfuscæ; squamæ et halteres flava. (Corp. long. 1 lin.; alar. 1 $\frac{1}{2}$  lin.)

August; on grass beneath trees; near London.

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ART. XXIV.—*The Honey Bee.* By EDWARD BEVAN, M. D.  
London: Baldwin & Cradock.

GENTLE Bee! bright example to mankind of industry, economy, concord, and obedience! what triumphs, what wonders, dost thou not achieve! It shall be our delightful task to talk of thee, and to write of thee; and if we talk not, and write not, pleasantly, then indeed the fault is in ourselves, and not in thee. Sweet is the sound of thy morning hum, attuned to music, when thou reellest on some gay bank of purple heather, visiting bell after bell in quest of their ambrosial essence, heaven-distilled! Sweet is the air around thee, air impreg-



nated with the breath of flowers! Sweet is the joyous concert of feathered choristers above and about thee! Sweet is the memory of those few happy days when we have drank freely of scenes like these, and basked in the early sunshine on some fragrant bed of thyme, “dazzled and drunk with beauty”—the beauty of nature.

Gentle reader! has thy soul never sympathized with nature—has it never been so deeply steeped in the love of nature as to have assumed, for a passing moment, her rosy hue? Young love lends a light to woods and fields that is not all their own—we have felt it, but feel it no longer.

Oh! the days are gone when beauty bright  
Our heart's-chain wove,  
When our dream of life, from morn to night,  
Was love—still love.

The “milder, calmer” days are now come, and we love nature for her own sake; our delight in her is perhaps a little diminished in intensity since objects have ceased to reflect the glowing tints of our thoughts, but there is a soberer, purer, more enduring beauty in the colours which are truly her own, and the soul now receives at her hands those hues which, in earlier life, it had the power to impart. Love invests objects with a joyous dancing splendour that is not real, as the glare of a noon-day sun gives a quivering motion to the white stones in a churchyard, while, in reality, they partake of all the deathly quiet of those whose tale they tell.

Gentle reader! we will now give thee a few directions about thy bees; and these, not thrown together at random, but the result of much observation and experience. Select the site for thy colony with care; let not the wide and rapid river roll by it, nor the pool stagnate near it; these are often sources of great loss of life to bees, especially in windy weather; yet a gently murmuring brook, bubbling, in all its transparent purity, over flattened pebbles, may harmlessly meander through thy clovery meadows, or even through thy garden, stored, as it must be, with honey-distilling flowers. Let a high wall or a close hedge protect thy colony from the biting north-wind, yet take care that it be not placed so as to hide the hives from thy view as thou art sitting in thy parlour, for thine eye should be continually upon thy treasure, taking instant cognizance of any thing that is amiss. Let each hive be placed on a stand,

at least eighteen inches from the ground, and four feet from each other. Let the hives stand quite clear from the wall or hedge, so that thou mayest approach them readily from behind. Let no tree or house overshadow or drip on them. And lastly, let no offensive smell or harsh noise trouble their quiet, for they enjoy quiet, and ease, and comfort. Gentle reader! listen while we repeat to thee an ode in commendation of these things.

Quiet—he prays for on the vast Ægean,  
When by black storm-clouds the fair moon is hidden,  
And the bright stars, those certain guides to seamen,  
Cease from their shining.

Quiet—the Thracian, furious in warfare :  
Quiet—the Mede, so graceful with his quiver :  
Grosphus—with jewels, purple, nor with riches  
Can it be paid for.

For neither treasures nor the consul's lictor  
Can move the spirit's miserable tumult,  
Nor yet the troubles that so often flutter  
Round gilded ceilings.

He may live well with little, whose paternal  
Salt-cellar shines upon his slender table ;  
Terror nor filthy avarice can mar his  
Peaceful slumbers.

Why so short-lived then plan we many projects ?  
Why do we seek for regions that are heated  
By other sunshine ? Who his country's exile  
Self too can fly from ?

Care inauspicious climbs the brass-clad vessel :  
Never abandons multitudes of horsemen :  
Swifter than stags are, and impelling rain-clouds ;  
Swifter than Eurus.

Spirits at present joyful, for the future  
Hate to be thoughtful ; and the bitter sweeten,  
Mirthful with smiling ; nothing is on all sides  
Doomed to be happy.

Sudden the death of heroic Achilles :  
Lingering old age wore away Tithonus :  
And to me the hour, that to thee's forbidden,  
Perhaps may be lengthened.

Hundreds of cattle, and of cows Sicilian,  
Low all around thee ; mares, too, raise their neighings,  
Yoked to thy chariot ; and in Afric's murex  
Doubly empurpled



and the drones sally forth together, grapple each other in the air, hug and scuffle for a minute, during which the poisonous dagger of the workers is plunged into the side of the drones, who bow down their heads, gather their legs together, and gracefully drawing their wings as a gauzy mantle around them, hide their face from observation, and so die.

The Workers are the smallest bees in the hive, and by far the most numerous; they have a longer lower lip for sucking honey than either of the others; their thighs are furnished with a brush for the reception of the farina of flowers; and their sting is straight. The workers do the entire work of the community; they build the cells, guard the hive and the queen, collect and store the honey, elaborate wax, feed the young, and kill the drones. The respective number of individuals in a full hive are thus: 1 queen, 2,000 drones, 20,000 workers.

The queen lays her eggs one in the bottom of each cell; the egg is long, slightly curved, and of a bluish colour; when laid it is covered with a glutinous matter, which enables it to adhere to the bottom of the cell. For eleven months the queen lays only workers' eggs; after that those which produce drones. As soon as this change has taken place the workers begin to construct royal cells, in which, without discontinuing laying the drones' eggs, she deposits now and then, about once in three days, an egg which is destined to produce a queen. The workers' eggs hatch in a few days, and become little white maggots, which immediately open their mouths to be fed: this the workers attend to with the utmost assiduity. In six days the maggot fills up its cell; it is then roofed in by the workers, spins a silken cocoon, and becomes a chrysalis, and on the twenty-first day it comes forth a perfect bee. The drones emerge on the twenty-fifth day, and the queens on the sixteenth.

As we have already stated, the queen for nearly a year lays no eggs that are destined to produce queens; it therefore follows, that if, during that period, any evil befall her, the hive is left without a queen: sometimes she dies; sometimes she wanders too near the mouth of the hive, falls out, and a bird devours her; sometimes she is taken away by the experimenting apiarian for the express purpose of watching the result. For twelve hours little notice is taken of the loss; it appears not to be known, and the workers labour as usual. After that period

a hubbub commences; work is abandoned; the whole hive is in an uproar; the nation has lost its sovereign, and feels the loss deeply; every bee traverses the hive at random, with the most evident want of purpose. This state of anarchy sometimes continues for days; then the bees gather in knots, clusters of a dozen or so, as though engaged in consultation; shortly after a resolution seems to have been made; a few of the workers go to work at the cells in which are the eggs of workers; three of these cells are quickly broken into one, the edges polished, and the sides smoothed and rounded; a single egg being allowed to remain at the bottom. When this egg hatches, the maggot it produces is fed with a peculiarly nutritive food, called royal bee bread, which is never given to any maggots but such as are to produce queens. Work is now resumed over the whole hive, and goes on as briskly as before. On the sixteenth day the worker's egg produces a queen, whose appearance is hailed with every demonstration of delight, and who at once assumes sovereignty over the hive.

Gentle reader! in the course of thy earthly pilgrimage thou wilt meet with many things that may seem at the first glance rather unaccountable, and this is perhaps one of those things; but a calm inquiry will relieve our statement of all impossibility, at least: let us endeavour to explain it. There are, as we have set forth, three kinds of bees in a hive; but there are only two sexes, male and female. Drones are the males; queens and workers are the females, the workers being for the most part abortive. That the workers are females is amply proved by their possessing a sting, and various other anatomical similarities, besides the circumstance of their occasionally laying eggs; and therefore, in the wonderful instance before us, the change is to be attributed solely to the difference of food and care bestowed on the maggot by the workers.

Let us pause an instant, and look at this fact in another light; let us recollect that, if each maggot were supplied with a sufficiency of food, and that food sufficiently nutritious, then every female would be a queen. How then would the labour of the hive proceed? there would be no cells, no honey stored for the winter, and the whole community would consequently perish. It is as remarkable, indeed it is more remarkable, that so large a proportion should thus be stinted in their growth, purposely that they might never be encumbered with the cares

of maternity, but their whole attention fixed on other matters, than that a maggot well supplied with wholesome nutriment should arrive at that perfect development which is the characteristic of its sex.

When, under ordinary circumstances, a young queen emerges from the chrysalis, the old one frequently leaves the hive, heading the first swarm for the season, and, flying to some neighbouring resting-place, is observed by the apiator, captured, placed under a new hive, and a new colony is immediately commenced. Before a swarm leaves the hive, sure indications are given of the intended movement; the workers leave their various occupations, and collect in groups, especially near the door of the hive, as though in consultation on the important event about to take place.

As the summer advances many queens are hatched, but the workers do not allow them instant liberty, as severe battles would instantly take place between them and the reigning queen, in which one would be killed. The workers, therefore, merely make a small hole in the ceiling of the royal cell, through which the captive queen thrusts her tongue, and receives supplies of food from the attentive workers. In this state of confinement the queens utter a low querulous sound, which has been compared to singing. When the reigning, or any other queen that has gained her liberty, finds one of these captives, she uses every effort to tear open the cell and destroy her rival. To prevent this the workers often interpose, pulling her away by the legs and wings. To this she submits but a short time, when, uttering a peculiar cry, called her voice of sovereignty, she commands instant attention and obedience, and is at once freed from her assailants.

We must not extend our remarks; we fear some of our readers will think we have already done so beyond the bounds of etiquette to our contributors, many of whom have become weary with long waiting. At a future time we may again use the title of Dr. Bevan's book as an excuse for writing about Bees; for the present we content ourselves with recommending it to our readers.

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ART. XXV.—*Entomological Captures at Mickleham and Neighbourhood.* By JOHN WALTON.

SIR,—I have now before me a numerous catalogue of insects captured, in the summer and autumn of 1832 and 1833, in the vicinity of the delightful village of Mickleham, situated in a narrow valley between the chalky ridges near Box-hill, Surrey. From this catalogue I have selected such as are stated to be rare or local, adding a few observations on their localities, &c., which, if you deem worthy to be published, are much at your service.

I.—LEPIDOTERA.			
Colias Electra		Xylophasia lithoxylea	Hypena proboscidalis
Leucophasia sinapis		sublustris	obesalis
Nemeobius Lucina		epomidion	Polygogon nemoralis
Melitæa Euphrosync		Hadena plebeia	Ennychia anguinahs
Argynnis Aglaia		capsincola	Pyrausta purpuralis
Paphia		Heliophobus popularis	porphyrialis
Vanessa Polychloros		Hama aliena	Hydrocampa nymphæata
Cynthia cardui		Apamea nictitans	Diaphania lucernalis
Hipparchia Semele		furca	Margarita palealis
Galathea		Scotophila porphyrea	flavalis
Thecla rubi		Miselia compta	Lozotœnia oporana
Polyommatus Alsus		Polia advena	fulvana
Corydon		tincta	Orthotœnia undulana
Adonis		serena	Pæcilochroma Udmanniana
Argus		Lucania rufescens	Xanthosetia Zœgana
Agestis		Cucullia Verbasca	Hamana
Thymele Alveolus		umbratica	Oncocera carnella
Tages		lucifuga	Crambus argentellus
Pamphila comma		Stilbia anomalata	Pterophorus didactylus
		Ophiura lusoria	
		Euclidia glyphica	
		—	
			IV.—COLEOPTERA.
Ino statices		Bupalus Piniarius	Lamprias nigrirarsis
Sphinx ligustri		Crocallis elinguaris	cycnocephalus
Deilephila porcellus		Campæa margaritata	Tarus angularis
Dasychira pudibunda		Hemithea vernaria	macularis
Enthemonia russula		Cleora lichenaria	Brachinus crepitans
Nemeophila plantaginis		Alcis repandata	Cychnus rostratus
Spilosoma menthastris		Aspilates gilvaria	Leistus spinibarbis
Callimorpha jacobææ		Larentia bipunctaria	Badister bipustulatus
Lithosia helvola		Harpalyce fulvata	microcephalus
griseola		ocellata	Licinus silphoides
Gnophria rubricollis		unangulata	depressus
Setina irrorella		Polyphasia immanata	Odontonyx rotundicollis
Triphæna orbona		Steganolphia prunata	Amara ærata
Cerigo texta		Anaitis plagiata	lata
Lytæa umbrosa		Xerene procellata	Bradytus discrepans
Agrotis corticea		rubiginata	marginatus
segetum		Phibalapteryx tersata	apricarius
Graphiphora brunnea		Triphosa dubitata	Harpalus thoracicus
punicea		Eupithecia nebulata	ignavus
C. nigrum		Centaureata	Ophonus azureus
Mythimna grisea		Emmelesia r.vulata	punctatissimus
Caradrina Morpheus		Strenia clathrata	puncticollis
glareosa		Ptychopoda lividata	cribellum
Pyrophila Tragopogonis		ornata	Atopa cervina
		Macaria liturata	Chrysomela hyperici
		Drepana unguicula	Callidium violaceum.

REMARKS.—*Nemeobius Lucina*, *Thecla rubi*, *Polyommatus Argus*, *Caradrina glareosa*, *Stilbia anomalata*,

*Ophiusa lusoria*.—On the east side of Sir Henry Leslie's park, adjoining the Beechwood.

*Polyommatus Corydon*, *P. Adonis*, *Pamphila comma*.—All very plentiful on the south side of Juniper-hill and in Norbury-park.

*Hipparchia Galathea*, *Polyommatus Alsus*, *Setina irrorella*, *Aspilates gilvaria*, *Ptychopoda ornata*, *Margaritia flavalis*.—On the first chalky bank, at the end of a wood on the left, in a lane leading from Juniper-hill to Headley, about a quarter of a mile from the principal road to Dorking.

*Dcilephila porcellus*, *Agrotis corticea*, *Xylophasia sublustris*, *Polia advena*, *P. tincta*.—Captured from the flowers of the *Lychnis dioica* and *Silene inflata*, with forceps, in fields intersected by a foot-path leading from behind the church, through a fir plantation, to Juniper-hill.

*Cerigo texta*, *Lytæa umbrosa*, *Heliophobus Popularis*.—Banks of the river Mole; in fields opposite a beech-wood, divided by the river.

*Lithosia helvola*.—Very plentiful on the west side of Box-hill.

*Callidium violaceum*.—Crawling on the gravel-walks, and in the house, of a cottage-villa adjoining Mr. Haynes' timber-yard.

*Tarus angularis*, *T. macularis*, *Lamprias nigratarsis*, *Badister microcephalus*, *Licinus silphoides*, *L. depressus*, *Bradytus marginatus*, *Harpalus thoracicus*, *H. ignarus*, *Ophonus azureus*.—Under flints, on the south-side of Box-hill, facing Dorking; *Licinus depressus* is in greater abundance on the same continuous bank, more easterly, near a large fir plantation, under flints on the grass eaten bare by sheep, which it seems to prefer to more sterile situations. I obtained upwards of three hundred specimens, frequently found in pairs (*in copulâ*), from the middle of September until the latter end of October. *Licinus silphoides* is more plentiful about a mile west of Mr. Denison's house, in every field on the same chalky ridge, which runs on to Guildford. In one stubble field I found thirty-five specimens in a few hours, under large pieces of chalk and flint. Unlike its congener, it seems to prefer situations more or less free from grass, to expedite its running after its prey, or otherwise. It is by far the commonest beetle in that neighbourhood, and not periodical in its times

of appearance. I have captured upwards of five hundred specimens in two successive years; and it is surprising that an insect so common, and to be found in so many habitats near London, should have been so rare, a few years back, as to be estimated to be worth a guinea a pair: I apprehend they are now at a discount, for I cannot get rid of my duplicates. *Tarus macularis* appears to be a mere variety of the *T. angularis*: the result of a comparison by entomologists of nearly one hundred specimens, captured in two successive autumns, seems to strengthen this opinion. It is plentiful in October, under flints, on the southern slope of Box-hill, opposite the town of Dorking. Every year's experience seems to confirm the opinion of Mr. Stephens, so often mentioned in his invaluable Illustrations, that insects which are stated to be rare or local are generally very plentiful in some of their localities: for example; I well recollect the difficulty I had, and the days which I lost in Norbury-park, in procuring a single pair of the *Lithosia helvola*, and the pleasure I felt when I at last succeeded; when, to my utter astonishment, about two miles from the same place, upon the west side of Box-hill, during twilight, I found this very rare insect in the greatest profusion. On the wing it performs its graceful undulations about the tops of yew-trees, particularly in warm, still evenings: this is a nearer habitat than the New Forest. Perhaps some persons will be surprised at my having described, as nearly as possible, the localities of the preceding insects, as well as those captured on yew-trees, (Vol. II. page 207.) I have not followed the system, so much in vogue, of disguising or of giving such vague and indefinite descriptions, as to render it impossible for any one to find them; on the contrary, I have copied from the botanist, and imitated the example of some entomologists, particularly Mr. Newman, in describing or directing the foot-step of every lover of nature to the locality of that beautiful insect, the *Chrysomela cerealis*, in the first number of the Magazine. I am quite aware of the difficulty, or utter impossibility, of accurately describing the habitats of some insects, on account of their extreme locality; but this does not excuse the attempt to misguide, or justify an entire suppression of the information. We have proof enough that the pages of the Magazine are impartially open to every humble labourer in the field of science; and is not the industry

of these necessary to assist the more scientific in completing the great fabric of the system of nature, and in giving accuracy and uniformity to its nomenclature?

Where insects are plentiful, the naturalist, I imagine, will experience less difficulty in ascertaining their habits and economy; but how is this interesting knowledge to be acquired if we continue to disguise their habitats? On the contrary, by publishing them we diffuse a more intimate knowledge of our indigenous productions, we give our brother entomologists the power of enriching their own cabinets, and we increase their enjoyments in the anticipation of the pleasure of supplying their friends with *desiderata*. Will it not have a tendency to surpress or discourage that dealing spirit, and all its degrading accompaniments? to shame and expose that petty, sordid selfishness of exulting in public or in private, like the miserable miser over his useless gold, in being the possessor of a series of insects of which others have not a specimen? Persons who do this are, in my opinion, ignorant in the extreme, and *totally insensible to the best pleasures of science*. "The happy influence of the study of nature is only felt by a few, giving more ardour to sentiment, more elevation to the thoughts, and more benevolence to the disposition."

I am, Sir,

Your obedient servant,

JOHN WALTON.

*Byard's Lodge, Knaresbro', Yorkshire,  
June 3, 1834.*

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ART. XXVI.—*Thoughts on the Geographical Distribution of Insects*.—By DELTA.

(Continued from p. 54.)

THE Entomologist, who feels interested in studying those laws which regulate the distribution of genera and species over the surface of the earth, will carefully observe, as far as he is able, the mean annual temperature, the mean summer and mean winter temperature, the elevation, the latitude and longitude, of the places where he may collect. He will remember, that it is not the *mean annual* temperature alone that influences

the production of any region, that these are influenced as much by the mean temperature of the coldest and hottest months; that often, countries, possessing the same mean annual temperature, differ surprisingly in their mean summer and mean winter temperatures; that, as we approach the equator, the temperature of elevated districts will become more and more uniform throughout the year, and less resemble that of the low grounds of higher latitudes, where the mean temperature is the same. Nor should he omit to observe the nature of the soil, the humidity or dryness of the atmosphere, and the generally clear or cloudy state of the sky, which so much influences vegetation.

In speaking of the generally cloudy state of the sky, I allude more particularly to parts where, as on the coast of Peru, or in the neighbourhood of Turbaco, in Colombia, the sky is almost always covered with a sort of haze, which of course diminishes much the effect of the sun's rays. It would be highly interesting to observe carefully the insects of parts situated under such a sky, because thence we might be enabled to form many interesting conjectures as to the effect of light upon their colouring. Without doubt the greater intensity of light in the equatorial regions adds to its richness and brilliancy. M. Boisduval informs us that *Urania Rhipheus*, if disclosed from the pupa in the shade, never attains its full beauty, the colouring always being fainter than when the wings are expanded in the sun.

Latreille, in his "Introduction à la Géographie Générale des Arachnides et des Insectes," observes, "Je crois pouvoir assurer que l'augmentation de la lumière tend à convertir le jaune en rouge ou en orangé, et que sa deperdition fait passer ce jaune au blanc. Ce fait s'applique aussi à des coquilles *L'Helix nemoralis*, ou la livrée, qui dans nos climats a le fond jaune est rouge ou rougeâtre en Espagne: dès qu'en allant du nord au midi l'on arrive à l'Ile de Ténériffe, l'on s'aperçoit déjà que notre papillon du chou (*Papilio Cheiranthi*, Hübn.) et celui qu'on nomme *le Vulcain* (*Atalanta*) ont éprouvé une modification dans leurs couleurs." This may all be perfectly true, but there follows a sentence which, I must confess, a little staggers me; and if M. Latreille brings forward the fact there stated to support his theory, that the diminution of light "fait passer ce jaune au blanc," nothing could be more unfortunate,

for it goes entirely against it. “*Les papillons diurnes de nos montagnes ont ordinairement le fond des ailes blanc ou d'un brun plus ou moins foncé.*” It really is most astonishing that this admirable entomologist should have so entirely forgotten himself; he must, had he given it a moment's consideration, have remembered that the intensity of light is much greater on elevated ground, and that, owing to this very cause, the vine is cultivated upon these mountains at an elevation which corresponds, in mean temperature, to that of the plains four degrees farther north than the extreme point at which, in the plains, it prospers by the effect of the mean temperature alone. “If the spaces, through which light passes in a uniformly dense diaphanous medium, increase in arithmetical progression, the quantity will decrease in geometrical progression.” Hence we can readily conceive how much more intense the light must be on high mountains than in vallies, to reach which it has to pass through some thousand feet of air, not uniformly, but increasingly, dense, and, moreover, often humid. I should attribute the changes to which he alludes more to the influence of temperature than to that of light, yet we cannot doubt that this last has some influence, for the diurnal Lepidoptera gain much more in brilliancy than do the nocturnal.

It is much to be regretted that naturalists, who visit foreign climes, which afford most excellent opportunities for physiological inquiries of this kind, mostly neglect them altogether, contenting themselves with merely collecting new species, to be described under barbarous half-Greek half-Latin names, by some fireside naturalist. Oh for another Humboldt! one who would do for entomology what he has done for botany. But, alas! such men are rare, and seem only given us

Ut in hoc infelici campo  
 Ubi luctus regnat, et pavor,  
 Mortalibus prorsus non absit solatium,  
 Hujus enim scripta evolvas  
 Mentemque tantarum rerum capacem  
 Corpori caduco superstitem credas.

And now, to show my admiration of this great man, I am going again to extract a passage from his “*Tableaux de la Nature.*” “The prodigious elevation, in the tropical regions, not of isolated mountains alone, but also of entire countries, and



the cool temperature of this elevation, procure to the inhabitants of the torrid zone an extraordinary spectacle. Besides groups of palms and bananas, they have around them forms of vegetables which seem to belong only to the regions of the north. Cypressess, firs, and oaks, barberries and alders, nearly resembling our own, cover the mountains of the south of Mexico, as well as the chain of the Andes, under the equator. In these regions, nature has enabled man to behold, without quitting his native land, all the forms of vegetables spread over the face of the earth, and the vault of heaven, which displays itself from pole to pole, with all its glittering worlds. These natural enjoyments, and an infinity of others, are wanting to the inhabitants of the north. Many constellations and many forms of vegetables, especially the most beautiful, those of the palms, the plantains, the arborescent *gramineæ*, and the *mimosæ*, with their fine pinnated foliage, remain for ever unknown to them. The languishing individuals contained in our hot-houses can give but a feeble idea of the majesty of tropical vegetation. But the perfection of our language, the burning inspiration of our poets, and the imitative art of our painters, open to us an abundant source of recompense. Our imagination may hence draw living images of exotic nature. In the rigorous climate of the north, in the midst of the desert heath, man, though solitary, can appropriate to himself all that has been discovered in the most distant regions, and thus create within himself a world, which, the offspring of his genius, is, like that, imperishable."

In countries which offer so great a variety of elevation and of temperature, an entomologist may sometimes wish to ascertain, within a little, the temperature and elevation of a spot when unprovided with the necessary instruments. Here he can call in botany to his aid. The different forms of plants alluded to in the above extract will enable him to form a tolerable estimate of the mean temperature. The abundance of the *Palmæ*, *Musaceæ*, and other plants confined to the hotter regions, of course will show that the elevation is but small, whilst the oaks, or *Cinchonæ*, will point out to him that he has reached that happy elevation where all fear of the dreadful disorders of the lowlands is at an end; where the air breathes nothing but health:—

Where a leaf never dies on the still blooming bowers,  
 And the bee banquets on through a whole year of flowers ;  
 Where only to feel that we breathe, that we live,  
 Is worth the best joys that life elsewhere can give.

But merely to judge by the general aspect of vegetation would be by far too vague, and there is a means of arriving at much more satisfactory conclusions. Nature has assigned to all plants certain limits which they cannot pass ;—they are limited in their range by temperature, elevation, and also as to latitude and longitude ;—and though the agency of man may carry them beyond these latter limits, yet no art can cause them to flourish without that degree of heat which is necessary to their development. The olive, the peach, and other fruits carried from Europe to the high plains of the Andes, never there ripen their fruit, although they attain a greater growth than even in their native country. The cause of this is, that they require a much higher temperature during one portion of the year (namely, the period of the growth and ripening of their fruit), than is to be found in these elevated regions. The temperature of these regions resembles more that of our spring months, only less changeable ; and hence, perhaps, we may be allowed to conjecture that their insects would be analogous to the vernal ones of the neighbouring countries nearer the poles. Now, if we know—and Humboldt has told us—the temperature required by those plants most commonly cultivated, we can, from the presence of two or more of these, deduce very nearly not only the mean annual temperature, but also the extremes of temperature. I say *two or more*, because any one may extend over a very considerable range as to climate, but by observing two or more, and comparing their limits, we may arrive at very precise ideas on these points. Let us suppose ourselves to be not more than ten degrees on either side of the line,—

Where the slumbering earthquake  
 Lies pillowed on fire,  
 And the lakes of bitumen  
 Rise boilingly higher ;—  
 Where the roots of the Andes  
 Strike deep in the earth,  
 As their summits to heaven  
 Shoot soaringly forth.

Suppose, that when unprovided with instruments, or without sufficient time to make use of them, we wish to ascertain the temperature of some one of the plains on the sides of these colossal mountains,—

Whose heads in wintry grandeur tower,  
And whiten with eternal sleet;  
While Summer, in a veil of flowers,  
Is sleeping rosy at their feet.

Let us look around us. The breeze plays wantonly through the dense dark-green foliage of the cacao, and the silky leaves of the banana, whilst the tree-ferns wave gracefully above thick groves of *Cinchonæ* and arborescent *Melastomæ*. The coffee flourishes, exposed to full radiance of the sun. There are no rows of plantains or of *Erythrinæ*, whose scarlet blossoms are frequented by humming-birds, to shelter it from its too great power. The presence of the cacao indicates a mean heat between  $84^{\circ}$  and  $74^{\circ}$  Fah., whilst that of the *Cinchonæ* indicates a much cooler temperature than the former of these. This shows us that we are near the limit,—as one ceases, the other begins to thrive. The coffee-shrub will only flourish without shelter from the sun where the mean temperature does not exceed  $75^{\circ}$  Fah. Comparing this with the limits of the cacao, we arrive at the conclusion, that the temperature is either  $74^{\circ}$  or  $75^{\circ}$  Fah.; and knowing this, and the latitude, we can easily deduce the elevation.

In plants, we find equinoctial forms extending much farther south of the equator than north of it; and this also appears to be the case in insects. Latreille states, that Trinidad is the extreme northern limit of *Morpho Menelaus* and other equinoctial insects, whilst these are well known to be far from rare at Rio, in lat.  $20^{\circ} 59'$  south; and, if I mistake not, Spix and Martius state, that they occur at an elevation of 2,000 or 3,000 feet on the *campos* in that latitude.

Although we may lay it down as a rule, that the insects of two countries enjoying the same temperature, but widely differing in latitude and longitude, will be totally different, yet we shall find a certain resemblance between them,—a kind of representation of one another,—which will be more strong in proportion as the soil and general outline of the two countries resemble one another. Thus we find the extraordinary South-

African genus *Manticora*, represented on the plains of New Mexico by a cognate genus, *Omus*; and on the sandy plains of Chili, the insects much resemble those of Africa, a very considerable portion of the *Coleoptera* being heteromerous. I am indebted for this information to my kind friend Mr. Walker, who also informs me that many insects from the extreme southern part of America nearly resemble our own. This is exactly what we should be led to infer from the nature of the climate, which may be called insular with as much propriety as that of our own country.

And now, reader, farewell! I doubt not that thou hast found many an error in this paper, and hast often exclaimed—

“Tramite quo tendis majoraque viribus audes,”

or something of that sort. These I trust that thou wilt pardon; and I promise that I will not often, in this way at least, intrude upon thee again; perhaps never, unless those visions should be realized which have been to me “like the vapour of the plains, which the thirsty traveller thinketh to be water, but when he cometh to it he findeth nothing.”

Vale!

Δ.

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ART. XXVII.—*Monographia Chalciditum*. By FRANCIS WALKER.

(Continued from p. 179.)

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“—— the green myriads in the peopled grass.”

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Family, PTEROMALIDÆ.

Corpus plerumque metallicolor aut nigrum: caput et thorax pubescentia, quasi squamea, nunquam aut rarissimè colore pallido variegata: caput breve, transversum, thoracis latitudine, *mari* sæpè magnum thorace latius: oculi mediocres, laterales: ocelli 3, supra verticem trigonè dispositi: os occultum: mandibulæ parvæ:

palpi plerumque simplices, *mari* rarissimè dilatati aut fissi: antennæ articulis 13, nonnunquam 12, rarissimè 11, *mari* plerumque filiformes corporis longitudine, *fem.* plerumque clavatæ corpore breviores, simplices, plus minusve pubescentes; articuli approximati, sublineares; 1<sup>us</sup>. longus; 2<sup>us</sup>. cyathiformis; clava triarticulata: thorax varius: mesothorax plerumque ejus ferè totum occupans: abdomen sessile, quasi subtilissimè squameum, supra planum, *maris* rotundum lineare aut spathuliforme, *fem.* ovatum sublineare aut basi latum inde ad apicem gradatim acuminatum: oviductus carinula ventrali receptus, nonnunquam subexertus et vaginis duabus lateralibus reconditus: pedes mediocres, sub-æquales, pubescentes; coxæ parvæ; tibiæ rectæ, apice spinis armatæ, *mari* nonnunquam dilatatæ; tarsi graciles, articuli 1<sup>o</sup>. ad 4<sup>um</sup>. longitudine decrescentes; 5<sup>us</sup>. 4<sup>o</sup>. longior; ungues et pulvilli parvi: alæ plerumque amplæ, pubescentes, iridescentes; proalæ nervo unico solito, cujus humeralis ulnari longior, radialis sat longa stigmatè terminata; metalæ nervo unico simplici, costæ medium attingente.

Metamorphosin in *Lepidopterorum*, aut rariùs *Muscidum* et *Tenthredinidum*, pupis subeunt; nonnullæ ad *Cleonymum* propinquæ *Coleoptera* lignivora (*Anobium Hylurgum* et *Hylesinum*) diruunt. *Mares* sæpè colore læto abdomineque flavo maculato gaudent; *feminæ* obscuriores, abdomine rarissimè maculato. Characteres quibus *Chalciditum* tarsis 5 articulatis familiæ discrepant breviter memorabo. *Spalangidum* caput planum; *Eurytomidum* corpus gibbosum aut cylindricum; *Chalcididum* et *Leucopsidum* metafemora incrassata; *Torymidum* et *Perilampidum* nervus cubitalis brevissimus; *Miscogasteridum* abdomen petiolatum; *Ormoceridum* antennæ moniliformes; *Pteromalidum* abdomen sessile et planum; *Cleonymidum* thoracis structura propria; *Eupelmidum* et *Encyrtidum* mesotarsi dilatati; *Aphelinidum* antennæ articulis paucis.

The genus *Pteromalus* was named and characterized by Swederus in the Stockholm Transactions, where fifteen species are described, which, with the exception of two or three, have been since removed to other genera. His first species, *P. puparum*, is very abundant, and has been often described by entomologists: from one to two hundred specimens of it are found in a single chrysalis of the common white or tortoiseshell butterfly (*Pontia Brassicæ* and *Vanessa Urticæ*). It is often difficult to identify the species of this family, for the males and females generally differ entirely in form and colour, and, like the *Ichneumonites*, the latter are either the most numerous

in individuals, or are oftener met with, being constantly engaged in search of chrysalises wherein to deposit their eggs. They comprise by far the greater part of the pentamerous *Chalcidites*. The parts of the mouth do not vary much. Generally the *prothorax* and the *metathorax* are very small, and the sutures between the *parapsides* and the *scutum* of the *mesothorax* indistinct. The first and last divisions depart from this structure; the first resembles many of the *Miscogasteridæ* and *Ormoceridæ*, the last is allied to the *Cleonymidæ*.

The principal divisions are the following:—

- \* *Prothorax brevissimus, transversus.*
- † *Mesothoracis parapsides scuto discretæ.*
- †† *Mesothoracis parapsides scuto ferè in unum confusæ.*
  - ‡ *Antennæ 11-articulatæ.*
  - ‡‡ *Antennæ 12-articulatæ.*
  - ‡‡‡ *Antennæ 13-articulatæ.*
- × *Antennæ articulo 3<sup>o</sup>. vix conspicuo, 4<sup>o</sup>. minimo, 5<sup>o</sup>. parvo.*
- ×× *Antennæ articulo 3<sup>o</sup>. et 4<sup>o</sup>. minimis, 5<sup>o</sup>. mediocri.*
- \*\* *Prothorax productus, anticè angustus.*

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- \* *Prothorax brevissimus, transversus.*
  - † *Mesothoracis parapsides scuto discretæ.*
- |         |   |                                   |                              |
|---------|---|-----------------------------------|------------------------------|
| Antennæ | { | 13-articulatæ . . . . .           | I. Seladerma.                |
|         |   | 12-articulatæ. Thorax punctis ma- | aspersus . . II. Semiotus.   |
|         |   | joribus . . . . .                 | non aspersus. III. Systasis. |

## GENUS I. SELADERMA,<sup>a</sup> Walker.

*Fem.*—Caput mediocre, thorace vix latius: mandibulæ elongato-subquadratae, paullò arcuatae, tridentatae, similes; dens externus et medius acuminati; internus latus, obtusus: maxillæ elongatae, subarcuatae, ciliatae, quæque internè apicem versus in lobum producta; palpi sat longi, 4-articulati, subfiliformes; articulus 1<sup>us</sup>. mediocris; 2<sup>us</sup>. paullò longior; 3<sup>us</sup>. 1<sup>o</sup>. æqualis: 4<sup>us</sup>. 2<sup>o</sup>. longior fusiformis: mentum elongato-ovatum, basi emarginatum: labium breve, latum, apice ciliatum; palpi 3-articulati, breves; articulus 1<sup>us</sup>. mediocris; 2<sup>us</sup>. brevis; 3<sup>us</sup>. 1<sup>o</sup>. paullò longior crassus acumi-

<sup>a</sup> Σέλας splendor, δερμα cutis.



natus: antennæ corporis dimidio æquales aut paullò longiores, subclavatae, pubescentes; articulus 1<sup>us</sup>. gracilis, filiformis; 2<sup>us</sup>. mediocris; 3<sup>us</sup>. et 4<sup>us</sup>. minimi; 5<sup>us</sup>. et sequentes ad 10<sup>um</sup>. gradatim breviores et latiores; clava ovata, articulis 9<sup>o</sup>. et 10<sup>o</sup>. paullò longior et latior: thorax ovatus, quasi planè squameus; prothorax minimus, supra vix conspicuus; parapsides convexæ scuto valdè distinctæ, scutellum conicum, paraptera et epimera benè determinata; metathorax mediocris: abdomen ovatum aut elongato-ovatum, ferè læve, subtus angulatum; segmentum 1<sup>um</sup>. magnum; sequentia breviora, subæqualia: oviductus occultus: femora et tibiæ gracilia: alæ amplæ; nervus cubitalis ferè alæ apicem attingens; stigma ramulum brevissimum, nonnunquam ferè obsoletum emittens.

Sp. 1. Sel. lætum. Fem. *Viride, antennis nigris, pedibus rufis, femoribus fuscis, alis subfuscis.*

Viride, nitens, sparsè pubescens: oculi ocellique rufi: antennæ nigræ, corporis dimidio longiores; articulus 1<sup>us</sup>. obscurè rufus, apice niger: thoracis segmentorum margines nonnunquam æneo-virides: abdomen nonnunquam cyaneo- aut æneo-viride, subtus valde angulatum: pedes obscurè rufi; coxæ virides; trochanteres et femora fusca, hæ apice basique rufa; tarsi apice, ungues et pulvilli fuscii; protarsi pallidè fuscii: alæ subfuscae; squamulæ fuscae; nervi nigro-fuscii; stigma parvum; metalorum nervi pallidiores. (Corp. long.  $1\frac{1}{2}$ — $1\frac{3}{4}$  lin.; alar.  $2\frac{1}{2}$ —3 lin.)

Var.  $\beta$ .—Minus: thoracis segmenta nonnulla cyaneo-viridia: abdomen viridi-cyaneum: femora, trochanteres et protarsi rufa, illa supra fusco vittata.—Species distincta.?

July; on grass beneath trees; near London.

Sp. 2. Sel. bicolor. Fem. *Viride, abdomine cupreo, antennis nigris, pedibus rufis, alis subfuscis.*

Viride, nitens, sparsè pubescens: oculi ocellique rufi: antennæ nigræ, corporis dimidio non longiores; articulus 1<sup>us</sup>. rufus; 2<sup>us</sup>. obscurè fuscus: thoracis segmentorum margines nonnulli æneo-virides: abdomen cupreum, *S. læto* brevius et convexius, subtus valdè angulatum; segmentum 1<sup>um</sup>. lætè viride, apice cupreum: pedes lætè rufi; coxæ virides; ungues et pulvilli fuscii: alæ subfuscae; squamulæ et nervi fusca; stigma parvum; metalorum nervi pallidiores. (Corp. long.  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.; alar.  $2\frac{1}{2}$ — $2\frac{1}{2}$  lin.)

June, July; on grass beneath trees; near London.

Sp. 3. Sel. convexum. Fem. *Cyaneo-viride*, *antennis nigris*, *pedibus fuscis*, *femoribus viridibus*, *alis subhyalinis*.

Cyaneo-viride, nitens, sparsè pubescens: caput viride: oculi ocellique rufi: antennæ nigræ, corporis dimidio vix longiores; articulus 1<sup>us</sup>. viridis: mesothoracis parapsides et scutum anticè purpurea: abdomen cyaneo-viride, subtus valde angulatum, eodem longitudine quod *S. bicolor*; discus æneo-viridis; segmentum 1<sup>um</sup>. purpureo-cyaneum: pedes fuscii; coxæ et femora viridia, hæ apice basique rufa; tibiæ basi et subtus, metatibiæ ferè totæ, rufæ; meso- et metatarsi rufo-fuscii, apice fuscii: alæ subhyalinæ; squamulæ et nervi fusca; stigma mediocre; metalarum nervi pallidiores. (Corp. long.  $1\frac{5}{4}$  lin.; alar.  $2\frac{1}{2}$  lin.)

July; on grass beneath trees; near London.

Sp. 4. Sel. breve. Fem. *Aureo-viride*, *antennis nigris*, *pedibus rufis*, *femoribus basi fuscis*, *alis hyalinis*.

Præcedentibus brevius et latius, lætè aureo-viride, sparsè pubescens: oculi ocellique rufi: antennæ nigræ, corporis dimidio paullò longiores; articulus 1<sup>us</sup>. viridis: abdomen subtus angulatum: pedes rufi; coxæ virides; femora basi fusca; meso- et metatarsi apice, unguis et pulvilli fuscii: alæ hyalinæ; squamulæ fusca; nervi nigro-fuscii; stigma mediocre; metalarum nervi pallidiores. (Corp. long.  $1\frac{1}{4}$  lin.; alar.  $2\frac{1}{2}$  lin.)

July; on grass beneath trees; near London.

## GENUS II.—SEMIOTUS,<sup>b</sup> *Walker*.

Corpus pubescens: caput mediocre, thorace vix latius: mandibulæ subquadratae, ferè rectæ, similes, dentibus 3 parvis acutis armatae; dens internus latus: maxillæ elongatae, subarcuatae quæque internè apicem versus in lobum producta; palpi 4-articulati, breves, ad apices gradatim crassiores; articulus 1<sup>us</sup>. et 2<sup>us</sup>. mediocres, subæquales; 3<sup>us</sup>. paullò longior; 4<sup>us</sup>. 3<sup>o</sup>. paullò longior, elongato-ovatus: mentum breve, conicum: labium parvum, quasi fissum; palpi 3-articulati, brevissimi, filiformes; articuli subæquales: antennæ 12-articulatae, *mari* ferè filiformes corporis dimidio longiores, *fem.* plus minusve clavatae corporis dimidii longitudine aut paullò breviores; articulus 1<sup>us</sup>. gracilis, filiformis; 2<sup>us</sup>. brevis; 5<sup>us</sup>. et sequentes ad 9<sup>um</sup>. lineares longitudine decrescentes; *mari*

<sup>b</sup> σημειωτός, signatus.

clava sublinearis, articulis 8<sup>o</sup>. et 9<sup>o</sup>. paullò longior et latior; *fem.* clava elongato-ovata, articulis 8<sup>o</sup>. et 9<sup>o</sup>. latior et paullò longior: thorax ovatus, quasi planè squameus, punctis majoribus aspersus: prothorax minimus, supra vix conspicuus: mesothorax magnus; parapsides benè determinatæ, scuto distinctæ; paraptera et epimera parva; scutellum apice subacuminatum: metathorax mediocris: *mas* abdomen elongato-ovatum, ferè læve; segmentum 1<sup>um</sup>. magnum; sequentia breviora, subæqualia: sexualia exerta, abdominis dimidio nonnunquam vix breviora: *fem.* abdomen ovatum, plus minusve elongatum et acuminatum, subtus angulatum, non compressum: pedes graciles; tibiæ simplices: alæ mediocres; nervus radialis cubitali paullò longior, humeralis prope apicem ramulum rejiciens brevissimum sed benè determinatum; stigma ramulum brevissimum nonnunquam ferè obsoletum emittens.

Sp. 1. Sem. mundus. Mas et Fem. *Viridis, pedibus rufis, alis hyalinis.*

*Mas.*—Viridis: caput posticè æneo-viride: oculi ocellique rufi: antennæ nigræ: abdomen viridi-cupreum, basi et utrinque viride: sexualia nigra, apice fusca: pedes rufi; coxæ virides; femora basi nigra; tarsi pallidè rufi, apice necnon ungues et pulvilli fusci; protarsi pallidè fusci: alæ hyalinæ; squamulæ et nervi pallidè fusca: stigma minimum; metalarum nervi flavi.

*Fem.*—Antennæ clavatæ, corporis dimidii longitudine; articulus 1<sup>us</sup>. flavus, apice et supra nigro-fuscus: abdomen nigro-viride, elongato-ovatum, basi cupreo-viride nitentius, subtus angulatum æneum, apice paullò attenuatum: pedes pallidè rufi; coxæ virides; meso- et metatarsi flavi; ungues et pulvilli fusci. (Corp. long.  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.; alar.  $1\frac{5}{4}$ —2 lin.)

July; on grass beneath trees; near London.

Sp. 2. Sem. clarus. Mas et Fem. *Præcedenti minor, fem. abdomine longiore, alarum nervis obscurioribus.*

*Mas.*—Viridis: oculi ocellique rufi: antennæ nigræ: abdomen cupreum; latera et apex viridia: sexualia nigra, apice fusca: pedes rufi; coxæ virides; femora basi nigra; meso- et metatarsi flavi; ungues et pulvilli fusci: alæ hyalinæ; nervi et squamulæ fusca; stigma parvum; metalarum nervi pallidi.

*Fem.*—Antennæ clavatæ, corporis dimidio breviores: abdomen cyaneo-viride, elongato-ovatum, subtus angulatum, apice attenuatum:

femora basi et coxæ viridia: meso- et metatarsi apice fusci.  
(Corp. long.  $1-1\frac{1}{2}$  lin.; alar.  $1\frac{1}{2}-1\frac{5}{4}$  lin.)

*Var. β.*—*Mas*, æneo-viridis.

*Var. γ.*—*Mas*, meso- et metafemora nigra, apice rufa; meso- et metatibiæ apice pallidè fusca.

June and August; on grass beneath trees; near London.

Sp. 3. Sem. tarsalis. *Mas et Fem. Viridis, pedibus fuscis, tarsis pallidis, alis hyalinis.*

*Mas.*—Viridis: oculi ocellique rufi: antennæ nigrae: abdomen cupreum, basi apice et utrinque viride: sexualia nigra, apice fusca: pedes rufi; coxæ virides; femora basi nigra; metafemora ferè omnino nigra; metatibiæ fusca, basi rufæ; tarsi straminei, apice necnon unguis et pulvilli fusci; protarsi pallidè fusci: alæ hyalinae; squamulae et nervi fusca; stigma parvum; metalarum nervi pallidiores.

*Fem.*—Antennæ subclavatae, corporis dimidio vix longiores: abdomen viridi-cupreum, elongato-ovatum, apice paullò acuminatum: femora, meso- et metatibiæ rufa, fusco cingulata; meso- et metatarsi flavi, apice fusci. (Corp. long.  $\frac{1}{2}-1$  lin.; alar.  $1-1\frac{5}{4}$  lin.)

*Var. β.*—*Mas*, mesothoracis scutum viridi-æneum.

*Var. γ.*—*Mas*, pro- et mesotibiæ pallidè fusca; metatibiæ obscuriores.

*Var. δ.*—*Mas*, femora omnia nigra, apice rufa; meso- et metatibiæ fusca.

*Var. ε.*—*Mas*, metafemora omninò nigra; tibiæ nigro-fusca; protibiæ fusca; meso- et metatarsi flavi, apice fusci.

*Var. ζ.*—*Mas*, protarsi rufi; meso- et metatarsi flavi.

*Var. η.*—*Mas*, abdomen purpureo-cupreum: tibiæ nigrae; protibiæ rufæ, fusco cingulatae.

*Var. θ.*—*Mas*, meso- et metatarsi pallidè fusci.

July; on grass beneath trees; near London. June; Windsor Forest.

Sp. 4. Sem. Scoticus. *Fem. Æneo-viridis, pedibus rufis, alis subhyalinis.*

Æneo-viridis: caput obscurè viride: oculi ocellique rufi: antennæ nigrae; clava articulo 9°. multò latior: thoracis puncta majora vix conspicua: abdomen viride elongato-ovatum, basi æneo-viride

nitentius, subtus angulatum æneum, apice non attenuatum : pedes rufi ; coxæ virides ; femora fusco cingulata ; ungues et pulvilli fusci : alæ subhyalinæ ; nervi et squamulæ pallidè fusca ; stigma minimum ; metalarum nervi pallidiores. (Corp. long.  $1\frac{1}{2}$  lin. ; alar. 2 lin.)

New Lanark, Scotland.

Sp. 5. Sem. varians. Mas et Fem. *Viridis, præcedenti brevior, pedibus fuscorufis, alis subfuscis.*

*Mas.*—Obscurè viridis : oculi ocellique rufi : antennæ nigræ : abdomen nigro-cupreum, basi et utrinque viride : sexualia nigra, apice fusca : pedes fusci ; coxæ virides ; trochanteres, femora apice, tibiæ basi tarsique flava ; tarsi basi et apice, ungues et pulvilli fusci : alæ subfusca ; squamulæ et nervi fusca ; stigma parvum ; metalarum nervi pallidè fusci.

*Fem.*—Viridis : antennæ clavatæ : abdomen nigro-viride, elongato-ovatum, basi æneo-viride, subtus angulatum æneum, apice vix attenuatum : pedes pallidè rufi ; coxæ virides ; femora basi viridia ; meso- et metatarsi flavi ; ungues et pulvilli fusci. (Corp. long.  $\frac{5}{4}$ — $1\frac{1}{4}$  lin. ; alar.  $1\frac{1}{3}$ —2 lin.)

*Var. β.*—*Mas*, meso- et metatarsi basi flavi.

*Var. γ.*—*Mas*, femora nigro-fusca, apice flava ; tarsi flavi, apice fusci.

*Var. δ.*—*Mas*, protibiæ rufæ ; tarsi flavi, apice fusci ; protarsi pallidè fusci.

*Var. ε.*—*Fem.* abdomen omninò æneo-viride.

*Var. ζ.*—*Fem.* protarsi fusci.

*Var. η.*—*Fem.* thorax viridi-æneus ; tarsi omnes pallidè rufi.

*Var. θ.*—*Fem.* abdomen cupreum, viridi marginatum : antennæ articulo 1<sup>o</sup>. basi rufo.

June ; on grass beneath trees ; near London. July ; near Clermont, Auvergne.

Sp. 6. Sem. præstans. Mas et Fem. *Æneo-viridis, pedibus rufis aut flavis, alis subfuscis, S. Scotico clava angustiore S. variante alis latioribus discrepans.*

*Mas.*—Viridis : oculi ocellique rufi : antennæ nigræ : caput posticè et mesothoracis scutum anticè æneo-viridia : abdomen cupreum, basi et utrinque viride : sexualia nigra, apice fusca : pedes rufi ; coxæ virides ; femora basi nigra ; meso- et metatibiæ et protarsi

pallidè fusca; ungues et pulvilli fusci: alæ subfuscæ; nervi et squamulæ nigro-fusca; stigma parvum; metalarum nervi pallidi.  
*Fem.*—Antennæ clavatæ: abdomen viride, ovatum, basi æneo-  
 viride nitentius, subtus paullò angulatum, apice acuminatum sed  
 vix attenuatum: femora basi viridia; tibiæ et protarsi rufa; meso-  
 et metatarsi flavi: pro-alarum nervi fusci. (Corp. long. 1—1½  
 lin.; alar. 1½—2 lin.)

*Var. β.*—*Mas*, viridis: abdomen cupreum, basi æneo-viride: tibiæ  
 omnes et protarsi rufa; meso- et metatarsi flavi.

*Var. γ.*—*Mas*, femora et protarsi fusca, illa apice flava.

*Var. δ.*—*Mas*, *Var. β.* similis: abdomen æneum, basi viride niten-  
 tius: meso- et metatarsi apice fusci.

*Var. ε.*—*Mas*, abdominis discus obscurè cupreus: pedes flavi;  
 coxæ virides; femora basi nigra; meso- et metatarsi straminei,  
 apice necnon ungues pulvilli et protarsi omninò fusci.

July; on grass beneath trees; near London. June; New  
 Forest, Hampshire.

Sp. 7. Sem. diversus. *Mas* et *Fem.* *Viridis, pedibus rufis,*  
*alīs fuscis, S. variante et præstante fem. abdomine longiore*  
*et angustiore discrepans.*

*Mas.*—Viridis: oculi ocellique rufi: antennæ nigræ, graciles:  
 abdomen basi nitentius: sexualia nigra, apice fusca: pedes rufi;  
 coxæ virides; femora basi fusca; meso- et metatarsi apice,  
 ungues et pulvilli fusci: alæ fuscæ; squamulæ et nervi obscu-  
 riora; stigma parvum; metalarum nervi pallidi.

*Fem.*—Antennæ clavatæ, corporis dimidio breviores: abdomen  
 æneo-viride, elongato-ovatum, angustum, subtus paullò angu-  
 latum, apice acuminatum et attenuatum: oviductus rufus: pedes  
 rufi; coxæ et femora basi viridia; meso- et metatarsi pallidè rufi;  
 ungues et pulvilli fusci. (Corp. long. 1—1⅔ lin.; alar. 1¼—1⅝  
 lin.)

*Var. β.*—*Mas*, femora basi nigra; protarsi pallidè fusci.

*Var. γ.*—*Fem.* antennæ articulo 1º. rufo: femora omninò rufa.

*Var. δ.*—*Fem.* æneo-viridis: antennæ articulo 1º. fusco: abdomen  
 æneum.

*Var. ε.*—*Fem.* *Var. δ.* similis, viridis: mesothoracis scutellum et  
 metathorax viridi-ænea: abdomen æneo-viride.

*Var. ζ.*—*Fem.* *Var. ε.* similis: abdomen obscurè viride, basi æneo-  
 viride nitentius: tarsi apice fusci.

June; on grass beneath trees; near London.—Jersey.



Sp. 8. Sem. quadratus. Mas et Fem. *Viridis, pedibus rufis, alis fuscis, specibus 4 præcedentibus alis angustioribus discrepans.*

*Mas.*—Viridis: oculi ocellique rufi: antennæ nigræ: abdomen cupreum, basi viride: sexualia nigra, apice fusca: pedes rufi; coxæ virides; femora nigra, apice rufa; profemora rufa, basi nigra; protarsi pallidè fusci; ungues et pulvilli fusci: alæ fuscae, breves, angustæ; squamulæ et nervi obscuriora; stigma parvum; metalarum nervi pallidi.

*Fem.*—Antennæ clavatæ, corporis dimidii longitudine; articulus 1<sup>us</sup>. rufus, apice fuscus: metathorax viridi-æneus: abdomen æneo-viride, ovatum, basi nitentius, subtus angulatum, apice acuminatum non attenuatum: femora et protarsi omninò rufa. (Corp. long.  $\frac{5}{4}$ — $1\frac{1}{4}$  lin.; alar.  $1$ — $1\frac{1}{2}$  lin.)

*Var. β.*—*Mas*, meso- et metatibiæ supra pallidè fuscae.

*Var. γ.*—*Fem.* antennæ articulo 1<sup>o</sup>. nigro, basi fusco: abdomen viride, basi æneo-viride nitentius: femora basi viridia.

*Var. δ.*—*Fem.* caput et thorax æneo-viridia; antennæ articulo 1<sup>o</sup>. nigro.

*Var. ε.*—*Fem.* caput et thorax cupreo nitentia: antennæ articulo 1<sup>o</sup>. nigro, basi fusco: abdomen apice æneum: meso- et metatibiæ rufo-fuscae.

*Var. ζ.*—*Fem.* abdomen cupreum, basi æneo-viride nitentius.

*Var. η.*—*Fem.* thoracis latera et abdomen viridi-ænea.

*Var. θ.*—*Fem.* viridis: antennæ totæ nigræ, femora basi viridia.

June; on grass beneath trees; near London.

Sp. 9. Sem. mærens. Mas. *Obscurè viridis, pedibus flavis, alis griseis.*

Obscurè viridis, longus, sublinearis: oculi ocellique rufi: antennæ nigræ: sexualia nigra, apice fusca: pedes flavi; coxæ virides; femora basi fusca; ungues et pulvilli fusci: alæ griseæ; squamulæ et nervi obscurè fusca; stigma parvum; metalarum nervi pallidi. (Corp. long.  $1$ — $1\frac{1}{4}$  lin.; alar.  $1\frac{1}{2}$ — $1\frac{5}{4}$  lin.)

*Var. β.*—Æneo-viridis: femora nigra, apice flava; tibiæ pallidè fuscae.

*Var. γ.*—Femora nigra; tibiæ fuscae, basi flavæ; tarsi apice fusci.

*Var. δ.*—Tibiæ nigro-fuscae; protibiæ et protarsi pallidè fusca.

*Var. ε.*—Pedes rufi; femora basi et coxæ viridia; meso- et meta-

tibiæ nigro-fuscæ, basi rufæ; meso- et metatarsi pallidè flavi, apice rufi.

June; on grass; Windsor Forest, New Forest. September; near Linton, North Devon.

### GENUS III. SYSTASIS,<sup>c</sup> Walker.

Corpus crassum, breve: caput mediocre, thoracis latitudine: mandibulæ breves, subquadratæ, similes, dentibus 3 vix acutis armatæ; dens externus et medius parvi, internus minimus: maxillæ elongatæ, subarcuatæ, quæque internè apicem versus in lobum producta; palpi 4-articulati, breves, ad apices gradatim crassiores; articulus 1<sup>us</sup>. mediocris; 2<sup>us</sup>. paullò longior; 3<sup>us</sup>. 1<sup>o</sup>. æqualis; 4<sup>us</sup>. 2<sup>o</sup>. paullò longior elongato-ovatus: mentum conicum: labium parvum, quasi fissum; palpi 3-articulati, brevissimi, crassi, subfiliformes; articuli subæquales, 3<sup>us</sup>. acuminatus: antennæ 12-articulatæ, *mari* subfiliformes, *fem.* clavatæ crassiores, corporis dimidio vix longiores; articulus 1<sup>us</sup>. linearis, longitudine triens; 2<sup>us</sup>. mediocris; 5<sup>us</sup>. et sequentes ad 9<sup>um</sup>. subæquales; clava elongato-ovata, articulis 8<sup>o</sup>. et 9<sup>o</sup>. longior et *fem.* latior: thorax convexus, brevis, ovatus: pro- et metathorax minimi, supra vix conspicui: mesothoracis scutum, scutellum, parapsides et paraptera benè determinata: abdomen breve, ovatum aut ferè rotundum, supra planum, *fem.* subtus carinatum et angulatum, *mari* angustius, apice vix acuminatum; segmentum 1<sup>um</sup>. magnum; sequentia breviora, sub-æqualia: oviductus non exertus: pedes graciles, simplices: alæ latæ, sat longæ; nervus humeralis ulnari longior ramulum rejiciens nullum, cubitalis radiali vix brevior stigmatè rotundo terminatus: metalæ nervo unico simplici solito.

Sp 1. Syst. encyrtoides. Mas et Fem. *Viridis, antennis nigris, pedibus viridibus, tarsis flavis aut fuscis, alis hyalinis, nervo humerali ramulum rejiciente nullum.*

*Mas.*—Lætè viridis, nitens, quasi minutè squameus: oculi ocellique rufi: antennæ nigræ; articulus 1<sup>us</sup>. viridis: abdomen ferè læve, basi æneo-viride nitentius: pedes virides; trochanteres nigro-fusci; genua rufa; tarsi flavi, apice fusci; articulus 5<sup>us</sup>., ungues et pulvilli nigro-fusci; protarsi fusci: alæ hyalinæ; nervi et squamulæ nigro-fusca; stigma parvum; metalarum nervi pallidi.

*Fem.*—Mesothoracis scutellum cupreo-vittatum: abdomen basi

cupreo-viride; segmenta basi ænea: tarsi flavi; protarsi rufi; omnium articulus 5<sup>us</sup>. nigro-fuscus. (Corp. long.  $\frac{5}{4}$ — $1\frac{1}{4}$  lin.; alar.  $1\frac{1}{2}$ —2 lin.)

*Var. β.*—*Fem.* scutelli vitta vix conspicua: abdomen basi æneo-viride: protarsi fusci.

*Var. γ.*—*Fem.* thorax cupreo-viridis; segmentorum margines cuprei: tarsi omnes fusci; metatarsi articulo 1<sup>o</sup>. basi flavo.

*Var. δ.*—*Fem.* thorax omninò viridis: abdomen cyaneo-viride, basi viride: profemora apice et protibiæ rufa, hæ supra fusco vittatæ.

*Var. ε.*—*Fem.* abdomen cupreum, utrinque et subtus viride: protarsi fusci.

*Var. ζ.*—*Fem.* viridi-cyaneus: caput viride: abdominis discus cupreus: genua et tarsi omnes flava, hi apice fusci.

*Var. η.*—*Fem.* *Var. ζ.* similis: protibiæ et protarsi fusca: alarum nervi pallidè fusci.

August; on grass beneath trees; near London. September; Isle of White.

Sp. 2. Syst. tenuicornis. Mas et Fem. *Viridis, præcedenti angustior, antennis nigris, pedibus fuscis aut viridibus, alis griseis, nervo humerali ramulum rejiciente brevissimum.*

*Mas.*—Obscurè viridis, quasi minutè squameus: oculi ocellique rufi: antennæ nigrae; articulus 1<sup>us</sup>. viridis: abdomen obscurè æneo-viride, angustum, ferè læve: sexualia nigra: pedes nigro-fusci: coxæ et femora viridia; protibiæ et protarsi fusca; meso- et metatarsi pallidè fusci, apice obscuriores, subtus flavi: alæ griseæ; squamulæ et nervi fusca; stigma parvum; metalarum nervi pallidi.

*Fem.*—Abdomen obscurè viride, ovatum; discus cupreo-viridis: pedes virides; trochanteres nigri; tarsi flavi, apice fusci; protarsi, ungues et pulvilli fusci. (Corp. long.  $\frac{5}{4}$ —1 lin.; alar.  $1\frac{1}{2}$ — $1\frac{3}{4}$  lin.)

June; on grass; Windsor Forest.

†† *Mesothoracis parapsides scuto ferè in unum confusæ.*

‡ *Antennæ 11-articulatæ.*

#### GENUS IV. EUNOTUS,<sup>d</sup> Walker.

*Mas.*—Corpus convexum, crassum, latum, contractum, quasi squameum, vix pubescens: caput maximum, thorace latius, breve:

<sup>d</sup> εδ̄ benè, νῶτος dorsum.

antennæ 11-articulatæ, clavatæ, thorace breviores; articulus 1<sup>us</sup>. linearis, gracilis; 2<sup>us</sup>. mediocris; 3<sup>us</sup>. et 4<sup>us</sup>. vix conspicui; 5<sup>us</sup>. et sequentes ad 8<sup>um</sup>. gradatim longiores et latiores; clava articulis 8<sup>o</sup>. et 9<sup>o</sup>. multò longior et latior, apice quasi truncata: thorax ferè quadratus: prothorax parvus, brevissimus: mesothoracis parapsidum suturæ vix conspicuæ; paraptera et epimera benè determinata; scutellum ferè rotundum, posticè subproductum et abdominis basin attingens: metathorax supra vix conspicuus: abdomen ferè quadratum, paullò longius quàm latum, quasi subtilissimè squameum; segmentum 1<sup>um</sup>. maximum, reliqua omninò obtegens et ultra abdominis apicem productum: pedes simplices, graciles, breves: alæ breves, angustæ: nervus alà dimidio brevior; humeralis longus; ulnaris brevis; cubitalis radialis longior et angulum plerisque hujus familiæ acutiorem fingens.

Sp. 1. Eun. cretaceus. Mas. *Nigro-viridis, antennis fulvo-fuscis, pedibus fuscis, alis subfuscis.*

*Nigro-viridis*, obscurus: oculi ocellique rufo-fusci: antennæ fulvo-fuscæ; articulus 2<sup>us</sup>. obscurè fuscus: abdomen quasi subtilissimè squameum, basi læve: pedes nigro-fusci; coxæ virides; tibiæ pallidè fuscæ; genua tarsique flava, horum articulus 5<sup>us</sup>. ungues et pulvilli fusci: alæ subfuscæ; squamulæ et nervi fusca; stigma minimum. (Corp. long.  $\frac{1}{2}$  lin.; alar.  $\frac{3}{4}$  lin.)

*Fem.*—Aptera.

June and September; on chalk cliffs in the Isle of Wight. I found one specimen of the female in the same situation, but have since lost it.

†† *Antennæ 12-articulatæ.*

Clava	{	mediocris. Thorax apice	{	latus . . . . .	V. MERAPORUS.
				angustus . . . . .	VI. METASTENUS.
		maxima . . . . .			VII. METOPON.

GENUS V.—MERAPORUS,<sup>e</sup> *Walker.*

Corpus breve, vix pubescens: *maris* caput magnum thorace latius, *fem.* thorace vix latius: mandibulæ 4-dentatæ, subquadratæ, ferè rectæ, intùs indentatæ, similes; dentes obtusi, parvi, subæquales: maxillæ elongatæ, subarcuatæ, apice angustæ, acuminatæ; palpi 4-articulati, mediocres, filiformes; articulus 2<sup>us</sup>. 1<sup>o</sup>. paullò longior;

<sup>e</sup> μέρος pars, ἄροπος egenus.

3<sup>us</sup>. 1<sup>o</sup>. brevior; 4<sup>us</sup>. linearis, 2<sup>o</sup>. et 3<sup>o</sup>. longior, apice acuminatus: mentum elongato-ovatum, posticè angustius: labium parvum, rotundatum, integrum, anticè ciliatum; palpi 3-articulati, breves, crassi; articulus 2<sup>us</sup>. brevissimus; 3<sup>us</sup>. acuminatus: antennæ corporis dimidii longitudine, clavatae; articulus 1<sup>us</sup>. gracilis, linearis; 2<sup>us</sup>. elongato-cyathiformis, mediocris; 5<sup>us</sup>. et sequentes ad 9<sup>um</sup>. gradatim latiores; clava ovata aut elongato-ovata, plana, articulis 8<sup>o</sup>. et 9<sup>o</sup>. latior et paulò longior: thorax ovatus, abdomine longior: prothorax et metathorax parvi, ille brevis: mesothoracis parapsides scuto in unum confusæ; paraptera et epimera benè determinata: *maris* abdomen brevissimum, rotundum; segmentum 1<sup>um</sup>. maximum, ejus ferè dimidium occupans; reliqua brevissima: *fem.* abdomen ovatum, thorace vix brevius, subtus paulò carinatum, apice acuminatum et sparsè pilosum; segmentum 1<sup>um</sup>. magnum; sequentia breviora, subæqualia: pedes simplices, graciles: alæ brevissimæ aut mediocres; nervus humeralis ulnari multò longior, ramulum rejiciens nullum; cubitalis radiali paulò brevior; stigmatis ramulus ferè obsoletus.

Sp. 1. Mer. graminicola. Mas et Fem. *Viridi-æneus, antennis aut flavis aut fuscis (mas) aut nigris (fem.), pedibus flavis aut fuscis, alis vix ullis.*

*Mas.*—Viridis, quasi subtilè squameus: oculi ocellique rufi: antennæ flavæ; articulus 2<sup>us</sup>. pallidè fuscus; clava ovata: mesothoracis scutellum æneo-viride: abdomen viridi-æneum, subtilissimè squameum, glabrum, basi viride: pedes flavi; coxæ virides; tarsi pallidè flavi; articulus 5<sup>us</sup>., ungues et pulvilli fusci: alæ hyalinæ, brevissimæ, volatu ineptæ.

*Fem.*—Obscurè viridis: antennæ nigræ; articulus 1<sup>us</sup>. pallidè rufus: abdomen viridi-æneum, apice sparsè pilosum: pedes pallidè rufi; coxæ æneæ; meso- et metatarsi flavi, apice necnon ungues et pulvilli fusci. (Corp. long.  $\frac{1}{3}$ — $\frac{3}{4}$  lin.)

*Var. β.*—*Mas*, antennæ articulis 3<sup>o</sup>. 4<sup>o</sup>. et 5<sup>o</sup>. pallidè fuscis: thorax et abdomen omninò viridi-ænea.

*Var. γ.*—*Mas*, antennæ articulis 3<sup>o</sup>. et 4<sup>o</sup>. pallidè fuscis.

*Var. δ.*—*Mas*, antennæ articulo 1<sup>o</sup>. fusco.

*Var. ε.*—*Mas*, æneus: caput æneo-viride: antennæ rufo-fuscæ; articuli 1<sup>o</sup>. ad 5<sup>um</sup>. fusci: metathorax viridis: femora fusca.

*Var. ζ.*—*Mas*, viridi-æneus: caput, thorax anticè et abdomen basi viridia: antennæ fuscæ; clava rufa: femora fusca.

*Var. η.*—*Mas*, omninò æneus.

- Var. θ.*—*Mas*, caput et thorax viridia : abdomen æneo-viride, basi viride : protarsi omninò pallidè flavi.
- Var. ι.*—*Mas*, caput viride: thorax viridi-æneus : abdomen cupreo-æneum.
- Var. κ.*—*Mas*, æneus : protarsi articulo 5<sup>o</sup>. pallidè fusco.
- Var. λ.*—*Mas*, æneus : femora pallidè fusca.
- Var. μ.*—*Mas*, æneo-viridis : abdomen cupreo-æneum, basi viride : femora pallidè fusca.
- Var. ν.*—*Mas*, æneo-viridis : antennæ fuscæ ; articulus 1<sup>us</sup>. flavus, apice fuscus ; 2<sup>us</sup>. nigro-fuscus : abdomen cupreo-æneum, basi æneo-viride.
- Var. ξ.*—*Mas*, antennæ articulis 1<sup>o</sup>. et 2<sup>o</sup>. fuscis : femora fusca, apice flava.
- Var. ο.*—*Fem.* caput et thorax æneo-viridia : abdomen cupreo-æneum : femora basi fusca.
- Var. π.*—*Fem.* antennæ articulo 1<sup>o</sup>. apice fusco.
- Var. ρ.*—*Fem.* femora viridia ; tibiæ pallidè fuscæ.
- Var. σ.*—*Fem.* femora et tibiæ pallidè fusca.
- Var. τ.*—*Fem.* obscurè æneus : abdomen basi cupreum.
- Var. υ.*—*Fem.* obscurè viridis : antennæ articulo 1<sup>o</sup>. fusco : abdomen basi æneo-viridi et nitentius : femora et tibiæ supra pallidè fusca.
- Var. φ.*—*Fem.* æneus : caput viride : femora et tibiæ pallidè fusca.
- Var. χ.*—*Fem.* æneus : antennæ articulo 1<sup>o</sup>. obscurè fusco.
- Var. ψ.*—*Fem.* viridis : mesothoracis scutellum et abdomen apice ænea.
- Var. ω.*—*Fem.* antennæ nigro-fuscæ.
- Var. αα.*—*Fem.* æneo-viridis : thorax æneus.
- Var. ββ.*—*Fem.* omninò viridis : antennæ articulo 1<sup>o</sup>. nigro-fusco.

August and September ; on grass in fields near London. September ; Isle of Wight, Westmoreland and Cumberland ; New Lanark, Scotland.

Sp. 2. Mer. alatus. *Mas. Æneo-viridis, antennis pedibusque flavis, alis subflavescentibus.*

Viridis, parùm nitens : oculi ocellique rufi : antennæ flavæ ; articulus 2<sup>us</sup>. pallidè fuscus ; clava elongato-ovata : mesothoracis scutellum, paraptera et epimera viridi-ænea : abdomen æneo-viride, nitens, glabrum, basi lætè viride ; sexualia flava : pedes flavi ; coxæ virides ; tarsi apice, unguis et pulvilli fusci ; meso- et metarsi pallidè flavi : alæ hyalinæ, amplæ, paullò flavescentes ; squamulæ et nervi fulva ; stigma parvum. (Corp. long.  $\frac{1}{2}$ — $\frac{2}{3}$  lin. ; alar.  $\frac{2}{3}$ — $\frac{3}{4}$  lin.)



*Var. β.*—Abdomen viridi-cupreum, basi lætè viride.

*Var. γ.*—Æneo-viridis: antennæ articulis 1<sup>o</sup>. ad 4<sup>um</sup>. fuscis: abdomen basi et metathorax viridia.

*Var. δ.*—Antennæ fulvæ; articulus 2<sup>us</sup>. obscurior.

*Var. ε.*—Viridi-æneus: antennæ omninò flavæ: abdomen basi viride.

*Var. ζ.*—Viridi-æneus: abdomen basi et metathorax viridia.

*Var. η.*—Abdomen basi cyaneo-viride.

*Var. θ.*—Antennæ omninò flavæ: abdomen cupreum, basi apiceque viride.

*Var. ι.*—Caput et thorax obscurè viridia: antennæ articulis 1<sup>o</sup>. ad 4<sup>um</sup>. fuscis.

*Var. κ.*—Æneo-viridis: abdomen viridi-æneum, basi viride.

*Var. λ.*—Lætè viridis: abdomen viridi-æneum, basi viride.

*Var. μ.*—*Var. præcedenti similis*: antennæ articulis 1<sup>o</sup>. ad 4<sup>um</sup>. fuscis.

July to September; on grass in fields; near London.

Sp. 3. *Mer. exiguus*. Mas. *Viridis, præcedenti multò gracilior, antennis fuscis, pedibus fulvis, alis subfulvescentibus.*

Viridis: oculi ocellique rufi; antennæ fuscae; articulus 1<sup>us</sup>. basi 2<sup>us</sup>que apice flavi: pedes fulvi; coxæ virides; femora tibiæque apice et protibiæ omninò flava; tarsi apice, ungues et pulvilli fuscis: alæ subfulvæ, amplæ; squamulæ et nervi obscuriora; stigma parvum. (Corp. long.  $\frac{1}{2}$  lin.; alar.  $\frac{2}{3}$  lin.)

October; on grass in fields; near London.

#### GENUS VI.—METASTENUS,<sup>f</sup> Walker.

*Fem.*—Corpus sparsè pubescens: caput thorace paullò latius: mandibulæ 4 dentatæ, arcuatæ, similes, basi angustæ; dentes acuminati; externus et 2<sup>us</sup>. magni, discreti; 3<sup>us</sup>. et internus parvi, basi connecti: maxillæ elongatæ, subarcuatæ, acuminatæ, apice angustæ; palpi 4-articulati, filiformes; articulus 1<sup>us</sup>. et 3<sup>us</sup>. subæquales; 2<sup>us</sup>. paullò longior; 4<sup>us</sup>. 2<sup>i</sup>. longitudine, apice acuminatus: mentum ovatum: labium minutum, breve, quasi fissum; palpi 3-articulati, breves, crassi; articulus 2<sup>us</sup>. brevissimus; 3<sup>us</sup>. 1<sup>i</sup>. longitudine, apice acuminatus: antennæ 12-articulatæ, subfusiformes, corporis dimidio breviores; articulus 1<sup>us</sup>. linearis,

<sup>f</sup> μετά post, στενός angustus.

gracilis; 3<sup>us</sup>. et 4<sup>us</sup>. vix discernendi: 5<sup>us</sup>. et sequentes ad 9<sup>um</sup>. lati approximati, subæquales; clava conica, acuminata, articulis 8<sup>o</sup>. et 9<sup>o</sup>. vix longior: thorax brevis, paullò longior quàm latus; prothorax brevissimus; mesothoracis parapsidum suturæ indistinctæ, paraptera et epimera magna, scutellum ferè conicum: metathorax apice angustus: abdomen ovatum, thorace paullò longius, subtus convexum, basi abruptè angustius, apicem versus gradatim acuminatum; segmentum 1<sup>um</sup>. magnum, ejus ferè trientem occupans; reliqua breviora, subæqualia: oviductus apicem non transiens: pedes graciles, simplices: alæ mediocres; nervus cubitalis longus, radialis ferè alæ apicem attingens; stigma ramulum brevissimum vix conspicuum emittens.

Sp. 1. Met. concinnus. Mas. *Cyaneus, antennis fuscis, pedibus fulvis, alis hyalinis.*

Cyaneus, obscurus: oculi ocellique rufi: antennæ pallidè fuscae, basi obscuriores, subtus flavæ: abdomen cupreo-cyaneum, nitens, glabrum, basi viride, apice sparsè pilosum: pedes fulvi; coxæ cyaneæ; femora et tibiæ apice tarsique flava; horum articulus 5<sup>us</sup>., ungues et pulvilli fusci; protarsi articulo 1<sup>o</sup>. fulvo: alæ hyalinæ; squamulæ et nervi fulva; stigma parvum. (Corp. long.  $\frac{3}{4}$  lin.; alar. 1 lin.)

Var.  $\beta$ .—Antennæ omninò fuscae.

August; on grass in fields: near London.

#### GENUS VII.—METOPON,<sup>ε</sup> Walker.

Fem.—Sparsè pubescens, quasi minutè squameum: caput maximum, thorace multò latius: antennæ 12-articulatæ, clavatæ, corporis dimidio longiores, apices versus crassissimæ; articulus 1<sup>us</sup>. gracilis, linearis; 2<sup>us</sup>. brevis; 5<sup>us</sup>. et sequentes ad 9<sup>um</sup>. longitudine subæquales, latitudine crescentes; clava maxima, elongato-ovata, apice acuminata, articulis 8<sup>o</sup>. et 9<sup>o</sup>. multò latior et longior: thorax brevis, ferè rotundus: prothorax minimus, supra vix conspicuus: mesothorax magnus; parapsides scuto in unum confusæ; paraptera et epimera benè determinata; scutellum convexum, ferè rotundum: metathorax mediocris: abdomen parvum, angustum, compressum, læve, thorace vix longius, supra planum lateribus elevatis, subtus carinatum; segmenta subæqualia: pedes graciles, simplices: alæ mediocres; nervus

humeralis ramulum rejiciens nullum; cubitalis radiali paullo brevior, stigmate rotundato terminatus.

Sp. 1. *Meto. atrum. Fem. Atrum, pedibus rufo-fuscis, antennis femoribusque nigris, alis fuscis.*

*Atrum, obscurum: oculi ocellique rufo-fusci: antennæ nigræ; articuli 1<sup>us</sup>. 3<sup>us</sup>. et 4<sup>us</sup>. rufi; 2<sup>us</sup>. fuscus: abdomen æneo-atrum, nitens, ferè glabrum: pedes rufo-fusci; coxæ et femora nigra; tarsi flavi, apice fusci: alæ fuscæ; squamulæ et nervi obscuriora; stigma parvum; metalarum nervi pallidi. (Corp. long.  $\frac{5}{4}$  lin.; alar.  $1\frac{1}{4}$  lin.)*

August; on grass beneath trees; near London.

††† *Antennæ 13-articulatæ.*

† *Antennæ articulo 3<sup>o</sup>. sæpè vix conspicuo. 4<sup>o</sup>. 5<sup>o</sup>. que minimis.*

Thorax supra	}	ferè planus. Corpus angustum, sublineare VIII. <b>PLAYTERMA.</b>
		convexus. Corpus breve, latum . . . . . IX. <b>AMBLYMERUS.</b>

### GENUS VIII.—*PLATYTERMA*,<sup>h</sup> *Walker.*

Corpus angustum, quasi squameum, plerumque sublineare: caput mediocre, thorace vix latius: mandibulæ 4-dentatæ, parvæ, rectæ, similes, intùs breves et emarginatæ; dens externus mediocris, subacutus; reliqui parvi, ferè obtusi: maxillæ elongatæ, subarcuatæ, angustæ, basi latæ, apice acuminatæ; palpi 4-articulati, filiformes; articuli, 1<sup>us</sup>., 2<sup>us</sup>. et 3<sup>us</sup>. subæquales; 4<sup>us</sup>. longior, apice acuminatus: mentum elongato-ovatum: labium parvum, quasi fissum; palpi 3-articulati, breves; articulus 2<sup>us</sup>. parvus; 3<sup>us</sup>. acuminatus: antennæ 13-articulatæ, clavatæ, latæ, corporis dimidio breviores; articulus 1<sup>us</sup>. sublinearis, gracilis; 3<sup>us</sup>. vix conspicuus; 4<sup>us</sup>. et 5<sup>us</sup>. minimi; 6<sup>us</sup>. et sequentes ad 10<sup>um</sup>. magnitudine crescentes, valdè approximati; clava brevi-ovata, depressa, non acuminata, articulo 10<sup>o</sup>. multò latior: thorax elongato-ovatus aut sublinearis, supra ferè planus: prothorax brevissimus: mesothoracis parapsides scuto ferè in unum confusæ: metathorax parvus, posticè vix angustius: *maris* abdomen sublineare, thorace paullo brevius et angustius; segmentum 1<sup>um</sup>. longum; sequentia paullo breviora, subæqualia: *fem.* abdomen ovatum aut sublineare nonnunquam subcompressum, apice acumi-

<sup>h</sup> πλατὺς latus, τερμα finis.

natum, subtus plus minusve angulatum; segmenta subæqualia: pedes graciles, simplices: alæ mediocres; nervus radialis cubitali paullò longior; stigma ramulum brevissimum emittens.

Sp. 1. Plat. nobile. Fem. *Viride, antennis fulvis, pedibus flavis, alis hyalinis.*

Lætè viride, sparsè pubescens: os flavum: oculi ocellique rufi: antennæ fulvæ, corporis triente vix longiores, supra pallidè fuscæ, basi obscuriores: thorax elongato-ovatus; mesothorax posticè viridi-cyaneus: abdomen elongato-ovatum, micans, ferè læve, thorace paullò longius, sparsè albo pilosum, subtus angulatum, apice acuminatum; discus cupreus: pedes lætè flavi; coxæ virides; mesofemora subtus prope apices setâ nigrâ armata; protibiæ et protarsi fulva; meso- et metatarsi apice, ungues et pulvilli fusci: alæ hyalinæ, albæ; squamulæ et nervi flava, hi ante costam attingunt obscuriores; stigma minutum. (Corp. long.  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.; alar.  $1\frac{2}{3}$ — $1\frac{3}{4}$  lin.)

*Var. β.*—Abdominis discus cyaneo-viridis; segmenta apice obscurè cuprea: meso- et metafemora basi fulva.

*Var. γ.*—Thorax omninò viridis: abdomen viride, basi apice et subtus cyaneo-viride; discus cupreus: meso- et metafemora basi fulva.

September; on grass in fields; near London. Isle of Wight.

Sp. 2. Plat. laticorne. Fem. *Præcedentis colore, antennis brevioribus et latioribus.*

Viridè, sparsè pubescens: oculi ocellique rufi: antennæ fulvæ, corporis triente paullò breviores; supra pallidè fuscæ: thorax elongato-ovatus: abdomen thorace longius, sublineare, ferè læve, sparsè albo pilosum, subtus angulatum, apice acuminatum pilosius et paullò attenuatum; segmentum 1<sup>um</sup>., 2<sup>um</sup>. et 3<sup>um</sup>. apice cuprea; apicale æneum: pedes fulvi; coxæ virides; femora basi fusca, apice flava; meso- et metatibiæ basi flavo cingulatæ; meso- et metatarsi pallidè fulvi, apice fusci; ungues et pulvilli fusci: alæ hyalinæ, albæ; nervi et squamulæ fulva, illi apice pallidiores; stigma minutum; metalarum nervi pallidè flavi. (Corp. long.  $1\frac{1}{2}$  lin.; alar.  $1\frac{3}{4}$  lin.)

August; on grass in fields; near London.

Sp. 3. Plat. teliforme. Mas et Fem. *Præcedentium colore, gracilius, abdomine longiore.*

*Mas.*—Lætè viride, sparsè pubescens: os flavum: oculi ocellique rufi: antennæ fulvæ, corporis dimidii longitudine; articuli 2<sup>o</sup>. basi fusco ad 6<sup>um</sup>. supra fusco-fulvi: thorax sublinearis: abdomen sublineare, ferè læve, thorace paullò brevius et angustius; discus cupreus: sexualia pallidè fusca: pedes lætè flavi; coxæ virides; protibiæ et protarsi fulva; meso- et metatarsi apice, ungues et pulvilli fusci: alæ hyalinæ, albæ; squamulæ et nervi straminea; stigma parvum.

*Fem.*—Antennæ paullò graciliores, corporis trientis longitudine; articuli 2<sup>o</sup>. ad 10<sup>um</sup>. supra pallidè fusci: abdomen cyaneo-viride, sublineare, thorace dimidio longius, paullò compressum, apice acuminatum et attenuatum, subtus angulatum: oviductus flavus, subexertus; tegmina nigra: protibiæ basi flavæ. (Corp. long.  $\frac{5}{4}$ —1 $\frac{1}{4}$  lin.; alar. 1—1 $\frac{1}{2}$  lin.)

*Var. β.*—*Fem.* antennæ articulis omnibus supra pallidè fuscis: abdomen viridi-cyaneum; segmenta apice viridia.

*Var. γ.*—*Fem.* abdomen supra æneo-viride.

*Var. δ.*—*Fem.* abdomen omninò viride.

September; Isle of Wight.

Sp. 4. Plat. prasinum. Fem. *Præcedentium colore, P. teli-formi et laticorni brevius illoque latius, P. claro abdomine non subtus angulato discrepans.*

Lætè viride, sparsè pubescens: oculi ocellique rufi: antennæ fulvæ, corporis triente vix longiores; clava lætè flava: thorax elongato-ovatus: abdomen elongato-ovatum, thorace vix longius, ferè læve, albo sparsè pilosum, subtus convexum, apice acuminatum non attenuatum; discus æneo-viridis: pedes lætè flavi; coxæ virides; femora basi fulva; protibiæ et protarsi fulva, hi apice pallidè fusci; meso- et metatarsi apice, ungues et pulvilli fusci: alæ hyalinæ, albæ; squamulæ et nervi straminea; stigma minutum. (Corp. long.  $\frac{5}{4}$ —1 lin.; alar. 1 $\frac{1}{4}$ —1 $\frac{1}{2}$  lin.)

*Var. β.*—Antennæ articulis 1<sup>o</sup>. ad 4<sup>um</sup>. supra pallidè fuscis: abdominis discus cupreo-viridis.

*Var. γ.*—Antennæ articulis 1<sup>o</sup>. ad 10<sup>um</sup>. supra fuscis.

*Var. δ.*—Abdomen omninò viride: femora basi fusca.

*Var. ε.*—Abdominis latera cyaneo-viridia.

September; Isle of Wight.

Sp. 5. Plat. cincticorne. Mas et Fem. *Præcedentium colore, antennis fulvis, mas; aut pallidè fuscis, fem.; fusco cingulatis.*

*Mas.*—Lætè viride, vix pubescens: oculi ocellique rufi: antennæ fulvæ, corporis dimidio paullò breviores; articulus 2<sup>us</sup>. basi nigro-fuscus; 6<sup>us</sup>. et sequentes ad 10<sup>um</sup>. basi fusci; clava fusca, basi flava: thorax elongato-ovatus: abdomen sublineare, thoracis longitudine sed paullò angustius; discus æneo-viridis: sexualia pallidè fusca: pedes lætè flavi; coxæ virides; protibiæ fulvæ; protarsi pallidè fusci; meso- et metapedum tarsi apice, ungues et pulvilli nigro-fusci: alæ hyalinæ, albæ; squamulæ et nervi fulva; stigma parvum; metalarum nervi pallidè flavi.

*Fem.*—Paullò gracilius: antennæ pallidè fuscæ, corporis dimidio breviores; articuli basi obscuriores; 1<sup>us</sup>. nigro-fuscus: caput posticè æneo-viride: abdomen viridi-cyaneum, elongato-ovatum, thorace paullò longius, subtus angulatum, apice acuminatum non attenuatum; discus æneus: oviductus subexertus: femora fusca, apice flava; protibiæ pallidè fuscæ; meso- et metapedum tarsi apice, ungues et pulvilli fusci. (Corp. long.  $1\frac{1}{4}$  lin.; alar.  $1\frac{1}{2}$  lin.)

May; on grass in fields; near London.

Sp. 6. Plat. terminale. Fem. *Præcedentium colore, P. claro laticorni et prasino abdomine angustiore, P. teliformi abdomine brevior discrepans.*

Lætè viride, vix pubescens: oculi ocellique rufi: antennæ flavæ, corporis dimidio vix longitudine; articulus 3<sup>us</sup>. et sequentes basi obscuriores: thorax elongato-ovatus: abdomen æneum, sublineare, compressum, thorace longius, basi viride, subtus paullò angulatum, apice acuminatum vix attenuatum: pedes lætè flavi; coxæ virides; femora fulva, apice flava; tarsi apice, ungues et pulvilli fulvi: alæ hyalinæ, albæ; squamulæ et nervi pallidè flava; stigma minutum. (Corp. long.  $1\frac{1}{4}$  lin.; alar.  $1\frac{1}{2}$  lin.)

August; on grass in fields; near London.

#### GENUS IX.—AMBLYMERUS,<sup>i</sup> Walker.

*Fem.*—Corpus crassum, latum, quasi squameum, sparse pubescens: caput breve, thorace vix latius: mandibulæ 4-dentatæ, sub-

<sup>i</sup> Ἀμβλύς obtusus, μέρος pars.



quadratae, paullo arcuatae, similes, intus breviores et emarginatae; dens externus et 2<sup>us</sup>. mediocres, acuti; 3<sup>us</sup>. et 4<sup>us</sup>. parvi, obtusi: maxillae elongatae, subarcuatae, acuminatae, apice angustae et ciliatae; palpi 4-articulati, filiformes; articuli 1<sup>o</sup>. ad 3<sup>um</sup>. breves, subaequales; 4<sup>us</sup>. 2<sup>i</sup>. et 3<sup>i</sup>. longitudine, apice acuminatus: mentum elongato-ovatum, angustum: labium parvum, angustum, quasi fissum; palpi 3-articulati, filiformes, breves, crassi; articulus 2<sup>us</sup>. brevissimus; 3<sup>us</sup>. apice acuminatus: antennae 13-articulatae, clavatae, thorace breviores; articulus 1<sup>us</sup>. gracilis, linearis; 2<sup>us</sup>. elongato-cyathiformis; 5<sup>us</sup>. et sequentes ad 10<sup>um</sup>. gradatim breviores et latiores; clava ovata, plana, articulis 9<sup>o</sup>. et 10<sup>o</sup>. latior sed vix longior: thorax ovatus, convexus: prothorax brevissimus: mesothoracis parapsidum suturae vix conspicuae; scutellum fere rotundum; paraptera et epimera bene determinata: abdomen ovatum, fere laeve, subtus carinatum et nonnunquam angulatum, apice acuminatum; segmentum 1<sup>um</sup>. fere trientis longitudine; reliqua breviora, subaequalia: pedes simplices, latiusculi: alae plerumque latae; nervus humeralis ulnari longior, ramulum rejiciens nullum; cubitalis radiali dimidio brevior, stigmate ramulum brevissimum emittente terminatus.

Sp. 1. Amb. amoenus. Fem. *Viridis aut aeneo-cupreus, antennis fuscis, abdomine non subtus angulato, pedibus flavis aut fulvis, alis hyalinis, proalis nonnunquam subflavescentibus.*

Læte viridis, caput thoracis latitudine: oculi ocellique rufi: antennae fuscae; articulus 1<sup>us</sup>. et 2<sup>us</sup>. pallide rufi: capitis, prothoracis mesothoracisque latera cupreo-viridia: abdomen cupreum, subtus carinatum non angulatum, apice pilosum; segmenta basi et utrinque viridia: pedes flavi; coxae virides; metatibiae intus fulvo vittatae; meso- et metatarsi straminei, articulo 5<sup>o</sup>, unguibus et pulvillis fuscis; protarsi articulo 5<sup>o</sup>. rufo: alae hyalinae, latae; squamulae et nervi pallide flava; stigma minimum. (Corp. long.  $\frac{5}{4}$ — $1\frac{1}{4}$  lin.; alar.  $1\frac{1}{2}$ — $2\frac{1}{4}$  lin.)

*Var. β.*—Antennae articulis 3<sup>o</sup>. ad 10<sup>um</sup>. rufo-fuscis.

*Var. γ.*—Thoracis dorsum cupreo variegatum: abdomen cupreum, basi et utrinque viridi variegatum: metatibiae omnino flavae.

*Var. δ.*—Antennae articulo 2<sup>o</sup>. rufo: thorax aeneo-viridis; segmentorum margines virides: femora et metapedum tibiae pallide rufa.

*Var. ε.*—Abdomen viride, apice cupreum; discus chalybeo fasciatus: femora, meso- et metatibiae fulva, apice flava.

*Var. ζ.*—*Var. ε.* similis : abdomen cupreum, basi æneo-viride.

*Var. η.*—Antennæ articulo 2<sup>o</sup>. supra fusco.

*Var. θ.*—Æneo-viridis : thorax anticè et utrinque cupreus : femora, tibiæ et protarsi pallidè rufa ; meso- et metatibiæ apice flavæ : proalæ sub-nervum ulnarem paullò flavescens.

*Var. ι.*—*Var. θ.* similis, æneo-cupreus : caput viridi-æneum, anticè et posticè viride.

*Var. κ.*—Thorax æneo-viridis ; scutellum cupreum.

*Var. λ.*—Viridis : thorax posticè æneo-viridis : abdominis segmentum 1<sup>um</sup>. viride, micans.

August ; on oak trees, &c. ; near London. September ; Isle of Wight.

Sp. 2. Amb. dubius. Fem. *Viridis aut æneus, præcedenti angustior, antennis fulvo fuscis, pedibus fulvis, alis hyalinis vix flavescens.*

Lætè viridis, caput thoracis latitudine : oculi ocellique rufi : antennæ fulvæ articuli 1<sup>o</sup>. ad 4<sup>um</sup>. flavi ; clava fusca : abdomen æneum, basi viride nitentius, subtus carinatum non angulatum : pedes fulvi ; coxæ virides ; femora fusca, apice flava ; tibiæ apice flavæ ; mesofemora subtus ante apices setâ validâ armata ; tarsi apice, unguis et pulvilli fusci : alæ hyalinæ, minimè flavescens ; squamulæ et nervi pallidè fusca ; stigma minimum. (Corp. long.  $\frac{5}{4}$ —1 lin. ; alar.  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.)

*Var. β.*—Antennæ fuscæ ; articulus 1<sup>us</sup>. omninò et 2<sup>us</sup>. subtus flavi : femora apice fulva ; metatibiæ fuscæ, apice flavæ ; tarsi et protibiæ flava, illi apice fusci.

*Var. γ.*—Æneus : abdomen basi viride, apice cupreum, segmenta apice nigro-ænea : pedes fulvi ; coxæ æneæ ; metafemora inermia ? ; meso- et metatarsi flavi, apice nigro-fusci.—Species distincta. ?

*Var. δ.*—*Var. γ* similis : abdomen nigro-æneum, basi apiceque viride.

August ; near London. September ; Isle of Wight.

Sp. 3. Amb. validus. Fem. *Æneus, viridi et cupreo variegatus, antennis fuscis, abdomine subtus angulato, pedibus fulvis, alis hyalinis, nonnunquam subflavescens.*

Cupreo-æneus : caput æneum, posticè æneo-viride, thorace paullò latius : oculi ocellique rufo-fusci : os pallidè flavum : antennæ fuscæ ; clava obscurior ; articulus 1<sup>us</sup>. pallidè rufus : abdomen

nigro-æneum, subtus angulatum, basi cupreo-æneum nitentius : pedes fulvi ; propedes flavi ; coxæ æneæ ; ungues et pulvilli fuscii ; meso- et metapedum genua et tarsi pallidè flava, hi apice fuscii : alæ subflavescentes : squamulæ fulvæ ; nervi pallidiores ; stigma minutum. (Corp long. 1—1 $\frac{1}{4}$  lin. ; alar. 1 $\frac{1}{4}$ —1 $\frac{5}{8}$  lin.)

*Var. β.*—Caput et thorax obscurè cupreo-ænea, illum posticè viride : abdomen cupreo-viride, basi nitentius ; discus nigro-æneus : alæ vix subflavescentes.

*Var. γ.*—Æneus : caput viride : antennæ pallidè fuscæ ; articulus 1<sup>us</sup>. flavus : abdomen nigro-æneum, basi viride nitentius ; segmenta apicalia viridescencia : coxæ virides ; profemora fulva : alæ omninò perlucidæ.

August ; near London. New Lanark, Scotland.

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ART. XXVIII.—*Entomological Society.*

SEVENTH SITTING.—APRIL 7.

WE observed Dr. Ure among the strangers present.

The PRESIDENT informed the meeting that Mr. Walker and Mr. Newman had withdrawn their names from the council of the Society, and that it was necessary that the vacancies thus occasioned in the council list be filled up by the Society. The council had met on the subject, and had agreed to propose to the meeting the name of Mr. Hanson, instead of Mr. Walker, and the name of Dr. Roget, instead of Mr. Newman.

The SECRETARY read letters from M. Wiedemann and M. Lefebvre, who had been elected honorary members of the Society.

The SECRETARY read a paper by Mr. Spence, detailing a curious mode, adopted in Italy, of excluding the house-fly from houses. The plan consisted simply in straining a net, made of white thread, across the aperture of an open window : the meshes of the net were about half-an-inch in diameter. It had occurred to Mr. Spence, whether it could be the dread of a spider's-net which caused the flies to avoid this thread-net, but on consideration he had determined otherwise, and he was

totally at a loss how to account for so singular a circumstance. Mr. Spence expressed a wish that the metaphysical history of insects might be more attended to than had at present been the case; he thought much instruction would result from it.

The SECRETARY read a paper by Mr. Saunders, on some Indian Insects, among which some nocturnal *Cicindelæ* were particularly remarkable.

The SECRETARY read a notice, by Mr. B. Standish, of the discovery of the larva of *Cucullia Thapsiphaga* on the golden-rod in Darent-wood, in a south-west aspect; he found one specimen on the 8th, and a second on the 23d, of September. They came out of the chrysalis in the following June, and proved to be male and female. An exquisite drawing of the larva, by a nephew of Mr. Standish, was presented to the Society.

The SECRETARY read an abstract of the Entomological affairs of the Linnæan Society. A paper had been read by Mr. Newman, giving an arrangement of the Annulate animals, and of that particular portion of them known as *insects*, solely by the metamorphosis. Mr. Newman referred the metamorphosis of insects to the change always going on in organized beings, and considered that insects had truly but three stages of existence: the *egg*, or *fœtal*; the *larva*, or *adolescent*; and the *imago*, or *adult*.

The SECRETARY read the remainder of Mr. Hope's paper on Amber Insects.

Dr. URE made some observations on the chemical properties of amber and anime: he had found (as we understood) amber soluble on the surface only, but anime was perfectly converted into gelatinous matter by alcohol and spirit of caoutchouc.

Col. SYKES made some observations, in reference to the paper by Mr. Saunders, on the singular places selected by insects for nidification; he instanced one which had built its nest in a flute.

#### EIGHTH SITTING.—MAY 5.

The SECRETARY read letters from Signor Passerini, of Florence, and Dr. Hammerschmid, of Vienna.

The SECRETARY read a paper by himself, on the onion-fly, and the *larva* of *Tipula*.

The SECRETARY read a description by the Rev. F. W. Hope, of two new and remarkable Coleopterous insects from Swan River.

The SECRETARY read a paper by Mr. W. B. Spence, illustrative of a passage in Herodotus, relating to the defence adopted by the fishermen of Egypt against the nightly attacks of gnats.

The SECRETARY read a second notice by Mr. B. Standish of *Cucullia Thapsiphaga*. The insect, and an exquisite drawing of it by a nephew of Mr. Standish, were exhibited. Mr. Standish had heard Mr. Stephens express an opinion that the insect in question was not the *Thapsiphaga*, but he (Mr. Standish) felt convinced that it was.

The PRESIDENT.—As Mr. Stephens is present, perhaps he will be kind enough to favour us with his opinion on the subject.

Mr. STEPHENS.—I am certainly of opinion that the insect now exhibited, which I have carefully examined, is not the *Cucullia Thapsiphaga*, nor does it appear to me to belong to the same division of the genus. I consider it an entirely new insect, at present undescribed.

The SECRETARY read a paper by Mr. Shuckard, on the economy of some fossorial Hymenopterous insects.

An interesting discussion took place on insects injurious to agriculture, in which Mr. Yarrell, Mr. Waterhouse, &c. took part: in the course of it frequent allusion was made to the celebrated letter of Rusticus on the turnip-fly, published in the fourth number of this Magazine.

NINTH SITTING.—JUNE 2.

The Rev. W. KIRBY took the chair.

The SECRETARY read letters from M. Schœnherr, of Stockholm, and M. Lefebvre, of Paris.

The SECRETARY read a paper by Mr. Stephens on *Thyridopteryx Ephemeræformis*, a unique insect formerly in the collection of the late Mr. Haworth, and described by that

eminent Lepidopterist under the name of *Sphinx Ephemæ-formis*.

The SECRETARY read a paper by Mr. Waterhouse on the *larvæ* of various Coleopterous insects, and the *pupa* of *Raphidia*.

The SECRETARY read a paper by himself on the economy of *Odynerus Antilope*, one of the wasp tribe.

The SECRETARY read a paper by himself on the genera *Lepisma* and *Podura*, introducing some notices of Irish species of these genera, by Mr. Templeton.

Mr. SPENCE exhibited some very minute ants, which he said had swarmed to so great a degree at Brighton, and some parts of London, that, in several instances which had come to his knowledge, the inhabitants had found no other alternative than entirely quitting their houses.

The SECRETARY announced that the council of the Society had agreed to appropriate annually the sum of five guineas as a prize for the best essay on the history of any insect prejudicial to agriculture, accompanied with figures, and detailing the result of experiments made for prevention or cure of its attacks. The Turnip-fly is the subject of the first essay, which must be delivered, with a fictitious signature, in Bond-street, by the fourth Monday in January, 1835, and be addressed to the Secretary of the Society.

[We were the first to connect Entomology with Agriculture, and we can scarcely express the delight we feel in finding that our dear little "Fire-fly" has lighted the way to this spirit of inquiry. A word more:—Several of our correspondents have complained that it is beneath our dignity to report the affairs of the Entomological Society, and that the space might be better occupied. To these we say, that nothing which tends, in ever so humble a way, to the advance of Entomology, shall ever be passed over by us as beneath our dignity. We have abridged already as much as possible, but we cannot, and will not, consent to give up these notices.]

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ART. XXIX.—*Entomological Notes.* By EDWARD NEWMAN.

(Continued from Vol. II., page 205.)

CLASS.—DIPTERA.

NATURAL ORDER.—SYRPHITES, *ined.*

GENUS.—ERISTALIS.

Eris. Stygius. *Nigro-æneus*; *pedes nigri, tibiis ad basin luteis.*

Black, shining, with a slightly metallic tinge; perfectly unicolorous: wings with the costal portion smoke coloured; the remainder perfectly transparent; the stigmal spot ochraceous, opaque, internally black: legs black, with the base of the tibiæ yellow.

*Var. α* of the male, with a bright brassy tinge.

*Var. β* of the male, with the basal joint of the tarsi yellow.

Taken on the south east and south coasts of England, frequenting the sea-walls, umbellate flowers, &c. In May, at Walton, by my friend, E. Doubleday.

[This is only a slight variety of *Eristalis æneus*, Fabr.—ED.]

CLASS.—COLEOPTERA.

NATURAL ORDER.—STAPHYLINITES, *ined.*

GENUS.—PSEUDOPSIS,<sup>a</sup> *Newman.*

Caput elongatum, angustum, antice rotundatum; epicranio valde depresso, partibus lateralibus supra oculos, iterumque parte media longitudinali, elevatis; clypeo prono, rotundato: antennæ filiformes 11-articulatæ, extus incrassatæ articulo apicali conico: maxilpalpi articulo apicali elongato, acuto, tenuissimo; proximo quadruplo majori, alia instrumenta cibaria haud examinavi: prothorax depressus fere circularis sed anticè et posticè paullò

<sup>a</sup> Ψευδης falsus, οψις aspectus.

truncatus; lateribus, lineisque quatuor disci longitudinalibus perspicue elevatis: elytra valde depressa, marginibus, sutura, lineisque duabus singuli disco longitudinalis perspicue elevatis: segmenta septem nuda, haud elytris tecta, medio depressa, lateribus elevatis, versus telum magnitudine pedetentim decrescentia; telo elongato angusto.

*Pseu. sulcatus. Niger, ore antennis pedibusque fuscis.*

Head long, narrow, rounded before, black, with the mouth brown; crown of the head very much depressed, with an elevated line passing along each side above the eyes, and a third less elevated, distinct and regular, passing between these down the centre: antennæ brown, moniliform, composed of eleven joints, of which the apical is somewhat conical; the following are rather more broad than long, and very gradually decrease in size towards the head: maxillary feelers, with the apical joint long, pointed, and very slender; the next incrassated, four times the size of the apical: the disk of the prothorax is somewhat circular, but evidently truncate anteriorly, and slightly so posteriorly; it is much wider than the head, and very flat; it has the lateral edges and four perfectly straight longitudinal lines on the disk very conspicuously elevated, thus producing five distinct longitudinal indentations or furrows: the elytra are rather wider than the prothorax, very flat, with their margins, suture, and two longitudinal lines on each, conspicuously elevated; the lines are not perfectly straight, but, as they recede from the base of the elytra exteriorly, incline towards the suture: there are seven segments entirely uncovered by the elytra; these are much depressed in the middle and elevated at the sides, and gradually decrease in size to the last, which is very long and narrow: the prothorax, elytra, and uncovered segments, are dull black: the legs are brown. (Length  $1\frac{1}{2}$  line.)

This singular insect was taken, by Mr. Walker, in the Isle of Wight, in the month of September. I regret not being able to furnish more complete characters from its mouth, but, as it is unique and exceedingly valuable, it would have been too great a risk to have attempted dissection. Its appearance is precisely that of a *Micropeplus*, to which genus it is evidently related, although presenting in so marked a manner the characters of *Staphylinites*. I hope the scientific reader will pardon the repetition of the supposed generic characters in English; for,

with only a single specimen of the genus in existence, it is difficult to say whether the sculpture on the prothorax and elytra is to be considered generic or specific; I must confess I incline to the latter opinion, and have named the insect accordingly. We find, in *Hister*, *Onthophilus*, *Oxytelus*, *Haliphus*, &c. &c., that similar markings serve merely to distinguish species.

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ART. XXX.—*Notice of Entomological Works.*

1. *British Entomology*; by John Curtis, F.L.S., &c.—Nos. 123—126.—Pl. 490. *Lucanus Cervus*, (Coleoptera Lucanidæ). Mr. Curtis has greatly detracted from the merits of this beautiful plate, by giving a most confused and erroneous nomenclature to the dissections. The *clypeus* is called the *labrum*; the remarkable *galea* is treated as a lobe of the *maxilla*, &c. &c. If Mr. Curtis were to take a little more trouble with his anatomical nomenclature, he would find it not ill-bestowed. Pl. 491. *Cochylis rupicola*, (Lepidoptera Tortricidæ); 492. *Livia Juncorum*, (Hemiptera Psyllidæ); 493. *Tipula longicornis*, (Diptera Tipulidæ); 494. *Donacia Typhæ*, (Coleoptera Crioceridæ); 495. *Hydrocampa stratiotata*, (Lepidoptera Pyralidæ?); 496. *Diodontus gracilis*, (Hymenoptera Crabronidæ). The plate, and the accompanying letter-press, present another instance of inattention to correct nomenclature; the species figured has no such character as that represented in the *labrum*: whether Mr. Curtis has dissected one insect and described another, or has misapplied the term *labrum*, we neither know, nor can we stop to inquire. Pl. 497. *Acentropus Garnonsii*, (Trichoptera Phryganidæ); 498. *Tritoma bipustulatum*, (Coleoptera Tritomidæ); 499. *Callimorpha Jacobææ*, (Lepidoptera Lithosiidæ); 500. *Atractus literatus*, (Hemiptera Coreidæ); 501. *Tanypus nebulosus*, (Diptera Tipulidæ); 502. *Mycetæa hirta*, (Coleoptera Engidæ?); 503. *Asopia pictalis*, (Lepidoptera Pyralidæ); 504. *Heriades truncorum*, (Hymenoptera Apidæ); 505. *Platystoma scminationis*, (Diptera Muscidæ).

2. *Genera et Species Curculionidum, cum Synonymia hujus familiae; a C. J. Schoenherr, &c. Tomus II. Pars 1<sup>ma</sup>. Parisiis, 1834.*

3. *Annales de la Société Entomologique de France. Tome II. Trimestre 4, Paris, 1834.*—Among the contents are a classification of the *Cerambycidæ*, with the characters of a host of new genera, by M. Audinet Serville, and various other interesting essays.

4. *Revue Entomologique, publiée par Gustave Silbermann. Strasbourg. Livraison 8. 1834.*—Almost the whole of this Number is occupied with an essay on the genus *Cicada*, by Professor Germar. The different sections of the genus are illustrated in eight plates, containing coloured figures of as many species.

5. *Iconographie du Règne Animal de M. le Baron Cuvier; par M. F. E. Guérin. Paris. Livraison 34. Insectes, Pl. 61.*—Several genera belonging to the class *Neuroptera*, and their dissections, are here delineated.

6. *Magazin de Zoologie; par F. E. Guérin. Paris, 1833.*—1. A monograph of the *Pselaphidæ*, by M. Aubé, which is here concluded. He divides them into thirteen genera, three of which are new, viz. *Tyrus*, *Trimium*, and *Batrissus*. 2. Description of *Amallopodes*, a new genus of *Prionidæ*, by M. Lequien, &c.

7. *Iconographie, &c. des Coléoptères d'Europe; par M. le Comte Dejean, et M. le Docteur J. A. Boisduval. Tome IV. Livraison 2.*—With illustrations of the genera *Anisodactylus*, *Bradybænus*, *Geodromus*, *Hypolithus*, *Gynandromorphus*, and *Harpalus*.

8. *Monographie des Cétôines, et Genres voisins, &c.; par M. H. Gory, et M. A. Percheron. Livraisons 2 et 3. Paris, 1833.*—Containing a detailed description, and a beautiful and correctly coloured figure, of each species.

9. *Annales des Sciences Naturelles. Tome Premier.*

*Zoologie. Janvier, 1834. Paris.*—The Botanical essays, formerly included in these “Annales,” now form a separate collection. This number contains two interesting essays: 1. “Recherches sur l’ordre des *Acariens* en général et la famille des *Trombididés* en particulier. Par Ant. Dugès. Premier Memoire.” He divides them into seven families (*Trombidiei, Hydrachnei, Gamasei, Ixodei, Acarei, Bdellei,* and *Oribatei*), and establishes the following new genera: *Rhaphignathus, Rhyncholophus, Diplodontus, Arreneurus, Dermanyssus,* and *Hypopus*. 2. “Recherches anatomiques et Considérations entomologiques sur quelques Insectes Coléoptères, compris dans les Familles des *Dermestins, des Byrrhiens, des Acanthopodes, et des Leptodactyles*; par M. Léon Dufour.

10. *Die Arachniden. Getreu nach der Natur abgebildet und beschrieben von D. Carl. Wilh. Hahn.; Erster Band. Sechstes Heft. Zweiter Band. Erstes Heft. 1833.*—Species of the genera *Atypus, Epeïra, Micrommata, Thomisus, Uloborus, Drassus, Phalangium, Trogolus, Clubiona* and *Lycosa*, are here figured.

11. *Die Wander-oder Prozessions-Raupe (Bombyx processionea) in naturhistorisch-landespolizeilich und medicinischer Hinsicht geschildert von Dr. A. H. Nicholai. Nebst einen Steindrucke. Berlin, 1833.*—The plate accompanying this pamphlet contains figures of the moth, with its *pupa, larva,* and nest.

12. *The Affinities of Plants with Men and Animals: a Lecture; by Edwin Lees. Edwards: London.*—Mr. Lees gives a new version of *analogy* and *affinity*. Ecce! “We perceive no *analogy* between a plant and a predaceous cat; but the cat, by smelling to, and playing with, pungent herbs, manifests a strong *affinity* with them. The child who brings home a handful of gaudy or fragrant flowers would be puzzled enough to make out an analogy between himself and his nosegay; but he might readily comprehend that the rich colours that charmed his eye, and the delicious odours that had attracted his scent, intimated design, and an intention that the colours and odours of the one were calculated to please

the senses of the other, and thus that an affinity or relationship was shewn between them in these respects. But when I say that the spongioles of the root of a plant act as tender nerves to the stem, by imbibing and conveying nourishment for its growth and support, I make use of an *analogy* which is well understood, though no one supposes that I mean to say these spongioles know what they are doing." (P. 4.) Will Mr. Lees allow us to throw the light of the "Fire-fly" on this subject for a single moment? *Analogy* is that external similarity observable between the hops so gracefully festooning the poles at Knightsford-bridge and the scarlet-runners in Mr. Lees' garden: *affinity* is the relationship between those rambling scarlet-runners and the pale-blossomed dwarf-beans growing at their feet.

13. *Magazine of Natural History*.—No. 39 contains but one Entomological article of any length; this is entitled, "On the Structure of Annulate Animals, and its Relation to their Economy; by *Omega*." It is the second of a series of letters on the same subject, and evidently emanates from the pen of an individual who is thoroughly master of his subject.

14. *Illustrations of British Entomology; by J. F. Stephens, F.L.S.*—Mr. Stephens has completed the *Coleoptera* and commenced a supplement; the *Lepidoptera* will be finished in one more number. We believe the remaining classes will be published by subscription; we hear that a large number of Entomologists have already sent in their names.

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ART. XXXI.—*Varieties*.

13. *Eggs and Larvæ of Orgyia antiqua*.—A friend sent me a deposition of the eggs of *Orgyia antiqua*, which commenced hatching on the 21st of January, and have continued to evolve their larvæ until the present time (February 25); thus occupying the space of five weeks in completing the hatching of the whole brood. The majority of those that were hatched first are still alive, having eaten, since their evolution,



nothing but the top or lid of their respective egg-shells, which they devour, as do the larvæ of *Pieris Cratægi*.<sup>a</sup> I am aware that Redi, and other entomologists, have observed that such larvæ as have been prevented from casting their first skins, owing to the want of alimentary stimulus, will continue to live in a state of perfect abstinence for many months; but as the instances are few and extraordinary, I anticipate that this will be granted a corner in your Magazine.

JAMES FENNELL.

14. *Preservation of Caterpillars*.—It is, perhaps, to be ascribed to the mode of preserving caterpillars being so imperfectly understood, that they so seldom gain a place in the entomological cabinet. It unfortunately does not appear that Mr. Abbott, (the author of *The Lepidopterous Insects of Georgia*,) whom Mr. Kirby mentions as having been “remarkable for the admirable manner in which he prepared caterpillars, so as scarcely to differ from life,” has recorded the method he pursued. Not being acquainted with any professed entomologists, and, consequently, having only witnessed the plans adopted in the preservation of these creatures in our public museums, I know not whether the following directions may possess aught deserving of attention. If the caterpillar be hairy or spiny, enlarge the orifice of the anus, and from thence endeavour, by gentle pressure, performed with a smooth instrument, to squeeze out as much of the contents of the inside as possible; and while thus operating, let the subject be laid on a sheet of blotting paper, that the moisture exuded, being imbibed, may be prevented from wetting and spoiling the hairs or spines. This done, insert frequently fresh pieces of dry blotting paper, rolled round the end of a smooth piece of stick, and continue to do so, until the dryness of the paper, when retracted, indicates that no moisture remains within. Let the skin be now distended into its proper shape, by means of a stuffing of down, or other soft materials, (but not of sand, as recommended in some books,) taking the precaution of guarding against the attacks of destructive insects, by enclosing within a small quantity of camphor, cayenne pepper, and red oxide of lead; ingredients which, for this purpose, I have found very serviceable. In preserving

<sup>a</sup> And of many other Lepidoptera.—Ed.

smooth, hairless caterpillars, care must be taken that their colours be not removed by a too rough application of the absorbing instrument. A specimen of the larva of *Cossus ligniperda*, in my possession, is partly divested of its reddish tinge, in consequence of its having been grazed internally by the absorber, a circumstance which shews that the colouring matter of this species lies beneath the surface.

JAMES FENNELL.

15. *Spider*. It is well known that there is found, in the palace of Hampton Court, a very large species of spider, called there the "Cardinal." Mr. Jesse, in his delightful *Gleanings in Natural History*, says, that he has only met with it in that locality, and conjectures that they have received the above appellation from their having been first observed in Cardinal Wolsey's Hall. Pray what scientific name has been conferred upon this species; is it *Hampton-Courtiensis*, *Wolseyensis*, or what?<sup>b</sup>

JAMES FENNELL.

16. *Gossamer Spider*.—On the 2d of November, I observed, near Wednesbury, in Staffordshire, an unusual quantity of the floating spider-web, commonly known by the name of "gossamer;" and on carefully examining the ground, I found every object which projected above the level of the field, as bents of grass, sticks, and particularly stones, covered with an innumerable quantity of small spiders. On one stone alone there were more than seven hundred. These gossamer spiders are about a line in length, and black, with the exception of the palpi, which are bright red; and those of the male at least three times the length of those of the female.

R. F \* \* \* \* \*

17. *Larva of Tipula*.—Near Wednesbury is a field in which are two kinds of soil very distinct from each other; one is a loose light sand, the other a heavy marly clay. In the spring of 1827 this field was cropped with barley, but the sandy part of it was so completely infested with the *larvæ* of a large *Tipula*, that, before the end of May, the crop was

<sup>b</sup> We are ignorant in this matter, but hope that some entomologist will be so kind as to inform us.—ED.

wholly destroyed. The ground was then ploughed, and immense swarms of sparrows came and devoured the *larvæ* as the plough turned them up; it was then cropped with potatoes, and the *Tipula* disappeared. The clayey part of the field, to the very limit of the sand, entirely escaped the devastation; thus, apparently, proving the *Tipulæ* could not penetrate the clay.

R. F \* \* \* \* \*

18. *Chelifer Cancroides*.—The habits of that little oddity, the *Chelifer Cancroides*, seem to have puzzled entomologists; at least, I cannot discover that they can assign any reason for its attachment to flies' legs. Perhaps the following facts may suggest a few queries which might elicit some light on this curious subject.

Last summer I watched the manœuvres of a *Musca Domestica* that had one of these crab-like dependents attached to its *femur*. It was in the window of a cold and damp out-office. The fly appeared but little annoyed, and continued to travel tardily about the glass, while its hanger-on busily occupied its free claw in seizing such minute objects as came in its way,—at least such appeared to be its business. On attempting to catch the fly, off it flew to another window with its wingless passenger. I followed closely and quickly, when lo! the little appendix relaxed its grasp, and dropped itself into a crevice in the frame, where I secured it. Intending to experiment, I put it into a pill-box with a fly, to the leg of which it soon clung, and would, with its neighbour's help, have speedily escaped, had it not been prevented by shutting them up together till another opportunity. But next morning my curiosity was dead. On recollecting these facts, the following queries occur to my mind:

Does not the *Chelifer* experience inconvenience, in consequence of its construction, when it would be pursuing its prey? and does it not take advantage of the leg which the fly so readily offers that it may ride out on its hunting excursions, and, by the aid of the fly's legs and wings, get cheaply conveyed from place to place? Is not one of its claws especially adapted for this purpose? and are not the resorts of the fly those which furnish prey for its occasional companion? If so, do not these circumstances present an additional instance of

accommodating provision, which is so often most beautifully illustrated in the habits of insects? <sup>c</sup>

Denmark Hill.

G. MOORE.

19. *Metamorphosis of Ephemera*.—On a fine evening, towards the latter end of May, I was collecting in the neighbourhood of Brixton, near some ponds, when I was suddenly covered by a multitude of a small species of *Ephemera*,—I think the genus *Cloeon*. They settled on me apparently from my being the most conspicuous object near on which to undergo their final transformation. Their colour was of a dusky white, and opaque. They retained their position without moving, enabling me to observe beneath the glass the process by which these fragile creatures withdraw themselves from the comparatively cumbrous garment which envelopes their beautiful and aerial form.

Immediately on settling, the wings were laid flat at right angles with the body, and the insect remained about half a minute in a state of repose. A slight motion then appeared about the bases of the wings, which gradually collapsed, and were drawn alongside the *abdomen*. At this moment the insect resembled a piece of dirty cotton wool with little form. The elevated portion of the *thorax* now distended, and then gave way longitudinally, exhibiting the bright brown *thorax* of

<sup>c</sup> The *Chelifer cancroides* is very abundant throughout the year on planks and bricks that are placed on decayed vegetable matter, where it preys on minute Diptera, (*Molobrus*, *Scatopse*, &c.) *Lonchæa vaginalis*, a fly common in the same situations during the month of June, is particularly infested by it, and also by *Acari*, and may be often seen on windows with from one to four *Cheliferi* attached by the claw to its *trochanteres*, and apparently without sustaining any injury from them. The other day we put several of both into a bottle, and often, when the fly approached the *Chelifer*, the latter immediately extended one of its claws, and seized the fly by the end of the *tarsus*; with the other claw it grasped either the middle of the *tarsus*, or the costal nervure of the wing, and then loosened the hold of each of its claws alternately till it arrived at the *trochanter*, where it remained fixed. We added three other flies, belonging to the genera *Anthomyia*, *Sepsis*, and *Borborus*. The first, a much more active insect than the *Lonchæa*, was soon seized by a *Chelifer*. It used its utmost efforts to disengage its *tarsus* without success; however, the *Chelifer* soon relaxed its hold of its own accord. When we looked at the insects the following day, the *Lonchæa*, the *Anthomyia*, and the *Borborus* were alive, and only the first had a *Chelifer* attached to it; so, likewise, had the *Sepsis*, whose death was probably occasioned by confinement, not by any wound.—ED.

the insect, which was rapidly followed by the head and anterior legs. After this effort the insect rested a few seconds. The next discernible motion was in the two or three last segments of the *abdomen*, where the muscles were in violent agitation, evidently for the purpose of extricating the fine *setæ* which adorn that part. The contractions continued upward; and the wings, freed from their flimsy covering, were fully developed, and in an instant the delivered captive took its flight: the whole process strongly resembling the drawing off of a tight glove. The whole operation did not, in most cases, exceed three minutes; in some cases less. Scarcely an instant elapsed between the full development of the insect and its taking flight: so rapidly did they acquire consistency. In some few instances I observed them coupled, in which case they soon died. I made a dozen or so find their way into a phial; they instantly deposited their eggs and died: one only, which I believe was a male, survived when I reached home, less than one hour after.

The number of the insect was truly surprising: they covered every part of my apparel, and my face and hands were not exempt. On my arrival at home my hat looked like a miller's, from being completely covered with the *exuvix*. I had taken several of these insects during the evening, and had put them into pill-boxes; almost all, however, were immature, and died without undergoing their metamorphosis; from which it would appear, that light and a free atmosphere are essential to its accomplishment. The principal swarm, however, appeared about an hour before sunset, and, I presume, enjoyed their hour's existence in one of the finest sunsets of this glorious summer.

The remarkable, and, I believe, peculiar habit, of the *Ephemera* to undergo a quadruple metamorphosis, deserves more notice than it has obtained. The insect appears to possess all the faculties of the perfect insect prior to this last change: it is true it does not fly so readily, and it is apparently of a more yielding matter: if disturbed in this state, although inactive, they will escape. Can any of your correspondents inform me as to the prior state of this tribe, and the characters of the *larvæ* and *pupæ*?

A. H. DAVIS.

20. *Hymenopterous Insect parasitic on the Eggs of a Spider*.—A few days ago, on tearing open the bag or nest of the common geometric spider, I was very much surprised to find that, instead of eggs, it contained several empty *pupæ*-cases of one of the minute parasitical *Hymenoptera*, probably a species of *Mymar*, whose *larvæ* had evidently destroyed the brood of spiders. On a further search, I found that every spider's nest in its vicinity had been visited by the same parasite, and in one I detected a full grown *larva* of a Dipterous insect, most likely an *Exorista*, but, being unfortunately damaged in taking it out, I was unable to rear it. The eggs of those insects which leave them exposed are, it is well known, subject to the attacks of the *Mymares*, but I don't recollect an instance where either they, or the parasitical *Diptera*, have been noticed as depositing their "Cuckoo" eggs in those apparently so well secured as the spiders are by the thick and closely interwoven web which envelopes them. I will endeavour to detect the female *Mymar* ovipositing next summer, or at least to secure the perfect insect on its escape from the *pupæ*, for the examination of my friend Mr. Walker, whose contributions, in conjunction with those of Mr. Haliday, have thrown so much light on this hitherto neglected portion of the insect world.

March, 1834.

G. WAILES.

21. *Capture of Callicerus Spencii*.—In May last I took a single specimen in Battersea-fields, and for the last fortnight I have made many captures of this insect at this place, on the south side of hedges, by brushing; and shall be most happy to supply any of your friends with examples.

Croft, March, 1834.

G. T. RUDD.

22. *Asiraca pulchella*.—I have taken this insect, both males and females, in plenty, and not one of them agrees with the *Cicada crassicornis* of Panzer, as stated in your Magazine, Vol. I. p. 454. I have taken another species allied to, but distinct from either, near Oxford; and saw a second specimen, near Ugg-Mere, last season.

J. C. DALE.



23. *Carabus exasperatus*.—This insect is not *Carabus violaceus*. I have seen it alive in the Isle of Portland, and it is different from the *C. violaceus* I have seen elsewhere.

J. C. DALE.

24. *Lasioglossum tricingulum*.—This is certainly a different genus from *Halictus*, which may be seen by comparing the dissections in Curtis's plate.

J. C. DALE.

25. *Cerapteryx Hibernicus*.—This is, I believe, *Chareas Graminis*; but it is, at least, a fine and large variety, and Mr. Curtis is fully justified in his observations; he merely says, "it may be a new species."

J. C. DALE.

26. *Hippobosca Equina*.—In the Entomological Magazine, you have said that Mr. Curtis's figure of this insect is much too highly coloured; I beg to say that I have a specimen of the insect much more highly coloured than Mr. Curtis's figure.

J. C. DALE.

27. *Hister 4-maculatus*.—You are wrong in saying that the *Hister 4-maculatus*, of Curtis, is the *Hister sinuatus* of authors, and Mr. Curtis is right, for it certainly is the *H. 4-maculatus* of Linné, of Gyllenhal, and of Paykull. *H. sinuatus* does not belong to the same division; it has not, what has been termed, a marginal stria on the elytra, and is a smaller insect; its thorax is semiovate and truncated before, so that the sides are rounded, and the base very much broader than the fore part, and the apical tooth of the anterior *tibiæ* is bidentate. Does this, I ask, agree with Mr. Curtis's description or figure?

J. C. DALE.

Blandford, 21st May, 1834.

28. *Smiera Mac Leanii*.—Dalman, in describing *C. Melanaris*, ♀, says "There is a white spot on each side between the eyes; the anterior *tibiæ* are rufescent, pale at the base on the outside: thighs with a somewhat apical white lunule on both sides." If Dalman's insect, of which he took twenty specimens,

had been the opposite sex to mine, of which I have seen four, I should have suspected that they might be one species, but, even then, I should not have been justified in making them so with the above differences; and Dalman does not mention any varieties, neither do mine vary.

To J. C. Dale, Esq.

J. CURTIS.

[Our valued friends, Messrs. Dale and Curtis, can do us no more acceptable service, nor any for which we shall feel more truly obliged, than in thus pointing out what they consider our errors: their great experience will, among Entomologists, ensure respect for their opinions. Mr. Dale has entered into argument with us somewhat largely on the mode of our reviewing Mr. Curtis's work—this we suppress; but we have extracted, verbatim, *all* the supposed errors in our review which he points out; thus the reader will have both sides before him, and may judge for himself. We think Mr. Dale should, in the case of *Asiraca*, *Carabus*, and *Lasioglossum*, have given *proofs* of our being wrong; the simple assertion will, we fear, hardly carry conviction to the general reader.—ED.]

29. *Stylops Melittæ*.—On the 5th May, I took a male specimen of *Andrena nigro-ænea*, which was very evidently infested by a *Stylops*. I brought the bee home alive, and placed it, with flowers, beneath a tumbler; next morning I had the satisfaction to see that the parasite had emerged, and was in perfectly good condition. An examination of its thoracic segments has led me to the following conclusions: 1st. that the *prothorax* is a very slender segment, almost lost in the *mesothorax*, as in Diptera; 2dly. that the *mesothorax* is the same large and conspicuous segment as in Lepidoptera, Diptera, and Hymenoptera, having its *scutellum* (I use this word as it is usually understood in Diptera) remarkably elongate and developed: this segment bears the *pseudelytra* on its anterior portion laterally, yet the *prothorax* is so small that they appear to originate close behind the head; they appear the precise analogues of the tippets of Lepidoptera, and behind them originate the fore wings, which are large and spreading, and fold longitudinally: the *metathorax*

is a minor, but still very apparent segment; it protrudes on each side of the *scutellum* of the *mesothorax*, and bears a pair of crumpled, opaque, whitish hind wings, which are somewhat pedunculated, and much resemble the hind wings or *halteres* of Diptera; my friend, Mr. Walker, called my attention to these. The mouth I have not dissected; as far as may be ascertained without dissection, its mandibles are elongate, linear, and without any horizontal motion; its *maxipalpi* fully developed as in Diptera, but the *maxillæ* scarcely discernible; its *labium* distinct and triangular, as in Lepidoptera, but the *labipalpi* minute or obsolete. None of these characters seems sufficient to separate this genus from Diptera.

E. N. D.

30. *Bombus Regelationis*.—I found fine females of this beautiful bee, which, I believe, has not hitherto been recorded as British, feeding on the blossoms of the whortleberry, on the marshy summit of the Black Mountain. They were in great abundance, but exceedingly difficult to capture, owing to the high wind and the rapidity of their flight.

E. N. D.

31. *Sapyga prisma*.—Last autumn I observed the females of this rare insect in considerable numbers, settling on the leaves of a Morella cherry-tree in my father's garden. I captured two only. On Dinmore, the beautiful *Vicia sylvatica* is now in full flower, festooning many of the trees to the height of twenty or thirty feet; and, in some instances, completely hiding their own foliage. There are but few *umbelliferæ* in blossom; I have taken one *Pachyta octomaculata*; and *Atherix Ibis* is in profusion on the river banks, especially on the *Symphytum*, many beautiful varieties of which are in blossom, some of a splendid purple.

Leominster, 1st June.

GEORGE NEWMAN, Jun.

32. *Farmer's Magazine*, v. *Rusticus*.—Were *Rusticus* in England our pen would not be required to defend him: as it is, we offer the following to the inspection of our readers, simply to show, what appears to us, the unceasing desire to extinguish truth:

## FARMER'S MAGAZINE.

"It occurred to the experimentalist to attack these eggs, which he did by making a pretty strong brine, in which the seed was soaked for twenty-four hours, taken out, dried, and sowed; *the plants rose freely*, on which neither grub, fly, nor beetle was to be seen."

## RUSTICUS.

"I accordingly made some pretty strong brine, and soaked the seed in it for twenty-four hours; then dried it thoroughly, and with all the precautions I have mentioned above, I sowed it again, and with a kind of success—there was not a single fly, *but neither was there a turnip.*"

The plan of thus misrepresenting an author in good repute is now of every day occurrence: when pointed out, the commentator quietly eats his own words, laughing in his sleeve at the mischief he has done to a brother candidate for public favour, and apparently losing nothing in the esteem of those who would rather perish than be guilty of such actions.—ED.

33. *Metamorphosis of Insects*.—A paper on this subject, by Mr. Newman, has been read at the Linnæan Society; as its substance will eventually appear in this Magazine, either as original matter or as a review, we abstain from giving an abstract; its main object appeared to us to be the confirmation of the septenary system, as proposed in *Sphinx Vespiformis*.—ED.

34. *Bombus opening the Nectary of Flowers*.—I have observed the great humble bee, *Bombus terrestris*, extracting the honey from the nectaries of the common Columbine; and, as I think the *modus operandi* has not hitherto been in print, I will relate it. The bee settles on the outside of the flower, looking upwards, then bites a small hole in the nectary with its mandibles, and instantly thrusts its proboscis into the aperture. On examining a number of flowers, not less than 250, I found that at least two-thirds of them were thus perforated.

E. N. D.

35. *Entomological Club Dinner*.—This was solemnized at the Bull Inn, Birch Wood, on the 21st of May last. Mr. Davis took the chair, and we observed among the company Messrs. Bowerbank, Hanson, Walker, Newman, Walton, W. Christy, J. Christy, Hoyer, Letts, Bennett, Bevington, &c.

THE  
ENTOMOLOGICAL MAGAZINE.

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OCTOBER, 1834.

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ART. XXXII.—*Colloquia Entomologica.*

Γνωθι σεαυτον.

SCENE—*The Parlour at the Bull Inn, Birch-wood-corner.*

ERRO and ENTOMOPHILUS.

ENTOMOPHILUS, (*adjusting a wreath of Vicia cracca round Erro's head.*) There's a purple crown: have we not an arm-chair in the room? he must not sit on this footy affair: oh! yes, I'll place it on the table: there's a throne; come, mount up: next to the possession of great genius is the capability of discerning it, and the disposition of honouring it in others. Come, come, mount, and make a speech; prorogue the parliament.

ERRO. What! what! what! no, don't be silly, I'm not going to perch myself up there.

ENT. Ah! that's the way; talent is always wayward; I'll put the chair down then. Now, take this water-net in the right hand for a sceptre, and this box in the left, so; it's a globe, the emblem of universal sovereignty, that's it. There sits the king of entomology! the friend of the wise, the terror of all pretenders, the abstractor of Straus-Dürckheim, the Delta, the Omega, the Rusticus, the Editor, wit, and critic, of the Entomological Magazine. Oh king! live for ever!

ERRO.—

Ast illos centeni quemque sequuntur,  
Purpurei cristis juvenes auroque corusci.

ENT. Answering the address in Hebrew; that's all right.

ERRO, (*Taking off the crown and admiring it*)—

Illæ continuo saltus sylvasque peragrunt,  
Purpureosque metunt flores.

ENT. Your majesty is very condescending. Now, thank the contributors; speak of the overflow of contributions; thank the public for the increased sale; say that the profits of the Magazine will be given to the Hope Assurance Company.

ERRO.—

Hic Venus indigno nati concussa dolore,  
Dictamnium genitrix Crætæa carpit ab Ida,  
Puberibus caulem foliis et flore comantem  
Purpureo.

ENT. Sire, on behalf of my brother entomologists, I beg to thank your majesty for your continued good will, so warmly expressed, and to assure your majesty of our undiminished regard and obedience.

ERRO. It could not be the *Dictamnus*, after all. See, they begin to droop already.

Purpureus veluti cum flos succisus aratra  
Languescit moriens; lassove papavera collo  
Demisere caput, pluvia cum forte gravatur.

ENT. Another speech! that will do, Roey.

ERRO. You have never got me seeds of the Dinmore-hill vetch, *Vicia sylvatica*. I want it for my garden.

ENT. Oh! don't try to gardenize it: it is beautiful in the woods, where its graceful festoons glow with a thousand bunches of bloom, delicately tinted; but in a garden with prim brick walls, it would fret, pine, droop, dwindle, and die: don't try it.

ERRO. What! why not? it would climb the trellis-work, and I should guide it and train it with *Lophospermum* and *Maurandya*, managing them so as to make a blaze of bloom.

ENT. It would not grow, indeed, Roey; or, if it did, it would smother the *Maurandya*, and break down the trellis.

ERRO. The *Gladiolus Byzantinus* is a very favourite flower of mine. I am sure it is Ovid's Hyacinthus.

Talia dum vero memorantur Apollinis ore,  
Ecce cruor qui fusus humi signaverat herbam,  
Desinet esse cruor: Tyrioque nitentior ostro  
Flos oritur; formamque capit quam lilia: si non



Purpureus color huic, argentius esset in illis.  
 Non satis hoc Phœbo est: is enim fuit auctor honoris,  
 Ipse suos gemitus foliis inscribit; et AI, AI  
 Flos habet inscriptum.

ENT. I hope you are entertained.

ERRO. The AI AI are just the white marks which the gladiole or cornflax, whichever you call it, bears on the lower petals, and the "Vaccinia nigra," in "Formosum pastor Corydon," is the same flower. Old Heyne says, "Vaccinia nigra esse eundem florem cum Hyacinthis poetarum;" and Duncan the same,—"Melius cum Turnebo et Salmasio dicemus Hyacinthum esse." "Martinus," says Heyne, "Hyacinthum poetarum lilium floribus reflexis sive Martagon esse putet;" the *common Martagon lily*: but this could not be; for we find in Theocritus, "Καὶ τὸ ἶον μέλαν ἐντὶ καὶ ἄγραπτα ὑακίνθος," which will not suit the Martagon: but all these things must remain doubtful. Some commentator even says, that the Narcissus of the ancients was our common red Valerian!

ENT. What think you was the Narcissus?

ERRO. The Narcissus of Ovid was certainly our Narcissus or Daffodil; the yellow centre, with the white petals round it, is very accurately described.

Croceum pro corpore florem  
 Inveniunt foliis medium cingentibus albis.

ENT. Roey, I must learn French.

ERRO. Ovid's Narcissus is a beautiful story.

Nec vigor, et vires, et quæ modo visa placebant,  
 Nec corpus remanet, quondam quod amaverat Echo;  
 Qui tamen ut vidit quamvis irata memorque  
 Indoluit; quotiesque puer miserabilis "Eheu"  
 Dixerat; hæc resonis iterabat vocibus "Eheu."

ENT. I must learn French; I know it must be useful—yes, I must learn it—I must, indeed—between ourselves, on purpose to puff myself in the French Magazines.

ERRO. M. Entomophilus a publié dans le Magasin Entomologique un traité sur l'Ostéologie des Insectes; ce savant a déployé la plus grande erudition et un génie vraiment étonnant.

ENT. I catch the idea of all that; it's about gardening; my mind's eye pictures you in a straw hat, half way up a little ladder, with a pair of scissors cutting off faded flowers and

withered leaves: now, was not that conveyed in what you have been saying?

Oh! could we do with this world of ours  
 As thou dost with thy garden bowers,  
 Reject the weeds and keep the flowers,  
 What a heaven on earth we'd make it!  
 So bright a dwelling should be our own,  
 So warranted free from sigh or frown,  
 That angels soon would be coming down,  
 By the week, or month, to take it.

Like those gay flies that wing through air,  
 And, in themselves, a lustre bear,  
 A stock of light still ready there,  
 Whenever they wish to use it;  
 So, in this world, I'd make for thee;  
 Our hearts should all like fire-flies be,  
 And the flash of wit and poesy  
 Break forth whenever we choose it.

ERRO. Would that my life were synchronous with such a blissful world; but, alas! how different is ours! Look on our entomological world, how barren the minds, not only of all wit and poesy, but of all greatness, and nobleness, and goodness! Ambulator, Hanson, Bird, and one other, are the only entomologists to whom I feel bound by any ties of kindred feeling, affection, or gratitude. The fourth shall be nameless; it is not well to detail the whole list of one's friends to every one with whom one may chance to have a gossip. (*Continues musingly and half aside.*)

Te vero mea quem spatiis propioribus atas  
 Insequitur, venerande puer, jam pectore toto  
 Accipio, et comitem casus complector in omnes.  
 Nulla meis sine te quæretur gloria rebus;  
 Seu pacem seu bella geram: tibi maxima rerum  
 Verborumque fides.

ENT. Come, I'll have nothing said against the Society, underhand: it is going down; I was at the meeting on Monday; there were not a dozen members present, and half of those wore visages I had never seen before; I went with Marshall, one of the good old school.

ERRO. I once hoped that the Entomological Society would have been the means of uniting entomologists into one body, and called forth kindlier feelings among us. I looked for

bread and discovered a stone; I sought for Antirrhodus and I found Scylla; I expected an isle of gardens, and I beheld a barren and dangerous rock: "it is as the mist of the valley in the desert, seen afar off by some thirsty traveller, and when he cometh thereto, he findeth nothing to drink." Had I the means, I would leave England for a few years, and bury myself in the woods of America, in the hope that, when I returned, I should find that entomologists had recovered their senses. Oh, America!

ENT. I am firmly persuaded, from what I see of the working members of its council, that the Entomological Society will retard, not advance, entomology. How differently I thought, how differently I spoke, nine months ago!

ERRO. "Totum per annum est aer instar aeris verni; ubivis sunt floridi campi, montes sylvescentes, rivi perennes, cœlum hilaritate et lætitia plenum."

ENT. My dear friend, on this subject, you may surely speak the vernacular.

ERRO. Palmarum feracissima regio, cœlo sereno. Nihil quietius, nihil muscosius, nihil amœnius.

ENT. Oh, envy! envy!

ERRO. How singular it is to see envy for ever watching the opportunity to transfer merit from one to another, thus endeavouring to diminish the actual amount.

ENT. Yet talk not of leaving us; there *are* good spirits, though very, very few, who have not turned their backs on the cause of truth.

ERRO. I may not go; yet life is to me of little value, now that its darling hope is crossed; I could say with Gray, whilst regarding the setting sun—

O! ego felix, vice si nec unquam  
 Surgerem rursus, simili cadentem  
 Parca me lenis sineret quieto  
 Tollere leto.

Fame, once my load-star, now no longer leads me.

Donec eram sospes tituli tangebar amore,  
 Quærendique mihi nominis ardor erat.

ENT. Roey, you mistake. A ruling passion never yields its sway, and the love of fame is with you a ruling passion; the possession to satiety could alone smother it. Say not that fame no longer leads, no longer influences: does a man who

is not in love prate of his *Dulcinea*? Our bosoms beat not with the hopes of our fathers, neither will those of our children echo the throbbings of our own; yet each individual bosom is ever faithful to its own aspirations. What do you think of when alone? for that is the test. Sweet is the smile that succeeds to weeping; sweet is the sun-gleam following a shower; sweet is the song of the nightingale at moonlit midnight; sweet, very sweet, is the voice of those we love; but sweeter by far is that perfectly uninterrupted solitude when we sit the centre of a halo of thought, when the mind asserts its empire, proclaims its power, and, unfettered, dashes onwards whithersoever it will. Fame, Roey, is your happiness, even though at present principally prospective; but, on that ground, none the less supreme; for, let me tell you, a principal character of happiness is stability, and that is the most unsullied which casts into futurity the longest shadow; whereas, unaccompanied by the idea of stability, all happiness, though obvious, sunny, and glaring, like the great pyramid at noon, is unsatisfactory, because, like that also, shadowless. Talk not to me of disappointed hopes; talk not to me of mankind, as though your knowledge of them was a painful and afflicting burden. Would you, I ask, unknow all that you know of man, just to believe the world better than it is? If there were placed within your reach a cup of the waters of *Lethe* that would instantly wash away all traces that good and evil had for a series of years impressed, and leave the mind a perfect vacuum, would you drink it? No! I answer for you, for I know you better than you know yourself. Let me once more entreat you to indulge less in idle speculation and morbid thought; you, who might astonish the world, are wasting your hours, days, and years, while you see—

ERRO.—

When cold in the earth lies the friend thou hast loved,  
 Be his faults and his follies forgot by thee then,  
 Or if, from their slumber, the veil be removed,  
 Weep o'er them in silence and close it again.  
 But, oh! if 'tis pain to remember how far  
 From the pathways of light he was tempted to roam,  
 Be it bliss to remember, that thou wast the star  
 That arose on his darkness and guided him home.

ENT. How beautiful! alas! I have no such power.

ERRO. Moore's versification is exquisite; it has a charm that seems almost mysterious; in what consists the sweet flow of his lines? I wish I was not so fond of poetry; I love it with enthusiasm; yet, to please you, I will give it up, and make up my mind to follow severer studies;—

Ite hinc, Camænæ, voce mellite divæ  
 Dulces Camænæ, nam fatebimur verum  
 Dulces fuistis; sed tamen meas chartas  
 Revisitote sed pudenter et raro.

So says old Virgil, and thereto I say, amen! I mean, some day or other, to be able to say—

Jamque opus exegi: quod nec Jovis ira, nec ignes,  
 Nec poterit ferrum, nec edax abolere vetustas,  
 Cum volet illa dies, quæ nil nisi corporis hujus  
 Jus habet, incerti spatium mihi finiat ævi.  
 Parte tamen meliore mei super alta perennis  
 Astra ferar: nomenque erit indelibile nostrum.

That would please even you, "my guide, philosopher, and friend."

ENT. Do you recollect, in this very room, two years ago this autumn, calling my "Sphinx" a monument, or something like that? Well, when my uncle was in America, he called on Thomas Say.

ERRO. Indeed! I should call that a "non sequitur."

ENT. Um! should you; I tell you it's a positive truth. My uncle was much delighted with Say; he was dressed in the homeliest manner, and appeared to be living in a state of patriarchal simplicity, but full of information, and his heart overflowing with boundless benevolence; and he was reading—guess what.

ERRO. Mrs. Trollope, I guess, or Malthus?—Adam Smith?—Hogg, on Sheep?—I give it up then.

ENT. "Sphinx Vespiformis;" he was pondering over the musings of your friend.

ERRO. Capital. I had long been bent on discovering the system of nature, when I saw your system first on paper, and I immediately exclaimed *ευρηκα*; as I have gone somewhat more minutely into detail, I have had occasional misgivings as to parts, but nothing affecting the main theory, especially the centrality of groups. I am inclined to think that we at present know so little of nature that we cannot make a very

near approach to truth ; but we may gather, here and there, some scattered rays which may help us in our search : did we possess a knowledge of the major parts of the productions of nature, we might possibly, by paying strict attention to internal as well as external conformation, and by placing together species, genera, and higher divisions, whenever we detected a relationship, thus covering some immense place with the objects themselves, and having them all under view at once, we might possibly make a near approach to, if not actually discover, the true natural position of each and all. How delicious to the theorist, to see creation thus arrayed, like a huge army, before him. I think I have said, somewhere, that that system is the most natural which preserves the most affinities, and breaks the fewest.

ENT. Were it not still better to arrange them before the mental eye ; that eye, whose gaze stops not with space, whose vision is uninterrupted by material grossness. Often, often the waking dreams of the night-watches of my childhood have presented to my imagination the picture you describe ; and now, now creation spreads itself before me, and each being that lives, each being that I have seen, or heard of, or read of, or thought of, or dreamt of, assimilates with its kind and assumes its appointed place : all is harmonious and glorious order ; and the mind gazes in exstasy, till, inebriated with thoughts of delight, it dances before the phantom it has raised.

ERRO. I believe it.

ENT. "Sphinx Vespiformis" gained me much ill-will.

ERRO. To be sure it did ; it set so completely at defiance the quackery of the day ; "and," says Bacon, "all men oppose with intense hatred him who first proposes an important alteration or evident improvement, because the very act implies that they have been previously in blind error ; and, moreover, the sudden unexpected appearance of such a work conveys to them the humiliating assurance that the author has not considered the knowing ones worth consulting on the subject. Genius has thus ever engendered envy and dislike among the minors, and has consequently been always, in some degree, a bar to fame. Let in the light upon a nest of young owls, and they forthwith cry out against the injury you have done them. Men of mediocrity are young owls ; when you present them with strong and brilliant ideas, they instantly



exclaim against them as false, dangerous, and deserving of punishment. Every abuse attempted to be reformed is the patrimony of those who have more influence than the reformers. He who would be great must go alone; he must not stop to curry favour here and there with every commentator. The hope to please all is the diseased yearning of a cold, selfish, and contracted heart."

ENT. *Does Bacon say all that?*

ERRO. I won't be certain that the passage is entirely Bacon's, but I think you will find some of the ideas in his works.

ENT. Roey! why always use the language of others?

ERRO. Because it is less trouble to employ the words of others, than to fit expressions to my own ideas; and because I can think nothing, express nothing, that has not before been thought and expressed far more beautifully: but I mean to copy you, in being original. [? ED.] I feel that, as the flame of that candle rises to the cigar which you are holding over it, so does my soul grow upwards to the stature you wish it to attain.

ENT. Change the subject, Roey, my heart is overflowing. How truly it is said, that the heart is ever ready to open to the heart that opens in return!

ERRO. Changed it is. You are wrong in the honey-bee paper, which you wrote for me, in saying, that our love of nature is less intense when the other love is gone. I once thought as you say, but I don't now. Love, commonly so called, is a meteor's light; the love of nature is like the light of a

Polar day, which will not see  
A sunset till its summer's gone:

it is a flame, only dying with our reason; the other only lives till our reason awakes, and tells us that what we love in another is only the fancied image of our own mind:—

Of its own image is the mind diseased.

I love nature more and more, man less and less; yet I do love mankind, though I would rather live in a desert than with the common run of men. Oh! I can recollect with intense pleasure the scenes we visited together in Wales, when, as

you say (quizzing me, I know), that the stored-up treasures of by-gone ages overflowed in a tumult of quotation: and it is true; the scenery called it forth; yes! I remember those scenes with more intense pleasure than when I witnessed them. Oh! that I were now on Snowdon's shaggy side, with one friend to whom I could whisper, "solitude is sweet."

ENT. Should you live until you have a beard on your face, your Platonic discourses will be very fine, about outliving love, and so forth; at present, they appear rather out of joint with time. What other criticisms have you for me? what other errors have you found?

ERRO. I have enough to do to criticise others, without finding fault with my contributors, and in *that* I can't give satisfaction; Swainson and W. Christy have both been written to by James Wilson, about his *Entomologia Edinensis*. Now, it's brother John, the magnifico, the Christopher North of Blackwood's Magazine, that I'm afraid of; if we offend him, he will annihilate us with his knout. What shall I do? I'd make any apology.

ENT. I should have thought you had had enough experience in making apologies already.

ERRO. True; I don't excel, I believe, in that species of composition.

ENT. People who excel in apologies excel in nothing else.

ERRO. I am heartily tired of the editorship. My first number cost me fourteen pounds in weight; my second eight pounds; and my Midsummer number fifteen pounds; before the volume is complete, I shall be a second living skeleton. I knew myself to be unfit from the first. "Mea semper fuit in hac re voluntas et sententia; quemvis ut hoc mallet de iis qui essent idonei suscipere quam me; me ut mallet quem neminem." I wish you had kept it.

ENT. Thank you, very cordially; but I do not feel sufficiently Quixotic to take the helm of the Fire-fly at the present crisis; besides, it's too much trouble, this hot weather, to contend with the malcontents. I'll take my copies, but no more trouble.

ERRO. But, about Wilson.

ENT. Be under no alarm about that: a regular scarifying from North would be an advertisement; he hawks not at ignoble game; lions prey not on mice; if Christopher do

throw down the gauntlet to you, it will be a proof that he considers you no unworthy foe; and as you, Roey, are a man of peace, you will confer an everlasting obligation on me by allowing me to take it up.

ERRO. You must be Editor again, next year.

ENT. Not I! The most suitable man in the club is my friend, Entex. I understand all eyes are turned to him for the third volume.

ERRO. Our entomological papa: that's good news!

ENT. It's a most profound secret; he would not have it known for the world. His other work is to be quarterly now.

ERRO. But I may have judged too hastily of the Entomologia Edinensis; it is really a work of some—some—

ENT. Some what?

ERRO. Some industry.

ENT. Pooh! My cigar is out.

ERRO. I should think, from the pile of ashes before you, that must be the twentieth, at least, since supper; is it the last? it must be growing late.

ENT. The passage of time is voiceless and imperceptible; the hours usually pass briskly when we meet at this enchanted spot. Suppose we take a draught of purer air, and then to bed. (*Goes to the window, and opens it.*) Mercy on us, it is daylight still!

ERRO. What, what! is it evening still? No!

Hâc vice sermonum roseis Aurora quadrigis  
Jam medium æthereo cursu trajecerat axem.

ENT. What a sky, Roey! ten thousand times ten thousand fleecy clouds, the sunward edge of each irradiate with rosy light, and all in squadron formed; scattered and separate each from each above our heads; but clouded and huddled at the horizon, and there more glorious than molten gold, and arranged all in due order; avenues of purest blue immaculate mark out the limits of each legion; avenues all tending to a point, that point the coming sun. Man is, indeed, a worm!

ERRO.—

Aurora interea miseris mortalibus almam  
Extulerat lucem, referens opera atque labores.

Let us, then, to the woods, and renew *our* toil.

ENT. To-morrow, Roey, by steam to Edinburgh ; but let us stay here as long as we can, and now—

Hie away ! to the woods, hie away !  
 Aurora with crimson has tinted the sky,  
 And the blithe lark, the herald of day,  
 Is pouring his music around from on high.  
 Hie away ! to the woods, hie away !

Hie away ! to the woods, hie away !  
 Field, flower, and forest, all glitter with dew,  
 And there droops, on its elegant spray,  
 The harebell, arrayed in its beautiful blue.  
 Hie away ! to the woods, hie away !

It is not the first time that we have made a door of this window.

ERRO. And the other doors will be fastened now. (*He takes up the nets.*)

Et jam prima novo spargebat lumine terras  
 Tithoni croceum linquens Aurora cubile :  
 Jam sole infuso, jam rebus luce retutis  
 Turnus in arma viros, armis circumdatus ipse  
 Suscitat.

(*Exeunt through the open window.*)

ART. XXXIII.—*Monographia Chalciditum.* By FRANCIS WALKER.

(*Continued from p. 309.*)

“ ——— the green myriads in the peopled grass.”

GENUS VIII.—PLATYTERMA.

Sp. 7. Plat. incultum. Mas. P. prasini *statura, antennis fuscis, alis subhyalinis.*

Viride : oculi ocellique rufo-fusci : antennæ pallidè fuscæ, corporis dimidio longiores, subtus fulvæ ; articulus 1<sup>us</sup>. lætè flavus ; clava obscurè fusca : abdomen thorace paullò longius ; discus obscurè cupreus : sexualia fusca : pedes lætè flavi ; coxæ virides ; tarsi apice fusci ; protarsi fulvi : alæ subhyalinæ ; squamulæ et nervi flava ; stigma pallidè fuscum, minutum. (Corp. long.  $\frac{5}{4}$  lin. ; alar.  $1\frac{1}{4}$  lin.)

September ; near the Land's End, Cornwall.

Sp. 8. Plat. comptum. Fem. P. terminali *simile*, caput et abdomen latiora, antennæ obscuriores.

Lætè æneo-viride: caput thorace latius: oculi ocellique rufo-fusci: antennæ fuscæ, corporis dimidii longitudine; articulus 1<sup>us</sup>. basi flavus: metathorax viridis: abdomen viride, elongato-ovatum, thorace paullò longius et latius, subtus non angulatum; discus cupreo-æneus: pedes pallidè flavi; coxæ virides; tarsi apice fusci; protarsi flavi: alæ hyalinæ; squamulæ et nervi pallidè flava; stigma minutum. (Corp. long. 1 lin.; alar. 1½ lin.)

July; on grass in fields; near London.

Sp. 9. Plat. femorale. Mas et Fem. *Viride, antennis fulvis apice fuscis* (mas) *aut fuscis* (fem.), *pedibus flavis*, fem. *femoribus viridibus, alis hyalinis*.

*Mas*.—Lætè viride: caput thoracis latitudine: oculi ocellique rufo-fusci: antennæ fulvæ, corporis dimidii longitudine; articulus 1<sup>us</sup>. flavus; 2<sup>us</sup>. supra et clava fusca: abdomen æneo-viride, nitens: sexualia fulva: pedes lætè flavi; coxæ virides; tarsi apice fusci; protarsi fulvi: alæ hyalinæ, paullò flavescentes; squamulæ et nervi flava; stigma minutum.

*Fem*.—Viride: antennæ fuscæ; articulus 1<sup>us</sup>. fulvus; 2<sup>us</sup>. viridis, apice fuscus: abdomen lætè viride, thorace vix longius, subtus non angulatum; segmenta apice cuprea: femora viridia, apice flava; meso- et metatarsi apice nigro-fusci: alæ fulvescentes; squamulæ et nervi fulva; stigma pallidè fuscum, minutum. (Corp. long. ½—1 lin.; alar. ½—1½ lin.)

*Var. β*.—*Mas*, antennæ articulis 11°. basi et 13°. apice fulvis.

*Var. γ*.—*Mas*, caput cyaneo-viride.

*Var. δ*.—*Mas*, antennæ clava fulva.

*Var. ε*.—*Mas*, abdomen viride.

*Var. ζ*.—*Mas*, abdomen viride; discus cupreo-viridis.

*Var. η*.—*Mas*, cyaneo-viride: abdominis discus æneo-viridis.

*Var. θ*.—*Mas*, abdominis discus cupreus.

*Var. ι*.—*Mas*, caput et thorax cyaneo-viridia, illum inter oculos et hujus scutum posticè æneo-viridia; abdomen viride; discus cupreus.

*Var. κ*.—*Fem*. antennæ articulo 1°. supra fusco.

*Var. λ*.—*Fem*. antennæ articulo 2°. viridi-fusco.

*Var. μ*.—*Fem*. antennæ articulo 1°. supra viridi-fusco.

*Var. ν*.—*Fem*. abdominis discus cupreo-æneus.

*Var. ξ*.—*Fem*. abdominis segmenta apice cyaneo-cuprea.

*Var. ο*.—*Fem*. femora et tibiæ fulva.

*Var. π.*—*Fem.* abdomen cupreo-æneum, basi apice que viride; segmenta nonnulla basi cyanea: alæ vix fulvescentes.

*Var. ρ.*—*Fem.* alæ omninò perlucidæ.

*Var. σ.*—*Fem.* thoracis dorsum æneo-viride: stigma fuscum.

*Var. τ.*—*Fem.* thoracis latera, abdomen subtus et femora æneo-viridia.

April to September; on grass in fields; near London. June; Windsor. June and September; Isle of Wight. September; Westmoreland and Cumberland; Penzance, Cornwall. New Lanark, Scotland.

Sp. 10. Plat. decorum. Mas et Fem. *Viride, abdomine purpureo, antennis fulvis (mas) aut fuscis (fem.), pedibus flavis, alis griseo-hyalinis.*

*Mas.*—Lætè aureo-viride: caput thorace vix latius: oculi ocellique rufo-fusci: antennæ fulvæ, corporis dimidio paullò breviores; articulus 1<sup>us</sup>. lætè flavus, apice fulvus; 2<sup>us</sup>. basi pallidè fuscus; clava obscurè fusca, apice pallidior, articulo 10<sup>o</sup>. paullò latior: caput anticè mesothoracisque scutellum apice viridia: abdomen thorace paullò longius, basi cupreo-viride; discus splendidè cupreo-purpureus: sexualia pallidè fusca: pedes lætè flavi; coxæ virides; tarsi apice fusci; protibiæ et protarsi fulvæ; alæ griseo-hyalinæ; squamulæ flavæ; nervi fusci; stigma minutum.

*Fem.*—Obscurè viride: antennæ fulvo-fuscæ, corporis dimidio multò breviores; articulus 1<sup>us</sup>. fulvus; 2<sup>us</sup>. fuscus: abdomen obscurè purpureum, thorace multò longius et paullò angustius, basi lætè cupreo-viride, subtus æneo-viride angulatum, apice concolor attenuatum acuminatum pubescens. (Corp. long.  $1\frac{1}{4}$ — $1\frac{1}{3}$  lin.; alar.  $1\frac{1}{2}$ — $1\frac{5}{4}$  lin.)

July and August; on oak trees; near London.

Sp. 11. Plat. remotum. Fem. *Præcedentibus latius et brevius.*

Lætè viride: caput thoracis latitudine: oculi ocellique rufo-fusci: antennæ fulvæ, corporis dimidii longitudine; articulus 1<sup>us</sup>. pallidior; clava obscurior: parapsidum suturæ æneo-virides: abdomen obscurè cupreo-æneum, thoracis longitudine et latitudine, basi lætè viride, subtus angulatum, apice acuminatum; segmenta basi viridi-ænea: pedes lætè flavi; coxæ virides; femora basi, meso- et metatibiæ medio pallidè fusca: tarsi apice fusci: protibiæ et protarsi fulvæ: alæ hyalinæ, minimè sub costam flaves-



centes; squamulæ et nervi flava; stigma minutum. (Corp. long.  $\frac{4}{7}$  lin.; alar.  $1\frac{1}{3}$  lin.)

July; on grass in fields; near London.

GENUS IX.—AMBLYMERUS.

Sp. 4. Amb. ruralis. Fem. A. valido *paullò minor et angustior; alæ obscuriores.*

Æneo-viridis: caput viride, thorace paullò latius: oculi ocellique rufo-fusci: antennæ fuscæ; articulus 1<sup>us</sup>. flavus: abdomen obscurè cupreum, thorace paullò longius, subtus angulatum; segmentorum margines basi et utrinque lætè virides: oviductus pallidè rufus, abdominis apicem non transiens: pedes pallidè fulvi; coxæ æneo-virides; genua, tibiæ apice tarsique pallidè flava, hi apice fusci; protarsi flavi: alæ subfulvæ; squamulæ et nervi fulva; stigma minutum. (Corp. long.  $\frac{3}{4}$ —1 lin.; alar.  $1-1\frac{1}{4}$  lin.)

Var.  $\beta$ .—Antennæ articulo 1<sup>o</sup>. fusco, basi subtusque flavo.

Var.  $\gamma$ .—Abdomen ferè omne nigro-cupreum; segmentum 1<sup>um</sup>. basi lætè viride.

August; on grass beneath trees; near London. September; Isle of Wight; New Lanark, Scotland.

Sp. 5. Amb. campestris. Fem. *Præcedenti similis, paullò brevior; clava angustior et acutior.*

Æneo-viridis, vix nitens: caput viride, thorace paullò latius: oculi ocellique rufo-fusci: antennæ fuscæ; articulus 1<sup>us</sup>. flavo-fulvus, basi flavus: abdomen nigro-cupreum, thorace vix longius, subtus non angulatum; segmenta basi lætè viridia: pedes fulvi; coxæ æneo-virides; protibiæ pallidè fulvæ, subtus flavæ; tarsi apice fulvi; meso- et metatarsi straminei: alæ subfulvæ; squamulæ et nervi fulva; stigma parvum. (Corp. long.  $\frac{1}{2}$  lin.; alar.  $\frac{5}{4}$  lin.)

Var.  $\beta$ .—Protibiæ omninò flavæ: meso- et metapedum genua tibiæque apice straminea.

August; on grass in fields; near London.

Sp. 6. Amb. latus. Fem. *Viridis, A. dubii statura, clava angustiore, antennis fuscis, pedibus flavis, alis subhyalinis.*

Viridis: caput thoracis latitudine: oculi ocellique rufi: antennæ obscurè fuscæ; clava pallidior; articulus 1<sup>us</sup>. fulvus: abdomen

thorace paullò longius, subtus non angulatum; discus nigro-æneus; segmenta 2<sup>o</sup>. ad 4<sup>um</sup>. cyaneo cingulata: pedes lætè flavi: coxæ virides; meso- et metatarsi straminei, apice fuscis; protarsi apice fulvi: alæ subhyalinæ, vix flavescentes; squamulæ fuscæ; nervi flavi; stigma parvum. (Corp. long. 1 lin.; alar. 1½ lin.)

September; Isle of Wight.

Sp. 7. Amb. truncatellus. Fem. *Æneo-viridis, præcedentibus multò brevior, antennis obscure fuscis, pedibus flavis, alis hyalinis.*

*Æneo-viridis*: caput thorace paullò latius: antennæ obscure fuscæ, corporis dimidio vix longiores; clava pallidior; articulus 1<sup>us</sup>. basi flavus: oculi ocellique fusco-rufi: abdomen viride, basi nitentius et cupreo variegatum, thorace paullò angustius vix longius, subtus angulatum; discus æneus: pedes flavi; coxæ æneo-virides; metafemora extus et mesotibiæ intus fulva; meso- et metatarsi straminei, apice fuscis; protarsi apice fulvi: alæ hyalinæ; squamulæ et nervi flava; stigma minutum. (Corp. long. ½ lin.; alar. ¾ lin.)

July; on grass in fields; near London.

Sp. 8. Amb. fulvipennis. Fem. *Cupreo-æneus, ferè A. validi statura, antennis fuscis, pedibus fulvis, alis fulvis.*

*Cupreo-æneus*: caput viridi-æneum, thorace paullò latius: oculi ocellique rufo-fuscis: antennæ obscure fuscæ, corporis dimidio vix breviores; articulus 1<sup>us</sup>. fulvus: abdomen cupreum, breve, latum, thoracis longitudine, subtus angulatum; discus obscurior: pedes fulvi; coxæ cupreo-æneæ; meso- et metatarsi flavi, apice fuscis: alæ fulvæ; squamulæ et nervi fusca; stigma minutum. (Corp. long. 1 lin.; alar. 1½ lin.)

*Var. β.*—Abdomen basi viridi-æneum: tibiæ apice basique flavæ: squamulæ et nervi pallidè fusca.

June; on grass beneath trees; near London; New Forest, Hampshire.

Sp. 9. Amb. modestus. Fem. *Viridis, præcedentis ferè statura sed minor, antennis nigro-fuscis, abdomine plerumque æneo, pedibus fulvis, alis fuscis.*

Obscurè viridis: caput thorace latius: oculi ocellique rufo-fuscis: antennæ nigro-fuscæ, crassæ, corporis dimidio breviores; articulus

1<sup>us</sup>. fulvus: abdomen viridi-æneum, thorace non longius sed multò latius, subtus non angulatum, basi nitentius: oviductus rufus: pedes fulvi; coxæ virides; femora fusca, apice fulva; meso- et metatarsi flavi, apice fusci: alæ fuscæ; squamulæ et nervi fulvo-fusca; stigma parvum. (Corp. long.  $\frac{1}{2}$ — $\frac{5}{4}$  lin.; alar.  $\frac{3}{4}$ —1 lin.)

*Var. β.*—Antennæ fuscæ; articulus 1<sup>us</sup>. fulvus, apice fuscus.

*Var. γ.*—Antennæ subnigræ; articulus 1<sup>us</sup>. obscurè fuscus, basi fulvus.

*Var. δ.*—Antennæ articulo 1<sup>o</sup>. omninò fusco.

*Var. ε.*—Antennæ articulo 1<sup>o</sup>. apice fusco: abdomen nigro-viride, basi æneo-viride nitentius.

*Var. ζ.*—Antennæ articulo 1<sup>o</sup>. fulvo-fusco: abdomen viride; discus nigro-viridis: pedes flavi; femora fulva; meso- et metatarsi straminei, apice fusci: alæ subfuscæ.

*Var. η.*—Antennæ articulo 1<sup>o</sup>. fusco, basi fulvo: abdomen obscurè æneo-viride; discus cyaneo-cupreus: alæ subfuscæ.

*Var. θ.*—Abdomen cupreo-æneum, basi viride nitentius, apice æneo-viride.

*Var. ι.*—Abdomen nigro-æneum, basi æneo-viride nitentius: femora omninò fulva.

*Var. κ.*—Abdomen basi æneo-viride: femora fulva; protibiæ et protarsi flava.

*Var. λ.*—Cyaneo-viridis: abdomen obscurè viridi-cyaneum, basi æneo-viride.

*Var. μ.*—*Var. λ* similis: femora fulva: alæ subfuscæ.

*Var. ν.*—Antennæ articulo 1<sup>o</sup>. flavo: protibiæ et protarsi flava: abdomen æneo-viride, basi viride: femora fulva.

*Var. ξ.*—Abdomen nigro-æneum, basi apiceque viride: femora fulva; protibiæ et protarsi flava: alæ fuscæ; discus obscurior.

*Var. ο.*—Obscurè viridi-æneus: abdomen nigro-æneum, basi apiceque æneo-viride: femora fulva.

*Var. π.*—Abdominis segmenta basi nigro-cyanea: femora fulva; alæ subfuscæ.

*Var. ρ.*—Antennæ fuscæ; articulus 1<sup>us</sup>. apice fuscus: abdomen viride; discus cyaneo-cupreus: pedes flavi; meso- et metatarsi straminei, apice fusci: alæ subhyalinæ.

*Var. σ.*—Æneo-viridis: antennæ nigræ; articulus 1<sup>us</sup>. nigro-fuscus, basi fulvus: abdominis segmenta apice nigro-cyanea: pedes fusci; tarsi flavi, apice fusci; genua et protarsi fulva: alæ subfuscæ.

August; on grass in fields; near London. September; Isle of Wight; Westmoreland and Cumberland; Land's End, Cornwall; New Lanark, Scotland.

Sp. 10. Amb. fuscipes. Fem. *Viridi-æneus*, A. amœni *statura, abdomine cupreo-æneo, antennis pedibusque fuscis, alis fulvescentibus.*

Viridi-æneus: caput viride, thorace latius: oculi ocellique rufo-fusci: antennæ fuscae, sat crassæ, corporis dimidio vix breviores; articulus 1<sup>us</sup>. obscurè fuscus, basi pallidior: abdomen purpureo-æneum, thorace paullò longius vix latius, apice basique æneo-viride, subtus angulatum et apice minimè elevatum; segmenta basi viridia: pedes obscurè fusci; coxæ virides; mesofemora subtus apice spina armata; genua fulva; protarsi fusci; meso- et metatarsi pallidè flavi, apice fusci: alæ subhyalinæ, amplæ, sub nervum fulvæ; squamulæ fuscae; nervi fulvi; stigma parvum. (Corp. long. 1 lin.; alar 1 $\frac{5}{8}$  lin.)

Var.  $\beta$ .—Caput supra æneum: thorax et abdomen cupreo-ænea, hujus discus cyaneo-purpureus: protarsi fulvi, apice fusci.

June; on grass in woods; near London.

Sp. 11. Amb. humilis. Fem. *Viridi-æneus, præcedenti similis, antennis pedibusque fuscis, femoribus viridibus, abdomine cupreo, alis subflavescentibus.*

Æneus: caput æneo-viride: oculi ocellique rufo-fusci: antennæ fuscae; articulus 1<sup>us</sup>. obscurior, basi fulvo-fuscus: abdomen obscurè cupreum, basi et subtus æneo-viride nitentius; segmenta basi viridia: pedes fusci; coxæ et femora viridia; protibiæ pallidè fuscae; genua et protarsi fulva; meso- et metatarsi flavi, apice fusci: alæ hyalinæ, sub costam flavescentes; squamulæ et nervi fulva; stigma obscurius, parvum. Corp. long.  $\frac{4}{5}$  lin.; alar. 1 $\frac{1}{2}$  lin.)

June; New Forest, Hampshire.

Sp. 12. Amb. albitarsus. Fem. *Viridi-cyaneus*, A. fuscipedis *statura, abdomine purpureo, antennis pedibusque fuscis, alis hyalinis.*

Viridi-cyaneus: caput thorace latius: oculi ocellique rufo-fusci: antennæ fuscae, graciles, corporis dimidii longitudine: abdomen purpureum, thorace longius et angustius, apice obscurè basi lætè viride, subtus non angulatum: metathorax lætè viridis: pedes nigro-fusci; coxæ virides; genua, tibiæ apice tarsique alba, hi apice nigro-fusci; propedum genua flava, tibiæ tarsique pallidè fusca: alæ hyalinæ, latæ; squamulæ fuscae; nervi fulvi; stigma parvum. (Corp. long. 1 lin.; alar. 1 $\frac{1}{3}$  lin.)

August; on grass beneath trees; near London.

Sp. 13. Amb. nitescens. Fem. *Viridi-æneus*, A. amœni *statura, abdomine purpureo-æneo, antennis pedibusque nigro-fuscis, alis subfuscis.*

Æneus: caput thorace latius, anticè viride: oculi ocellique rufo-fusci: antennæ nigro-fuscæ, corporis dimidio paullò longiores; articulus 1<sup>us</sup>. fuscus, basi fulvus: metathorax æneo-viridis: abdomen viride, thorace longius, subtus non angulatum; discus purpureo-æneus; segmenta basi viridia: coxæ virides; trochanteres fulvi; femora nigro-viridia; tibiæ nigræ, apice basique flavæ; protibiæ et protarsi fusca, illæ extus nigræ; meso- et metatarsi flavi, apice fusci; alæ subfuscæ, prope costam obscuriores; squamulæ et nervi fusca; stigma mediocre, nigrum. (Corp. long.  $1\frac{1}{2}$  lin.; alar.  $2\frac{1}{2}$  lin.)

August; on grass under trees; near London.

Sp. 14. Amb. pusillus. Fem. *Æneo-viridis, præcedentibus angustior*, A. dubio *similis at minor, antennis fuscis, pedibus flavis, alis subhyalinis.*

Æneo-viridis: caput thorace paullò latius: oculi ocellique fuscorufi: antennæ fuscæ, corporis dimidii longitudine; articulus 1<sup>us</sup>. basi flavus: scutellum viridi-æneum: abdomen thorace longius, subtus non angulatum; discus cupreo-æneus: pedes flavi; coxæ æneo-virides; tarsi apice fusci: alæ subhyalinæ, minimè flavescentes; squamulæ fulvæ; nervi flavi; stigma minutum. (Corp. long.  $\frac{1}{2}$ — $\frac{2}{3}$  lin.; alar.  $\frac{3}{4}$ —1 lin.)

*Var. β.*—Caput viride.

*Var. γ.*—Viridis: prothorax æneo-viridis: abdominis discus cupreo-æneus.

September; Isle of Wight.

Sp. 15. Amb. tenuicornis. Fem. A. pusillo *similis, antennis gracilioribus, abdomine longiore et angustiore.*

Æneo-viridis: caput anticè viride, thoracis latitudine: oculi ocellique rufo-fusci: antennæ fuscæ, corporis dimidii longitudine, hujus generis plerisque graciliores clava angustiore et acutiore; articulus 1<sup>us</sup>. basi flavus: abdomen viride, thorace longius, subtus paullò carinatum; segmenta 2<sup>o</sup>. ad 5<sup>um</sup>. nisi ad apices nigro-ænea: pedes flavi; coxæ æneo-virides; tarsi apice pallidè fusci: alæ hyalinæ; squamulæ et nervi flava; stigma minimum, vix conspicuum. (Corp. long.  $\frac{2}{3}$  lin.; alar.  $\frac{3}{4}$  lin.)

July; on grass in fields; near London.

Sp. 16. Amb. hebes. Fem. *Viridis*, A. modesti *statura*, *præcedentibus plerisque crassior, antennis fuscis, abdomine æneo, pedibus fulvis, alis hyalinis.*

Viridis: caput thorace vix latius: oculi ocellique fusci: antennæ obscurè fuscæ, crassæ, corporis dimidii longitudine; articulus 1<sup>us</sup>. flavus, apice fulvus: scutellum æneo-viride: abdomen thorace vix longius, subtus non angulatum, medio cupreo-æneum parùm nitens, basi æneum nitentius: pedes fulvi; coxæ æneo-virides; tarsi flavi, apice fusci: alæ hyalinæ; squamulæ et nervi fusca; stigma minutum. (Corp. long.  $\frac{3}{4}$  lin.; alar. 1 lin.)

August; on grass in fields; near London.

Sp. 17. Amb. tenellus. Fem. A. pusillo *similis sed paullo longior et angustior.*

Viridis: caput thorace vix latius: oculi ocellique fusco-rufi: antennæ fuscæ, corporis dimidio breviores; articulus 1<sup>us</sup>. basi flavus: abdomen thorace multò longius, subtus non angulatum; discus cupreo-æneus: pedes flavi; coxæ virides; tarsi pallidè flavi, apice fusci: alæ subhyalinæ; squamulæ et nervi fulva; stigma parvum. (Corp. long.  $\frac{2}{3}$  lin.; alar.  $\frac{3}{4}$  lin.)

September; Isle of Wight.

Sp. 18. Amb. fulvipes. Fem. *Præcedenti similis, clava latiore, abdomine subtus angulato.*

Viridis: caput thorace paullo latius: oculi ocellique rufi: antennæ pallidè fuscæ, corporis dimidio vix breviores; articulus 1<sup>us</sup>. basi flavus; clava articulo 10°. multò latior: scutellum æneo-viride: abdomen æneo-viride, thorace paullo longius, subtus angulatum: pedes fulvi; coxæ virides; protibiæ et tarsi omnes flava, hi apice fusci: alæ subfulvæ; squamulæ et nervi fulva; stigma minutum. (Corp. long.  $\frac{2}{3}$  lin.; alar.  $\frac{3}{4}$  lin.)

September; Isle of Wight.

Sp. 19. Amb. stupidus. Fem. A. lato *similis sed paullo angustior.*

Viridis: caput thoracis latitudine: oculi ocellique rufo-fusci: antennæ fuscæ, corporis dimidio breviores; articulus 1<sup>us</sup>. basi flavus: abdomen æneo-viride, thorace longius, subtus angulatum: segmenta 2°. ad 5<sup>um</sup>. apice cupreo-ænea: pedes flavi; coxæ virides; femora viridia, apice basique flava; meso- et metatarsi pallidè



flavi; omnes apice fusci: alæ subhyalinæ, paullo flavescens; squamulæ et nervi fulva; stigma parvum. (Corp. long.  $\frac{2}{3}$ —1 lin.; alar. 1—1 $\frac{1}{2}$  lin.)

*Var. β.*—Tibiæ fulvæ.

*Var. γ.*—Thoracis dorsum æneo-viride: protarsi fulvi.

*Var. δ.*—Antennæ articulo 2<sup>o</sup>. viridi-fusco.

*Var. ε.*—Caput, thorax, et femora viridi-ænea.

September; Isle of Wight.

Sp. 20. Amb. nanus. Fem. A truncatelli *ferè statura, paullo angustior.*

Viridis: caput supra cyaneo-viride, thorace paullo latius: oculi ocellique rufo-fusci: antennæ fulvæ, corporis dimidii longitudine; articulus 1<sup>us</sup>. basi flavus: abdomen viridi-æneum, thorace vix longius, subtus angulatum: pedes flavi; coxæ virides; femora et metatibiæ fusca; mesotibiæ fulvæ; meso- et metatarsi pallidè straminei, apice fusci: alæ hyalinæ; squamulæ et nervi pallidè fulva; stigma minutum. (Corp. long.  $\frac{1}{2}$  lin.; alar.  $\frac{3}{4}$  lin.)

July; on grass in fields; near London.

Sp. 21. Amb. linearis. Fem. A. tenuicornis *statura, antennis apice crassioribus, clava brevior et obtusior, alis subfulvescentibus.*

Viridi-æneus: caput thoracis latitudine: oculi ocellique rufo-fusci: antennæ fusca, corporis dimidio breviores; articulus 1<sup>us</sup>. basi flavus: mesothoracis scutellum et scuti discus cupreo-ænea: abdomen æneum, thoracis longitudinem superans, subtus paullo angulatum, basi cupreo-æneum nitentius; discus nigro-æneus: pedes fulvi; coxæ viridi-æneæ; femora et tibiæ apice, meso- et metatarsi flava, hi apice fusci; protarsi apice obscurè fulvi: alæ subfulvæ, apice et posticè pallidiores; squamulæ et nervi pallidè fulva; stigma minutum. (Corp. long.  $\frac{1}{2}$ — $\frac{2}{3}$  lin.; alar.  $\frac{2}{3}$ — $\frac{3}{4}$  lin.)

*Var. β.*—Æneo-viridis: scutellum æneum: abdomen nigro-æneum, basi æneo-viride nitentius; segmenta basi et utrinque viridia: metafemora subfusca.

*Var. γ.*—Æneo-viridis: caput viride: abdominis discus cupreo-æneus.

September; on grass in fields; near London. Isle of Wight.

Sp. 22. Amb. temperatus. Fem. *Præcedenti similis, antennis paullo brevioribus et crassioribus, abdomine latiore.*

Viridis: caput thoracis latitudine: oculi ocellique rufi: antennæ fuscæ, corporis dimidio breviores; articulus 1<sup>us</sup>. fulvus, apice supra fuscus: abdomen nigro-æneum, thorace longius, subtus non angulatum, apice basique viride: pedes fulvi; coxæ virides; tarsi apice fuscii; genua, meso- et metatarsi flava: alæ subhyalinæ, vix flavescentes; squamulæ et nervi pallidè fulva: stigma minutum. (Corp. long.  $\frac{2}{3}$  lin.; alar.  $\frac{3}{4}$  lin.)

Var.  $\beta$ .—Æneo-viridis: abdomen nigro-æneum, apice basique æneo-viride.

July; on grass in fields; near London. September; Isle of Wight.

Sp. 23. Amb. iners. Fem. *Præcedenti similis sed latior, antennis brevioribus et crassioribus.*

Viridi-æneus: caput thoracis latitudine: oculi ocellique rufo-fuscii: antennæ fuscæ, corporis dimidio breviores; articulus 1<sup>us</sup>. flavus: abdomen nigro-æneum, thorace latius et paullò longius, basi apiceque viride, subtus non angulatum: pedes fulvi; coxæ æneo-virides; tarsi flavi, apice fuscii: alæ fulvæ; squamulæ et nervi fulva; stigma parvum. (Corp. long.  $\frac{1}{2}$  lin.; alar.  $\frac{2}{3}$  lin.)

September; Isle of Wight.

Sp. 24. Amb. trossulus. Fem. *A. modesti statura, abdomine paullo brevior, antennis fulvis, alis hyalinis.*

Æneo-viridis: caput viride, thorace paullò latius: oculi ocellique rufo-fuscii: antennæ fulvæ, crassæ, corporis dimidio longiores; articulus 1<sup>us</sup>. flavus; 2<sup>us</sup>. supra basi et clava pallidè fusca: abdomen obscurè cupreum, thorace latius sed non longius, basi lætè viride, subtus non angulatum; segmenta apice viridi-ænea: pedes flavi; coxæ virides; meso- et metatarsi straminei, apice pallidè fuscii: alæ hyalinæ, minimè flavescentes; squamulæ pallidè fuscæ; nervi flavi; stigma fulvum, parvum. (Corp. long.  $\frac{2}{3}$  lin.; alar.  $\frac{3}{4}$  lin.)

August; on grass in fields; near London.

Sp. 25. Amb. stenomerus. Fem. *A tenuicorni similis, paullo brevior et gracilior, alis angustioribus.*

Viridis, angustus, sublinearis: caput thorace paullò latius: oculi ocellique rufofuscii: antennæ pallidè fuscæ, graciles, corporis dimidii vix longitudine; articulus 1<sup>us</sup>. fulvus; clava articulo 10°. multò latior: scutellum et abdomen viridi-ænea; hoc thorace

paullò longius, subtus non angulatum: pedes pallidè fuscì; coxæ virides; protibiæ et tarsi omnes flava, hi apice fuscì: alæ subfuscæ, angustæ; squamulæ et nervi fulva; stigma minutum. (Corp. long.  $\frac{2}{3}$  lin.; alar.  $\frac{3}{4}$  lin.)

October; on grass beneath trees; near London.

Sp. 26. Amb. tenebricus. Fem. A. nitescentis *statura, obscurior, stigmatè majore.*

Viridi-æneus, obscurus, crassus: caput æneo-viride, thoracis latitudine: oculi ocellique fuscì: antennæ nigræ, crassæ, corporis dimidio paullò breviores; articulus 1<sup>us</sup>. fuscus, basi fulvus: mesothoracis scutellum cupreo-æneum: abdomen obscurè cupreum, thorace brevius et paullò latius, subtus angulatum, basi cupreo-viride nitentius, apice elevatum: pedes nigro-fuscì; coxæ et femora viridi-ænea; trochanteres fuscì; genua fulva; tarsi articulo 1<sup>o</sup>. fusco, basi pallidè flavo: alæ obscurè fuscæ; squamulæ fulvæ; nervi nigro-fuscì, metalis pallidiores; stigma nigrum, magnum. (Corp. long.  $1\frac{1}{2}$  lin.; alar. 2 lin.)

October; on grass in fields; near London.

Sp. 27. Amb. mirus. Fem. *Viridiæneus, antennis nigris, abdomine basi pedibusque fulvis, oviductu exerto, alis hyalinis.*

Nigro-iridis, quasi productus, *Callimomi* similis: caput thorace paullò latius: oculi ocellique fuscì: trophi ferruginei: antennæ nigræ, crassæ, breves, corporis trientis longitudine; articuli 1<sup>o</sup>. ad 5<sup>um</sup>. fulvi, clava nigro-fusca, ferè rotunda: prothorax lætè viridis, macula supra cupreo-cyanea: thorax subtus viridi-cyaneus: abdomen cupreo-æneum, thorace paullò longius, subtus angulatum, basi fulvum, apice fuscum; latera æneo viridia: oviductus rufus, abdominis trientis longitudine; vaginæ nigro-fuscæ, pilosæ, apice pallidiores: pedes fulvi; coxæ cyanæ, apice flavæ; femora extus pallidè fusca; trochanteres, genua, meso et metatarsi flava, hi apice fulvi: alæ hyalinæ angustæ; squamulæ et nervi fulva; stigma parvum. (Corp. long.  $1\frac{1}{4}$  lin.; alar.  $1\frac{3}{4}$  lin.)

August; on grass in fields; near London.

†† *Antennæ articulis 3<sup>o</sup>. et 4<sup>o</sup>. minimis, 5<sup>o</sup>. mediocri.*

§ *Clava brevis, vix acuminata.*

Mari mesotibiæ	{	-intus dilatata . . . . .	PLATYMESOPUS.
		-extus dilatata . . . . .	MESOPOLOBUS.
		-simplices . . . . .	EUTELUS.

GENUS X.—PLATYMESOPUS, *Westwood*.

*Mas.*—Caput mediocre, thorace paullò latius: antennæ clavatæ; articulus 1<sup>us</sup>. validus, subfusiformis; 3<sup>us</sup>. et 4<sup>us</sup>. minimi; 5<sup>us</sup>., 6<sup>us</sup>. et 7<sup>us</sup>. subæquales; 8<sup>us</sup>., 9<sup>us</sup>. et 10<sup>us</sup>. gradatim latitudine crescentes; clava ovata, articulo 10<sup>o</sup>. multò latior: mandibulæ 4-dentatæ, subquadratae, vix arcuatae, intùs emarginatæ, subæquales; una dente externo mediocri acuminato, 2<sup>o</sup>. obtusiore et multò minore, 3<sup>o</sup>. et 4<sup>o</sup>. minutis, hoc latiore et obtusiore; altera dentibus brevioribus, 3<sup>o</sup>. et 4<sup>o</sup>. minimis vix discretis aut conspicuis: maxillæ basi latae, inde abruptè angustatæ, angulum utrinque extus fingentes, ad apices elongatæ acuminatæ; lacinia in lobum quæque intus producta; palpi 4-articulati, crassi, longitudine mediocri; articuli 1<sup>us</sup>. et 2<sup>us</sup>. breves; 3<sup>us</sup>. et 4<sup>us</sup>. magni, dilatati, hic ovatus, ille ferè rotundus: labium<sup>a</sup> angustum, sublineare, posticè conicum; ligula<sup>b</sup> parva, anticè quasi fissa; palpi 3-articulati, breves, crassi; articulus 2<sup>us</sup>. brevissimus; 3<sup>us</sup>. apice acuminatus: thorax ovatus: prothorax brevissimus: mesothoracis scutum et scutellum maxima; parapsidum suturæ vix conspicuæ; paraptera et epimera benè determinata: metathorax parvus, subtilissimè squameus: abdomen elongato ovatum, thorace angustius sed non longius; segmentum 1<sup>um</sup>. magnum; sequentia brevia, subæqualia: sexualia exerta: pro- et metapedes simplices; mesopedum femora apices versus spina gracili subtus armata, tibiæ intus valde dilatatæ: alæ mediocres; nervus humeralis ulnari vix longior, setis armatus, ramulum rejiciens nullum; cubitalis radiali brevior, stigmatè ramulum brevissimum emittente terminatum.

*Fem.*—Antennæ articulo 1<sup>o</sup>. gracili, 5<sup>o</sup>. et sequentibus ad 10<sup>um</sup>. gradatim latitudine crescentes; clava articulo 10<sup>o</sup>. paullò latior; palpi maxillares graciles, filiformes; articuli 1<sup>o</sup>. ad 3<sup>um</sup>. subæquales; 4<sup>us</sup>. 2<sup>i</sup>. et 3<sup>i</sup>. longitudine: abdomen thorace paullò latius, subtus non angulatum, apice acuminatum: oviductus non exertus: mesopedum tibiæ simplices.

Sp. 1. *Platy. tibialis*. *Mas. Viridis, antennis fulvis apice nigris, abdomine cupreo, pedibus flavis, alis hyalinis.*  
*Fem. Viridi-cæneus, cupreo variegatus, antennis pedibusque fuscis, alis subhyalinis.*

<sup>a</sup> The *mentum* of my former descriptions. Vide *Osteology of Insects*, by Mr. Newman, page 71 of this volume.

<sup>b</sup> The *labium* of my former descriptions.

*Platymesopus tibialis.* Westwood, *Lond. and Edinb. Phil. Mag.* Third Series. Vol. II. No. XII. p. 444.

*Mas.*—Lætè viridis: oculi ocellique rufo-fusci: trophi flavi; maxillæ basi et mentum viridi-ænea: antennæ fulvæ, corporis dimidio longiores, vix pubescentes; articulus 1<sup>us</sup>. lætè flavus, apice fulvus; 9<sup>us</sup>. et 10<sup>us</sup>. fusci; clava nigra: abdomen cupreum, basi apiceque viride nitentius, subtus æneo-cupreum pubescentius: sexualia fusca: pedes lætè flavi; coxæ virides; profemora basi extus ferruginea; mesofemora intus ferrugineo vittata, spina fusca armata; protibiæ extus ferrugineo et mesotibiæ intus fusco vittatæ, hæ rubro marginatæ puncto nigro pilis nigris ciliato terminatæ; tarsi pallidè fulvi, apice fusci: alæ hyalinæ; squamulæ flavæ; nervi fulvi, ubi costam attingunt pallidè fusci; stigma concolor, parvum.

*Fem.*—Caput viride: antennæ pallidè fuscæ, corporis dimidio vix longiores, apice obscuriores, basi fulvæ: thorax æneo-viridis, cupreo variegatus: mesothoracis scutellum purpureo-cupreum: metathorax viridis: abdomen æneo-cupreum; segmenta basi viridia: pedes fusci; coxa æneo-virides; femora et tibiæ apice tarsique pallidè flava, hi apice fusci; protibiæ et protarsi flava, illæ extus fulvæ: alæ subhyalinæ. (Corp. long.  $\frac{1}{2}$ — $1\frac{1}{3}$  lin.; alar.  $\frac{5}{4}$ —2 lin.)

*Var. β.*—*Mas*, caput supra et circum oculos æneo-viride: mesothoracis dorsum cupreo-viride; scutum anticè viride: metathorax æneo-viridis: abdomen apice basique æneo-viride.

*Var. γ.*—*Mas*, *Var. β.* similis: thorax viridis; mesothoracis scutum anticè cupreoæneum.

*Var. δ.*—*Mas*, abdomen purpureo-cupreum, basi apiceque æneo-cupreum.

*Var. ε.*—*Mas*, caput et thorax cyaneo-viridia.

*Var. ζ.*—*Mas*, abdomen purpureo-cupreum, basi æneo-viride.

*Var. η.*—*Mas*, antennæ articulo 1<sup>o</sup>. omninò flavo.

*Var. θ.*—*Mas*, thorax anticè et utrinque viridicyaneus.

*Var. ι.*—*Mas*, caput supra, mesothoracis scutum anticè, epimera et paraptera cupreo-ænea: abdomen cupreum, basi æneo-viride.

*Var. κ.*—*Mas*, caput anticè cyaneo-viride: abdomen purpureo-cupreum, basi apiceque viride.

*Var. λ.*—*Mas*, caput supra æneo-viride.

*Var. μ.*—*Mas*, prothorax omninò et mesothorax anticè æneo-virides.

*Var. ν.*—*Mas*, antennæ articulo 9<sup>o</sup>. fulvo: abdomen æneo-viride.

- Var. ξ.*—*Mas*, antennæ articulis 1<sup>o</sup>. ad 7<sup>um</sup>. flavis, 8<sup>o</sup>. et 9<sup>o</sup>. fulvis, 10<sup>o</sup>. fusco.
- Var. ο.*—*Mas*, nervi omnes pallidè fulvi.
- Var. π.*—*Fem.* caput supra æneo-viride : protibiæ fuscaë.
- Var. ρ.*—*Fem.* antennæ obscurè fuscaë, basi pallidiores : thorax æneo-viridis ; mesothoracis scutum cupreo-æneum.
- Var. σ.*—*Fem.* mesothoracis scutellum cupreo-æneum.
- Var. τ.*—*Fem.* metathorax æneo-viridis.
- Var. υ.*—*Fem.* femora fusco-viridia.
- Var. φ.*—*Fem.* mesothoracis scuti dorsum cyaneo-viridi maculatum.
- Var. χ.*—*Fem.* thorax æneo-viridis ; mesothoracis scutellum ferè omne et scutum posticè cupreo-cyanea.
- Var. ψ.*—*Fem.* *Var. χ.* similis sed mesothoracis macula cuprea.
- Var. ω.*—*Fem.* abdominis segmentum 1<sup>um</sup>. basi viride ; 2<sup>um</sup>. et sequentia basi ænea : alæ subflavescentes ; stigma obscurè fuscum.
- Var. αα.*—*Fem.* thorax cupreo-æneus : abdominis segmenta basi viridi-ænea.
- Var. ββ.*—*Fem.* thorax æneo-viridis ; metathorax viridis.

May and June ; on grass in woods ; near London. June ; Windsor. New Forest, Hampshire. Isle of Wight.

#### GENUS XI.—MESOPOLOBUS, *Westwood*.

*Mas.*—Corpus angustum, sublineare : caput parvum, thoracis latitudine : antennæ subclavatae ; articulus 1<sup>us</sup>. gracilis, sublinearis ; 3<sup>us</sup>. et 4<sup>us</sup>. minimi ; 5<sup>us</sup>. et sequentes ad 10<sup>um</sup>. subæquales, latitudine gradatim crescentes ; clava ovata, articulo 10<sup>o</sup>. paullo latior : mandibula una 4-dentata, subquadrata, vix arcuata, intus emarginata ; dens externus mediocris, 2<sup>us</sup>. minor, ambo acuminati, 3<sup>us</sup>. et 4<sup>us</sup>. brevissimi, ille subacuminatus, hic latior obtusus ; altera similis sed dentibus 3<sup>o</sup>. et 4<sup>o</sup>. vix discretis aut conspicuis : maxillæ basi latæ, ad apices angustæ et acuminatæ ; quæque in lobum lacinia intus producta ; palpi 3-articulati ?, graciles, longitudine mediocri, articulus 1<sup>us</sup>. cyathiformis, mediocris ; 2<sup>us</sup>. 1<sup>i</sup>. longitudine, basi crassior ; 3<sup>us</sup>. subfusiformis, 1<sup>o</sup>. et 2<sup>o</sup>. longior, ramulum intus prope basim longum gracilem emittens : labium angustum, basi conicum ; ligula minuta, anticè quasi fissa ; palpi 3-articulati, breves, crassi ; articulus 2<sup>us</sup>. brevissimus : thorax elongato-ovatus, angustus : prothorax brevissimus : mesothoracis scutum et scutellum maxima ; parapsidum suturæ vix conspicuæ ; paraptera et epimera magna : metathorax mediocris : abdomen sublineare, thorace paullo brevius et angustius, basi et apice



angustatum; segmentum 1<sup>um</sup>. maximum; sequentia breviora; apicalia parva: pedes graciles; metacoxæ longiores; mesotibiæ apices versus in lobum extus productæ trigonum: alæ mediocres; nervus humeralis ulnari multò longior, ramulum rejiciens nullum; cubitalis radiali brevior; stigma ramulum brevem emittens.

Sp. 1. Mesop. fasciiventris. Mas. *Viridis, antennis pedibusque flavis, abdomine cupreo flavo fasciato, alis hyalinis.*

Mesopolobus fasciiventris. *Westwood, Lond. and Edinb. Phil. Mag. Third Series. Vol. II. No. XII. p. 443.*

Lætè viridis, nitens: oculi ocellique rufo-fusci: trophi lætè flavi: mandibulæ apice rufæ: antennæ lætè flavæ, corporis dimidii longitudine: metathorax subtilissimè squameus: abdomen cupreum, ante medium latè flavo fasciatum, apice viride: sexualia fusca: pedes lætè flavi, graciles; coxæ virides; mesotibiarum lobi apice nigri et pilis nigris vestiti; tarsi apice pallidè fusci: alæ hyalinæ, subangustæ, inter nervos cubitalem et radialem fuscæ; squamulæ flavæ; nervus humeralis flavus, pilis nonnullis nigris vestitus, ubi costam attingit obscurè fuscus; ulnaris pallidè fulvus; radialis obscurior; cubitalis obscurè fuscus; stigma concolor, parvum; metalarum nervi pallidè flavi, ubi costam attingunt fulvi. (Corp. long.  $\frac{2}{3}$ — $1\frac{1}{4}$  lin.; alar.  $\frac{3}{4}$ — $1\frac{1}{3}$  lin.)

*Var. β.* — Caput, thorax et coxæ æneo-viridia: abdomen basi cupreo-æneum.

*Var. γ.*—*Var. β.* similis: antennæ articulis 1<sup>o</sup>. apice et 2<sup>o</sup>. supra pallidè fulvis: alæ inter nervos cubitalem et radialem subhyalinæ; nervi pallidiores.

*Var. δ.*—Metalarum nervi ubi costam attingunt fusci.

*Var. ε.*—Abdomen basi æneo-viride.

*Var. ζ.*—Thorax anticè et caput cyaneo-viridia: abdomen basi æneo-viride.

*Var. η.*—Nervus cubitalis et stigma pallidè fusca.

*Var. θ.*—Nervi pallidè fulvi; nervus humeralis ubi costam attingit fuscus.

May and June; on grass beneath trees; near London. June; New Forest, Hampshire. September; Isle of Wight.

GENUS XII.—EUTELUS, <sup>c</sup> Walker.

*Mas et Fem.* — Corpus multiforme : caput mediocre : antennæ clavatae ; articulus 1<sup>us</sup>. *mas* subfusiformis, *fem.* sublinearis gracilior ; 3<sup>us</sup>. et 4<sup>us</sup>. minimi ; 6<sup>us</sup>. 5<sup>o</sup>. longior ; sequentes ad 10<sup>um</sup>. gradatim breviores et latiores ; clava articulo 10<sup>o</sup>. latior et plus duplò longior : mandibulæ 4-dentatæ, subquadratae, vix arcuatae, intus emarginatae ; una dente externo mediocri acuminato, 2<sup>o</sup>. obtusiore minore, 3<sup>o</sup>. et 4<sup>o</sup>. minutis, hoc latiore obtusiore ; altera dentibus brevioribus, 3<sup>o</sup>. et 4<sup>o</sup>. minimis vix discretis aut conspicuis : maxillæ elongatae, subarcuatae, basi latae ; intus lacinia quæque in lobum producta ; palpi 4-articulati, graciles, filiformes, longitudine mediocri ; articuli 1<sup>us</sup>., 2<sup>us</sup>. et 3<sup>us</sup>. mediocres subæquales ; 4<sup>us</sup>. subfusiformis, 2<sup>i</sup>. et 3<sup>i</sup>. longitudine : labium elongato-ovatum, posticè conicum ; ligula parva, anticè quasi fissa ; palpi 3-articulati, breves, crassi ; articulus 2<sup>us</sup>. minimus : prothorax et metathorax brevía : mesothoracis scutum et scutellum maxima ; parapsidum suturæ vix conspicuæ ; paraptera et epimera benè determinata : *fem.* abdomen acuminatum ; segmentum 1<sup>um</sup>. magnum ; sequentia breviora, subæqualia : oviductus plerumque occultus : pedes simplices ; mesofemora sæpè apices versus spina armata : alæ mediocres ; nervus humeralis ulnari multò longior, ramulum rejiciens nullum ; cubitalis radiali brevior ; stigma ramulum brevissimum emittens.

Sp. 1. Eut. dilectus. *Mas.* *Viridis, antennis pedibusque flavis, illarum articulo 8<sup>o</sup>. clavaque fuscis, abdomine cupreo flavo fasciato, alis hyalinis.*

Lætè viridis, latus : caput thorace paullò latius : oculi ocellique fusciorum : antennæ lætè flavæ, corporis dimidii longitudine ; articulus 1<sup>us</sup>. validus ; 8<sup>us</sup>. pallidè fuscus ; clava fusca, apice pallidior : thorax elongato-ovatus : abdomen cupreum, ovatum, thoracis longitudine, ante medium flavo latè fasciatum, basi apiceque viride ; segmenta basi æneo-viridia : sexualia fusca : pedes lætè flavi ; coxæ virides ; tarsi apice fuscii : alæ hyalinæ ; squamulæ et nervi flava, hi pilis nigris vestiti ; pro- et metalarum nervi humerales ubi costam attingunt pallidè fuscii ; stigma concolor, parvum. (Corp. long.  $\frac{2}{3}$ — $1\frac{1}{4}$  lin. ; alar. 1—2 lin.)

*Var. β.*—Antennæ articulo 2<sup>o</sup>. basi fusco : alæ subflavescentes.

*Var. γ.*—*Var. β.* similis : alæ hyalinæ ; stigma flavum.

*Var. δ.*—Abdominis segmenta basi cuprea : stigma flavum.

*Var. ε.*—Metathorax basi æneus.

*Var. ζ.*—Caput et thorax æneo-viridia : abdomen purpureo-cupreum : stigma flavum.

June to October ; on grass beneath trees ; near London.  
June ; Windsor. September ; Linton, North Devonshire.  
New Lanark, Scotland.

Sp. 2. Eut. immaculatus. Mas. *Viridis, antennis pedibusque flavis, illarum articulo 8<sup>o</sup>. clavaque fuscis, abdomine cupreo, alis hyalinis.*

Lætè viridis, crassus, *E. dilecti* statura : caput thorace paullò latius : oculi ocellique rufo-fusci : antennæ lætè flavæ, corporis dimidii longitudine ; articulus 1<sup>us</sup>. validus ; 8<sup>us</sup>. pallidè fuscus ; clava fusca, apice pallidior : abdomen cupreum, immaculatum, thorace paullò brevius et angustius, basi apiceque cupro-æneum : sexualia fusca : pedes læte flavi ; coxæ virides ; tarsi apice pallidè fusci ; protibiæ apice et protarsi fulvo-flava : alæ hyalinæ ; squamulæ flavæ ; nervi pallidè fulvi ; stigma minutum. (Corp. long. 1 lin. ; alar. 1½ lin.)

*Var. β.*—Metathorax æneo-viridis.

August ; on grass beneath trees ; near London.

Sp. 3. Eut. signatus. Mas. *Viridis, E. dilecto angustior, antennis pedibusque flavis, illarum articulo 8<sup>o</sup>. clavaque fuscis, abdomine cupreo flavo fasciato, alis hyalinis.*

Viridis, *E. dilecto* minor angustior et multò obscurior : caput thorace latius : oculi ocellique rufo-fusci : antennæ pallidè flavæ, corporis dimidii longitudine ; articuli 2<sup>us</sup>. supra, 7<sup>us</sup>. apice et 8<sup>us</sup>. fusci ; clava nigro-fusca, apice basique flava : abdomen cupreum, thorace paullò brevius, flavo antè medium latè fasciatum : sexualia fusca : pedes pallidè flavi ; coxæ virides ; tarsi apice pallidè fusci : alæ hyalinæ ; squamulæ flavæ ; nervi pallidè fulvi ; stigma parvum. (Corp. long. ½ lin. ; alar. ⅔ lin.)

September ; Ambleside, Westmoreland.

Sp. 4. Eut. pygmæus. Mas. *Viridis*, E. dilecto *angustior*, *antennis fulvis, articulo 2<sup>o</sup>. clavaque fuscis, abdominis fascia pedibusque flavis, alis hyalinis.*

*Viridis*, E. dilecto *angustior* et minor: caput thoracis latitudine: antennæ fulvæ, corporis dimidio paullò longiores; articulus 1<sup>us</sup>. lætè flavus; 2<sup>us</sup>. fuscus, apice flavescens; clava fusca; oculi ocellique rufo-fusci: abdomen thoracis longitudine, ante medium flavo fasciatum: pedes lætè flavi; coxæ virides; tarsi apice pallidè fuscii; alæ hyalinæ; squamulæ et nervi pallidè flava; stigma minutum. (Corp. long.  $\frac{1}{3}$  lin.; alar.  $\frac{1}{2}$  lin.)

August; on grass beneath trees; near London.

Sp. 5. Eut. diffinis. Mas. *Viridis*, *antennis fulvis apice fuscis, abdomine fulvo fasciato, pedibus flavis, alis hyalinis, metalis fusco maculatis.*

Lætè viridis, E. dilecto paullò *angustior*: caput thorace vix latius: oculi ocellique rufo-fusci: antennæ fulvæ, corporis dimidii longitudine; articulus 1<sup>us</sup>. flavus; 2<sup>us</sup>. basi, 3<sup>i</sup>. et sequentium ad 8<sup>um</sup>. suturæ et clava fusca, hæc apice pallidior: abdomen æneo-viride, thorace paullò brevius, basi apiceque viride; segmentum 2<sup>um</sup>. apice fulvum: pedes lætè flavi; coxæ virides; mesotibiæ intus et tarsi apice fusca: alæ hyalinæ; squamulæ et nervi flava; stigma minutum: metalæ nisi ad basim subfuscæ; maculæ in cujusque disco fuscæ irregulares medio connectæ duæ. (Corp. long.  $\frac{1}{3}$ — $\frac{5}{4}$  lin.;  $\frac{1}{2}$ —1 lin.)

*Var. β.*—Caput et thorax æneo-viridia.

*Var. γ.*—Mesotibiæ intus ad apices obscurè fuscæ, ante apices flavæ.

*Var. δ.*—Proalæ sub nervum ulnarem fulvescentes.

August to October; on grass in fields; near London. September; Isle of Wight; Lyme Regis, Dorsetshire; Sidmouth and Plymouth, Devonshire. New Lanark, Scotland.

Sp. 6. Eut. jucundus. Mas. *Viridis*, *antennis pedibusque flavis, abdomine cupreo flavo fasciato, alis hyalinis.*

Lætè viridis, angustus: caput thorace vix latius: oculi ocellique rufo-fusci: antennæ lætè flavæ, corporis dimidio paullò breviores: caput posticè thoracisque latera et apex æneo-viridi variegata: abdomen cupreum, thorace paullò brevius, ante medium latè

flavo-fasciatum, apice viride: pedes lætè flavi; coxæ æneo-virides; tarsi apice pallidè fusci: alæ hyalinæ; squamulæ pallidè flavæ; nervi pallidè fulvi; stigma minutum. (Corp. long.  $\frac{3}{4}$ — $1\frac{1}{4}$  lin.; alar.  $1\frac{1}{4}$ — $1\frac{3}{4}$  lin.)

*Var. β.*—Caput et thorax omnino viridia.

*Var. γ.*—Abdomen basi æneo-viride.

May and June; on grass beneath trees; near London.

Sp. 7. Eut. placidus. Mas. *Viridis*, E. diffinis *statura*, *antennis flavis fusco maculatis*, *pedibus flavis*, *alis hyalinis*.

Lætè viridis: caput thorace vix latius: oculi ocellique rufo-fusci: antennæ fuscæ, corporis dimidio paullò longiores; articuli 1<sup>us</sup>., 3<sup>us</sup>., 4<sup>us</sup>., 5<sup>us</sup>., et 8<sup>us</sup>. flavi; 9<sup>us</sup>. et 10<sup>us</sup>. pallidè fusci: abdomen thorace paullò longius; discus cupreo-viridis: sexualia fusca: pedes lætè flavi; coxæ virides; tarsi apice pallidè fusci; pro-tarsi fulvi: alæ hyalinæ; squamulæ et nervi pallidè flava; stigma minutum. (Corp. long.  $\frac{3}{4}$  lin.; alar. 1 lin.)

*Var. β.*—Antennæ articulo 8<sup>o</sup>. supra pallidè fusco.

*Var. γ.*—Mesothoracis paraptera et epimera æneo-viridia: antennæ articulo 8<sup>o</sup>. pallidè fusco: abdominis discus obscure cupreus.

*Var. δ.*—Antennæ articulis 6<sup>o</sup>. et 7<sup>o</sup>. pallidè fuscis; 8<sup>o</sup>., 9<sup>o</sup>. et 10<sup>o</sup>. fulvis: thoracis latera abdominisque margo æneo-viridia.

August; on lime-trees; near London.

Sp. 8. Eut. ocellus. Mas. *Viridi-æneus*, *antennis nigris*, *abdominis fascia flava*, *pedibus fulvis*, *pro-alis quasi ocelligeris*.

Viridi-æneus, obscurus, latus: caput thorace paullò latius: oculi ocellique rufo-fusci: trophi fusci: antennæ nigræ, corporis dimidii longitudine, apice nigro-fuscæ; articulus 1<sup>us</sup>. pallidè flavus; 2<sup>us</sup>., 3<sup>us</sup>. et 4<sup>us</sup>. pallidè fusci: abdomen cupreum, thoracis longitudine, ante medium flavo-fasciatum, apice viridescens: pedes fulvi, validi; coxæ cyaneo-virides; genua, tibiæ basi, meso- et metatarsi flava, hi apice pallidè fusci: alæ subfulvescentes, angustæ, breves, infectæ?; proalæ fusco apice marginatæ et sub stigmatate maculatæ; squamulæ et nervi pallidè fusca, nervus ulnaris obscurior; stigma obscure fuscum, mediocre. (Corp. long.  $1\frac{1}{4}$  lin.; alar.  $1\frac{1}{2}$  lin.)

New Lanark, Scotland.

Sp. 9. Eut. eximius. Fem. *Æneus aut viridis, antennis pedibusque fulvis, alis hyalinis plus minusve flavescen-*  
*tibus.*

Lætè æneus, latus : caput thoracis latitudine, posticè viride : oculi ocellique rufo-fusci : antennæ fulvæ, subtus pallidiores, corporis dimidio vix breviores ; articulus 1<sup>us</sup>. pallidè fulvus ; sequentes basi fusci : thorax ovatus ; segmentorum margines virides : abdomen cupreo-æneum, thorace paullò brevius, subtus non angulatum ; discus obscurè cupreus : pedes fulvi ; coxæ viridi-æneæ ; genua, tibiæ apice tarsi que flava ; hi apice fusci ; protibiæ et protarsi fulvo-flava : alæ hyalinæ, sub costam flavescens ; squamulæ et nervi flava ; stigma minutum. (Corp. long. 1—1 $\frac{1}{2}$  lin. ; alar. 1 $\frac{3}{4}$ —2 $\frac{1}{4}$  lin.)

Var.  $\beta$ .—*Æneo-viridis* : abdomen basi viride ; segmenta 1<sup>o</sup>. ad 4<sup>um</sup>. purpureo-cuprea.

Var.  $\gamma$ .—Lætè viridis : abdomen æneum, basi lætè viride, medio cupreum : coxæ virides ; profemora et protibiæ flava : alæ vix flavescens.

September and October ; on oak-trees ; near London. New Lanark, Scotland.

Sp. 10. Eut. platycerus. Fem. *Æneus, antennis pedibusque fuscis, tarsis pallidè flavis, alis hyalinis plus minusve flavescen-*  
*tibus.*

*Æneus*, latus, parùm nitens : caput æneo-viride, thoracis latitudine : oculi ocellique rufo-fusci : antennæ fuscæ, validæ, corporis dimidii longitudine, subtus pallidiores ; articulus 1<sup>us</sup>. omninò 2<sup>us</sup>.-que subtus fulvi : abdomen obscurè cupreum, thoracis longitudine, basi lætè æneo-viride, subtus non angulatum ; segmenta basi viridia : pedes pallidè fusci ; coxæ æneo-virides ; trochanteres, femora apice, tibiæ apice et basi tarsi que pallidè flava ; hi apice fusci ; protibiæ et protarsi fulva : alæ hyalinæ, subflavescens ; squamulæ fulvæ ; nervi flavi ; stigma fulvum, parvum. (Corp. long. 1—1 $\frac{1}{4}$  lin. ; alar. 1 $\frac{1}{2}$ —1 $\frac{3}{4}$  lin.)

Var.  $\beta$ .—Caput viride : thorax viridi-æneus.

Var.  $\gamma$ .—Caput viridi-æneum : thorax cupreo-æneus ; segmentorum margines virides.

Var.  $\delta$ .—Caput viride : thorax cupreus : abdominis segmenta basi ænea.

Var.  $\epsilon$ .—Thorax viridi-æneus, cupreo variegatus.



*Var. ζ*.—Thorax æneo-cupreus; segmentorum margines virides: abdominis segmenta basi viridi-ænea.

*Var. η*.—Caput viride: thorax viridi-æneus; mesothoracis scutellum cupreo-æneum.

*Var. θ*.—Caput cyaneo-viride: thorax æneo-cupreus: meso- et metapedum femora et tibiæ fusca: alarum nervi fulvi; stigma fuscum.

*Var. ι*.—Metathorax æneo-viridis.

*Var. κ*.—Abdominis segmenta basi ænea.

*Var. λ*.—Antennæ articulo 1<sup>o</sup>. pallidè fusco: alarum nervi fulvi; stigma fuscum.

*Var. μ*.—Tibiæ omnes fulvæ.

*Var. ν*.—Protibiæ et protarsi flava.

June to October; on grass beneath trees; near London. June and September; Isle of Wight. June; New Forest, Hampshire. September; Sidmouth, Devonshire.

Sp. 11. Eut. bicolor. Fem. *Præcedentis ferè statura, plerumque major, colore lætiore, pedibus pallidioribus.*

Æneus: caput viride, thorace sublatius: oculi ocellique rufo-fusci: antennæ pallidè fuscæ, corporis dimidii vix longitudine; articulus 1<sup>us</sup>. omninò 2<sup>us</sup>.-que subtus fulvi: mesothoracis scutellum cupreo-æneum: abdomen æneum, thorace paullò longius; segmentum 1<sup>um</sup>. basi æneo-viride cupreo maculatum; sequentia apice obscurè cuprea: pedes fulvi; coxæ viridi-æneæ; genua, tibiæ apice et tarsi flava; hi apice obscurè fusci; protibiæ et protarsi pallidè fulva; alæ hyalinæ, minimè flavescens; squamulæ et nervi fulva; stigma paullò obscurius, parvum. (Corp. long.  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.; alar,  $1\frac{3}{4}$ —2 lin.)

*Var. β*.—Abdominis segmenta basi cupreo-ænea.

*Var. γ*.—Femora, meso- et metatibiæ pallidè fusca.

September; on grass in fields; near London. Isle of Wight.

Sp. 12. Eut. platynotus. Fem. *Viridis, E. platyceri statura.*

Viridis: caput cyaneo-viride, thorace vix latius: oculi ocellique rufo-fusci: antennæ fulvæ, corporis dimidii longitudine, supra pallidè fuscæ, apice obscuriores; articulus 1<sup>us</sup>. fulvus: abdomen thoracis longitudine; segmenta apice cupreo-ænea: pedes fusci; coxæ virides; tibiæ apice tarsique straminea, hi apice fusci;

trochanteres, genua, protibiæ et protarsi fulva: alæ hyalinæ; squamulæ et nervi fulva; stigma parvum. (Corp. long.  $\frac{3}{4}$ —1 lin.; alar.  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.)

*Var. β.*—Thorax posticè æneo-viridis: protibiæ et protarsi flava.

July; on grass beneath trees; near London.

Sp. 13. Eut. sobrinus. Fem. *Præcedentibus 3 paullò longior.*

Æneus: caput viride, thorace sublatius: oculi ocellique rufo-fusci: antennæ obscurè fulvæ, corporis dimidii longitudine, supra fuscæ; clava obscurior; articulus 1<sup>us</sup>. fulvus, apice fuscus: thoracis latera viridi-ænea: abdomen obscurè cupreum, thorace paullò longius; segmenta basi lætè æneo-viridia: pedes fusci; coxæ æneæ; femora viridi-fusca; meso-femora apices versus spina fusca subtus armata; trochanteres et protarsi fulva; genua, tibiæ apicè tarsique flava, hi apice fusci; protibiæ flavæ, extus fuscæ: alæ hyalinæ, minimè fulvescentes; squamulæ et nervi fulva; stigma obscurius, parvum. (Corp. long. 1— $1\frac{1}{4}$  lin.; alar.  $1\frac{1}{2}$ — $1\frac{3}{4}$  lin.)

*Var. β.*—Caput inter oculos æneo-viride: antennæ articulis 1<sup>o</sup>., 3<sup>o</sup>. 4<sup>o</sup>.-que omninò fulvis: thorax viridi-æneus: protibiæ extus fulvæ.

*Var. γ.*—Caput inter oculos æneo-viride: antennæ fuscæ; articulus 1<sup>us</sup>. fulvus: thoracis dorsum cupreo-æneum: abdominis segmenta 2<sup>um</sup>. et sequentia basi ænea.

*Var. δ.*—Antennæ articulo 1<sup>o</sup> omninò fulvo; thorax supra cupreo-æneus; segmentorum margines virides: abdominis segmentum 1<sup>um</sup>. basi cupreo variegatum.

*Var. ε.*—Thorax supra abdominisque segmenta 2<sup>um</sup>. et sequentia basi cupreo-ænea; protibiæ utrinque fuscæ; pro-alæ fulvescentes.

*Var. ζ.*—Mesothoracis scutellum cupreo-æneum: abdominis segmenta basi viridi-ænea.

May and June; on grass in fields; near London. June; Windsor.

Sp. 14. Eut. catenatus. Fem. *Viridis, 4-præcedentibus angustior.*

Viridis: caput thoracis latitudine: oculi ocellique rufo-fusci: antennæ fusco-fulvæ, corporis dimidii longitudine; articulus 1<sup>us</sup>. fulvus: mesothoracis scutum æneo-viride: abdomen cupreum, thorace paullò longius; segmenta basi æneo-viridia: pedes fulvi; coxæ virides; femora, meso- et metatibiæ fusca, apice flava;

meso- et metatarsi flavi, apice fuscī: alæ hyalinæ, nonnunquam minimè flavescētes; squamulæ et nervi fulvæ; stigma parvum. (Corp. long.  $\frac{3}{4}$ —1 lin.; alar.  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.)

*Var. β.*—Caput inter oculos thoracisque dorsum æneo-*viridia*.

June; on grass beneath trees; near London; New Forest, Hampshire.

Sp. 15. Eut. inornatus. Fem. *Æneus, antennis nigris, pedibus fuscis, alis subfuscis.*

Obscurè æneus, brevis: caput nigrum, thorace vix latius: oculi ocellique rufo-fuscī: antennæ nigræ, corporis dimidio breviores; articulus 1<sup>us</sup>. basi fuscus: abdomen cupreo-æneum, thorace latius sed non longius, subtus non angulatum; segmentum 1<sup>um</sup>. basi et sequentia apice viridi-ænea: pedes fuscī; coxæ æneæ; femora apice, tibiæ basi, trochanteres et tarsi fulvæ, hi apice fuscī: alæ subfuscæ; squamulæ et nervi fusca; stigma minutum. (Corp. long.  $\frac{5}{4}$  lin.; alar.  $1\frac{3}{8}$  lin.)

*Var. β.*—Caput, thorax utrinque et posticè, coxæ et femora obscurè *viridia*.

*Var. γ.*—Abdomen basi cupreo-*viride*.

September; Westmoreland and Cumberland.

Sp. 16. Eut. fulvicornis. Fem. *Æneo-*viridis*, E. dilecto angustior, antennis fulvis, pedibus flavis, alis hyalinis.*

Lætè æneo-*viridis*: caput thoracis latitudine: oculi ocellique rufo-fuscī: antennæ fulvæ, corporis dimidio breviores; clava pallidior; articulus 1<sup>us</sup>. flavus: abdomen thorace longius, subtus paullò angulatum, apice acuminatum vix attenuatum; discus et apex obscurè cuprei: oviductus fulvus: pedes lætè flavi; coxæ virides; tarsi apice fuscī; protarsi fulvo-fuscī: alæ hyalinæ, sub costam minimè flavescētes; squamulæ et nervi flava; horum humeralis ubi costam attingit et cubitalis fulvi; stigma minutum. (Corp. long. 1— $1\frac{1}{2}$  lin.; alar.  $1\frac{1}{2}$ — $2\frac{1}{2}$  lin.)

*Var. β.*—Caput et thorax *viridia*, hujus segmentorum margines æneo-*virides*.

*Var. γ.*—Caput et thorax omninò *viridia*.

*Var. δ.*—Cyaneo-*viridis*: abdomen *viride*; discus cupreus.

*Var. ε.*—Antennæ articulo 1<sup>o</sup>. apice supra pallidè fulvo.

*Var. ζ.*—Abdomen cupreo-æneum; discus obscurè purpureo-cupreus.

*Var. η.*—Abdomen basi cupreo-*viride*.

*Var. θ.*—Abdomen supra obscurè cupreum, basi cupreo-*viride*, subtus et utrinque æneum segmentis basi cupreis.

*Var. ι.*—Nervi omninò flavi.

*Var. κ.*—*Var. ι* similis : metafemora fulva.

*Var. λ.*—*Var. κ* similis : abdomen cupreum, basi lætè viride ; segmenta utrinque et subtus basi viridia.

*Var. μ.*—*Var. κ* similis : antennæ fusco-fulvæ.

*Var. ν.*—Nervi radialis et ulnaris fulvi.

July to October ; on grass in fields ; near London. September ; Isle of Wight ; Linton, Devonshire ; New Lanark, Scotland.

Sp. 17. Eut. flavipes. Fem. *Viridis, antennis fuscis, pedibus flavis, alis hyalinis.*

Lætè viridis : caput thorace paullò latius : oculi ocellique rufo-fusci : antennæ fuscae, corporis dimidii longitudine ; articulus 1<sup>us</sup>. basi fulvus ; 2<sup>us</sup>. supra obscurè fuscus : thorax brevis : abdomen longius et gracilius, basi angustum, medio supra obscurè cupreum, subtus æneum non angulatum : pedes flavi ; coxæ virides ; tarsi apice fusci ; protarsi fulvi : alæ hyalinæ ; squamulæ et nervi flava ; stigma fulvum, minutum. (Corp. long.  $\frac{3}{4}$  lin. ; alar.  $1\frac{1}{4}$  lin.)

July ; on grass in fields ; near London.

Sp. 18. Eut. æquus. Fem. *Æneo-viridis, antennis fusco-fulvis, pedibus flavis, alis hyalinis.*

Æneo-viridis, angustus, sublinearis : caput thorace latius : oculi ocellique rufo-fusci : antennæ fusco-fulvæ, corporis dimidio breviores ; articulus 1<sup>us</sup>. pallidè fulvus : abdomen æneum, thorace paullò brevius et latius, basi cupreo-viride, subtus non angulatum, apicè vix acuminatum : pedes lætè flavi ; coxæ æneo-virides ; trochanteres pallidè fulvi ; meso- et metatarsi straminei, apice fusci : alæ hyalinæ, minimè flavescens ; squamulæ et nervi flava ; stigma minutum. (Corp. long.  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin. ; alar.  $1\frac{1}{2}$ —2 lin.)

*Var. β.*—Viridis : antennæ articulo 1<sup>o</sup>. supra apicè fusco-fulvo : abdominis discus cupreus.

*Var. γ.*—Antennæ fuscae, apicè fusco-fulvæ : abdomen æneo-viride.

*Var. δ.*—Antennæ fuscae ; articulus 1<sup>us</sup>. fulvus, basi flavus : abdomen viride, basi nitentius ; discus cupreus : metathorax lætè viridis.

*Var. ε.*—Abdomen cupreo-æneum ; discus obscurè cupreus.

*Var. ζ.*—Thoracis dorsum cupreo et purpureo maculatum.

*Var. η.*—Femora omnia et mesofemora præcipuè basi fulva.

August to October; on grass in fields; near London. September; Isle of Wight. New Lanark, Scotland.

Sp. 19. Eut. planus. Fem. *Cyaneo-viridis, antennis nigris, pedibus flavis, alis hyalinis.*

Lætè cyaneo-viridis, angustus, elongatus: caput viride, thorace vix latius: oculi ocellique rufo-fusci: antennæ nigræ, corporis dimidio breviores, apice fuscæ; articulus 1<sup>us</sup>. flavus, apice nigro-fuscus: abdomen æneum, thorace paullò brevius, subtus non angulatum; discus cupreo-æneus: pedes lætè flavi; coxæ virides; meso- et metapedum tibiæ tarsique straminea, hi apice pallidè fusci: alæ hyalinæ, apice subgriseæ; squamulæ et nervi flava; stigma minutum. (Corp. lon. 1½ lin.; alar. 2¼ lin.)

May; on grass beneath trees; near London.

Sp. 20. Eut. gracilis. Fem. *Viridis, antennis nigris, pedibus flavis, alis hyalinis.*

Lætè viridis, angustus, elongatus: caput thorace vix latius; oculi ocellique rufo-fusci: antennæ nigræ, corporis dimidio breviores, apice nigro-fuscæ; articulus 1<sup>us</sup>. fulvus, apice nigro-fuscus: mesothoracis scutellum æneo-viride: abdomen thorace paullò longius, subtus non angulatum; discus cupreus; segmenta basi subtus et utrinque ænea: pedes lætè flavi; coxæ virides; tarsi apice fusci: alæ hyalinæ; squamulæ flavæ; nervi pallidè fulvi; stigma minutum. (Corp. long. 1½ lin.; alar. 2 lin.)

New Lanark, Scotland.

Sp. 21. Eut. helvipes. Fem. *Viridis, pedibus flavis, antennis femoribusque fulvis, alis hyalinis.*

Lætè viridis, longus, angustus: caput thoracis latitudine: oculi ocellique fusco-rufi: trophi flavi: antennæ fulvæ, corporis dimidio breviores, supra fuscæ; articulus 1<sup>us</sup>. omninò fulvus: abdomen cupreum, angustum, thorace longius, subtus non angulatum; segmentum 1<sup>um</sup>. basi lætè viride; sequentia basi æneo-viridia: pedes lætè flavi; coxæ virides; trochanteres pallidè fulvi; femora fulva; metafemora fusca; tarsi apice fusci: alæ hyalinæ; squamulæ et nervi pallidè flava; stigma minimum. (Corp. long. 1½ lin.; alar. 1¾ lin.)

New Lanark, Scotland.

Sp. 22. Eut. posticus. Fem. *Æneo-cupreus, antennis nigris, pedibus fulvo-flavis, alis hyalinis.*

*Æneo-cupreus*, obscurus: caput viridi-æneum, thoracis latitudine: oculi ocellique rufo-fusci: antennæ nigræ, corporis dimidio paullò breviores, apice nigro-fuscæ; articulus 1<sup>us</sup>. basi fulvus: thorax angustus; metathorax lætè viridis: abdomen purpureo-cupreum, thorace latius sed non longius, apice et subtus viridi-æneum; segmentum 1<sup>um</sup>. cupreo-viride; reliqua basi viridia: pedes flavi; coxæ virides; femora basi fusca; profemora basi fulva; meso- et metatibiæ et protarsi fulva, illæ basi apiceque flavæ; tarsi apice fusci: alæ minimè fuscæ, parvæ; squamulæ et nervi fulva; stigma fuscum, parvum. (Corp. long.  $1\frac{1}{4}$  lin.; alar.  $1\frac{2}{3}$  lin.)

New Lanark, Scotland.

Sp. 23. Eut. elevatus. Fem. *Æneo-viridis, antennis nigris, pedibus fulvis, femoribus viridibus, alis subhyalinis.*

*Æneo-viridis*, obscurus: caput thoracis vix latitudine: oculi ocellique rufo-fusci: antennæ nigræ, corporis dimidio paullò breviores, apice nigro-fuscæ; articulus 1<sup>us</sup>. viridis, basi fulvus; 2<sup>us</sup>. æneo-viridis: abdomen thorace longius, subtus angulatum, apice elevatum acuminatum attenuatum; segmenta apice viridia: pedes fulvi; coxæ æneo-virides; femora viridia, apice fulva; trochanteres et protarsi fusci; meso- et metapedum tibiæ apice tarsique basi flava: alæ subhyalinæ; squamulæ et nervi fulva; stigma obscurius, parvum. (Corp. long.  $1\frac{1}{4}$ —2 lin.; alar.  $1\frac{2}{3}$ — $2\frac{2}{3}$  lin.)

*Var. β.*—Meso- et metafemora fusco cingulata.

*Var. γ.*—Viridi-æneus: abdomen basi æneum.

*Var. δ.*—Antennæ nigro-fuscæ: abdomen æneo-viride; segmenta basi cuprea.

September; Isle of Wight.

Sp. 24. Eut. intermedius Fem. *Præcedenti similis; abdomen paullò brevius et latius.*

*Viridi-æneus*, obscurus: caput æneo-viride, thoracis latitudine: oculi ocellique rufo-fusci: antennæ fuscæ, corporis dimidii longitudine; articulus 1<sup>us</sup>. basi fulvus: abdomen lætè viride, thorace vix longius, apice basique cupreo variegatum, medio cupreum: pedes flavi; coxæ et femora æneo-viridia; tibiæ fusco fasciata; tarsi apice fusci; trochanteres, protibiæ et protarsi fulva: alæ subhy-



alinæ; squamulæ et nervi fulva, horum humeralis flavus; stigma parvum, obscurius. (Corp. long.  $1\frac{1}{2}$  lin.; alar. 2 lin.)

*Var. β.*—Meso- et metatibiæ fulvo fasciatæ: alarum squamulæ fulvæ; nervi flavi; stigma fuscum.

September; Isle of Wight.

Sp. 25. Eut. semotus. Fem. *Viridi-æneus, antennis fuscis, pedibus flavis fusco cingulatis, alis hyalinis.*

*Viridi-æneus*, obscurus, *E. clavato* et *intermedio* abdomine minus attenuato hoc quoque antennis gracilioribus discretus: caput æneo-viride, thoracis latitudine: oculi ocellique rufo-fusci: antennæ obscurè fuscæ, corporis dimidii longitudine; articulus 1<sup>us</sup>. fusco-viridis, basi fulvus: abdomen purpureo-cupreum, apice elevatum cupreo-viride, subtus angulatum cupreum; segmentum 1<sup>um</sup>. cupreum, basi viride; 2<sup>um</sup>. et sequentia ad 5<sup>um</sup>. apice ænea: pedes flavi; coxæ virides; trochanteres fusci; femora fusco-viridia; tibiæ fusco cingulatæ; tarsi apice fusci; protibiæ et protarsi fulva: alæ hyalinæ; squamulæ fulvæ; nervi flavi; stigma fuscum, parvum. (Corp. long.;  $1\frac{1}{2}$ — $1\frac{2}{3}$  lin.; alar. 2— $2\frac{1}{4}$  lin.)

*Var. β.*—Antennæ articulo 1<sup>o</sup>. fusco basi fulvo: abdominis segmentum 1<sup>um</sup>. basi cupreo maculatum, 5<sup>um</sup>. basi æneo-viride: meso- et metatibiæ fulvo cingulatæ.

September; Isle of Wight.

Sp. 26. Eut. altus. Mas et Fem. *Viridis, antennis fuscis, pedibus fulvo flavis, femoribus viridibus, alis subhyalinis.*

*Mas.*—Cyaneo-viridis, crassus: caput thorace latius: oculi ocellique rufo-fusci: antennæ fuscæ, corporis dimidii longitudine; articulus 1<sup>us</sup>. fulvus, apice fuscus: abdomen thoracis longitudine; discus cupreus: sexualia fusca: pedes lætè flavi; coxæ virides; femora viridi-fusca, apice basique flava; tarsi apice fusci; protarsi fulvi: alæ subhyalinæ; squamulæ et nervi pallidè fusca; stigma parvum.

*Fem.*—Lætè viridis: antennæ corporis dimidio breviores: abdomen cyaneo-viride; segmenta basi cuprea: trochanteres fusci; femora viridia, apice basique fusca; tibiæ fulvæ, apice flavæ; metatibiæ fusco cingulatæ; protarsi fusci. (Corp. long. 1— $1\frac{1}{4}$  lin.; alar.  $1\frac{1}{2}$ — $1\frac{3}{4}$  lin.)

*Var. β.*—*Fem.* antennæ obscurè fuscæ; articulus 1<sup>us</sup>. basi fulvus: abdominis discus cupreus: tibiæ fuscæ, apice basique fulvæ; squamulæ et nervi obscurè fusca.

June; Windsor Forest.

Sp. 27. Eut. chlorospilus. Mas et Fem. *Viridis aut æneus, antennis nigris aut fuscis, maris abdomine flavo maculato, pedibus fuscis, femoribus nonnunquam viridibus, tarsis flavis, alis subhyalinis.*

*Mas.*—Æneus, obscurus: caput æneo-viride, thorace latius: oculi ocellique fuscii: antennæ fuscae, corporis dimidii longitudine; articulus 1<sup>us</sup>. fulvus, apice fuscus: abdomen obscurè æneo-viride, thoracis longitudine, basi viride nitentius, ante medium flavo maculatum: sexualia pallida: pedes fuscii; coxæ æneo-virides; femora viridi-fusca; tibiæ apice basique flavæ; tarsi flavi, apice fuscii: alæ subhyalinæ; squamulæ et nervi pallidè fusca; stigma mediocre.

*Fem.*—Viridi-æneus: antennæ nigro-fuscae, corporis dimidio breviores; articulus 1<sup>us</sup>. niger, basi fuscus: abdomen thorace paullo longius, subtus angulatum, basi lætè viride: oviductus fulvus: pedes flavi; coxæ viridi-æneæ; femora fusca; tibiæ fusco cingulatae; tarsi apice fuscii: protibiæ et protarsi fulvo-flava. (Corp. long.  $\frac{3}{4}$ —1 lin.; alar.  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.)

*Var. β.*—*Fem.* Viridis: antennæ nigræ; articulus 1<sup>us</sup>. nigro-viridis, basi fuscus: abdomen cupreum, basi, apice et subtus viride: coxæ et femora viridia; trochanteres et tibiæ fusca.

September; Isle of Wight. Exeter, Devonshire.

Sp. 28. Eut. fuscipennis. Fem. *Æneo-viridis, antennis nigro-fuscis, pedibus fuscis, femoribus viridibus, alis fuscis.*

Obscurè æneo-viridis: caput obscurè viride, thorace latius: oculi ocellique rufo-fuscii: antennæ nigro-fuscae, corporis dimidio breviores, apice subtus pallidiores; articulus 1<sup>us</sup>. fulvus: mesothorax posticè et metathorax virides: abdomen obscurè cupreum, thorace paullo longius, subtus angulatum, basi lætè viride, apice æneo-viride; segmenta utrinque basi viridia: pedes fuscii; coxæ et femora viridia, hæ apice basique fusca; tibiæ viridi-fuscae, apice flavæ; tarsi flavi, apice fuscii; protibiæ et protarsi fulva, hi apice fuscii, illæ apice flavæ: alæ fuscae, basi pallidiores; squamulæ et nervi obscurè fusca; stigma mediocre. (Corp. long.  $1\frac{1}{2}$ — $1\frac{2}{3}$  lin.; alar. 2— $2\frac{1}{4}$  lin.)

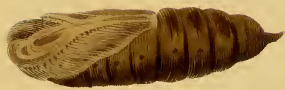
*Var. β.*—Antennæ articulo 1<sup>o</sup>. apice fusco: thorax viridis: abdominis segmenta supra basi cyaneo-viridia.

*Var. γ.*—Metathorax cupreo-viridis.

June; Windsor Forest.









Sp. 29. Eut. politus. Fem. *Viridis, antennis fuscis basi viridibus, pedibus flavo-fulvis, femoribus viridibus, alis hyalinis.*

Lætè viridis, ferè glaber: caput thorace vix latius: oculi ocellique rufo-fusci: antennæ fuscaë, corporis dimidio breviores; articuli 1<sup>us</sup>. et 2<sup>us</sup>. virides: thorax crassus, hujus familiæ plerisque lævior, anticè utrinque æneo-viridis: abdomen ferè læve, thorace longius et paullò angustius, subtus non angulatum; discus cupreo-viridis: pedes flavo-fulvi; coxæ et femora viridia, hæ apice flava; tarsi apice fusci; protarsi fulvi: alæ hyalinæ; squamulæ fulvæ, nervi flavi; stigma minimum. (Corp. long.  $\frac{5}{4}$  lin.; alar.  $1\frac{1}{4}$  lin.)

August; on grass in fields; near London.

Sp. 30. Eut. vagans. Fem. *Æneus, antennis pedibusque fuscis, alis subhyalinis.*

Æneus, ad *Amblymerum* propter articulo 3<sup>o</sup>. parvo antennas propinquus: caput posticè viride, thorace paullò latius: oculi ocellique rufo-fusci: antennæ pallidè fuscaë, corporis dimidio longiores; clava obscurior; articulus 1<sup>us</sup>. flavus; 3<sup>us</sup>. et sequentes ad 6<sup>um</sup>. fulvi: metathorax viridi-æneus: abdomen thorace paullò longius et latius, subtus viridi-æneum non angulatum: pedes pallidè fusci; coxæ æneæ; tibiæ apice tarsique helva, hi apice pallidè fusci; protibiæ et protarsi fulvæ: alæ subhyalinæ; squamulæ fuscaë; nervi pallidè fulvi; stigma obscurius, minutum. (Corp. long.  $\frac{1}{2}$  lin.; alar.  $\frac{3}{4}$  lin.)

Var.  $\beta$ .—Caput et metathorax omninò viridia: antennæ articulis 3<sup>o</sup>. ad 6<sup>um</sup>. pallidè fuscis.

July; on grass in fields; near London. June; Isle of Wight.

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ART. XXXIV. — *Notes on Deilephila Euphorbiæ.* (See Plates VIII. and IX.)

GENTLE READER,—Turn with us to the beautiful plates of *Deilephila Euphorbiæ*, the present of our valued friend, Mr. Raddon. Our friend, we imagine, has no great partiality for the pen; for with so prolific a subject, one which would have elicited from some of our modern entomologists abstruse disquisitions on system, physiology, and metamorphosis, Mr.



Raddon has positively not sent us a single line. We must endeavour to supply the deficiency; we have ourselves watched the progress of a *Sphinx*, from the egg to the imago, and the operations of the whole tribe are nearly similar; we will therefore intertwine our own gleanings with the information Mr. Curtis has given us in his *British Entomology*, information which that author received from Mr. Raddon.

Gentle Reader,—Let us call thy attention to Curtis's collection of *Sphingites*,—alike, but different. We are turning them over to find out all about *Euphorbia*. What exquisite softness, and downyness, and featheryness on that *Death's Head!* and what velvetyness, what rotundity, what life, what reality, in this caterpillar of *Carolina!* surely pencil never told the tale more truly! surely the lovers of beauty never gazed on a more delightful assemblage! Curtis, thou art without compeer!

Gentle Reader,—Pitifully contracted must be the mind that, to preserve consistency, would deviate from the path of rectitude; pitifully shallow must be that reasoning which would lead to perseverance in reproof no longer merited; pitifully weak must be that resolution which shrinks from the *right*, lest others should suppose it *wrong*; but, above all, pitifully painful must be that soul-cramp which attributes all praise after blame to motives of policy or expediency. We have met Mr. Curtis at the social board; we have for years lived on terms of intimacy, we may say of friendship, with him: furthermore, Mr. Curtis was friendly to our undertaking; he was desirous of its success; he exerted himself to assist us: he had an extensive entomological acquaintance, who bowed to his opinion; his good will, his good word, were of great importance to us; yet, even under these circumstances, when he adopted a course which, in our sober, unbiassed judgment, we considered wrong, we did not fail to give the public our opinion openly and boldly,—not in haste; we weighed the consequences well. In our subsequent notices the want of space has compelled us to be brief, very brief; but in pointing out trivial errors, we imagine we have still followed the path of duty; of our praise we have been sparing, perhaps too sparing, but the exceeding beauty of many of the figures from which we have turned without a comment, *must* make its own way, *must* speak its own praise.

Gentle Reader,—We have very unintentionally introduced an episode but little connected with our subject; we crave thy pardon, and proceed. When June, with his bitter blasts and drenching rains, has sodden the immense sand-hills of Braunton Burrows,<sup>a</sup> and the few intervals of sunshine have warmed the surface of the reeking sand, the beautiful moths represented in the Plate<sup>b</sup> awaken from a winter's slumber, shake off the grave-clothes which had shrouded them, and emerge from the waste of sand like unquiet ghosts deserting their abode in the tombs. On their first appearance the wings are small, clumsy, shapeless appendages, and are more soft and yielding than the lightest silk that undulates with a breath. The newly-born moth, in this state, crawls along the sand till it espies a solitary bent, a stick, a stone, or, better than all, the stem of its favourite plant, *Euphorbia Paralias*; either of these objects it ascends, till it has found firm footing in a vertical position; it then remains stationary, allowing its wings opportunity to expand and strengthen as they droop behind it. In this position it is most beautiful to observe the shivering pulsatory motion by which the blood seems to be forced into its newly-developed channels,—to watch the gradual expansion of the wing, until it has attained its full dimensions,—to mark the satisfied quiet that follows this expansion, while the wings hang side by side, and closely touching behind its back, like those of a butterfly at rest. In half an hour the wings are brought forward, and assume their usual position.

When the sun has been gone for about half an hour below the horizon, the whole tribe of moths begin to quit their diurnal shelter, and venture on the wing. It is then that our beautiful *Deilephila* first essays his newly-acquired powers of flight, and skims rapidly and in circles over the various branches of spurge which are scattered about the surrounding waste; here he finds a virgin-bride, like himself the child of the departed day. Next comes the laying of eggs; these, when first produced, are covered with an adhesive, gummy substance, which enables the female to stick them on the small leaves of the spurge, as represented in Plate IX. In a fortnight these eggs hatch, and produce little black caterpillars, four of which are represented

<sup>a</sup> Near Barnstaple, in Devonshire.

<sup>b</sup> Plate VIII. The middle figure represents the male, the lower the female, and the upper figure the under side of the insect.

on the same sprig of spurge; the one with red head and tail being a few days older than the others. After this they grow very fast; the middle uncoloured figure represents one at about five weeks old. In nine weeks the caterpillar attains its full size and perfect beauty, as represented in the upper figure; the red line down the back, the red head and tail, and the double row of yellow spots along each side, distinguish it readily from every other described or known caterpillar; when full fed, Mr. Curtis informs us, the caterpillars are so conspicuous that marine birds see them at a distance, and devour great numbers of them.

Two or three days after the caterpillar has attained the size depicted, it ceases to eat, crawls down the stem of the spurge, and roves about on the sand in the most restless manner; after wandering for many hours in this way, it makes a shallow hole in the sand, and, without spinning any web, becomes a chrysalis, as represented by the lowest of the three principal figures; this takes place in September, and in the following June the perfect insect again appears. "Sometimes, however," observes Mr. Curtis, "they remain in the pupa state two seasons, as many of the Lepidoptera do; a wise precaution of nature, to prevent any accident from destroying the whole brood. The sand-hills, where the larvæ are found, being of great extent, must have been collected by the winds and storms to which they are constantly exposed; during the winter the whole soil is frequently removed, so as completely to alter the surface of the country; a great number of the pupæ must consequently be either destroyed, or buried at a considerable depth below the surface, where probably they lie hid until brought to life and light by the influence of the elements."

Mr. Curtis gives a general view of the group called *Crepuscularia*, or *Lovers of twilight*, a name we think rather erroneous. The species are nocturnal or diurnal; but this we apprehend does not make them crepuscular. *Sesia* is a true lover of the sun; its flight is only in his rays; he who has not seen this faëry creature pendulizing over a purple patch of *Ajuga*,—anon descending to sip, without alighting, the sweets of each corolla,—he who has not watched its porrected tube dive into cup after cup, its body the while motionless, its legs shivering, and its wings invisible through excess of motion; he who has not seen it again rise, and again pendulize, and



Fig. 1.



Fig. 2.



Fig. 3.



then dart off with immeasurable speed; he who has not witnessed these things, has yet a delight to come: let him explore the woods of Kent during the month of May, when the air is calm and sunny, and he will surely be gratified. But what is this at our jasmine, with bird-like head, with brilliant eye, with spread and party-coloured tail, humming loudly, and, though driven off, returning again and again, day after day, from the rising to the setting of the sun? it is *Macroglossa*: from January to December we have some flower welcome to her, and she is welcome, most welcome, to us and ours. *Deilephila*, thy wing is scarcely less alert, and around our honeysuckle we often hear thy happy, thy contented hum, and with our lanthorn light thee to thy feast; but thy wing is not all unwearying, and fain wouldst thou rest awhile on each cup thou drinkest from, and if disturbed flit circling round our head as loth to leave. Next comes the heavy *Sphinx*; his body droops, his tube, longest of all, rifles e'en the *Bignonia's* bloom; his wing is strong, swift and direct his flight, he wastes it not in airy show. O'er widest pastures, o'er the desert plain, o'er ocean's waters, the giant *Acherontia* roams; turning ever and anon his broad side to the blast, he wings his swift course onwards. Lastly, comes thy soft and feeble flight, *Smerinthus*, silent and owl-like as the wafted flake or feather at the midnight hour, when all beside is still.



ART. XXXV. — *Description of some Coleopterous Larvæ.*  
By G. R. WATERHOUSE.

*Larva of Megatoma serra.* Fab. Plate X. Fig. 3.

HEAD corneous: body subcoriaceous, of a dull brown colour, variegated with markings of a deeper hue, and covered with long brown hairs; four of the abdominal segments have a second series of hairs, which are shorter, and very thickly set. The telum is also furnished with a long brush of hairs. (Length,  $1\frac{1}{2}$  lin.)

Head subrotundate: antennæ three-jointed; basal joint short and stout; second elongate, narrowed anteriorly and posteriorly; terminal, elongate and slender. The head is furnished with six

stemmata on each side, which are placed behind the base of the antennæ. Maxillary palpi three-jointed, the joints short and compact; labial palpi minute, two-jointed; body twelve-jointed; oblong-ovate, depressed; the segments are of three descriptions. The prothorax, mesothorax, and metathorax are broader (taking the breadth of each segment longitudinally of the insect) than the remaining joints, and without the ridge common to them. The three next joints are very narrow and compact, and have a slightly elevated ridge towards the lower part. Four of the remaining joints are broader than the last mentioned, and have the ridge very much elevated, and forming a base from which the abdominal brush of hairs springs; these hairs, when viewed sideways, present four distinct layers. The telum is very minute, and placed within the apex of the paratelum.

\* *Description of the Figure.*

*a* The larva magnified. *b* The same, with the hairs removed. *cc* Sides of two of the joints at large, showing the part from which the abdominal hairs spring. *d* Under side of the head. *e* Part of the side of the head at large, showing the antennæ, and position of the stemmata. The line in each figure is the natural size of the larva.

The power which the larva possesses of erecting the abdominal hairs when molested, as the porcupine does its quills, is remarkable. At first it was rather difficult to ascertain how this was accomplished; but upon examination, after removing the hairs from the larva, I found that the object was attained by an oblique movement of the four abdominal segments, to which these hairs are attached, somewhat after the fashion of the laths of a Venetian blind. These segments are furnished with a loose fold of skin on the under edge, to admit of the above movement.

I kept one of these larvæ for upwards of a month, in company with others of a voracious nature, and observed that, on any of the latter coming in contact with the longer hairs of this larva, it erected its abdominal brush, on which they receded; this fact seems to prove, that it is only by the sudden movement of the brush that the alarm is caused.

The long brush of hairs springing from the *telum*, or terminal joint of the abdomen, is also of service as a means of defence. When the larva is walking, it is always kept in a tremulous motion, and thus defends it from attack in the rear.

I would query whether the corneous abdominal segment, which is armed with spines in many of the Coleopterous larvæ,



may not be of use to the animal in somewhat the same way? These larvæ generally live in holes in decayed trees, which their body completely fills up; carnivorous larvæ, following in their track, would not be able to wound this part.

I know that, in one instance, it would be a perfect protection. I possess a small Coleopterous larva, which will fix its jaws in the soft skin of others, and there remain sucking until it is satisfied; after a little time it will repeat the operation, and this it will do until there is nothing left but the skin. Now this larva has not strength of jaws sufficient to wound these corneous segments.

The larva is found, during the winter months, under the loose bark of elm trees. I have found many of them, and invariably in company with a particular species of spider, which spins a web-like case, in which it lives, and upon which, I believe, the *Megatoma* larva feeds. Here we see the especial necessity for this protection, without which, I should think, it would soon be devoured by the spider.

I reared several specimens of this larva four or five years ago, but having misplaced the jar in which they were kept, did not see the pupa. When I found the jar, which was by accident, they had assumed the *imago* state;—the insect was dead.

*Larva of Dasycles serricornis.* Kirby. Plate X. fig. 1.

HEAD and tail pitchy black; body whitish, variegated with markings of a dull green hue. (Length,  $1\frac{1}{2}$  lin.)

Head rotundate, rugose, with four whitish spots, two placed near the base on each side, and two anteriorly, behind the antennæ; just above, and between which and the antennæ, are two stemmata on each side. Antennæ short, three-jointed. Body elongate, soft and pubescent, gradually swelling towards the apex, which is armed with a corneous forked process.

*Description of Figure.*

*a* The larva magnified. *b* The head at large, showing the situation of the stemmata and white spots. *c* The telum.

The accompanying drawing was made from one of a number which I reared in the year 1828. I found the larva and pupa, about the beginning of March, in decayed blackthorn and

pear-trees; they assumed the imago state at the latter end of April.

Not having a specimen of the larva at present, I am unable to show the trophi at large. In habits and appearance, however, it is closely allied to those of *Thanasimus* and *Opilus*.

*Larva of Orchesia micans.* Lat. Plate X. fig. 2.

HEAD corneous; body soft, cylindrical, slightly pubescent, and of a pink colour. (Length,  $1\frac{1}{2}$  lin.)

Head rotundate; antennæ very minute; labrum semicircular; mandibles short, slightly unidentate internally; maxillæ, with the blade, soft and fleshy, the apex sparingly furnished with spinous hairs; maxillary palpi three-jointed, the joints equal in length, terminal joint conic. Body elongate, cylindrical; all the joints are transverse, and nearly equal, excepting the telum, which is rather small, and semicircular.

*Description of Figure.*

*a* The larva magnified. *b* The pupa. *c* The head of the larva at large. *d* Mandible. *e* Maxilla. *f* Leg.

The larva is found, during the autumn, in *boletus* of the ash tree, and is generally in a bent position, and very sluggish, like those of the *Curculionidæ*. The pupa begins to partake of the activity of the perfect insect, rigging about very much when touched; its head is curiously dilated at the sides, and depressed.

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ART. XXXVI.—*Two Letters, written by Mr. Addison, in the Year 1708, to the Earl of Warwick, (afterwards his Son-in-Law,) when that Nobleman was very young.* Communicated by ARTHUR DAVIS, Esq.

[TO THE EDITOR OF THE ENTOMOLOGICAL MAGAZINE.]

SIR,—Some years since a friend of mine permitted me to transcribe two original letters from the celebrated Addison to his after-acquired son-in-law, the Earl of Warwick. I was, and am still, much delighted with the elegant simplicity which

pervades them, and having been assured that they have never yet met the public eye in print, I am inclined to think the subject of them is not absolutely unfit for the pages of a Magazine, so prominently identified with nature as the Entomological Magazine.

If you shall consider them worth insertion, they are at your service; but if not, please send me back the transcript, as it may save my copying them, perhaps, at a future time.

Believe me, yours, &c.

ARTHUR DAVIS.

*Deptford, 22d July, 1834.*

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MY DEAR LORD, — I have employed the whole neighbourhood in looking after birds' nests, and not altogether without success. My man found one last night, but it proved a hen's, with fifteen eggs in it, covered with an old broody duck, which may satisfy your Lordship's curiosity a little, though I am afraid the eggs will be of little use to us. This morning I have news brought me of a nest that has abundance of little eggs, streaked with red and blue veins, that, by the description they give me, must make a very beautiful figure on a string. My neighbours are very much divided in their opinions upon them; some say they are a sky-lark's,—others will have them to be a canary bird's; but I am much mistaken in the colour and turn of the eggs if they are not full of tom-tits. If your Lordship does not make haste, I am afraid they will be birds before you see them; for, if the account they give of them be true, they can't have above two days more to reckon.

Since I am so near your Lordship, methinks, after having passed the day among more severe studies, you may often take a trip hither, and relax yourself with these little curiosities of nature. I assure you no less a man than Cicero commends the two great friends of his age, Scipio and Lælius, for entertaining themselves at their country-house, which stood on the sea-shore, with picking up cockle-shells, and looking after birds' nests. For which reason I shall conclude this learned letter with a saying of the same author, in his treatise of Friendship: "Absint autem tristitia, et in omni re severitas: habent illa quidem gravitatem; sed amicitia debet esse lenior

et remissior, et ad omnem suavitatem facilitatemque morum proclivior." If your Lordship understands the elegance and sweetness of these words, you may assure yourself you are no ordinary Latinist; but if they have force enough to bring you to Sandy-End, I shall be very well pleased.

I am, my dear Lord,

Your Lordship's most affectionate and obedient,

J. ADDISON.

May 20, 1708.

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MY DEAREST LORD,—I can't forbear being troublesome to your Lordship whilst I am in your neighbourhood. The business of this is to invite you to a concert of music, which I have found out in a neighbouring wood. It begins precisely at six in the evening, and consists of a blackbird, a thrush, a robin-red-breast, and a bull-finch. There is a lark that, by way of overture, sings and mounts till she is almost out of hearing, and afterwards, falling down leisurely, drops to the ground, or as soon as she has ended her song. The whole is concluded by a nightingale, that has a much better voice than Mrs. Tofts, and something of the Italian manner in her divisions. If your Lordship will honour me with your company, I will promise to entertain you with much better music, and more agreeable scenes, than you ever met with at the Opera; and will conclude with a charming description of a nightingale out of our friend Virgil:—

Qualis populeâ mœrens Philomela sub umbrâ  
 Amissos queritur fœtus, quos durus arator  
 Observans nido implumes detraxit, at illa  
 Flet noctem, ramoque sedens, miserabile carmen  
 Integrat, et mœstis latè loca questubus implet.

So, close in poplar shades, her children gone,  
 The mother nightingale laments alone:  
 Whose nest some prying churl had found, and thence,  
 By stealth convey'd th' unfeather'd innocence:  
 But she supplies the night with mournful strains,  
 And melancholy music fills the plains.

Your Lordship's most obedient,

J. ADDISON.

May 27, 1708.

ART. XXXVII.—*Attempted Division of British Insects into Natural Orders.* By EDWARD NEWMAN.

*Note.*—In a few instances the connexions in the following arrangement would have been imperfect without an allusion to exotic genera; such exotic genera, or higher divisions, as may occur, are invariably inclosed by parentheses. In the following table those orders to which an asterisk is attached are merely designated, not described. The expression “Larva and pupa unknown,” simply signifies that they are unknown to the author, not to invalidate, in the slightest degree, descriptions which may have been given of them elsewhere.

TABLE OF THE ARRANGEMENT.

HEXAPODA TETRAPTERA.

AMORPHA	<i>Tabanina</i>	<i>Vespina</i>
I. LEPIDOPTERA	Cyrtites	Vespites
<i>Sphingina</i>	Bombiliites	(Masarites)
Sphingites	Tabanites	<i>Apina</i>
<i>Papilionina</i>	Anthracites	Lithurgites
Hesperites	Stomoxites	Panurgites
Erycinites*	Conopites	Andrenites
Coliites*	Æstrites	Melliturgites
(Heliconiites)*	<i>Asilina</i>	Apites
Papilionites	Leptites	Apathites
Nymphalites*	Therevites	Chrysites
(Morphites)*	Asilites	<i>Ichneumonina</i>
<i>Geometrina</i>	Midasites	Proctotrupites
Geometrites	Empites	Mymarites
<i>Noctuidina</i>	Tachydromiites	Chalcites
Phytometrites	Dolichopites	Cynipites
Catocalites*	<i>Syrphina</i>	Evaniites
Noctuides	Xylophagites	Ichneumonites
<i>Phalænina</i>	Stratiomites	Braconites
Arctiites	Chrysotoxites	<i>Sirecina</i>
Bombycites	Syrphites	Sirecites
Phalænites	Eristalites*	Xyphidriites
Notodontites	Volucellites*	Xyelites
Cossites	Rhingiites*	Oryssites
Ægeriites	<i>Muscina</i>	<i>Tenthredinina</i>
<i>Pyralina</i>	Muscites	Allantites
Glaucoptes	Scatophagites	Hylotomites
Pyralites	Tetanocerites	Tenthredinities
Crambites	Tephritites	Lydites
<i>Tineina</i>	Phytomyzites	Cephites
Yponomeutites	Phorites	—
Tortricites	Borborites	IV. COLEOPTERA
Tineites	<i>Hippoboscina</i>	<i>Blapsina</i>
Alucitites	(Carnites)	Blapsites
—	Hippoboscites	Helopites
Pulicites*	Nycteribiites	Mordellites
—	—	Pyrochroites
II. DIPTERA	Styloplites	Cantharites
<i>Tipulina</i>	—	Anthicites
Cecidomiites	NECROMORPHA	<i>Buprestina</i>
Tipulites	III. HYMENOPTERA	Ptinites
Mycetophilites	<i>Formicina</i>	Clerites
Rhyphites	Formicites	Melyriites
Bibionites	Mutillites	Lampyrites
Scatopsites	<i>Sphecina</i>	Cebrionites
<i>Culicina</i>	Scholiites	Elaterites
Simuliites	Sapygites	Buprestites
Sphæromiites*	Pompilites	<i>Scarabaina</i>
Ceratopogonites*	Sphecites	Cetoniites
Culicites	Larrites	Melolonthites
Chironomites*	(Bembicites)	Trogites
Corethrites*	Crabronites	Scarabæites
Psychodites	—	Lucanites

Histerites	Curculionites	<i>Notonectina</i>
Byrrhites	Anthribites	Notonectites
<i>Silphina</i>	Salpingites	<i>Cicadina</i>
Dermestites		Cicadites
Ipsites	ISOMORPHA	<i>Coccina</i>
Nitidulites	V. ORTHOPTERA	Coccites
Silphites	<i>Forficulina</i>	<i>Aphina</i>
Spheridiites	Forficulites	Aphites
Hydrophilites	<i>Achetina</i>	—
Helophorites	Achetites	Aleyrodites
<i>Carabina</i>	<i>Gryllina</i>	—
Gyrinites	Gryllites	ANISOMORPHA
Dytiscites	<i>Locustina</i>	VII. NEUROPTERA
Carabites	Locustites	<i>Termitina</i>
Cicindelites	( <i>Spectrina</i> )	Termites
Staphylinites	(Spectrites)	<i>Perlina</i>
Pselaphites	( <i>Mantina</i> )	Perlites
Scydmænitites	(Mantites)	<i>Raphidiina</i>
<i>Chrysomelina</i>	<i>Blattina</i>	Raphidiites
Endomycites	Blattites	<i>Hemerobiina</i>
Coccinellites	—	Hemeroblites
Cassidites	Thrypsites	<i>Phryganina</i>
Chrysomelites		Phryganites
Halticites	VI. HEMIPTERA	<i>Ephemerina</i>
Galerucites	<i>Cimicina</i>	Ephemerites
Criocerites	Cimicites	<i>Libellulina</i>
<i>Cerambycina</i>	<i>Hydromelrina</i>	Libellulites
Lepturites	Hydrometrices	—
Cerambycites	<i>Nepina</i>	Panorpites
Cucujites	Nepites	
Bostricites		

### DIVISION I.—TETRAPTERA AMORPHA.

Larva and pupa<sup>a</sup> bearing no resemblance in external appearance to the imago. Pupa perfectly quiescent, having the organs of manducation and locomotion undeveloped.

#### SECTION I.—T. A. ADERMATA,

Which on entering the pupa state throw off the last skin of the larva, and consequently exhibit through the remaining skin the parts of the future imago.

#### CLASS I.—LEPIDOPTERA.

Larva with strong corneous mandibles, moving horizontally, and six articulated feet, situated in pairs on the second, third, and fourth segments: the fifth and sixth, eleventh and twelfth segments invariably with feet; the other segments each subject to the possession of a pair of fleshy prehensile feet: feeds on the leaves, bark, wood, or roots of vegetables. Imago with short, undeveloped, immovable labrum and mandibles; elongate palpigerous maxillæ, slender, flexible, and tubular; when at rest, convoluted between the labial feelers; labium triangular,

<sup>a</sup> In a paper read in the course of last spring, at the Linnæan Society, I have attempted to prove that the pupa is not a distinct state, but simply the matured larva; the term is, however, convenient to express that matured state.

bearing two erect conspicuous feelers: all the wings fully and nearly equally developed, and, together with the body, clothed with scales: feeds on the honey of flowers, and on fruit.

STIRPS.—SPHINGINA.

NATURAL ORDER.—SPHINGITES, *Hawk-moths*.

Larva naked, of uniform substances, with ten prehensile legs, and a stout corneous recurved horn on the paratelum. Pupa smooth, rounded, generally quite naked; changes in or on the ground. Imago with the antennæ incrassated in the middle; the tips furnished with a recurved hook composed of fine bristles; wings narrow; hind wings small; body stout: flight rapid and well sustained; diurnal or nocturnal. *Sesia*, *Macroglossa*, *Smerinthus*, *Sphinx*, *Acherontia*, *Deilephila*, (*Castnia*,) &c.

STIRPS.—PAPILIONINA.

NATURAL ORDER.—HESPERITES, *Skippers*.

Larva generally naked, stout in the middle, and attenuated at the extremities with ten prehensile legs. Pupa stout, smooth, unangulated; changes in a loose web among the leaves on which the larva feeds, attached by the tail and a thread round the middle. Imago with the antennæ partially clavated; sometimes nearly filiform, hooked at the extremity; the hind wings of the insect, when at rest, reposing in a nearly horizontal position; the fore wings nearly erect; flight diurnal, brisk, and bustling. *Hesperia*, *Thymele*.

NATURAL ORDER.—PAPILIONITES, *Butterflies*.

Larva sometimes naked, but generally covered with down, hair, or spines; with ten prehensile legs. Pupa naked; mostly angulated, always attached by the tail; changes in the air. Imago with clavated antennæ not hooked; all the wings erect, and meeting above the back when at rest. *Polyommatus*, *Lycæna*, *Thecla*, *Amaryssus*, *Colias*, *Pontia*, *Apatura*, *Limenitis*, *Hipparchia*, *Vanessa*, *Argynnis*,<sup>b</sup> &c.

<sup>b</sup> This order appears to require further division, before we arrive at families; perhaps when we attain a more perfect knowledge of the anterior states of butterflies, they will be found to be divisible thus:—

NATURAL ORDERS.

- |                    |                  |
|--------------------|------------------|
| I. NYMPHALITES.    | IV. ERYCINITES.  |
| II. MORPHITES.     | V. COLIITES.     |
| III. HESPERITES.   | VI. HELICONITES. |
| VII. PAPILIONITES. |                  |



## STIRPS.—GEOMETRINA.

NATURAL ORDER.—GEOMETRITES, *Loopers*, or *Slender bodies*.

Larva naked, slender, and very elongate, with four prehensile feet; in consequence of the length of body without feet, its back is arched in walking. Pupa smooth, rounded; situation of change, various. Imago with antennæ tapering to a point; in the males often highly pectinated; wings ample, expanded; body very slender; flight in the evening, silent, feathery. *Geometra* and *Phalæna* of Haworth.

## STIRPS.—NOCTUINA.

NATURAL ORDER.—PHYTOMETRITES, *Half-loopers*.

Larva naked, elongate, less slender than the preceding, with six prehensile feet; in walking its back is arched, but not so decidedly as in the preceding. Pupa smooth, rather pointed at the tail; changes in a slight web. Imago with filiform antennæ; small deflexed wings; moderately stout body; beautifully coloured: often with brilliant metallic markings; flight at all hours; in the hottest sunshine, and at midnight. *Plusia*, *Ophiusa*, *Heliothis*, *Acontia*, *Erastria*, *Phytometra*,<sup>c</sup> &c.

NATURAL ORDER.—NOCTUITES, *Full-bodied Moths*.

Larva generally naked, cylindrical, robust, with ten prehensile feet;<sup>d</sup> rolls in a ring when touched. Pupa smooth; mostly changes in the ground. Imago with filiform antennæ; occasionally pectinated in the males; wings small, deflexed; body stout and heavy; colour dusky; flight very rapid; nocturnal. *Brepha*, *Catocola*, and the *Noctuidæ*. *Noctua* and *Hemigeometra* of Haworth.<sup>e</sup>

## STIRPS.—PHALÆNINA.

NATURAL ORDER.—ARCTIITES, *Millers*.

Larva very hairy; sometimes with bunches, brushes, or fascicles of hairs; with ten prehensile legs; rolls in a ring when touched.

<sup>c</sup> This order corresponds with the genus *Phytometra* of Haworth; as he appears to have been the first, and indeed nearly the only author who considered it as decidedly distinct from the *Noctuites*, I have adopted his name.

<sup>d</sup> Eight only in a few.

<sup>e</sup> The genus *Hemigeometra* of Haworth, including *Brepha* and *Catocala*, differs in having larger wings, a more slender body, brighter colours, diurnal flight, and a half-looping larva: it may possibly, hereafter, form a distinct order, under the name *Catocalites*. The *Geometrites* and *Noctuites* still require subdivision.

Pupa, more or less hairy; changes in a cocoon composed of silk, in which the hairs of the larva are always intermixed. Imago, the males with somewhat slender bodies; more or less pectinated antennæ, and active; often flying by day; the females very heavy, sluggish, and often apterous. *Acronycta* (part), *Spilosoma*, *Arctia*, *Hypercampa*, *Lithosia* (part), *Hypogymna*, *Laria*, *Orgyia*.<sup>†</sup>

NATURAL ORDER.—BOMBYCITES, *Eggars*.

Larva elongate, cylindrical, of equal substance, hairy, with ten prehensile feet; rolls in a ring when touched. Pupa in a silken cocoon, more close than the preceding. Imago with pectinated antennæ in both sexes; males with slender bodies, very active, and fly by day; females heavy, sluggish, and seldom fly; predominating colour, fulvous. *Eriogaster*, *Odonestis*, *Gastropacha*, *Lasiocampa*.

NATURAL ORDER.—PHALÆNITES, *Emperor-moths*.

Larva obese, with fascicles of bristles disposed in rings on each segment. Pupa short, obtuse, flat, with bristles at the tail; changes in a tough pear-shaped cocoon, of which the smaller end remains open. Imago with highly pectinated antennæ in both sexes; wings amazingly expanded; the fore wings more or less falcate; beautifully coloured, and ocellated; body short and small; flight of the males diurnal, of the females rare, and mostly in the evening. *Saturnia*.

NATURAL ORDER.—NOTODONTITES, *Prominents*.

Larva generally naked; sometimes slightly downy; attenuated towards the tail, with eight prehensile feet; the two posterior ones being mostly wanting, and the segment usually bearing them elevated in the air. Pupa smooth, obese, compact; mostly changes in a cocoon or web, but occasionally on or in the ground. Imago with the antennæ of the males more or less pectinated; wings deflexed; flight, with few exceptions, in the evening. *Endromis*, *Cerura*, *Stauropus*, *Platypteryx*, *Cilix*, *Notodonta*, *Pygæra*, *Clostera*.

NATURAL ORDER.—COSSITES, *Wood-eaters*.

Larva depressed, rather attenuated towards either extremity; naked, except a few scattered hairs; prothorax flat and corneous; ten

<sup>†</sup> Those in which the larva is furnished with brushes of hair, and in which the female imago is apterous, I have elsewhere treated as a separate order; the distinctions, however, seem of very doubtful value.

prehensile feet; feeds on the bark, solid wood, pith, or roots of vegetables. Pupa furnished with a double row of short spines on each segment; it changes in a tough cocoon amongst its food, after remaining through the winter in the larva state. Imago with the antennæ of the males more or less pectinated; flight nocturnal. *Hepialus, Cossus, Zeuzera.*

NATURAL ORDER.—ÆGERIITES, *Clear-wings.*

Larva and pupa, in habit and economy, precisely as in the preceding. Imago with antennæ incrassated externally, and the tip furnished with a slightly recurved hook, consisting of a few bristles; in the males ciliated; wings narrow, mostly transparent; body elongate, slender, and tufted; flight diurnal, in the hottest sunshine, and eminently graceful. *Ægeria.*‡

STIRPS.—PYRALINA.

NATURAL ORDER.—GLAUCOPITES, *Burnet-moths.*

Larva obese, hairy, with ten prehensile legs. Pupa smooth, very glossy; changes in a close gummy cocoon, pointed at both ends, and attached generally to a blade of grass. Imago with clavate antennæ; slightly pectinated in the males. *Zygæna, Ino.*

NATURAL ORDER.—PYRALITES, *Pearl-moths.*

Larva rather more slender than the foregoing, slightly hairy, with ten prehensile feet. Pupa elongate, very lively; changes in a silken cocoon. Imago with filiform antennæ; wings somewhat triangular, deflexed: legs very long, and furnished with long spurs. *Ennychia, Pyrausta, Hydrocampa, Botys, Scopula, Pyralis, Polypogon, Hypena.*

NATURAL ORDER.—CRAMBITES, *Veneers.*

Larva elongate, naked, with ten prehensile feet. Pupa elongate; changes in a slight cocoon. Imago with very prominent labial feelers, filiform antennæ, sometimes pubescent; wings ample, folded round the body; flight in the evening. *Crambus*, and allied genera.

‡ The great difference between this and the preceding order, in the imago state, has induced me to propose this additional order.

## STIRPS.—TINEINA.

NATURAL ORDER.—YPONOMEUTITES, *Ermine-moths*.

Larva elongate, slightly hairy, with ten prehensile feet; gregarious, spinning a web; if touched, runs backwards, falls and suspends itself by a thread. Pupa elongate, smooth; changes in a cocoon amongst its food. Imago with filiform antennæ; wings folded round the body, often beautifully dotted and marked with black. *Yponomeuta*, and neighbouring genera.

NATURAL ORDER.—TORTRICITES, *Bell-moths*.

Larva more obese than the foregoing, slightly hairy, with ten prehensile feet; gregarious, spinning a web; if touched, runs backwards with a rapid twisting motion, and falls, hanging by a thread. Pupa elongate, attached by the tail; changes in a silken cocoon, generally amidst the web of the larva. Imago with filiform antennæ; the fore wings with a prominent shoulder, which gives the insect, when at rest, precisely the shape of a bell. *Tortrix*, and allied genera.

NATURAL ORDER.—TINEITES, *Clothes-moths, &c.*

Larva elongate, with ten prehensile legs; concealed in a sack constructed by itself, which it enlarges from time to time as it increases in bulk; feeds on woollen cloths, hair, and decayed animal and vegetable substances. Pupa elongate; changes within the sack. Imago with filiform antennæ, and narrow wings; flight gregarious, rising and falling. *Tinea*, and allied genera.

NATURAL ORDER.—ALUCITITES, *Plume-moths*.

Larva slender, with ten prehensile feet; the anterior part capable of great attenuation and extension, in the manner of a leech. Pupa elongate; changes in a silken cocoon. Imago with filiform antennæ; wings extended at right angles with the body; very narrow, and divided to the base, each division having the appearance of a perfect and distinct feather. *Pterophorus*, *Alucita*.

NATURAL ORDER.—PULICITES, *Fleas*.

## CLASS II.—DIPTERA.

Larva with minute but corneous mandibles, moving horizontally; without articulate or prehensile feet; feeds on recent or

decaying animal and vegetable substances. Imago with the parts of the mouth variously developed; the mandibles never possessing the horizontal motion, or masticatory power; the fore wings fully developed; the hind wings undeveloped; assuming the appearance of small pedunculated knobs, and denominated halteres or poisers; tarsi five-jointed.

#### STIRPS.—TIPULINA.

##### NATURAL ORDER.—CECIDOMIITES, *Hessian-fly*, &c.

Larva elongate, inhabits and feeds on the blossoms of wheat and other grain, the leaves of plants, &c. causing excrescences. Pupa changes in the same situation, in a tough case. Imago usually with moniliform antennæ, as long as the body, composed of about twelve or thirteen joints in the female, and twice as many in the male; joints nearly globular, connected by a slender filament; maxillary feelers four-jointed; labium short, obtuse, and tomentose; other parts of the mouth obsolete; wings wide, as long as the body, which they cover horizontally; female furnished with an oviduct, frequently as long as the body. *Cecidomya*, *Campylomyza*.

##### NATURAL ORDER.—TIPULITES, *Crane-flies*.

Larva stout, very soft, attenuated anteriorly, abruptly terminated posteriorly; inhabits the earth, feeding on the roots of corn, grass, and other vegetables, or occasionally decayed wood. Pupa changes in the same situations; it has often two remarkable recurved horns porrected from its head, through which it is said to breathe; and the segments of the body are mostly armed with spines. Imago with antennæ thirteen to seventeen-jointed; frequently pectinated in the males; labium fleshy, bilobed, dilated; maxillary feelers five-jointed, moderately long, curved, the points turning outwards; the other organs of the mouth nearly obsolete; ocelli none. *Ctenophora*, *Pedicia*, *Tipula*, *Erioptera*, *Limnobia*.

##### NATURAL ORDER.—MYCETOPHILITES.

Larva elongate, glabrous; inhabits and feeds on decaying fungi. Pupa changes in the same situations. Imago with antennæ sixteen-jointed, sometimes very long, moniliform, and simple in both sexes; labium and other organs of the mouth obscurely developed or obsolete; ocelli three; wings rather wide, cover the body

horizontally; body very slender, the same length as the wings; legs long. *Bolitophila*, *Macrocera*, *Synapha*, *Mycetobia*, *Platyura*, *Sciophila*, *Leia*, *Mycetophila*, *Molobrus*, *Lestrema*, *Zygoneura*.

#### NATURAL ORDER.—RHYPHITES.

Larva very elongate, smooth, cylindrical, encompassed by eleven corneous shining rings; head furnished with two hooks; tail with four short cylindrical tubes: inhabits the earth and cow-dung. Pupa changes in the earth. Imago with filiform, sixteen-jointed, antennæ, rather longer than the head; ocelli three; maxillary feelers four-jointed; labium distinctly bilobed, other parts of the mouth not fully developed; wings broad, lying horizontally on the body, which they much exceed in length. *Rhyphus*.

#### NATURAL ORDER.—BIBIONITES.

Larva elongate, attenuated at each extremity; divisions of the segments deeply marked, and fringed with hairs; head furnished with two obtuse hooks: inhabits earth, on which it appears to feed, no other substance being found in the intestines. Pupa changes in the earth. Imago with stout, nine-jointed, antennæ, not longer than the head; maxillary feelers four or five-jointed; labium pubescent and bilobed, the other parts of the mouth obsolete; head and eyes large in the male, small in the female; ocelli three; wings frequently opaque, lying horizontally on the body, which they equal in length. In the spring every lane and meadow swarms with these insects, either sailing in the air like balloons, or settled on flowers, vegetables, paling, walls, and even on the ground. *Bibio* (*Penthetria*), *Dilophus*.

#### NATURAL ORDER.—SCATOPSITES.

Larva and pupa unknown. Imago, with antennæ, cylindric-conic, acute, twelve-jointed; labium small, pubescent, and bilobed; maxillary feelers very short, exarticulate. Inhabits flowers; is sluggish in its movements. *Scatops*.

#### STIRPS.—CULICINA.

##### NATURAL ORDER.—SIMULIITES, *Musquitoes*.

Larva aquatic; supposed to feed on vegetable substances; elongate, cylindrical, incrassated posteriorly, semi-transparent; two horns rise nearly in front of the head, and extend forwards; eyes or ocelli four; two fleshy prehensile legs appear to be placed beneath the mesothorax, and two more at the posterior extremity: its

motion in water is like that of a leech. Pupa also aquatic, but quiescent; ovate, gibbous, brown-coloured, clearly exhibiting all the parts of the future imago: four double filaments, nearly as long as the pupa, arise from the region of the prothorax on each side of the head; these are probably organs of respiration; the pupa is inclosed in a sheath, like a watch-pocket, the anterior portion alone being visible, the sheath being attached to some substance under the water. Imago, with antennæ, eleven-jointed, very short; maxillary feelers elongate, incurved, composed of four distinct joints, the fourth very long and pointed; the labrum, mandibles, and maxillæ sharp and wedge-shaped; the labium fleshy and bilobed; ocelli none; wings very wide, with stout costal nervures, and scarcely any elsewhere; legs short, and frequently hairy; tarsi four-jointed; mesothorax globose, very prominent; body short and small, colour black. Inhabits forests, woods, and all damp places, feeding on the blood of man and animals; and is perhaps the most annoying and wearisome persecutor with which mankind is acquainted. *Simulia*.

#### NATURAL ORDER.—CULICITES, *Gnats*.

Larva elongate, carnivorous, active, aquatic. Pupa equally active, but rather shorter, and the head and prothorax much incrassated. Imago, with fourteen-jointed antennæ, plumose in the males, hairy in the females; labium slender and elongate, forming, together with the mandibles, maxillæ, tongue, and labrum, (which are all fully developed, and as long as the labium,) a porrected blood-sucking apparatus; the maxillary feelers are long, divaricating, and clavate; all the organs of the mouth exceed the antennæ in length; ocelli none; wings linear, covering the body; body narrow, linear, elongate; legs very long. Inhabits woods, &c. entering houses; feeds on the blood of man and quadrupeds. *Culex*, *Anopheles*, (*Ædes*), *Chironomus*?<sup>h</sup> *Corethra*? *Tanytus*? *Ceratopogon*? *Sphæromias*? The last five genera differ much in the antennæ, mouth, &c. and properly form several distinct orders.

#### NATURAL ORDER.—PSYCHODITES, *Moth Gnats*.

Larva and pupa unknown. Imago, with antennæ, filiform, and perfectly simple, alike in both sexes; labium short, entire,

<sup>h</sup> The order *Culicites* appears to require division. The British *Culicina* may probably be divided thus: *Psychodites*, *Corethrites*, *Chironomites*, *Culicites*, *Ceratopogonites*, *Sphæromyites*, *Simulites*.



somewhat pointed; wings deflexed, very hairy, enveloping the body laterally, and their inner margins uniting above it. *Psychoda*.

STIRPS.—TABANINA.

NATURAL ORDER.—CYRTITES, *Bald-headed Flies*.

Larva and pupa unknown. Imago, with antennæ entirely concealed, so that the head appears perfectly globular; they are situated below the eyes, are very small, and seven-jointed; the basal joint is short and small, the second stout, and the remaining five united into one, which is very acute at the apex, and somewhat incrassated at the base: labium, as in the *Bombiliites* (but much smaller, shorter, and less obviously porrected), a slender elongate tube; ocelli three; wings longer than the body, but too narrow to cover it; alulæ large; prothorax and body very globose. Inhabit white thorn, furze, rushes; very seldom fly, and appear exceedingly sluggish. The body in the British genera is so soft as to indent on the slightest pressure. *Henops*, *Acrocera*. (*Cyrtus*).

NATURAL ORDER.—BOMBILITES, *Unicorn Flies*.

Larva and pupa inhabit the earth; their habit and economy is imperfectly known. Imago, with antennæ, composed of seven joints; the basal and second joint short; the apical portion long, linear, and consisting of five united joints, of which the terminal one is acute; labium very long, rigid, and porrected like a horn; ocelli three; wings widely divaricating, narrow, variegated; alulæ small; legs long, slender; body short, globose, very hairy. Inhabits lanes and woods, hovering over flowers, occasionally suspended motionless in the air, and then darting away with such inconceivable velocity that no eye can follow it. *Bombylius*, (*Usia*).

NATURAL ORDER.—TABANITES, *Gadflies*.

Larva inhabits the earth; is elongate, cylindrical; head corneous, linear, elongate, and furnished with two hooks. Pupa changes in the earth; has two tubercles anteriorly, and six sharp points near the posterior extremity. Imago, with antennæ composed of seven joints, the basal joint long and rather stout, the second minute, the remaining five of various dimensions and sizes, differing in the different genera, but also closely connected, and

corresponding apparently with the apical seta of the *Muscina*; labium large, bilobed, porrected; and the other organs of the mouth very perfectly developed; ocelli none; wing divaricating, as long as the body; alulæ large; body flat; colour griseous: male feeds on the farina of flowers; females suck the blood of man and quadrupeds. *Tabanus, Hæmatopota, Chrysops.*

#### NATURAL ORDER.—ANTHRACITES.

Larva and pupa unknown. Imago, with the antennæ composed of seven joints; the basal joint long and stout, the second globular, and the remaining five frequently united into one; labium large, fleshy, bilobed, and rather porrected; the other organs less perfect than in the *Tabanites*; ocelli three; wings somewhat divaricating, long, extending beyond the body, beautifully variegated with black or brown; alulæ small; body flattened, truncate at the extremity. Inhabits the borders of woods, heaths, &c. settling, on flowers, on the farina of which it probably feeds. *Anthrax, Stygia.*

#### NATURAL ORDER.—STOMOXITES.

Larva and pupa unknown. Imago, with the antennæ six-jointed; the basal and second joints short, the third produced inferiorly, pendulous, and received into a cavity in front of the head; the remaining joints forming a seta which is often plumose; labium very elongate, and porrected in front of the head; wings slightly divaricate; alulæ very large; body stout; colour griseous or mottled. Inhabits woods, meadows, houses, &c. feeding on the pollen of flowers and the blood of man and quadrupeds; particularly annoys horses, piercing its porrected labium through their skin; and, seeking shelter in the dwellings of man as winter approaches, draws his blood even through a worsted stocking. *Stomoxys, Bucentes.*

#### NATURAL ORDER.—CONOPITES.

Larva elongate; feeds on the bodies of humble bees. Pupa changes in the same situations. Imago, with antennæ placed on a distinct pedicle, six-jointed; basal joint long, second and third long and incrassated, the remaining ones short and decreasing to a point; labium long, porrected; wing narrow, divaricating; alulæ obsolete; body elongate, narrow, recurved. Inhabits woods, feeding on composite flowers, and occasionally, it is said, sucking the blood of cattle. *Conops, Myopa,* and *Zodion* differ essentially in the antennæ and alulæ, but perhaps belong to this order.

NATURAL ORDER.—ÆSTRITES, *Botts.*

Larva cylindrical, oblong; feeds in the stomachs, frontal cavities, or backs of quadrupeds; when full fed it falls to the ground. Pupa changes in the earth, or, if the larva inhabit the stomach, in the dung of the animal it has preyed on. Imago, with six-jointed antennæ; basal and second joints short, scarcely distinct; third large, globose; the remaining three forming a seta, which is incrassated at the base; organs of the mouth obsolete; wings divaricating; alulæ moderately large; body pilose, short, stout. Inhabits meadows and commons, flying about cattle, and causing them much uneasiness; this is done in order to deposit its eggs, not for the purpose of attacking them: it takes no food. *Æstrus*, *Cuterebra*.

## STIRPS.—ASILINA.

## NATURAL ORDER.—LEPTITES.

Larva elongate, rather attenuated at the anterior end; inhabits funnel-shaped holes, which it constructs in loose sand, to serve as a pitfall to small insects, on which it feeds; the larva remains perfectly motionless when waiting for its prey, and so nearly resembles the surrounding soil in colour, that it is effectually concealed from observation. Pupa changes in the same situation. Imago, with antennæ five-jointed; the basal, second, and third joints short, and somewhat globose, but varying much in the genera; the fourth and fifth closely united, and forming a long, slender seta; labium large, membranous, bilobed; the maxillary feelers long, two-jointed, and porrected; ocelli three; wings long, divaricating, often spotted; alulæ obsolete; body moderately long. Inhabits moist hedges, banks of rivers, &c.; flight short, weak; preys on small insects. *Leptis*, *Atherix*, *Rhagio*.

## NATURAL ORDER.—THEREVITES.

Larva very elongate, with two air-tubes at the posterior extremity, and the divisions of its segments very distinct; inhabits moist sand, mud and moss. Pupa changes in the same situations. Imago, with the antennæ composed of seven joints; the basal joint longer than the second, the remaining five united into one, which is acute at the apex; the labium is short, linear, and bilobed; the wings cover the body; alulæ obsolete; body very hairy. Inhabits the sand of the sea shore, roads, &c. making short flights; preys on small insects. *Thereva* (*Chryomyza*.)

## NATURAL ORDER.—ASILITES.

Larva inhabits the earth; it is elongate, cylindrical, slightly depressed, very smooth, and has a corneous head, which is slightly clothed with down, and armed with two hooks; the prothorax and paratelum have each a pair of spiracles: feeds on the minute insects which abound near the surface of the ground, especially at the roots of grass. Pupa changes in the same situation, without spinning any cocoon; it is very smooth, anteriorly cylindrical, posteriorly conical; the head has a bifid projection in front, and on each side below this is a trifid excrescence; the prothorax has on each side a tubercle, which seems to contain a spiracle; the body laterally, and at the extremity, is furnished with small spines. Imago, with the antennæ five-jointed; the basal and second joints moderately long, the three forming the apical portion always distinct; the terminal joint acute, but not setiform; labium large, cylindrical, and corneous; ocelli three; wings as long as the body, which they cover horizontally; alulæ obsolete; body elongate, hairy. Inhabit heath and commons very abundantly, flying a short distance at a time, settling on the ground, and preying on other insects, particularly *Diptera*. *Dasyopogon*, *Asilus*, *Gonipes*.

## NATURAL ORDER.—MIDASITES.

Larva and pupa unknown. Imago, with the antennæ five-jointed; the basal joint long, the second short and nearly globular, the three forming the apical portion united into an elongate, stout club, on which the union of the joints is marked transversely; labium longer and more acute than in the *Asilites*; maxillæ and mandible acute; ocelli nearly obsolete; wings as in the *Asilites*; legs and body hirsute. Inhabits woods, forests, settling on leaves, &c. preying voraciously on insects, particularly *Hymenoptera*. *Dioctria?* *Laphria?* (*Midas*.)

## NATURAL ORDER.—EMPITES.

Larva and pupa unknown. Imago, with antennæ five-jointed; the basal joint oblong, the second nearly globular, the three forming the apical portion often united, of different proportions in different genera; labium very long, slender, recurved, contains elongate and acute maxillæ, &c. resembling very much the beak of a bird; ocelli three; wings large, particularly wide in the female; alulæ small or obsolete; body rather hairy, linear, slender. Inhabits woods, lanes, and gardens, preying on other insects. *Hilara*, *Gloma*, *Empis*, *Rhamphomyia*, *Hybos*.

## NATURAL ORDER.—TACHYDROMITES.

Larva and pupa unknown. Imago, with antennæ five-jointed; the basal and second joints oblong, the third elongate and robust, the fourth and fifth forming a seta, which is bent nearly at a right angle with the third; labium short, bilobed; ocelli three; wings very large and wide, lying horizontally on the back; body rather pilose, short, stout, pointed. Inhabits woods, hedges, and umbellate flowers, preying on dipterous and minute hymenopterous insects; black, brown, or fulvous. *Hemerodromia*, *Tachydromia*, *Platypalpus*, *Drapetis*.

## NATURAL ORDER.—DOLIPOCHITES.

Larva attenuate at the extremities, elongate; inhabits moist earth and mud. Pupa changes in the same situations, having all the parts of the perfect insect distinctly visible. Imago, with the antennæ five-jointed; the basal, second and third joints robust, the fourth and fifth forming a seta: labium very stout, short, and bilobed; ocelli three; wings very large, lying horizontally over the body; alulæ obsolete; legs very long; body short and small; colour beautifully metallic green, often with a silvery pilosity. Frequents ponds and damp places in woods, preying upon small insects. *Porphyrops*, *Chrysotus*, *Dolichopus*, *Medeterus*, and several minor genera separated from these.

## SECTION II.—T. A. DERMATA.

Which, on entering the pupa state, do not throw off the last skin of the larva, and consequently do not exhibit in any degree the parts of the future imago.

## STIRPS.—SYRPHINA.

## NATURAL ORDER.—XYLOPHAGITES.

Larva elongate, inhabits decaying wood. Pupa changes in the same situations: in a cocoon. Imago, with the antennæ ten-jointed; the basal and second joint are short, moderately robust, and hairy; the portion corresponding to the apical seta of the *Muscina* is robust, and composed of eight distinct joints; labium large, fleshy, and pilose; ocelli three; wings horizontally covering the body; alulæ none; hind tarsi often dilated in the males; body linear, very depressed. *Xylophagus*, *Actina*, *Beris*.

## NATURAL ORDER.—STRATIOMITES.

Larva very elongate, attenuated at the anterior end, composed of twelve very distinct segments, besides the head; inhabits the water. Pupa changes on the surface of the water, and continues floating: no material alteration in the form takes place. Imago, with the antennæ eight-jointed; the basal and second joint are uniformly robust and hairy, the remaining six are variously formed in the genera, and sometimes indistinct; the labium is large, fleshy, and bilobed; the other organs of the mouth minute and nearly obsolete; ocelli three; wings narrow, reposing one on the other, and seldom wholly covering the body, which appears on each side; alulæ obsolete; body very flat, short, and wide. Flies in the sunshine, settling on leaves and flowers. *Stratiomys*, *Odontomyia*, *Oxycera*, *Nemotelus*, *Sargus*.

## NATURAL ORDER.—CHRYSOTOXITES.

Larva and pupa unknown; the former supposed to feed on the roots of corn, &c. Imago, with the antennæ six-jointed; basal and second joint long and slender, third very long and more robust, the remaining three forming a slender and perfectly uniform seta, which arises from near the base of the third; labium large, much dilated, bilobed; wings divaricating; alulæ small or obsolete; body very stout, convex above. Inhabit woods, &c.; fly briskly in the sunshine, settling, the males on umbellate flowers, the females on leaves. *Microdon*, *Chrysotoxum*. *Psarus*? *Paragus*?

NATURAL ORDER.—SYRPHITES.<sup>1</sup>

Larva always elongate, but of a variety of forms; feeds on *Aphites*, larvæ of bees and wasps, small water insects, &c. &c. Pupa changes in the habitat of the larva, excepting when aquatic; it then leaves the water, and attaches itself to some tree, wall, paling, or other vertical substance. Imago, with the antennæ six-jointed; the basal and second joint short and small, the third very large and nearly globose, the remaining three forming a perfectly uniform seta, often plumed; labium always terminated by two large, long and very distinct lobes; the other organs of the mouth distinct and fully developed; ocelli three; wings wider than in the *Stratiomites*, slightly divaricated; body convex above. Fly in the sunshine, feeding on flowers. *Ascia*, *Sphegina*, *Baccha*,

<sup>1</sup> The order SYRPHITES appears to require further division into *Syrphites*, *Eristalites*, *Volucellites*, and *Rhingites*.



*Eumerus, Psilota, Chrysogaster, Pipiza, Cheilosia, Scæva, Syrphus, Eristalis, Helophilus, Tropidia, Xylota, Spilomyia, Milesia, Merodon, Criorhina, Sericomomyia, Volucella, Brachiopa, Rhingia.*

STIRPS.—MUSCINA.

NATURAL ORDER.—MUSCITES, *Flies.* 7

Larva obese, but capable of great elongation and attenuation anteriorly; inhabits and feeds on dung, putrid flesh and vegetables, bark and roots of trees, recent and putrescent fungi, and the larvæ of other insects. Pupa changes in similar situations, oblong, perfectly uniform and rounded as though turned in a lathe. Imago with the apical seta of the antennæ tri-articulate; labium elongate, dilated at the extremity, retractile; alulæ of the wings distinct and conspicuous; body hairy; form obese; colour black, brown, or grey, with metallic green and blue. *Phasia, Gymnosoma, Phania, Miltogramma, Gonia, Trixa, Tachina, Echinomyia, Melanophora, Leucostoma, Metopia, Exorista, Eriothrix, Ocypteryx, Dexia, Mesembrina, Sarcophaga, Musca, Anthomyia, Cænosia, Lispe,* and the numerous genera which have been separated from these.

NATURAL ORDER.—SCATOPHAGITES, *Dung-flies.*

Larva inhabits dung, fungi, putrid substances, and the pith of plants. Pupa as in the *Muscites*. Imago with the apical seta of the antennæ obscurely triarticulate; labium elongate, slightly recurved, scarcely dilated, retractile; alulæ of the wings very minute; body very hairy; form oblong; colour yellow. *Scatophaga, Dryomyza, Sapromyza.*

NATURAL ORDER.—TETANOCERITES.

Larva inhabits moist plants, fruits, putrid substances, also mud at the banks of ponds, rivers, and all wet places. Pupa as in the *Muscites*. Imago with the apical seta of the antennæ exarticulate; labium short and broad; alulæ of the wings wanting; wings narrow; form elongate, often very slender: glabrous, not hairy; colour black, black with yellow spots, brown or yellowish. *Ortalis, Sepsis, Lonchæa, Luuxania, Ulidia, Piophila, Psila, Calobata, Micropeza, Tetanocera, Loxocera, Heteromyza, Platycephala, Sciomyza, Lucina, Chryliza, Lissa, Platystoma, Sepedon, Dorycera,* and the genera separated from these.



## NATURAL ORDER.—TEPHRITITES.

Larva inhabits galls or excrescences on the bark and leaves of plants. Pupa as in the *Muscites*. Imago with the apical seta of the antennæ exarticulate; labium large, fleshy, bilobed, and pilose; alulæ of the wings wanting; wings rather wider than in the preceding order, beautifully variegated, striped and spotted with different shades of black and brown; body glabrous, of moderate length and stoutness, and, in the females, furnished with a large exerted and conspicuous ovipositor. *Tephritis*.

## NATURAL ORDER.—PHYTOMYZITES.

Larva inhabits the interior of plants and fruits, and sometimes putrid substances. Pupa as in the *Muscites*. Imago with the apical seta of the antennæ exarticulate; labium large, fleshy, clavate; alulæ of the wings wanting; wings as wide as in the preceding order; the body very delicate, often very slender, glabrous; colour black, or black variegated with yellow. *Phytomyza*, *Chlorops*, *Meromyza*, *Agromyza*, *Discomyza*, *Gymnopa*, *Asteia*, *Drosophila*, *Ochthiphila*, *Opomyza*.

## NATURAL ORDER.—PHORITES.

Larva inhabits the flowers and seeds of vegetables, and the larvæ of other insects. Pupa as in the *Muscites*. In the imago the apical seta of the antennæ is composed of four joints, the three basal ones being very short, the apical one very long; labium very short; alulæ of the wings wanting; wings very wide, extending beyond the body, which is very small, acute at the extremity, and in colour inclining to black or yellow. *Phora*.

## NATURAL ORDER.—BORBORITES.

Larva inhabits putrid animal and vegetable substances. Pupa as in the *Muscites*. Imago, with the apical portion of the antennæ, perfectly simple and exarticulate, sometimes orbicular; labium large, membranous, and bilobed; alulæ of the wings wanting; wing very large and wide; body very small, and of a black colour. *Borborus*, *Ochthera*, *Dichæta*, *Ephydra*, *Notiphila*, *Homalura*, *Orygma*, *Cælopa*.

## STIRPS.—HIPPOBOSCINA.

## (NATURAL ORDER.—CARNITES.

Larva and pupa unknown. Imago, with antennæ, consisting of a minute tubercle, situate in a fovea before the eyes; mandibles

unknown; maxillæ short, their feelers apparently exarticulate, short, erect; ocelli none; fore-wings short, not formed for flying; hind-wings assuming the form of halteres, small, but distinct. Inhabits the common starling. The only species at present described is *Carnus hæmapterus*.)

#### NATURAL ORDER.—HIPPOBOSCITES.

Larva, apod and nearly spherical, is nourished and attains perfection in the ovary of its parent. Pupa changes in the same situation, and is produced in the state in which it undergoes the final change; its structure is nearly as in the *Muscina*, excepting an evident indentation at the end, which becomes the lower extremity of the future imago. Imago, with triarticulate antennæ, the second joint most developed, and the third originating in a hollow or socket near the base of the second; mouth apparently adapted for suction, its component parts appear to be two mandibles, two maxillæ, and a sheath-like labium; tarsi five-jointed; occasionally with the fore-wings developed, and the hind-wings appearing as poisers. Infects quadrupeds and birds. *Hippobosca*, and the genera separated from it.

#### NATURAL ORDER.—NYCTERIBITES.

Larva and pupa as in the preceding order. Imago, with the antennæ, obsolete; the mouth situated on the back of the prothorax, in which the head seems sunk; parts of the mouth obsolete or unascertained; wings entirely obsolete; legs, with the femora and tibiæ, each two-jointed, the tarsi five-jointed. Infests bats. *Nycteribia*. Authorities for these characters, Leach and Latreille; they are not written from actual investigation, and appear somewhat unsatisfactory.

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Situation at present doubtful.

#### NATURAL ORDER.—STYLOPITES, *Bee-parasites*.

Larva apod, with a hard corneous head; inhabits the bodies of bees in the imago state, feeding on those parts not positively essential to life. Pupa changes in the same situation. Imago, when hatched, comes from between the segments of the body, generally between the protelum and paratelum; antennæ six-jointed, the joints variously developed in the genera; labrum distinct; mandibles linear and rigid; maxillæ less developed, each bearing an exarticulate feeler; labium triangular and pointed, bearing no

feeler; eyes large, hemispherical, granulated, and distant; ocelli none; head broader than long; prothorax very short; mesothorax very large; fore-wings ample, folded longitudinally; alulæ none; before these are two patagia or tippets, similar to those of *Lepidoptera*, being naked, pedunculate processes, which the insect can move rapidly at pleasure; hind-wings obsolete; tarsi five-jointed. (*Xenos.*) *Stylops*, *Elenchus*, *Halictophagus*.

## DIVISION II.—TETRAPTERA NECROMORPHA.

Larva bearing no resemblance to the imago. Pupa perfectly quiescent, having the organs of locomotion and manducation confined by a shell-like skin; yet displaying all the limbs and organs, placed in order by the sides of the body, and detached from it, except at the usual points of connexion.

## CLASS III.—HYMENOPTERA.

Larva with small corneous mandibles, moving horizontally; in one stirps, with six articulate, and twelve to sixteen prehensile, feet; in the remaining stirps, without feet. Feeds on a composition provided by the imago (Stirps I. and III.); the putrefying bodies of other insects (Stirps II.); honey and pollen (Stirps IV.); the fleshy parts of living insects (Stirps V.); the wood of dead trees (Stirps VI.); or the leaves of living vegetables (Stirps VII.) Imago, with the mandibles strong, moving horizontally, and masticatory; the other organs of the mouth fully developed; three ocelli; wings all developed, the fore- exceeding the hind-wings in size, membranaceous, and used in flying; the mesothorax largely developed at the expense of the pro- and metathorax; the podoon mostly restricted; the tarsi five-jointed. Food very various.

### STIRPS.—FORMICINA, *Ants*.

#### NATURAL ORDER.—FORMICITES, *Social Ants*.

Larva an inactive, obese, voracious maggot, residing entirely in the earth, and dependant for food on the care of the perfect insects. Pupa changes in a tough leathery cocoon; these cocoons are commonly known as "ants' eggs." Imago, with the antennæ, composed of about thirteen joints, often elbowed, slightly incrassated exteriorly; mandibles somewhat triangular, toothed; maxillæ obtuse; labium short, obtuse, its ligula not produced;

maxillary and labial feelers fully developed and distinctly articulate; fore-wings ample; hind-wings small; lives underground in immense societies, consisting of three kinds of individuals, males, females, and abortive females; the latter differ from the two former in wanting wings, and in having the pro-, meso-, and metathorax of nearly uniform development. *Formica*. (*Polyergus*, *Odontomachus*, *Ponera*), *Myrmica*, (*Eciton*, *Atta*, *Cryptocerus*).

NATURAL ORDER.—MUTILLITES, *Solitary Ants*.

Larva and pupa unknown. Imago, with antennæ composed of about thirteen joints, not elbowed, rather attenuated exteriorly; mandibles long, dentate at the apex; maxillæ obtuse; labium short, obtuse, its ligula not produced; maxillary and labial feelers fully developed and distinctly articulate; ocelli indistinct or wanting; wings possessed by the males only; females usually with the pro-, meso-, and metathorax equally developed; abortive females none. Inhabits sandy situations, is solitary. (*Dorylus*, *Labidus*, *Apterogyna*, *Psammotherma*,) *Mutilla*, *Myrmosa*, (*Myrmecoda*, *Scleroderma*,) *Methoca*. This and the preceding order require subdivision.

STIRPS. — SPHECINA, *Sand-wasps*.

NATURAL ORDER.—SCHOLIITES.

Larva an elongate inactive maggot; inhabits a burrow or hole made in the sand by its parent, and feeds on the larvæ or imagines of other insects which she has provided for its sustenance. Pupa changes in a silken cocoon spun by the larva at the bottom of its domicile. Imago, with antennæ composed of about thirteen joints, very short, recurved, almost forming a ring; mandibles short, strong, dentate; maxillæ long, their feelers also long; labium longer than in the *Formicina*; its ligula trilobed; ocelli three, distinct; wings alike in both sexes; legs short, stout, spiny; female with a pungent sting. Solitary; inhabits sandy districts, settling occasionally on umbellate flowers; feeds on insects. *Tiphia*, (*Myzina*, *Meria*, *Scholia*.)

NATURAL ORDER.—SAPYGITES.

Larva and pupa supposed to be as in the preceding order. Imago, with antennæ composed of about thirteen joints, exteriorly incrassated, particularly in the males, longer and more robust than in the preceding order; mandibles, labium, &c. nearly as in the

*Scholiites*; ocelli three, distinct; wings alike in both sexes; legs short but slender, and without spines; female with a sting. Solitary; female inhabits walls, palings, and posts; male settles on umbellate flowers. (*Thynnus*, *Polochrum*), *Sapyga*.

#### NATURAL ORDER.—POMPILITES.

Larva and pupa as in *Scholiites*, the food of the former consisting frequently of spiders provided by its parent. Imago, with antennæ composed of about thirteen joints, more long and slender than in the two preceding orders, attenuated exteriorly, and mostly recurved; mandibles long, dentate at the apex; labium short, with its ligula short and trilobed; ocelli three, distinct; wings alike in both sexes; legs long, spiny; female armed with a sting; inhabits all sunny banks in sandy situations, running with great activity, and continually vibrating its antennæ and wings; feeds on insects. *Ceropales*, *Pompilus*, (*Planiceps*) *Aporus*.

#### NATURAL ORDER.—SPHECITES.

Larva and pupa as in *Scholiites*, the food differing only in the kind of insect provided. Imago, with the antennæ composed of thirteen joints, short and recurved in both sexes; mandibles very long, acute; maxillæ very long, obtuse at the apex of their lacinia; labium, with its ligula, elongate, bifid, and flexible; ocelli three; pecten elongate and very slender, whereas in the three preceding orders it is very short; legs long. Inhabits sandy situations, flying heavily, but running with agility, and feeding on insects. (*Dolichurus*, *Pelopæus*), *Ammophila*, (*Sphex*).

#### NATURAL ORDER.—LARRITES.

Larva and pupa as in the *Scholiites*, the former frequently feeding on *Cimicites*, provided for it by its parent. Imago, with antennæ composed of thirteen joints, shorter in the females than the males, and often incrassated exteriorly; mandibles less elongate than in the *Sphécites*, and bifid at the apex; maxillæ very obtuse; labium short, its ligula short, obtuse, and bilobed; ocelli three; pecten generally short and indistinct; legs moderately long. Inhabits sandy situations, occasionally umbellate flowers; is fond of settling on stones, leaves, &c.; feeds on insects. *Gorytes*, *Psen*, *Larra*, *Lyrops*, *Dinetus*, *Trypoxylon*, *Oxybelus*.

#### (NATURAL ORDER.—BEMBECITES.

Larva and pupa as in the *Scholiites*, the food provided for the larva consisting of *Syrphina* and *Muscina*. Imago, with

antennæ thirteen-jointed, elbowed at the second, short, and of nearly uniform substance; &c. &c. (*Bembex*, *Monedula*.)

#### NATURAL ORDER.—CRABRONITES.

Larva and pupa as in the *Scoliites*, excepting that in this order many are frequently found in the same burrow. Imago, with antennæ thirteen-jointed, short, and slightly incrassated externally; mandibles long, acute, and terminating in a single point; maxillæ obtuse; labium elongate, its ligula short, dilated, obtuse, and terminating in four lobes; ocelli three; head very large, square; legs short and stout, fore-legs often patellated; body, with its greatest diameter, about the ninth segment, very glabrous, black, or black and yellow. Inhabits sandy banks, settling on leaves, stones, and umbellate flowers. *Cerceris*, *Philanthus*, *Crabro*, *Rhapalum*, *Stigmus*.

#### STIRPS.—VESPINA, Wasps.

#### NATURAL ORDER.—VESPITES.

Larva an obese inactive maggot, inhabiting a cell provided by its parent, who supplies it with food, consisting of honey, pollen, &c. Pupa changes in a silken cocoon, which the larva spins in its cell. Imago, with antennæ composed of twelve joints in the female, thirteen in the male, slightly elbowed at the second joint; eyes somewhat reniform, the indented portions facing each other; ocelli three; upper-wings folded longitudinally; pecten slender, but short; eighth segment largest, both as to length and breadth. Live commonly in societies composed of three kinds of individuals, males, females, and abortive females; the two last are furnished with stings: inhabit all climates and all situations, devouring almost every article capable of affording nutriment, but particularly fond of sugar, fruits, the flesh of animals and living insects. *Vespa*, *Eumenes*, *Odynerus*, *Epipone*.

#### (NATURAL ORDER.—MASARITES.

Larva and pupa as in the *Vespites*. Imago, with the antennæ composed of thirteen joints, of which the five terminal ones are closely united and form a club; wings as in the *Vespites*, &c. *Masaris*, *Chelonites*.)

#### STIRPS.—APINA, Bees.

#### NATURAL ORDER.—OSMIITES.

Larva an obese inactive maggot, deposited as an egg in the midst of a semi-fluid substance, composed of honey and pollen, collected



by its parent, and stored in cells which are constructed for the purpose, mostly in timber which is going to decay; these cells are sometimes crowded together without order, but mostly regularly following each other in a cylindrical tube, composed of wax, leaves, mortar, and a variety of substances; this cylindrical tube being constructed in, and closely fitted to, a perforation made in the timber for the purpose, as the perforation passes completely through the substance of the timber, the larvæ which are first deposited, and consequently first become pupæ and perfect insects, escape one after another without disturbing those above them. Imago, with antennæ thirteen-jointed in the female, fourteen-jointed in the male; they are slightly elbowed at the second joint, which is much longer than the others; the blade of the maxillæ is elongate and somewhat falcate; the maxillary feelers are minute, and generally composed of six indistinct joints; the labium has its ligula variously developed; it is always trilobed, but the central lobe, though always elongate, varies in the proportion it bears to the labial feelers; the lateral lobes are very minute, short, and acute; the labial feelers have the basal joint long, the second longer, the third and fourth short, somewhat conical, and forming an angle with the second; the hind-tibiæ are not formed for collecting pollen, but the body of the female is clothed beneath with a thick covering of hair, which serves for this use. *Anthidium*, *Megachile*, *Osmia*, *Heriades*, *Chelostoma*, *Ceratina*?

#### NATURAL ORDER.—PANURGITES.

Larva and pupa, as far as the British genera are concerned, unknown. Imago, with antennæ thirteen-jointed in the females, fourteen-jointed, and somewhat moniliform, in the males; maxillæ with the blade lanceolate and of moderate length; the maxillary feelers of equal length, and six-jointed; labium, with the ligula trilobed, the central lobe about equal to the true lip in length, the lateral lobes very short and acute; the labial feelers with four joints, varying but slightly in length from each other; the feelers exceed the ligula in length; wings large, flight slow; insect inactive; economy unknown; body rather stout; black, hairy. Inhabits in immense abundance the flowers of *Leontodon*, *Hieracium*, and other similar composite plants, in August and September. *Panurgus*. (*Systropha*, *Xyocopa*,) &c. are closely allied; the latter insect's economy nearly approaches that of *Ceratina* in the preceding order.



## NATURAL ORDER.—ANDRENITES.

Larva inhabits a long tortuous burrow, formed by its parent in the ground; a small heap of earth, produced in excavating which, may almost invariably be observed at the mouth of the burrow; feeds on a globular pellet of pollen, collected, moistened, and kneaded into a consistent mass, by the parent. Pupa changes in the earth. Imago, with antennæ thirteen-jointed in the female, fourteen-jointed, and of much greater length, in the male, elbowed, particularly in the females, at the second joint; maxillæ with the blade somewhat obtuse, and no longer than the maxillary feeler, which is distinctly six-jointed; labium, with the ligula very short, and quadrilobed, the lateral lobes usually equalling the internal ones in length; hind-tibiæ formed for collecting pollen. Inhabits sunny banks, and flies incessantly about hedges and evergreens in the spring; is gregarious, but each pair has its proper nest. Two kinds of individuals only. *Colletes*, *Dasy-poda*, *Andrena*, *Halictus*, *Sphecodes*.

## NATURAL ORDER.—MELLITURGITES.

Larva inhabits nests constructed by its parent, either in the ground or against a bank or wall, and consumes pollen provided by its parent, and stored up at the time the egg is deposited. Pupa changes in a silken cocoon in the same situation. Imago, with antennæ thirteen-jointed in the female, fourteen-jointed in the male, elbowed at the second joint; maxillæ, with the blade lanceolate, elongate; the maxillary feelers six-jointed and setaceous; labium, with its ligula, trilobed, central lobe very long, obtuse, pubescent, lateral lobes not more than a fourth of its length, very acute; ligula, labial feelers, and blade of maxillæ, nearly corresponding in length; hind-tibiæ formed for collecting pollen; body short, robust; wings small; economy not social. Two kinds of individuals only, both of which labour in the construction of the nests. *Saropoda*, *Anthophora*.

NATURAL ORDER.—APITES, *Social Bees*.

Larva inhabits a cell usually hexagonal, and made of wax by the imago; it is fed with honey or a preparation of pollen by the imago. Pupa changes in a silken cocoon within the cell. Imago, with the antennæ thirteen-jointed in the female, fourteen-jointed in the male, elbowed at the second joint; labium, with its ligula trilobed, the central lobe elongate, hirsute, extending beyond the labial feelers, the lateral lobes very short and obtuse; the labial

feelers with the basal joint twice the length of the second, the third and fourth minute, short, and seated on the back of the second, rather before its extremity; blade of the maxillæ lanceolate, nearly as long as the labial feelers; maxillary feelers minute, apparently exarticulate; hind-tibiæ with brushes for collecting farina. Live in large societies, composed of three kinds of individuals, males, females, and abortive females; the latter perform the laborious offices of the commonwealth. *Apis*, the honey-bee; *Bombus*, the humble-bee.

#### NATURAL ORDER.—APATHITES, *Cuckoo-bees*.

Larva hatched from an egg, deposited by its parent in the nests of all the preceding *Apina* at the time when their own eggs are laid; when it hatches, being stronger and larger than the rightful possessor of the cell, it consumes the food provided for its companion, and starves it to death; and in those instances in which fresh supplies of food are daily provided, it continues to receive and appropriate them as its own. Pupa changes in the same situation, in a silken cocoon, spun by the larva. Imago has no apparatus either on the body or legs for collecting honey; in other respects it resembles in structure each of the orders of *Apina* before described; it enters their nest with perfect familiarity, and seems to be quite unsuspected of intrusion; it collects no pollen or honey, never builds a nest of any kind or takes any care of its young, but spends its time among flowers, or hovering about sand-banks in which other bees have fixed their habitations. *Apathus*,<sup>k</sup> *Cœlixys*, *Melecta*, *Stelis*? *Epeolus*, *Nomada*, *Hylæus*?

#### NATURAL ORDER.—CHRYSIDITES.

Larva and pupa, as in the *Apathites*, prey on the food destined for other insects, particularly of the two preceding Stirpes. Imago, with the antennæ thirteen-jointed in both sexes, the second joint elongated, and forming a slight elbow; maxillæ obtuse, dilated, their palpi five-jointed; labium, with the ligula obtuse, entire; labial palpi three-jointed; ocelli three; body convex above, flattened or sometimes concave beneath, furnished, in the females, with a tubular retractile oviduct, but without a sting; colours excessively brilliant, red, green, and blue, with a metallic

<sup>k</sup> *Apathus*. The genus *Psithyrus* of Dalbom. It closely resembles *Bombus*, except in the want of the hirsuties on the hind legs for collecting pollen. In both of our lists of British insects the species of this genus are scattered throughout the genus *Bombus*: the same is the case in Kirby's "Monographia Apum Angliæ." *Psithyrus* is a genus of *Sphingites*.—A, *absque*, παθος, *affectio*.

gloss; abundant in fine sunshiny weather, settling on walls, sand-banks, posts, railings, &c. running with activity, and a vibrating motion of the antennæ. (*Parnopes*, *Stilbum*, *Euchræus*,) *Hedychrum*, *Elampus*, *Chrysis*, *Cleptes*.

STIRPS.—ICHNEUMONINA, *Parasites*.

NATURAL ORDER.—PROCTOTRUPITES.

Larva inhabits and feeds on the larvæ of other insects. Pupa changes in the same situations. Imago, with antennæ composed of ten to fifteen joints, elongate in the males, shorter and often clavated in the females; mandibles somewhat elongate, their extremity generally bifid; maxillæ with the blade dilated, rounded, feelers generally three-jointed; labium, with its ligula seldom produced, entire, feelers minute, often exarticulate; ocelli three; fore-wings with a single principal nervure; hind-wings without nervures; oviduct of the female tubular and retractile, being simply an elongation of the body. Inhabits grass under trees, &c. during the greater part of the year. *Cinetus*, *Psilus*, *Proctotrupes*, *Platygaster*, *Teleas*, *Ceraphron*, *Sparasion*, *Dryinus*, *Helorus*?

NATURAL ORDER.—MYMARITES.

Larva inhabits and feeds on the eggs of Lepidopterous insects. Pupa changes within the shell of the egg. Imago, with the antennæ nine- to thirteen-jointed, sometimes twice the length of the body in the male, in the female elbowed and clavated; mandibles at the apex tridentate; the other organs of the mouth are obsolete or undiscovered; fore-wings pedunculated, with one short basal nervure, strongly ciliated; hind-wings the same, often a mere seta; legs long; podoon elongate, slender; ovipositor very slender, concealed beneath the body in a groove. Inhabits grass under trees. *Ooctonus*, *Litus*, *Anagrus*, *Polynema*, *Mymar*, *Eustochus*.

NATURAL ORDER.—CHALCITES.

Larva inhabits and devours other insects in all stages, particularly the larvæ of *Lepidoptera* and *Diptera*. Pupa usually changes within the skin of its victim. Imago, with the antennæ generally composed of thirteen joints, the second long, forming an elbow, the remaining joints generally incrassated towards the apex; mandibles obtuse; maxillæ, with the blade rather produced, but obtuse; maxillary palpi four-jointed; labium, with its

ligula always produced, but short and entire; labial palpi three-jointed; ocelli three; head very large, square; fore-wings with a single nervure, often ciliated; hind with none; body often short and depressed in the males, more elongate and pointed in the females; oviduct of the female slender, mostly concealed; colour mostly brilliant. *Perilampus*, *Leucospis*, *Smiera*, *Chalcis*, *Callimome*, *Pteromalus*, *Encyrtus*, *Eulophus*, *Spalangia*, *Eucharis*.

#### NATURAL ORDER.—CYNIPITES.

Larva inhabits and causes the excrescences we observe on the trunks, twigs, leaves, &c. of trees, particularly the oak, and commonly known as "galls," feeding on the sap or substance. Pupa changes in the cavity made by the larva. Imago, with the antennæ composed of thirteen to fifteen joints, increasing in size exteriorly, but never clavated; mandibles obtuse; maxillæ dilated, obtuse, feelers often five-jointed; labium short, with its ligula produced, generally as long as the feelers, entire; feelers mostly three-jointed; wings with many nervures; head rather small, somewhat retiring; mesothorax large and convex; podoon short, very slender; body compressed; decatory in the female very large; ovipositor curved, or spirally convoluted beneath the body. Beaten out of trees, and off grass, in the summer. *Cynips*, *Figites*, *Ibalia*, *Anacharis*.

#### NATURAL ORDER.—EVANIITES.

Larva inhabits the larvæ of *Sphécina*, and occasionally of *Blattina*. Pupa changes within the cocoon spun by the larva of the former of these Stirpes. Imago, with antennæ thirteen-jointed, of uniform thickness, and very straight; mandibles short, stout, acute, and bifid; maxillæ dilated and obtuse, feelers six-jointed; labium, with the ligula very short, quadrilobed, the lateral lobes very minute, feelers long, often robust, four-jointed; wings with many nervures; podoon slender. Found in summer, flying over flowers and about sand-banks, in which the *Sphécina* have formed their burrows and provided for their young. *Evania*, *Brachygaster*, *Fœnus*, (*Pelecinius?* *Stephenus?*) *Plancus*.

#### NATURAL ORDER.—BRACONITES.

Larva more obese, without distinct markings and divisions; feeds, often in company, on the larvæ of *Lepidoptera*, and other insects, while they are still living. Pupa changes within the skin of the Lepidopterous larva, or in small silken cocoons, attached to the

hair or body of its prey, or to the trees and leaves in the neighbourhood, from which it is occasionally seen suspended by a silken thread; more than thirty of these parasites sometimes feed within the body of a single caterpillar of the cabbage butterfly, which may be seen in numbers glued to palings, in the autumn, by these parasites, and surrounded by their little yellow cocoons, giving to the uninstructed the idea of a caterpillar sitting on its eggs. Imago, with the antennæ ten- to twenty-jointed; mandibles short, generally bifid; maxillæ obtuse, feelers six-jointed, elongate; labium short; ligula obtuse and entire; feelers four-jointed; ocelli three; fore-wings with fewer nervures than the following Order; hind-wings with still less; podoon slender and short; oviduct with two protecting appendages. Inhabits grass, shrubs, &c. throughout the summer; often flies in a vaulting company, like gnats in the sunshine; runs slowly. *Bassus*, *Rogas*, *Alysia*, *Bracon*, *Microgaster*, *Microdus*, *Sigalphus*, *Aphidius*.

#### NATURAL ORDER.—ICHNEUMONITES.

Larva elongate, with the divisions of the segments clearly defined; an indentation frequently passes along the sides, above and below the middle portion, which thus becomes raised: solitary; inhabits and devours the fleshy parts of other insects, while they are themselves yet alive and performing their usual functions; during the whole of its parasitic career taking care to do no injury to those parts on which the life of its prey depends. Pupa changes sometimes within the shell of the pupa of the Lepidopterous insects; sometimes in the ground, in a tough, close, leathery cocoon, spun by the larva. Imago, with long filiform antennæ composed of about forty joints; mandibles short, stout, acute, and bifid; maxillæ dilated and obtuse, their feelers six-jointed, and often very long; labium short, its ligula short and bilobed, its feelers generally four-jointed; ocelli three; fore- and hind-wings with numerous nervures; podoon always slender, seldom or never elongate; oviduct generally defended by a setaceous appendage on each side, thus appearing to be triple: varies greatly in length. Inhabits vegetables of all kinds throughout the summer, the females busily engaged in searching after Lepidopterous larvæ in which to deposit their eggs; their wings and antennæ are continually in motion; the males frequent umbellate flowers, and feed on pollen; the females not unfrequently eat small insects and larvæ. *Ichneumon*, *Anomalon*, *Ophion*, *Banchus*, *Pellastes*, *Alomya*, *Cryptus*, *Pimpla*, *Xylonomus*.

## STIRPS.—SIRECINA.

## NATURAL ORDER.—SIRECITES.

Larva hatched from eggs deposited in the wood of the fir-tree, sometimes two or three hundred in a cluster, cylindrical, with six rudimental articulate legs; head corneous; paratelum incrasated; gnaws the timber, making a bore, in which it lives, the exact size of its body. Pupa changes in the same situation. Imago, with antennæ filiform, attenuated exteriorly, composed of fifteen to thirty joints, the number varying in different individuals of the same sex and species; mandibles strong, trifid; maxillæ rather elongate, soft, flexible, obtuse, their feelers very minute, exarticulate; labium somewhat triangular; ligula short, entire, dilated; feelers three-jointed, the terminal joint long and incrasated; ocelli three; wings ample, with many strong nervures; prothorax fully developed, broader than the head, its anterior and posterior margins concave; the following segments fully and equally developed; ovipositor exerted, composed of three setæ. Inhabits fir-plantations. *Sirex*, (*Tremex*.)

## NATURAL ORDER.—XYPHIDRIITES.

Larva perfectly without feet. Inhabits and lives on the dead or dying wood of various trees. Pupa changes in the same situations. Imago, with antennæ composed of seventeen or eighteen joints, gradually attenuated towards the apex; mandibles small, with four distinct teeth; maxillæ short, obtuse, their feelers biarticulate; labium short; ligula, minute, entire; feelers four-jointed; ocelli three; head orbicular, large; prothorax very long, slender, and neck-like; the remaining segments of uniform size; the oviduct of the female exerted, covered above by a sheath-like appendage. Inhabits posts, decayed willows, &c. flying in the sunshine. *Xyphidria*.

## NATURAL ORDER.—XYELITES.

Larva perfectly without feet. Feeds in the wood of fir-trees, making channels, as in the two preceding Orders. Pupa changes in the same situations. Imago, with antennæ twelve-jointed, the basal and second joint short, the third very long, and the nine following very short, together scarcely equalling the third in length, elbowed twice, at each end of the long joint; mandibles moderately long, acute, and dentate internally; maxillæ with the blade small, obtuse, the galea biarticulate, the feelers very long and four-jointed; labium short, ligula hitherto undiscovered,



feelers four-jointed; ocelli three; wings very ample; legs short; prothorax not developed superiorly, the mesothorax and head meeting above it; podoon as wide as the other segments; oviduct ensiform, exerted, enclosed between two appendages. Inhabits fir-trees, occasionally settling on umbelliferous plants. *Xyela*.

NATURAL ORDER.—ORYSSITES.

Larva and pupa unknown; the former is supposed to feed on the wood of dead fir-trees and old horn-beams. Imago, with antennæ eleven-jointed in the male, ten-jointed in the female, short, rather incrassated exteriorly, the joints of various proportions and forms; mandibles dilated, rounded, pubescent; maxillæ, with the blade, obtuse, rounded; the galea rather elongate, narrow, and truncate at the apex; feelers long, pubescent, and five-jointed; labium short, with the ligula small, rounded, and entire, and the feelers rather short and three-jointed; ocelli three; fore and hind wings moderately large, with numerous nervures; legs short; prothorax with very little development superiorly; podoon as wide as the other segments; ovipositor spirally convoluted beneath the body. Inhabits fir and horn-beam trees, running over them in the sunshine with great rapidity; the male has been found on umbellate flowers. *Oryssus*.

STIRPS.—TENTHREDININA, *Saw-flies*.

NATURAL ORDER.—ALLANTITES.

Larva cylindrical, of uniform substance, with six articulated and twelve or fourteen membranaceous feet. Inhabits vegetables, feeding upon their leaves in the manner of *Lepidopterous* larvæ. Pupa sometimes changes in a cocoon, fixed in a curled leaf of the plant the larva feeds on, but most commonly on or in the ground. Imago, with antennæ nine-jointed, of uniform substance, or attenuated towards the apex; mandibles short, strong, very acute at the apex, and having one internal tooth; maxillæ, with the blade acute, the galea obtuse and exarticulate, the feelers long and six-jointed; labium short, with the ligula distinctly trilobed; wings ample, the disposition of their nervures afford characters for generic division; podoon equally developed with the other segments; oviduct with teeth like a saw. The species of this order are most abundant in the spring and summer in woods, gardens, and lanes, settling on leaves and flowers, flying with ease, but not far at a time, and being full of motion and activity in the sunshine. They feed apparently on the pollen of flowers.



*Nematus, Cladius, Cræsus, Emphytus, Dolerus, Dosytheus, Allantus, Fenusa, Selandria, Athalia.*

#### NATURAL ORDER.—HYLOTOMITES.

Larva cylindrical, rather attenuated towards the extremities, with six articulated and fourteen membranaceous legs. Inhabits and feeds on the leaves of vegetables; changes its colour with every change of skin, a peculiarity to which some of the *Allantites* are also subject. Pupa changes mostly on the surface of the ground. Imago, with the antennæ three-jointed; the basal and second joints very short, the third very long, ciliated, and often double, or having two shafts in the manner of a fork; mandibles corneous, acute, with a small internal tooth; maxillæ with the blade acute, the galea robust and obtuse, the feeler long and six-jointed; labium short, with the ligula small, but distinctly trilobed; feelers four-jointed; ocelli three; body, with the segments and oviduct, as in the *Allantites*. Settles and feeds on umbellate flowers. *Schizocerus, Hylotoma.*

#### NATURAL ORDER.—TENTHREDINITES.

Larva mostly chagreened, cylindrical, with six articulate and twelve prehensile legs. Feeds on the leaves of trees. Pupa changes in a case composed of a glutinous matter, which becomes very hard when exposed to the air; the case is attached to a slender twig of the plant on which the larva feeds; in this case the larva remains unchanged during the months of autumn, winter, and spring. Imago, with antennæ seven-jointed, of which the third joint is always elongate, and the apical ones always form a club; the mandibles are longer than in the preceding order, acute at the apex, and internally bidentate; maxillæ, with the lacinia, obtuse and hirsute, the galea rather obtuse and distinctly articulate, and the feelers long and six-jointed; labium short, with the ligula distinctly trilobed, the feelers four-jointed; ocelli three; segments of the body fully developed; oviduct as in the *Allantites*. Inhabits flowers and leaves; flies in the sunshine. *Abia, Zaræa, Cimber, Trichissoma, Clavellaria.*

#### NATURAL ORDER.—LYDITES.

Larva smooth, cylindrical, with six short, articulate, and no prehensile legs. Feeds on the leaves of trees, inhabiting a web of its own making. Pupa changes in a silken cocoon on the stem of the trees it inhabits, or on the ground. Imago, with the antennæ composed of seventeen to thirty segments, filiform, and attenuated

exteriorly; mandibles long, acute at the apex, and having one tooth internally; maxillæ, with the blade and galea, obtuse, the feeler long and six-jointed; labium short, ligula more produced, trilobed; ocelli three; head large, orbicular; wings ample, with numerous nervures; legs short; podoon fully developed; body short and robust. Inhabits woods, flying in the sun, settling on leaves, and occasionally, but rarely, on flowers. *Tarpa*, *Lyda*, *Lophyrus*? which principally differs in its pectinated antennæ.

#### NATURAL ORDER.—CEPHITES.

Larva elongate, with its feet obsolete or rudimental. Inhabits and feeds on the stalks of corn and the buds of fruit-trees. Pupa changes within the stalk. Imago, with antennæ twenty-jointed, long, filiform, slightly incrassated externally; mandibles short, broad, trifid; maxillæ with the blade distinct and acute, the galea elongate, and separated from the maxilla by a distinct line, resembling an anchylosed articulation, the feeler long and six-jointed; labium, with its four parts, perfectly developed, the feeler-bearer elongate, and notched at the apex, the ligula produced and trilobed, and the feeler four-jointed; ocelli three; head rather square, broader than the following segments; prothorax fully developed, cylindrical, quite detached from the mesothorax; podoon fully developed, divided on the back longitudinally; body elongate; legs elongate; flight easy and graceful in the sunshine. Settles in abundance on composite flowers by the road-side, and in meadows on *Ranunculi*. *Cephus*.

#### CLASS IV.—COLEOPTERA.

Larva, with corneous mandibles moving horizontally; a pair of articulate feet, generally on the second, third, and fourth segment; no other feet, unless a prehensile caudal appendage occasionally present can be so denominated. Food very various. Pupa of nearly uniform appearance. Imago, with the parts of the mouth fully developed; the mandibles moving horizontally, and being employed in mastication. Wings fully developed; fore-wings hard, crustaceous, not used in flying, when closed meeting with parallel edges, and completely covering the hind-wings, to protect which appears their only office; hind-wings generally much longer than the body, folded longitudinally and transversely beneath the fore-wings. Prothorax very large; mesothorax small; metathorax large. Food various.

## STIRPS.—BLAPSINA.

NATURAL ORDER.—BLAPSITES, *Slow-legged-beetles*.

Larva elongate, cylindrical, with six articulate and one caudal leg. Lives in the dark, feeding on decayed animal and vegetable substances. Pupa changes in the same situations. Imago, with moniliform antennæ, the third joint being the longest; mandibles small but strong, bifid at the apex; maxillæ with a single tooth internally; wings, particularly the hind pair, frequently wanting. Inhabits cellars, out-houses, decayed trees, shunning the light, and moving by night with a slow, awkward, and disgusting gait; of uniform dark brown or black colour. (*Pimelia*), *Blaps*, *Tenebrio*.

## NATURAL ORDER.—HELOPITES.

Larva very elongate, cylindrical, frequently with two hooks on the telum. Inhabits and feeds on decayed wood. Pupa changes in the same situations. Imago, with filiform antennæ; mandibles sometimes bifid, sometimes terminating in a single point; maxillæ without the internal tooth; fore-wings generally soft and flexible, hind-wings generally perfect, adapted for flight. Inhabits decayed woods, flowers, &c. *Helops*, *Cistela*, *Melandrya*, *Conopalpus*, *Hypulus*, *Nothus*, *Ædemera*?

## NATURAL ORDER.—MORDELLITES.

Larva less elongate, soft, and more fleshy; legs less distinct. Inhabit and feed on decaying wood, flowers, and sometimes parasitical in the nests of wasps. Pupa changes in the same situations. Imago, with pectinated antennæ, particularly the males; head somewhat heart-shaped, and united vertically to the prothorax; fore-wings flexible, wide at the base, narrow at the apex; hind-wings mostly without the longitudinal fold. Inhabit flowers; diurnal, fly and run with rapidity and ease. *Mordella*, *Anaspis*, *Ripiphorus*.

NATURAL ORDER.—PYROCHROITES, *Soldier-beetles*.

Larva more depressed; head as wide as the prothorax; paratelum the largest segment; telum corneous, and produced into two spines. Inhabits and feeds on decaying wood. Pupa changes in the same situations or in the ground. Imago, with long pectinated antennæ; head exserted, triangular, and porrected, horizontally narrower than the prothorax; fore-wings soft, flexible, brilliant red; diurnal, flying readily in the sunshine. *Pyrochroa*.

NATURAL ORDER.—CANTHARITES, *Blister-beetles*, &c.

Larva and pupa unknown, supposed in some instances to be parasitical. Imago, with moniliform antennæ incrassated about the middle; head larger than the prothorax, to which it is attached vertically; fore-wings short, their margins crossing each other, flexible; hind-wings often wanting; tarsi with the terminal claws double. *Meloë*, *Cantharis*.

NATURAL ORDER.—ANTHICITES, *Flower-beetles*.

Larva and pupa in decayed wood. Imago, with filiform antennæ sometimes slightly serrated; elongate linear body; soft fore-wings. Inhabits flowers, flying readily and in the day-time. *Notoxus*, *Anthicus*, *Xylophilus*.

## STIRPS.—BUPRESTINA.

NATURAL ORDER.—PTINITES, *Wood-boring-beetles*.

Larva, with the articulate feet distinct, incrassated in the middle, narrower towards the tail, often covered with bristles. Commonly inhabits dry wood, through which it bores in all directions, reducing it to a powder. Pupa changes in the galleries made by the larva. Imago, with long antennæ generally filiform, but in some of the males highly pectinated; the mandibles strong and toothed; the head retractile within the prothorax; the prothorax more or less spherical; the fore-wings completely covering the body, and having often an inflated appearance. Inhabits the habitations of the larva, and occasionally flowers. *Ptilinus*, *Ptinus*, *Anobium*, *Mezium*, *Gibbium*.

## NATURAL ORDER.—CLERITES.

Larva in structure like the preceding order, but more elongate, and less commonly hairy. Feeds on the larvæ of the preceding order, and occasionally of some *Hymenoptera*. Imago, with the antennæ incrassated externally; the mandibles bifid; the maxillæ obtuse; the prothorax is long, slender, cylindrical, of less circumference than the head or body. *Necrobia*, *Clerus*, *Opilus*, *Thanasimus*, *Tillus*.

## NATURAL ORDER.—MELYRITES.

Larva and pupa unknown. Imago, with the antennæ filiform, tapering to the extremity; mandibles elongate, toothed, bifid at the apex; head nearly corresponding in width with the prothorax, but rather less; prothorax with the margins often dilated; when

touched, a red fleshy substance is protruded from several parts of the body and again withdrawn. Inhabits flowers; flies readily and in the sunshine. *Dasytes?* *Malachius*.

NATURAL ORDER.—LAMPYRITES, *Glow-worms*.

Larva composed of thirteen very distinct segments, the divisions between which are deeply marked, giving the back a serrated appearance; legs very perfect, the caudal leg also present. Inhabits old hedges among decayed sticks, found also under stones; feeds on minute snails, &c. Pupa changes under ground. Imago, with the antennæ filiform, moniliform, or pectinated; the mandibles small, soft, and somewhat imperfect; the prothorax flattened, dilated at the margins; the fore-wings flexible, leathery; females sometimes without wings; frequently emitting from the two last segments a bright phosphoric light. *Lampyris*, *Drilus*, *Telephorus*, *Lycus*.

NATURAL ORDER.—CEBRIONITES.

Larva and pupa unknown. Imago, with the antennæ very simple, (in the British genera) filiform; mandibles imperfect, terminating in a single point; prothorax semicircular, the convex, being the anterior margin, completely concealing the head; fore-wings and whole body soft and flexible, as though immature; more round and compact in shape than the preceding orders. Inhabits the leaves and flowers of plants in summer. *Dascillus*, *Elodes*, *Scirtes*.

NATURAL ORDER.—ELATERITES, *Click-beetles*.

Larva elongate, cylindrical, with six articulate and one caudal leg; slothful. Feeds on the roots of wheat, potatoes, &c., also occasionally in decaying timber; is very destructive to crops, and known to farmers as the WIRE-WORM. Pupa mostly changes in the ground. Imago, with moniliform antennæ, not unfrequently serrated or pectinated in the males; mandibles bifid at the extremity; head received into the prothorax; prothorax with a projecting spine beneath; metathorax with a cavity for the reception of the spine; by means of this instrument the insect, if laid on its back, leaps to a considerable height, with a loud clicking noise; diurnal, flies readily. Inhabits flowers, &c. *Elater*, *Campylus*.

NATURAL ORDER.—BUPRESTITES, *Burn-cows*.

Larva very elongate, cylindrical, with six articulate and one caudal prehensile leg. Feeds on timber. Pupa changes in the same situation. Imago, with serrated or pectinated antennæ; mandibles

short, strong, and bifid ; head more than two-thirds received into the prothorax ; prothorax beneath produced posteriorly into a spine ; but there being no corresponding cavity in the mesothorax, the insect has not, when placed on its back, the power of leaping possessed by the *Elaterites*. These insects are diurnal ; they possess the most gorgeous metallic colours ; they run and fly with ease and rapidity. *Buprestis*.

## STIRPS.—SCARABÆINA.

NATURAL ORDER.—CETONITES, *Day chafers*.

Larva, with six elongate, weak, articulate legs, and the posterior extremity of the body incrassated, soft, and recurved under the fore-part, which, touched, rolls in a ring, with the tail on one side of the head. Inhabits and feeds on decaying wood. Pupa changes in the same situations, or in the ground. Imago, with antennæ composed of ten joints, of which the three or four terminal ones are produced laterally, and form a club ; labium membranaceous, most concealed by the clypeus ; mandibles and maxillæ pubescent and membranaceous ; colours various and brilliant ; form generally flattened above ; diurnal, flies with ease and rapidity. Feeds on the farina or honey of flowers. *Cetonia*, *Trichius*.

NATURAL ORDER.—MELOLONTHITES, *Cock-chafers*.

Larva resembles that of the preceding order. Inhabits the earth, feeding on the roots of vegetables. Pupa changes in the ground. Imago, with antennæ composed of nine or ten joints, the six or seven terminal ones produced laterally, and forming a flabellated club ; labium more corneous than in the preceding order, and not entirely concealed by the clypeus ; mandibles corneous and masticatory ; colour less brilliant ; form generally convex above ; flight easy, not rapid ; mostly nocturnal. Feeds on the leaves of vegetables. *Hoplia*, *Anomala*, *Melolontha*, *Amphimalla*, *Omaloelia*, *Phyllopertha*, *Serica*.

NATURAL ORDER.—TROGITES, *Sand-chafers*.

Larva resembles that of the two preceding orders. Feeds on decaying animal and vegetable matter found in sand, which it inhabits. Pupa changes in the sand. Imago, with antennæ composed of nine or ten joints, the three or four terminal ones forming a small round club ; labium and mandibles concealed and membranaceous ; colour black ; form oval and very convex above. Inhabit sand, particularly by the sea-shore ; seldom fly. *Trox*, *Ægialia*, *Psammodyus*.

NATURAL ORDER.—SCARABÆITES, *Dung-chafers*.

Larva resembles the preceding. Inhabits and feeds on the excrement of animals. Pupa changes in the ground. Imago, with antennæ composed of nine or ten joints, the terminal one forming a compressed club; labium generally concealed by the clypeus; mandibles sometimes corneous, sometimes membranaceous; colour brown, black, or metallic-tinted black; form oval, convex above. Inhabit and feed as in the larva state; flight easy, rapid, mostly nocturnal. *Aphodius*, *Geotrupes*, *Bolboceras*, *Onthophagus*, *Copris*.

NATURAL ORDER.—LUCANITES, *Stag-beetles*.

Larva resembles the preceding; feeding on decayed wood. Pupa changes in the same situations. Imago, with ten-jointed antennæ, the basal joint very long, and the others bending forward from it at a right angle, forming an elbow, the three apical joints forming a club; labrum concealed or obsolete; mandibles very long, strong, and toothed; maxillæ weak and pilose. Flight nocturnal. Feed on the sap of plants. *Sinodendron*, *Lucanus*, *Platycerus*.

NATURAL ORDER.—HISTERITES, *Mimick-beetles*.

Larva rather more elongate than that of the *Lucanites*, in other respects nearly similar in formation. Inhabits and feeds on putrid substances. Pupa mostly changes in the ground. Imago, with clavate antennæ; strong corneous and projecting mandibles; head retractile within the prothorax; fore-wings square and very short; legs contractile; form a long square; covering excessively hard, highly polished. Inhabits putrid substances; mimics death when disturbed; flies occasionally in the sunshine. *Hister*, *Dendrophilus*, *Onthophilus*, *Abræus*.

NATURAL ORDER.—BYRRHITES, *Pill-beetles*.

Larva as in the *Histerites*, but somewhat pilose. Feeds on the roots of vegetables and decaying wood. Pupa mostly changes in the earth. Imago, with moniliform antennæ incrassated towards the extremity, but not clubbed; mandibles corneous but not projecting; form nearly globular; covering downy, not polished; head and legs contractile. Inhabits vegetables, mimicking death if touched; crawls in the day; flies but seldom. *Nosodendron*, *Byrrhus*, *Aspidiphorus*, *Simplocaria*.

## STIRPS.—SILPHINA.

## NATURAL ORDER.—DERMESTITES.

Larva somewhat shuttle-shaped, very pilose. Inhabits and feeds on decayed and dried animal substances. Pupa changes in the



same substances. Imago, with short clavated antennæ; mandibles short, strong, and toothed; form oval; head and legs retractile, but less perfectly so than in the two preceding Orders. Inhabits dead animals; when shaken out or disturbed mimicking death: flight principally nocturnal. *Attagenus, Dermestes, Megatoma.*

#### NATURAL ORDER.—IPSITES.

Larva more elongate, slightly pubescent. Inhabits and feeds on the bark of trees or fungi. Pupa changes in the bark. Imago, with clavated antennæ, the club not abrupt, but generally formed by a gradual incrassation of the antennæ externally; prothorax nearly square, generally longer than wide; form elongate: flight only occasional, mostly diurnal. *Lyctus, Sylvanus, Rhizophagus, Nemosoma, Ips, Tetratoma, Triplax, Mycetophagus, Antherophagus.*

#### NATURAL ORDER.—NITIDULITES.

Larva pubescent, more active than the preceding. Generally inhabits and feeds on decayed animal substances. Pupa changes in the same situations or in the earth. Imago, with clavated antennæ, the club abrupt and well defined, usually composed of three joints: active; fly readily. Inhabits, in great quantities, decayed animal substances, particularly bones, and also strongly-scented flowers. *Catheretes, Meligethes, Strongylus, Nitidula, Thymalus.*

#### NATURAL ORDER.—SILPHITES, *Carrion-beetles.*

Larva glabrous, depressed, attenuated posteriorly; very active. Inhabits putrefying animal substances. Pupa changes mostly in the earth. Imago, with antennæ clavated, or moniliform, externally incrassated; mandibles strong, pointed, and prominent; head capable of being bent vertically, and concealed by the prothorax, but not withdrawn into it; prothorax as wide as the body. Inhabits putrid animal substances, as dead birds, mice, rats, &c. which it buries in the earth as receptacles for its eggs; flight diurnal and nocturnal; scent very offensive. *Silpha, Necrophorus, Choleva, Catops, Ptomaphagus, Scaphidium, Scaphiosoma.*

#### NATURAL ORDER.—SPHERIDIITES, *Globe-beetles.*

Larva inhabits and feeds on the dung of horses and cows. Pupa changes in the same situations. Imago, with antennæ clavated; club distinct and abrupt; form nearly spherical or oval. Inhabits

and feeds as in the larva state; runs and flies with rapidity in the sunshine. *Sphæridium, Cercyon. Anisotomidæ?*

NATURAL ORDER.—HYDROPHILITES, *Herbivorous Water-beetles.*

Larva elongate, attenuated posteriorly, active, carnivorous, aquatic; head large, with long curved mandibles. Pupa changes in the earth or under dung. Imago, with clavated antennæ; mandibles strong and obtusely toothed; maxillary feelers very strong, and used in the water as antennæ; the form oval, the sides and back very convex, the surface glabrous. Inhabits water, swimming with ease, the feet being moved alternately; female covers her eggs with silk, forming a kind of cocoon, which she carries about with her in the manner of some spiders. Feeds on the decaying leaves of water-plants. *Spercheus, Hydrophilus, Hydroïus, Hydrobius, Berosus.*

NATURAL ORDER.—HELOPHORITES, *Diving-bell-beetles.*

Larva less elongate; sluggish; margins of the segments fringed with hair. Inhabits duckweed, and other plants on the surface and banks of ponds, also the surface of stones, mud, &c. Pupa changes sometimes in the same situations, but mostly in the earth. Imago, with antennæ more or less clavated, short, and generally concealed; the maxillary feelers being employed as antennæ; form elongate. Inhabits the banks of ponds and rivers, among aquatic plants, on which it feeds; enclosed in a bubble of air, it crawls on water-plants and on the surface of water, with the back downwards, but does not swim. *Hydræna, Helophorus, Hydrochus, Georyssus, Elmis, Parnus, Heterocerus.*

STIRPS V.—CARABINA.

NATURAL ORDER.—GYRINITES, *Water-fleas.*

Larva, with strong arcuate mandibles; a long fleshy process, fringed with hair, rising from both sides of each segment; carnivorous, aquatic, natatory. Pupa changes at the edge of ponds. Imago, with short clavated antennæ; mandibles short and obtuse, but strong; maxillæ somewhat obtuse; galea palpiform, exarticulate; fore-legs long, middle and hind-legs short and incrassated; carnivorous. Inhabits water, performing in the sunshine its beautiful and social gyrations on the surface. *Gyrinus.*

NATURAL ORDER.—DYTISCITES, *Carnivorous Water-beetles.*

Larva, with strong arcuate mandibles, perforated at the extremity for suction; carnivorous, aquatic, natatory. Pupa changes in the

earth, at the margins of ponds, among roots of trees and grass. Imago, with filiform antennæ; mandibles short and strong; maxillæ arcuate and very acute; galea palpiform and articulate; the fore-tarsi patellated in the males; the middle and hind-legs flattened and ciliated; form oval. Inhabits water, feeding on aquatic animals; swims with great ease and swiftness, moving the corresponding legs simultaneously. *Acilius*, *Dytiscus*, *Colymbetes*, *Noterus*, *Hydroporus*, *Haliphus*?

NATURAL ORDER.—CARABITES, *Ground-beetles*.

Larva with strong arcuate mandibles; active and carnivorous. Inhabits roots of grass, rubbish-heaps, decaying vegetables, moss, under stones, &c. in which situations it pursues and seizes its prey. Pupa changes in the earth. Imago, with moniliform antennæ; mandibles moderately short, very strong; maxillæ terminate in a blade, sometimes acute, but never articulated; galea articulate and palpiform. Universally distributed, running on the ground in pursuit of prey; chiefly nocturnal, and during the day found principally under stones and timber, at the roots of grass, in the sand of gravel-pits, &c.; sometimes flies, but not to avoid pursuit. *Elaphrus*, *Bembidium*, *Harpalus*, *Carabus*, *Dyschirius*, *Brachinus*, *Dromius*, *Odocantha*, *Drypta*.

NATURAL ORDER.—CICINDELITES, *Tiger-beetles*.

Larva with strong arcuate mandibles, and frequently with two remarkable recurved hooks on its back; it is carnivorous, and lies in wait for its prey in holes or dens, which it constructs in loose earth or sand, in sunny places. Pupa changes in the holes of the larva. Imago, with strong, long, arcuate, and deeply-toothed mandibles, which cross each other at about half their length; blade of the maxillæ acute and articulated; galea palpiform and articulated; legs very long and slender: diurnal, carnivorous, of light and elegant form; brilliant colours. Runs with amazing activity; flies to avoid pursuit. *Cicindela*.

NATURAL ORDER.—STAPHILINITES, *Devil's Coach-horses*.

Larva with strong mandibles; active, mostly carnivorous. Found under stones, at the roots of grass, and in rubbish-heaps, &c. Pupa changes in the same situations. Is remarkable for the compactness with which the limbs are attached, giving it the appearance of the *Amorpha adermata*. Imago, with moniliform antennæ; strong and acute mandibles; obtuse maxillæ; rounded and never palpiform galea. These beetles are distinguished at

once from all others by their square, short fore-wings, naked body, elongate form, and disgusting manner of turning up the tail like a scorpion. Inhabits and devours all putrefying substances, also living insects. *Staphylinus*.

#### NATURAL ORDER.—PSELAPHITES.

Larva and pupa unknown. Imago, with acute dentate mandibles; obtuse maxillæ; rounded, exarticulate, though somewhat palpi-form galea; maxillary feelers, clavated, immensely developed, often equalling the antennæ in size; antennæ with ten or eleven joints, the last joint incrassated, forming a club; fore-wings quadrate and abbreviated; hind-wings usually wanting; tarsi two-jointed. Very minute; slow in its movements. Inhabits moss and the roots of grass, feeding on the *Acari* which occur in those situations. *Pselaphus*.

#### NATURAL ORDER.—SCYDMÆNITES.

Larva and pupa unknown. Imago, with antennæ eleven-jointed, moniliform, incrassated exteriorly; the basal joint rather long, the apical one ovate, which, with the two preceding, is incrassated; maxillary feelers very large, the third joint stout and conical, the fourth and terminal one small, acute; fore-wings completely cover the body; the tarsi five-jointed. Inhabit moss, and under planks near cucumber frames; feed on *Acari*. (*Mastigus*), *Scydmænus*, *Eutheia*.

#### STIRPS VI.—CHRYSOMELINA.

##### NATURAL ORDER.—ENDOMYCITES, *Fungus-beetles*.

Larva, with six distinct articulate legs; head small; middle of the body stout, gradually attenuated to the tail. Principally inhabits and feeds on the interior of fungi. Pupa changes in the same situations. Imago, with moniliform antennæ, incrassated externally; acute mandibles; tarsi three-jointed; form very convex, oval, glabrous. Inhabits fungi. (*Dasycerus*), *Lycoperdina*, *Endomychus*.

##### NATURAL ORDER.—COCCINELLITES, *Lady-birds*.

Larva in structure like that of the preceding Order, but rather more elongate and active. Inhabits the leaves of vegetables, feeding on the *Aphites* which suck their sap. Pupa attaches itself by the tail to a leaf, and changes in that position. Imago, with short and rather clavate antennæ; acute mandibles; tarsi three-jointed; form very convex above, nearly hemispherical. Inhabits vege-

tables, feeding on the *Aphites* which infest them. *Cacicula*, *Chilochorus*, *Coccinella*.

NATURAL ORDER.—CASSIDITES, *Tortoise-beetles*.

Larva more obese and obtuse, spiny or radiated round the margin; the tail furnished with a remarkable forked appendage, on which the excrement accumulates, forming a kind of umbrella, which protects it in some degree from observation. Inhabits and feeds on vegetables. Pupa changes in the same situations. Imago, with moniliform antennæ; mandibles and maxillæ obtuse and minute; galea palpiform, exarticulate; head completely hidden by the prothorax, which, together with the fore-wings, form a complete covering, like the carapax of a tortoise; tarsi four-jointed; form nearly hemispherical. Inhabits vegetables, on which it feeds. *Cassida*.

NATURAL ORDER.—CHRYSOMELITES.

Larva still more obese, inactive; legs short. Feeds on the leaves of vegetables. Pupa sometimes attaches itself, and changes in the same situations, and sometimes in the earth. Imago, with moniliform antennæ, inserted far from each other; mandibles rather obtuse; maxillæ obtuse; galea palpiform, exarticulate; head nearly concealed by the prothorax; tarsi four-jointed; legs not formed for leaping; form very globose, inactive; flies seldom. Inhabits vegetables, on the leaves of which it feeds. When touched frequently emits a red fluid from the mouth. *Cryptcephalus*, *Clythra*, *Chrysomela*.

NATURAL ORDER.—HALTICITES, *Flea-beetles*.

Larva and pupa nearly as in the preceding Order; the former rather less obese. Imago, with much longer and more filiform antennæ, and inserted nearer together; more acute mandibles; maxillæ obtuse; galea palpiform and articulate; hind-legs incrassated, formed for leaping; form less globose. Inhabits and feeds on vegetables; its size is little larger than that of a flea, an insect which it emulates in the activity of its leaps; it is excessively injurious to crops, sometimes causing a total failure of turnips, rape, &c. *Haltica*.

NATURAL ORDER.—GALERUCITES.

Larva and pupa nearly as in the *Chrysomelites*. Imago, with long filiform antennæ, inserted much nearer to each other than in either of the two preceding Orders; mandibles acute; maxillæ

obtuse, with a distinctly articulate palpiform galea; legs of similar structure, not formed for leaping; form more elongate. Inhabits and feeds on vegetables; flies more readily than the two preceding Orders, but does not leap. *Galeruca*, *Adimonia*, *Auchenia*, *Laperus*.

#### NATURAL ORDER.—CRIOCERITES.

Larva more linear and elongate. Feeds on the leaves or within the stems of vegetables. Pupa generally changes in a silken cocoon, attached to the stems or roots of the vegetables on which it feeds. Imago, with moniliform antennæ, slightly incrassated externally, about as long as in the *Galerucites*; mandibles arcuate, bifid at the apex; maxillæ obtuse; galea incrassated, but not palpiform; prothorax proportionately much smaller than in any other Order of the Stirps; somewhat cylindrical; tarsi four-jointed; colours brilliant; flight only occasional, diurnal. Inhabits vegetables. *Crioceris*, *Donacia*.

#### STIRPS VII.—CERAMBYCINA.

##### NATURAL ORDER.—LEPTURITES.

Larva is almost entirely without feet, fleshy, linear; inhabits decaying timber. Pupa changes in the same situations. Imago, with filiform antennæ, usually about the length of the body, inserted between the eyes, but not interfering with their form; the head is elongated at its junction with the prothorax, somewhat in the manner of a neck; mandibles terminated generally in an acute point; maxillæ obtuse; galea obtuse, not palpiform; form elongate, attenuated posteriorly; tarsi four-jointed, diurnal. Inhabits flowers, apparently feeding on their farina. *Leptura*, *Pachyta*.

##### NATURAL ORDER.—CERAMBICITES, *Capricorn-beetles*.

Larva and pupa as in the preceding Order. Imago, with filiform antennæ, often much longer than the body, inserted close to the eyes, and partly surrounded by them; the eyes, consequently, become somewhat kidney-shaped; the head is not elongated at its junction, but is partly received into the prothorax; mandibles with an acute point; maxillæ and their galea obtuse; tarsi four-jointed; form elongate, nearly linear, slightly attenuated posteriorly: flight both diurnal and nocturnal. Inhabits the stems of trees, decayed wood, and sometimes flowers. *Molorchus*, *Clytus*, *Callidium*, *Cylindera*, *Obrium*, *Saperda*, *Lamia*, *Cerambyx*, *Prionus*.



NATURAL ORDER.—CUCUJITES, *Flat-bodied-beetles*.

Larva with six very short articulate legs ; found in decayed timber. Pupa changes in the same situation. Imago, with filiform antennæ generally not longer than the prothorax ; mandibles acute, porrected, and elongate, especially in the males ; the maxillæ obtuse ; galea pilose ; head somewhat triangular, elongated posteriorly into a kind of neck ; prothorax nearly square, very flat ; body very flat ; tarsi four-jointed. Inhabits timber. *Cucujus*, *Trogossita* ? (*Parandra*, *Passandra*.)

## NATURAL ORDER.—BOSTRICITES.

Larva a white maggot, completely without legs ; inhabits and feeds on the bark or wood of trees, causing their death with unerring certainty. Pupa changes in the same situations. Imago, with clavated antennæ ; mandibles generally bidentate ; maxillæ, with their galea obtuse ; the prothorax very convex, and usually as large as the remainder of the body ; tarsi four-jointed ; form cylindrical. Inhabit circular holes, which it bores in the bark and wood of trees, either to escape, after changing, from the pupa, or to deposit their eggs. *Cis*, *Bostrichus*, *Tomicus*, *Platypus*, *Hylesinus*, *Scolytus*, *Hylurgus*.

NATURAL ORDER.—CURCULIONITES, *Weevils*.

Larva without legs, and having occasionally in their place small mamillary processes ; inhabits and feeds on the flowers, fruits, seeds, leaves, stalks, bark, wood, pith, and roots, of vegetables. Pupa changes in the same situations, sometimes naked, sometimes in a hard compact case, sometimes in a silken cocoon. Imago, with antennæ generally twelve-jointed, incrassated externally, the basal joint generally very long, the others bending forwards at a right angle, forming an elbow ; these antennæ are placed on a long rostrum, which proceeds from between the eyes, and has the mouth at its extremity ; mandibles generally obtuse ; blade and galea of the maxillæ united and indistinct ; tarsi four-jointed : mostly diurnal ; feed on vegetables. *Curculio*.

## NATURAL ORDER.—ANTHRIBITES.

Larva as in preceding, feeding on wood. Pupa changes in the channels made by the larva. Imago, with antennæ generally twelve-jointed, the basal joint not particularly elongate, therefore not elbowed, moniliform, incrassated externally, not situated on a



distinct rostrum, much elongated in the males; mandibles and maxillæ nearly as in the preceding Order; tarsi four-jointed. Inhabits the bark and wood of trees. *Brachytarsus*, *Platyrrhinus*, *Anthrribus*. *Bruchus* differs only in the superior size of its labrum, and in feeding on pulse.

#### NATURAL ORDER.—SALPINGITES.

Larva and pupa as in the preceding Orders; the former feeds on the wood and bark of trees. Imago, with antennæ shorter, moniliform, somewhat incrassated externally, and situated on a rostrum; mandibles and maxillæ obtuse; fore- and middle-tarsi five-jointed; hind-tarsi four-jointed. Found in the same situations as the larva, and also among the leaves of trees. *Salpingus*, *Sphæriestes*.

#### DIVISION III.—TETRAPTERA ISOMORPHA.

Larva resembling the imago in structure, appearance, mode of feeding, &c. wings only being wanted. Pupa, or quiescent state, none.

#### CLASS IV.—ORTHOPTERA.

Imago, with the parts of the mouth fully developed; labrum quadrate and movable; mandibles strong, bony, masticatory, and moving horizontally; maxillæ with feelers, and a distinct, exarticulate, palpiform galea; fore-wings coriaceous, little used in flight; hind-wings longitudinally folded; flight weak and badly sustained.

#### STIRPS.—FORFICULINA.

##### NATURAL ORDER.—FORFICULITES, *Earwigs*.

The antennæ are many-jointed, moniliform, and decrease in size to the extremity; the fore-wings square, coriaceous, meeting with a straight suture, very short, and not used in flight; the hind-wings ear-shaped, folded, and projecting beyond the fore-wings; hind-legs not formed for leaping; tarsi three-jointed; telum furnished with two appendages which meet like forceps; nocturnal insects, feeding on vegetables. *Forficula*, *Labia*, *Labi-dura*.

#### STIRPS.—ACHETINA.

##### NATURAL ORDER.—ACHETITES, *Crickets*.

Antennæ very long, slender, and composed of many joints; fore-wings short, coriaceous, one partially covering the other, not

used in flight; hind-wings folded longitudinally, and projecting beyond the fore-wings; hind-legs incrassated, formed for leaping; tarsi three-jointed: nocturnal, subterranean insects, feeding on vegetables. *Gryllotalpa*, *Acheta*.

STIRPS.—GRYLLINA.

NATURAL ORDER.—GRYLLITES, *Grasshoppers*.

Antennæ very long, slender, and composed of many joints; fore-wings coriaceous, as long as the hind-wings, which are folded longitudinally beneath them; hind-legs incrassated, formed for leaping; tarsi four-jointed; female furnished with an exerted oviduct: diurnal; feed on vegetables. *Gryllus*.

STIRPS.—LOCUSTINA.

NATURAL ORDER.—LOCUSTITES, *Locusts*.

Antennæ short, incrassated towards the middle or extremity, consisting of about ten joints; fore-wings coriaceous, generally as long as the hind-wings, which are folded longitudinally beneath them; hind-legs incrassated, formed for leaping; tarsi five-jointed; diurnal: feed on vegetables. *Locusta*, *Gomphocerus*, *Acrydium*.

(STIRPS.—SPECTRINA.

NATURAL ORDER.—SPECTRITES, *Spectres*.

Antennæ short, stout, composed of few joints; fore-wings coriaceous, small, short, often wanting, never covering the hind-wings, not used in flying; hind-wings folded longitudinally, often very large and beautifully coloured, sometimes wanting; legs alike in structure, not formed for leaping; tarsi five-jointed; prothorax short: diurnal; feed on leaves. *Spectrum Phasma*.)

(STIRPS.—MANTINA.

NATURAL ORDER.—MANTITES, *Walking-leaves*.

Antennæ long, filiform, very slender, and composed of many joints; fore-wings coriaceous, horizontal, generally covering the hind-wings, which are folded beneath them; fore-legs incrassated, and armed with teeth, longer than the middle- and hind-legs; tarsi five-jointed; prothorax long: diurnal; feed on other insects. *Mantis*.)

## STIRPS.—BLATTINA.

NATURAL ORDER.—BLATTITES, *Cockroaches*.

Antennæ very long, filiform, tapering, and many-jointed; head bending beneath the prothorax; fore-wings somewhat coriaceous, horizontal, one folding over the other, covering the hind-wings, which are folded beneath them; legs alike in structure; tarsi five-jointed: nocturnal; voracious; omnivorous; run rapidly; fly badly; do not leap. *Blatta*.

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Situation at present doubtful.

NATURAL ORDER.—THRIPSITES, *Ticklers*.

Antennæ conspicuous, composed of eight joints; fore- and hind-wings linear, and of equal length; tarsi two-jointed. Very minute. Inhabit flowers, feeding on the farina. When running on the skin they cause an intolerable itching. *Thrips*.

## CLASS V.—HEMIPTERA.

Imago, with the parts of the mouth only partially developed; the mandibles are without any horizontal motion, but elongate and slender, and, together with the maxillæ and tongue, are inclosed in a sucker, which is composed of the labium principally, but protected about by the labrum; this sucker is bent beneath the head and breast, excepting when in use, when it is usually thrust perpendicularly into the rind of vegetables, or skin of animals, to extract the sap or blood, which, in the class, constitute the food; the feelers are obsolete; all the wings are fully developed, and in the greater portion serve occasionally as organs of flight; the flight is, however, weak, and of short duration.

## STIRPS.—CIMICINA.

NATURAL ORDER.—CIMICITES, *Bugs*.

Antennæ elongate, conspicuous, four- or five-jointed; fore-wings with the basal portion coriaceous, the apical portions which cross each other membranaceous; the legs are of uniform structure, not formed for leaping; the tarsi are three-jointed: terrestrial; run fast; fly rapidly, but not far at a time; feed generally on the sap of vegetables, sometimes on other insects, and occasionally,

but apparently unnaturally, on the blood of vertebrate animals. *Cimex*,<sup>1</sup> &c.

STIRPS.—HYDROMETRINA.

NATURAL ORDER.—HYDROMETRITES, *Water-bugs*.

Antennæ elongate, conspicuous, four- or five-jointed; fore-wings coriaceous, of uniform substance; hind-wings membranaceous; all the wings linear; legs of uniform structure, very long, not formed for leaping; tarsi three-jointed; body elongate, linear: aquatic, running with ease and rapidity on the surface of water. *Hydrometra*, *Gerris*, *Velia*.

STIRPS.—NEPINA.

NATURAL ORDER.—NEPITES, *Water-scorpions*.

Antennæ very short, concealed below the head; fore-wings coriaceous, crossed at the apex; hind-wings membranaceous, completely concealed beneath them; fore-legs hooked, predatory; tarsi with a single joint; middle- and hind-legs not formed for swimming; tarsi two-jointed; tail armed with two long setaceous appendages: aquatic; carnivorous; crawl on aquatic plants, but do not swim. *Ranatra*, *Nepa*.

STIRPS.—NOTONECTINA.

NATURAL ORDER.—NOTONECTITES, *Water-boatmen*.

Antennæ very short, concealed below the head; fore- and hind-wings as in the preceding; fore-legs unarmed, middle- and hind-legs formed for swimming; all the tarsi two-jointed; tail without appendages: aquatic; carnivorous; swim with ease, swiftness, and elegance; cannot crawl on aquatic plants like the preceding. *Naucoris*, *Notonecta*, *Corixa*, *Sigara*.

STIRPS.—CICADINA.

NATURAL ORDER.—CICADITES, *Frog-hoppers*.

Antennæ very short, scarcely projecting beyond the head; fore-wings coriaceous, meeting with a straight suture; hind-wings membranaceous; hind-legs incrassated, formed for leaping; tarsi three-jointed; leap readily; fly badly. Inhabit vegetables, on the sap of which they feed. *Cicada*, *Cercopis*, *Membracis*, *Psylla*, &c.

<sup>1</sup> The *Cimicites* require further division. See M. de Laporte's excellent classification of them.

## STIRPS.—COCCINA.

NATURAL ORDER.—COCCITES, *Gall-insects*.

Antennæ hirsute, long, moniliform, many-jointed; fore-wings semi-coriaceous, of uniform substance; hind-wings wanting, or replaced by appendages similar to the halteres of *Diptera*; legs of uniform structure, not formed for leaping; tarsi two- or three-jointed in the male, with a single joint in the female; tail furnished with two long setæ. The females are apterous, and attach themselves to the bark and leaves of trees, on which they deposit their eggs, covering them with their bodies; in this situation the female resembles a gall, or casual excrescence of the plant. *Coccus*.

## STIRPS.—APHINA.

NATURAL ORDER.—APHITES, *Plant-lice*.

Antennæ conspicuous, elongate, seven-jointed; fore-wings deflexed, meeting over the back with a straight suture; hind-wings much smaller and shorter; all the wings membranaceous; legs of uniform structure, not formed for leaping; tarsi two-jointed. Infest all vegetables, sucking the sap: reproduction without union of sexes for many generations. *Aphis*.

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Situation at present doubtful.

## NATURAL ORDER.—ALEYRODITES.

Larva oval, flat, and scale-like. Pupa changes within the skin of larva; is quiescent. Imago, with the antennæ filiform, conspicuous, and six-jointed; wings equally developed, both as to length and breadth, covered with a white, mealy substance like the scales of *Lepidoptera*; legs of uniform structure, not formed for leaping. Sits on the under-side of the leaves of the plants on which the larva feeds. *Aleyrodes*.

## DIVISION III.—TETRAPTERA ANISOMORPHA.

Larva and pupa possessing no uniform mode of metamorphosis, but assuming, in different Orders, that of other Divisions.

## CLASS I.—NEUROPTERA.

Larva, with strong corneous mandibles moving horizontally, and six articulate feet, situated in pairs on the second, third,

and fourth segments; prehensile feet none. Pupa various. Imago usually with the organs of the mouth, and all the wings fully developed, and resembling net-work.

STIRPS.—TERMINA.

NATURAL ORDER.—TERMITES, *White Ants*, &c.

Larva with long, filiform, multi-articulate antennæ; strong, corneous, and well-developed, and masticatory mandibles, and six elongate articulate legs: active, omnivorous, and apparently perfect, in one genus living in immense societies. Pupa isomorphous. Imago, with long, filiform, multi-articulate antennæ; strong, corneous, masticatory mandibles; wings fully developed, recumbent, reticulated; tarsi three-joints. (*Termes*), *Psocus*. The larva of a *Psocus*, which feeds on preserved insects in our cabinets, is called *Atropos pulsatorius* by some authors, and is said to make the ticking noise frequently heard in houses, and commonly known as the death-watch; in its perfect or winged-state it is not uncommon among old books, on windows, &c.

STIRPS.—PERLINA.

NATURAL ORDER.—PERLITES, *Pearl-flies*.

Larva with long, filiform, multi-articulate antennæ; strong, corneous, masticatory mandibles; telum furnished with two long, setiform appendages; active, carnivorous, aquatic. Pupa isomorphous. Imago, with long, filiform, multi-articulate antennæ; strong, corneous, masticatory mandibles; wings fully and equally developed, reticulated, recumbent; the hind-wings folded; tarsi three-jointed. Inhabits the banks of running waters, and is a very favourite food for fish; flight nocturnal. *Perla*, *Isogenus*, *Nemoura*. *Sialis* has a necromorphous pupa.

STIRPS.—RAPHIDIINA.

NATURAL ORDER.—RAPHIDIITES, *Snake-flies*.

Larva with filiform antennæ, and corneous, masticatory mandibles; active. Inhabits and feeds on decayed wood. Pupa isomorphous. Imago, with moniliform antennæ; corneous, masticatory mandibles; large porrected head; elongate prothorax; wings uniformly and fully developed, recumbent, deflexed, not folded, beautifully reticulated; tarsi four-jointed; telum with a seta: flight diurnal, in the sunshine. *Raphidia*.

NATURAL ORDER.—HEMEROBIITES, *Lace-winged-flies*.

Larva, with filiform antennæ; prominent corneous mandibles and maxillæ; sacciferous, carnivorous. Inhabits the leaves of vegetables. Pupa necromorphous; changes within the sack formed by the larva. Imago, with long, moniliform antennæ; corneous, masticatory mandibles, wings fully and equally developed, not folded, beautifully reticulated, deflexed; tarsi five-jointed; smells fetid; flies mostly in the evening. *Hemerobius*, *Chrysopa Osmylus*. (*Myrmoleon* and *Ascalaphus* differ only in their singular pit-fall making larvæ and their clavated antennæ).

## STIRPS.—PHRYGANINA.

NATURAL ORDER.—PHRYGANITES, *Stone-flies*.

Larva with short antennæ; corneous, masticatory; mandibles; sacciferous, aquatic. Pupa necromorphous, changes in the sack formed by the larva. Imago, with very long, multi-articulate, filiform antennæ; mandibles and maxillæ obsolete; fore-wings deflexed, very hairy; hind-wings ample, much folded longitudinally, not so hairy; tarsi five-jointed. Inhabits the neighbourhood of water; flies in the evening and during the night, and is a favourite food of fish. *Phryganea*.

## STIRPS.—EPHEMERINA.

NATURAL ORDER.—EPHEMERITES, *Caddew-flies*.

Larva with long, filiform antennæ; corneous, masticatory mandibles; six articulate legs, and numerous lateral fins, which aid it in swimming, and which also serve to separate air from the water, and convey it to the trachææ; aquatic, carnivorous. Pupa isomorphous. Imago, with short concealed antennæ; mandibles and maxillæ obsolete; fore-wings fully developed; hind-wings small or obsolete; all the wings beautifully reticulated, erect, and meeting above the back; tarsi four-jointed; telum furnished with long setiform appendages; retains a superfluous skin after having attained its final form, characters, and even the power of flight; this skin renders the wings opaque, when shed they are more transparent. Flight in the evening, in company, rising and falling; a favourite food of fish, and a bait much in request among anglers. *Ephemera*, *Baëtis*, *Cloëon*.

## STIRPS.—LIBELLULINA.

NATURAL ORDER.—LIBELLULITES, *Dragon-flies*.

Larva with short antennæ; corneous, masticatory mandibles; very elongate, jointed, and remarkable labium, furnished with preda-



tory, acute, mandibuliform palpi; aquatic, carnivorous. Pupa isomorphous. Imago, with minute antennæ nearly concealed; strong, corneous, masticatory mandibles; labium of moderate proportions; wings of uniform development, beautifully reticulated, porrected, laterally or erect, meeting above the back; tarsi three-jointed; flight rapid, well sustained; active, carnivorous. *Agrion*, *Libellula*, *Æschna*.

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Situation at present doubtful.

NATURAL ORDER.—PANORPITES, *Scorpion-flies*.

Larva and pupa unknown. Imago, with long, filiform, multi-articulate antennæ; mandibles and maxillæ corneous, produced into a beak; wings of equal development, horizontally recumbent on the back; tarsi five-jointed; telum armed with an appendage resembling a lobster's claw; flight weak, of short duration, diurnal. Inhabits abundantly the woods and hedges of England throughout the summer. *Panorpa*, (*Bittacus*, *Nemoptera*).

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ART. XXXVIII.—*Entomological Society*.

TENTH SITTING.—JULY 7.

THE SECRETARY read a paper, by Mr. Babington, upon the genus *Dromius*.

THE SECRETARY read a paper by himself, describing a British Neuropterous Insect, and giving it a new generic name: the name escaped us.

THE SECRETARY read a paper by M. Chevrolat, on a species of the family *Curculionidæ*, which he had received from St. Helena.

THE SECRETARY read a paper by himself, on the Neuropterous genera *Acentropus* (Curtis), *Acentria* and *Zancle* (Stephens' Nom. 2d Edit.); the author considers these genera Lepidopterous.

THE SECRETARY read the conclusion of the paper by himself and Mr. Templeton, on the genera *Lepisma* and *Podura*.

THE SECRETARY read the title of a paper by himself, entitled "Notes upon Nomenclature;" but the President thinking the meeting had sat sufficiently long, it was withdrawn.

During the meeting, a long discussion took place about a species of *Aphis*, which has committed great ravages among the sugar-canes in the West Indies. A Mr. J. C. Johnson, who was present, and who had lately arrived from the West Indies, stated that full two-thirds of the crops had been destroyed by it.

ELEVENTH SITTING.—AUGUST 4.

COL. SYKES took the chair.

Mr. INGPEN exhibited the nest of a wasp (probably of the genus *Odynerus*) which he had found behind a book-shelf; some paper, which had fallen in the same situation accidentally, had been curiously employed by the insect for the outer covering of its nest. The nest itself was composed of a kind of mortar made from mud; it was nearly five inches in length, and had various circular apertures through which the insects, on coming to perfection, had made their exit.

The SECRETARY read a paper by Col. Sykes, on some Indian species of ants, and gave some highly interesting particulars of their economy. The descriptions were of three separate species. The first species builds its nest in trees, fixing it with great strength and firmness; the nest itself is nearly globular, about eight inches in diameter, and built entirely of dried cow-dung. The second species (we understood the name to be *indefessus*) exhibits a remarkable instinct very little short of reason. He was accustomed to have his desert placed on a sideboard, near a wall, and left all night, the legs of the sideboard being immersed in vessels of water; notwithstanding which precaution, the sideboard was found in the morning covered with ants, and the sweets were plundered most severely. On seeking the mode in which the intrusion was effected, he found that they got one after another into the water, till a floating living bridge was stretched across it, and then the legs were readily mounted. This mode of access was effectually stopped by a rim of turpentine round each of the legs just above where they entered the water; but the evil was not cured; for, on the following morning, the ants were on the table, and the good things plundered as before; he found that the ants had crawled up the wall in great numbers, and crowded to the part level with the edge of the side-board, which was not more than an inch from the wall, and so

stretched across and obtained a footing, thus running the risk of a fall, which many of them received. The sideboard was now moved quite away from the wall, and for awhile the sweets remained untouched; but soon the usual visitants were again observed, and, for several days, it appeared impossible to account for the intrusion; when, at last, he was standing near the table, and observed a solitary ant climbing quietly up the wall of the room: when it had mounted to rather more than a foot above the level of the sideboard, it took a spring and came down among the sweets; this seemed altogether so extraordinary a proceeding, that he thought it must be the effect of chance; but very soon he saw many other ants make their appearance and mount the wall, like their forerunner, until they reached a certain elevation above the sideboard, when they one and all, without exception, leaped from the wall, *seriatim*, and alighted safely among the sweets: thus their continued appearance was accounted for. The third species was remarkable, as disproving the somewhat absurd theory, proposed by Gould, and almost universally received, that ants do not lay up stores for the winter; a theory which entomologists in particular had fully adopted and entered into. He had seen the ants of this species, in great numbers, carrying the seeds of a grass, which they carried with great care and tenacity to their nests, and laid up in their stores.

The SECRETARY read a paper by himself, being a description of *Lamia Norrisii*, one of the family *Cerambycidae*.

The Rev. F. W. HOPE combatted the opinion expressed by Col. Sykes, that the ant's nest was constructed of cow-dung; he thought it was more probably composed of that paper-like substance employed by some other gregarious insects, particularly wasps.

#### TWELFTH SITTING.—SEPTEMBER 1.

The SECRETARY read a paper by the Rev. F. W. Hope, on the genus *Mimela*, belonging to the *Scarabæidæ*.

The SECRETARY read a paper by himself, on the Naming of Insects; he defended, at great length, the various subjects attacked by a writer in the Entomological Magazine, and shewed that they were perfectly justifiable and in accordance with established usage: he instanced a long name, of his own giving, and pointed out its advantages, (we did not catch the

name, but it appeared of very great length and harshness); he then dwelt on the propriety of naming insects after persons who have captured them, by adding the letter *i* to the surname of the captor; he particularly instanced *Waterhouse-i*, which he thought a very excellent name, and much better than *Aquadomi*, which would be the Latin of Mr. Waterhouse's name; he, however, suggested that such names should be pronounced *Waterhous-e-i*, *Ho-pe-i*, *Davi-si-i*, the nominatives being *Waterhous-eus*, *Ho-peus*, and *Davi-sius*.

The SECRETARY read a letter from Dr. Haslar, of Philadelphia, relative to *Cicada Septendecem*, an insect which abounds in North America. Dr. Haslar states that, in the larva state, these insects live in the earth; on appearing above-ground, they are devoured with avidity by poultry, and those hens which had eaten a great number of them usually laid eggs with colourless yolks. Specimens of the insect, in the imago state, were exhibited, as well as some of the pupæ about to change.

[The attendance of members at these sittings has greatly decreased; at the July sitting, about twenty members were present; at the August sitting, about fifteen; at the September sitting, about twelve.]

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#### ART. XXXIX.—*Varieties.*

36. *Capture of Lepidoptera at Great Yarmouth.*—SIR, Should you have any room, it may be interesting to record the capture of three very rare insects at this place, two of which have never been observed here before. They were all taken during this present month; namely, one specimen of *Vanessa Antiopa*, which was captured by a boy, in a garden in the town, on the 26th inst. A single specimen of *Argynnis Lathonia* was caught on the 2d, near Caistor-rails, about a mile from this town: it adjoins Caistor-marrams, which, I am told, is very similar to the Castle-meadow, Dover, as to soil and vegetation. The other insect is *Deilephila Galii*, of which only one instance occurred till this month, when it has been observed rather common: one was caught on the 3d, two on the 9th, and one on the 29th; besides which five or six more were seen, but so shy that they escaped: with

one exception, they were all seen in gardens on honeysuckles. Two that were caught proved females, and laid eggs, from which I have now several caterpillars by me, feeding on the *Galium verum*.

I remain, Sir,

Your most obedient servant,

Great Yarmouth, August 31, 1834.

C. J. PAGET.

37. *Captures*.—Want of space compels us to compress various notices of captures. *Colias Electra* has appeared in some abundance in many of the counties; York, Devon, Hereford, Worcester, Dorset, Hants, Sussex, Surrey, Kent, and Essex. *Colias Hyale*, in Northumberland, on the authority of Mr. Standish; at Mickleham it has been taken by Mr. Bennet; at Darent, by Mr. Desvignes; and at Great Yarmouth it has been seen by Mr. Paget; the dates varying from the middle to the end of August. *Argynnis Lathonia* has been taken in Northumberland, on the authority of Mr. Standish; and at Mickleham, by Mr. Bennett, the end of August—rather a wasted specimen. *Melitæa Dia* has been taken, two following years, by Mr. Weaver, of Birmingham, at Suttonpark, near that town, and also by Mr. Stanley; the locality we cannot state. *Polyommatus Arion* was taken on the 15th of June, 1833, in a situation abounding with long grass and brambles, at Langport, near Taunton, by Mr. John Queket; in number, about forty specimens: on the same day, in the present year, Mr. Queket took about twenty specimens; Mr. Dale has taken about ten specimens. *Deilephila Galii* has been taken by Mr. Smith, near York. *Agrotis radia*, by Mr. Newman, at Deptford, on palings. *Agrotis radiola*, by Mr. Newman, at Deptford; by Mr. Doubleday, at Epping; by Mr. Standish, at Camberwell. *Agrotis nigricans*, by Mr. Standish, in the Deptford-marshes, in great abundance. *Ceratina cærulea* has been taken by Mr. Davis, at Birch, and by Mr. Newman, at Birch-wood and Wickham; all between the 20th and the end of May. *Tarpa Panzeri* has occurred on Plumstead-heath, on the authority of Mr. Shuckard. *Lamia Sutor* has been taken at York by a boy, and since purchased by Mr. Meynell. *Chrysomela Hanoverensis*, *Spercheus emarginatus*, *Hygrotus decoratus*, *Macrolepa Zosteræ*, at Askem-bog, on the authority of Mr. Preston. *Carabus clathratus* and *glabratus*, in abundance in Suther-

land, by Mr. J. Wilson. *Plinthus caliginosus*, at Ramsgate, by Mr. Leplastrier. Mr. Weaver has found the pupa-case of *Cicada hæmatodes*; it was attached by the legs to the stem of a fern; he conjectures that the larva feeds under-ground, on the roots of the fern. Mr. Iliff has bred splendid specimens of *Phalæna Cecropia*, from pupæ received from North America.

38. *Mode of killing Insects*. — “What a cruel practice!” frequently exclaims the spectator, when he beholds an entomologist’s box, in which a fine *Bombus*, or other lively insect, is impaled upon a pin, and whose futile exertions to extricate itself produce the semblance of agonized writhings. My present object, however, is not to moot the broad question of insect feeling, but to quiet the apprehensions of those humane individuals whose fine sympathies are called into action by a practice (as above alluded to) which savours more of cruelty than humanity. You will perhaps, therefore, Mr. Editor, allow me to mention an expeditious, certain, and not unpleasant mode of destroying vitality in the little objects of our research—a plan communicated to me by my friend F. Wood, Esq.; one which, from having recently tried its effect, I can safely recommend for adoption; and may be resorted to in almost every situation, unaccompanied by the danger attendant upon employing the active poisons,—such as the nitric, oxalic, or prussic acids, which are frequently used,—the inconvenience resulting from the change of colour in the species when sulphur, &c. is employed,—or the smell from tobacco, &c.

The plan is simply this:—Take three or four juicy leaves (the younger the better, with, if a more powerful effect is required, a small portion of the tip of the stalk,) of the common laurel; break or cut them into small pieces, and crush them quickly between two stones,<sup>a</sup> in a thin piece of paper; screw up the produce in the latter, with as little exposure to the air as can be avoided, and fix the mass by a pin in a corner of the collecting box in which the living insects are to be previously placed; keep the box closely shut, and in about five minutes every specimen will have expired. It is necessary that the external air should be excluded, otherwise the fumes

<sup>a</sup> At home a mortar may be employed.



of prussic acid, which are evolved from the crushed leaves, will become too much attenuated to affect the respiratory organs of the insects, and the latter will partially revive if too speedily exposed to the vivifying influence of a purer atmosphere. I have tried the experiment rather extensively upon insects of various families: *Bombi* and *Helophili* die very rapidly in less than two minutes, and without any struggling, as is the case when heat, &c. is applied; and moths, in a state of repose, expire without a single previous motion: consequently the process I have recommended is most admirably adapted for killing the larger *Lepidoptera* almost immediately upon their capture, and thus fine specimens may be conveyed home uninjured. I yesterday killed a gigantic *Epeira diadema* in less than half a minute; and a specimen of *Helops cæruleus*, with one or two fresh-captured *Philonthi*, at liberty in the box, were also dead when it was opened. I therefore strongly recommend the above process to the notice of the practical entomologist, as being, from its convenience, better adapted for general application than any hitherto proposed.

J. F. STEPHENS.

*Hermitage, South Lambeth,*  
17th Sept. 1834.

39. *Capture of Nyssia zonaria.*—This beautiful and remarkable addition having been made to our British *Lepidoptera*, and Mr. Eveleigh, the President of the Banksian Society of Manchester, supposing it to have been an entirely new species, having most kindly brought to town three specimens purposely for description in this Magazine, among my "Entomological Notes;" I immediately submitted them to the notice of Mr. Stephens, who had never seen any thing like them before. I then applied to Mr. Children, whose entomological library I knew to be unrivalled in this country, and who, with the most prompt kindness, informed me the insect was the *zonaria* both of Hubner and Duponchel. A single specimen of the male was taken on the rushes about half a mile below Black-rock, near Liverpool, in September, 1832; and about the middle of the same month, in the following year, from twelve to twenty specimens of the same insect, both males and females, were taken in the same locality. The captor is Mr. Nicholas Cook, of Liverpool. The following is a description of the insect:—Antennæ, with the ciliæ black, the shaft white: pilosity of



mesothorax very long, dark brown, with two longitudinal white lines, and a dash of white at the base of each wing: body nearly black, with six delicate rings, of a pinkish yellow colour: fore-wings brown, with two oblique, transverse, white lines nearly parallel with the exterior margin, and within these are irregular white markings on the disk; hind-wings white, with two broad bands, and the nervures brown: legs black, the tarsi annulated with white. The female apterous, with seven rings on the body. The size is, as nearly as may be, that of *N. hispidaria*. I shall be glad to show the specimens to any entomologist who may wish to see them.

EDWARD NEWMAN.

40. *Capture of Georyssus pygmæus*.—SIR, When engaged in collecting fossils in the cliffs, at Walton-on-the-Naze, Essex, about a month since, I came upon a spot where numerous plants of *Tussilago furfara* and *Epilobium hirsutum* indicated the presence of water filtering through the cliff. A large mass of half indurated clay attracted my attention, from having many minute particles of clay or mud apparently animated, and slowly moving upon its surface. With some trouble I succeeded in picking up and bottling two of these, and, on subsequent examination, proved them to be specimens of *Georyssus pygmæus*, bearing masses of clay larger than themselves, and thus entirely concealed. I regret not getting more, as I believe it is by no means a common insect.

If this notice is worth putting in a corner of your Magazine, it may draw the attention of entomologists to this insect in similar situations.

Yours, &c.

W. CHRISTY, Jun.

Clapham Road, 15th Aug. 1834.

41. *Wilson's Entomologia Ediniensis*.—SIR, A moment's reflection will, I think, convince you that what has been said of this work, at p. 222, is not quite in unison with the usual candour of your Magazine. It is perfectly true that it contains a great number of the "commonest London insects;" but is this any fault of the author's? or does this fact, in the slightest degree, diminish the value of the work as a local fauna? Assuredly not. If the work professed to give an account of those insects *only* which were peculiar to the

*neighbourhood of Edinburgh*, the case would be different; nay, the work might have been contained on a single page. To me it appears that this, and all similar catalogues, are particularly useful, not only for local entomologists, but as contributing valuable materials to a better knowledge of the distribution and range of species. Who would have known that these common London insects were also common round Edinburgh, but for this publication?

W. SWAINSON.

13th June, 1834.

42. *A List of described Diptera, new to Britain.*—SIR, The dipterous insects contained in the following list have not, as I believe, been hitherto recorded as British. If you deem its insertion of any value, it is at your service.

I remain yours, &c.

F. WALKER.

London.

Chironomus leucopogon, Meig. ictericus, Meig.	Tachina pallipes, Fall. plebeia, Fall. ignobilis, Meig.	Gymnopa subsultans, Fabr. Chlorops nasuta, Gmel. notata, Meig.
Limnobia occulta, Meig.	vetusta, Meig.	scalaris, Meig.
Hexatoma nigra, Latr.	egens, Wied.	speciosa, Meig.
Zygoneura sciarina, Winth.	luctuosa, Meig.	circumdata, Meig.
Sciara minima, Meig. nitidicollis, Meig.	laticornis, Meig.	tarsata, Fall.
Mycetophila fenestralis, Hgg.	Musca agilis, Meig.	palposa, Fall.
Scatopse leucopeza, Meig. brevicornis, Meig.	tempestiva, Fall.	vindicata, Meig.
Dilophus albipennis, Meig.	Anthomyia ruralis, Meig.	Agromyza nigripes, Meig.
Sargus pallipes, Meig.	variata, Fall.	ornata, Meig.
Callomyia speciosa, Meig.	ciliata, Fabr.	latipes, Meig.
Rhagio notata, Gürtl.	cunctans, Meig.	exigua, Meig.
Empis nigritarsis, Meig.	varicolor, Meig.	pusilla, Meig.
Hilara thoracica, Macq.	compuncta, Wied.	amena, Meig.
Ocydromia nigripennis, Fabr.	Cordylura flavicauda, Meig.	variegata, Meig.
Hemerodromia oratoria, Fall.	liturata, Wied.	Phytomyza nigripennis, Fall.
Elaophropeza ephippiata, Fall.	Sapromyza albiceps, Fall.	obscura, Fall.
Drapetis nigra, Meig. exilis, Meig.	Lauxania Elisæ, Wied.	atra, Meig.
exilis, Macq.	Sciomyza fuscipennis, Meig.	agromyzina, Meig.
Platypalpus ciliaris, Fall.	obtusa, Fall.	albipennis, Fall.
longicornis, Meig.	Tetanocera reticulata, Meig.	affinis, Fall.
flavipalpis, Macq.	punctata, Meig.	rufipes, Meig.
articulatus, Macq.	Helomyza olens, Meig.	notata, Meig.
flavicornis, Meig.	griseola, Meig.	præcox, Meig.
rapidus, Meig.	Notiphila nigriceps, Meig.	fasciata, Meig.
Lonchoptera rivalis, Meig.	calceata, Meig.	albiceps, Meig.
flavicauda, Meig.	nigrina, Meig.	terminalis, Meig.
Tachina longicornis, Fall.	nigella, Meig.	pallida, Meig.
	Drosophila littoralis, Meig.	flava, Meig.
	Ochthiphila Juncorum, Fall.	Phora opaca, Meig.

43. *Mode of destroying Ants.*—These modes for destroying them, or attracting them to the end of their being destroyed, have been published in the Gardener's Magazine, V. 730. VII. 315. Baits: the refuse part of melons, slices of raw turnip rubbed over with honey, recently cooked bones of roast or boiled meat or fish. Poisons: a well-compounded mixture

of equal parts of loaf sugar, oxyde of arsenic, and well pulverized white bread, strewed as occasion may require, both as to time and quantity, in the haunts of the ants. The mixture to be kept in a bottle dry for use.—*J. D. in Loudon's Magazine of Natural History.*

44. *Ophrys Apifera*.—I have been fortunate in discovering this beautiful plant in great abundance, on the skirts of Birch Wood, among fern and heath, in that field on the further side of the wood, which most entomologists know as the one where *Endromis versicolor* has so frequently been taken; by looking carefully along the margin of the wood it will be readily found. Is not this a nearer London habitat than has yet been recorded?—fourteen miles.

E. N. D.

45. *Question respecting Names*.—SIR, May I trouble you for the names of two butterflies which have appeared here in great abundance during the present month? the first is bright orange-colour, with a wide black border, and frequents the blossoms of lucern; it is a bold butterfly, easily caught, and is about the size of the large *garden-white*. [*Colias Electra*, or the *clouded yellow*.—ED.] The other is marked very much like the *admiral*, but is paler in colour, both above and below; it settles on the lucern and on China asters. [*Vanessa Cardui*, or the *painted lady*.—ED.] By answering these questions you will much oblige a subscriber.

*Epsom, Aug. 24, 1834.*

JAMES B. SMITH.

46. *Earwigs destructive to Dahlias*.—SIR, You will confer a great benefit on the cultivators of that beautiful plant, the Dahlia, if you will inform them, through your excellent Magazine, what insect it is that devours the petals of the flowers as soon as they expand; and also what remedy is to be applied.

*Guildford, Aug. 1.*

[The mischievous insect alluded to is the common earwig. *Remedy*.—Place a small quantity of hay in a very small flower-pot; invert one of these flower-pots on every stake to which a Dahlia is tied; the earwigs will seek these for roosting-places at the approach of daylight, and may thus be entrapped, and every morning shaken out and destroyed.]

THE

ENTOMOLOGICAL MAGAZINE.

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JANUARY, 1835.

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ART. XL.—*Colloquia Entomologica.*

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NOTE.—Last night I dreamed a dream! I had been correcting some proofs—delicious occupation!--till an early hour, and then I leaned my head on the table, and fell asleep; I was instantly wafted into what appeared a land of spirits, and that which followeth passed before me, as nearly as my memory serveth me.—C. S.

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SCENE—*An open Plain in Elysium.*

STOMENTOMOLOGUS and LEPIDOPTEROPHILUS.

STOMENTOMOLOGUS. A Briton! Oh, I joy to meet with one so newly landed from a realm I loved, and more than this, if more need be desired, fraught with the knowledge that I most esteem.

LEPIDOPTEROPHILUS. Stranger, thou dost delight me; who art thou? fain would I question thee of what I see.

STO. Stomentomologus my name on earth. Ask what thou wilt, and I will promptly tell all that I know; yet this were idle toil, admitted here no knowledge is withheld, and soon thou wilt perceive instinctively all thou wouldst wish to know; still ask, and I will then demand of thee concerning earth and its inhabitants, for 'tis of these alone we nothing know but by the voice of those who wander thence, when they no more can linger on that sphere.

LEP. Explain, Stomentomologus, what are those forms so beautiful, yet plainly armed with fearful strength, on which

across the plain my fellow mortals ride, immortal now: are then the animals of yonder earth admitted here? It is most strange!

STO. Why strange? here each pursues unchecked his favourite theme. Wouldst thou exclude the beast, the bird, the fish? the hum of insect life? Wouldst thou hew down those groups of graceful and most lovely palms, waving in measure to the tuneful breeze? or these delicious shrubs, oppressed with fruit, or clad in beauteous bloom? Wouldst thou destroy the mossy turf on which we now recline? wouldst still this breeze? wouldst dissipate the balmy perfume that around exhales from thousand fruits and flowers? Or wouldst thou evaporate these limpid streams, that flow like molten silver? Wouldst thou exhaust the delicate air we breathe? Or wouldst thou hide that glorious sun, a sea of life and light, because such things are shadowed forth on earth?

LEP. Ah, no! and yet on earth we fondly paint our wished-for heaven a scene of clouds alone.

STO. Yes; and they represent immortal man as dwindled to a sprite, a head with wings! of angels such is their sublime idea! How far below the truth exemplified in yonder God-like, mammoth-mounted forms.

LEP. Hah! they salute thee! see!—their noble beasts, proud of their riders, scarce indent the turf! How do they guide them?

STO. Solely by the will! The riders are inseparable friends: Aristoteles, with the coal black beard; Raius, a Briton, on the further side; Cuvier, the noted Gaul, on this.

LEP. And all so young!

STO. Observe that perfect form, irradiate with light: mark well her mien, and the rich glories of her golden hair: she plucks the tempting fruit with timid hand from the o'erladen branches of yon tree, and gives it to that melancholy man. These have transgressed; and yet their only doom is, that through all this wilderness of bliss the memory of their error yet remains.

LEP. How very beautiful, and yet how sad!

STO. Most bright indeed are they, yet pure as bright, and pure, without offence we here admire the vision of such matchless excellence: here beauty is in mind; the child of mind; a bodied emanation of the thought; itself enchanting, but it

mostly owes one half its lustre to the mental eye of him who gazes.

LEP. Stomentomologus, the princes show, the kings, the emperors, where is there abode?

STO. Alas, my friend, they hold no sceptres here! if any come (the fact I never heard), they all must mingle with the countless throng.

STO. Come, shall we mount on these gigantic elks (see how they winny and invite the hand), and gallop to the soft and perfumed shade of yonder distant wood, awhile to hide from our unclouded sun's too warm embrace; thither at noon-tide myriads repair.

LEP. 'Tis not my wont to ride.

STO. Linnæus, ho! ecce discipulus!

LEP. *Is* that Linnæus with a butterfly? surely we may not capture insects here!

STO. Indeed we may: we do whate'er we chose—the will to err is now extinct within; we capture and admire, but do not kill.

LEP. I wish that I had brought my emperor net.

## SCENE II.—*An open Plain in Elysium.*

GALILEO and NEWTON.

GALILEO. It were not well to wish, or I could fain desire the instrument I had of yore to mark the passage of that beautiful orb across the solar disk.

NEWTON. It seems on fire. We cannot here judge of degrees of heat. Oft have I fondly dwelt upon the heat of this bright planet where we dwell in ease—ease, ay, in luxury the most profound; 'tis not for man to venture on *too* far with idle speculation.

GAL. That I know. Experience schooled me pretty thoroughly: my freedom was the forfeit that I paid for too great daring.

NEWTON. Superstition's veil had darkened your maligner's powers of sight; my land, somewhat emancipate, conferred her honours for the very thoughts that led you to a jail.

(*Manent.*)

SCENE III.—*A mossy Bank in Elysium, a thick Wood behind, a large Lake in front.*

ARISTOTELES, RAIUS, LINNÆUS, CUVIER, and LATREILLE.

CUVIER. One of our brethren has arrived from earth: his name is Lepidopterophilus.

LATREILLE. His *Lepidoptera Britannica* I recollect, a very worthy book: Carolus Linnæus, thy follower.

CUV. I saw him with thy brilliant friend of Kiel, Fabricius Stomentomologus.

LINNÆUS. To whom I ever bow in duty bound, and to my worthy Raius whose name in every honour should take place of mine.

CUV. Time will accomplish all things that should be. Raius is great, great is Linnæus too; time will advance the one to higher fame, but thine, Linnæus, never will be lost; Aristoteles to the end of time shall stand unrivalled, but the kindred names Raius and Linnæus shall be twins in fame.

ARISTOTELES. Fair modesty herself might sit enshrined on Cuvier's brow! Pray, where stands Cuvier's name? where stands *his* name who in a single map displayed the vast creation? Where his name, whose wondrous skill defined each iota composing mortal frames, who, not content with things that live and breathe, dived deeply down, examining the bowels of the earth, and with a superhuman intellect described the beings of another world? Yon mammoths sporting in the grateful pool, and lashing up the water into foam; and those fish-crocodiles, with lustrous eyes, beyond proportion large, and scaly fins; (mark that immense one, basking in the sun, outstretched upon the bank!) ten thousand birds, like Egypt's sacred Ibis, or the stork that seeks the fellowship of ruling man, or soft sultana, purple, plume their wings, or monopedate and immovable stand, without crowding on the creature's back: those graceful forms which undulating flit amid the festoons of the glowing vine, part bat, part bird, part Saurian reptile, scaled as though in armour clad, pursuing swift those many-tinted habitants of air, that rest on perfumed zephyrs in the sky—that live on dew-drops falling in the morn, caught e'er they reach the mossy earth we tread, each drop becoming rainbows in their



plumes,—those were to him familiar as the beings of the day.

LAT. As Raius for Linnæus did unfold a mighty plan Linnæus did perfect, Aristoteles was the first who drew an outline of the whole, which Cuvier filled ; Aristoteles and my Cuvier wear a first and equal crown in fame on earth.

(*Manent.*)

SCENE IV.—*A thick Wood in Elysium.*

STOMENTOMOLOGUS and LEPIDOPTEROPHILUS.

STO. Now, Lepidopterophilus, survey this beauteous scene ; above our heads behold the interwoven boughs, meeting in arch, pointed, or Gothic, as we said of yore ; luxuriant leaves, in tint and graceful form more exquisite than erst on earth we saw, while luscious fruit in purple clusters hangs. See climbing plants, with slender tortuous stems, snake-like enfold the trunks : expanding wide a thousand blossoms, crimson, white and blue, shed the rich perfume on the scene below ; beneath clusters the brushwood, rich in fruit and flower ; each fruit a ball of gold, each flower a scarlet tube, offering its sweets to the long suckers of those gold-green bees, radiant as light ; and beetles, well encased in gorgeous armour !

LEP. And such butterflies ! What words can paint their ever shifting hues ? what eyes can gaze on such resplendent tints ; and what are those divinely blazing gems ? The emerald, ruby, and the amethyst, the rich carbuncle, and the diamond pure, emitting colourless and liquid light ; vaulting they rise, and undulating fall, like a glad company of gnats at even. Tell me, my friend and leader ! what are those ?

STO. Those graceful beings to the feathered tribe belong ; their forms are found amid the flowers that deck Columbus' land. But turn this way, observe those birds magnificent, with slow step, of grandeur conscious, coming from the brake ; compared with these, e'en India's peacock pales ; and hark ! in concert all their voices join harmonious, each to each so well attuned, as when the sackbut and the deep bassoon mix with the breathings of the gentle flute, the hautboy sweet, and the loud trumpet's call.

(*Manent.*)

SCENE V.—*Another part of the Wood, very shaded.*

CUVIER and ARISTOTELES reclining on the ground.

CUVIER. Among the errors mortals still commit, of those who follow science' paths I speak, the chiefest seems to me that doubtful line they draw 'twixt Nature's self and Nature's God: Nature they worship as a sovereign power, distinct and independent; nor admit God the great cause, and Nature the effect.

ARISTOTELES. God is Creator, Nature his create: life, light, and being, emanate from him. How is it that the human intellect can dare to doubt so obvious a truth? 'Tis but a pagan fable, that would make a ruling nature, deify a work; yet Cuvier says,—immortal Cuvier says, and saying, seems by heaven itself inspired,—that *Nature* thus demonstrates her results, and things like these (*pointing to a group of mammoths*) are *her* experiments.

CUV. And *Nature* is not!—where then was the good of thus deluding others with a dream?

ARIS. O! were it possible again to stray to yonder earth, forsaking these bright realms, and pour out all the knowledge we have gained, to unfold the beautiful and simple plan on which the Omnipotent has made all these wonderful forms linking together oft beings, whose structure made e'en Cuvier pause; the patient camel, isolate no more, the tall giraffe, and that strange paradox, to me unknown, except from thy discourse, now become links, which wanting, the great plan would seem imperfect.

CUV. Thou dear enthusiast! pause not—

ARIS. I must pause; the thought has vanished ere it was a wish.

CUV. 'Tis not impossible for man to learn the mighty plan on which the whole is formed, and it is best that he himself should learn, without a visit from departed souls. Newton has done as much—laid down the laws by which the Almighty governs rolling worlds; and others long before had dimly seen the obvious dawns of the mighty truth.

ARIS. The boundary line how slight that separates e'en

man himself from yonder sportive crew, surpassing us in size, and armed with strength of body greater, and of mind scarce less, yet bowing down submissive to our will, and worshipping in us our Maker's likeness.

Cuv. And here the line seems slighter than on earth: there what a power was gained by artifice! Here every want abundantly supplied: the genial air precludes the use of clothes, the teeming soil supplies abundant food, and memory is more than written books; and all these there we gained by artifice, and gaining them, displayed a difference greater than now appears. It was the mind aiding forbidden lusts, by artifice aiming at lawless power, that assumed the right to take, to injure, to destroy, all that it lusted for, and, drunk with power, sung its own praise; to hide its impotence, forged fetters, to keep others weaker still, and reigned by superstition o'er its kind.

ARIS. Reason, the highest gift of Providence, and most abused on earth, here reigns supreme; or rather, for none reigns supreme but One, it is the minister by which He reigns. Reason's eternity is here begun; 'tis reason teaches what we owe to Him, 'tis reason shows our duty to mankind: but reason is not ours exclusively, all that reflect possess it; man, indeed, the larger portion, but these creatures each in some degree. My Pyttalus, who knows my every will, is not without his share; for reason is no other than the power that from an obvious cause draws inference.

Cuv. And therefore 'tis not reason in the bee that builds her waxen cells; the Maker rules in her by other means more potent still: your Pyttalus or my Mimallones vary each action with the circumstance, they think and act, she acts and never thinks, but builds unceasingly her hexagons.

ARIS. Oh! hadst thou seen the steed Bucephalus, how well he knew that daring, glorious boy—glorious before his hand was dyed in blood. Ah! how I loved that boy, and he loved me! he listened and he learned; but blood, alas! erects a barrier between earth and heaven. It is a weakness, but the rising tear is ever ready when I think on him.

Cuv. And I, too, have a noble warrior known, whose name, with Alexander's, will be heard while time endures on earth: his giant soul strode over empires, trod on empires' dust. I never once addressed him but I felt here is my master mind;

my spirit sank not, but yet I always felt that it was looking up—a feeling, but with him, I never knew.

ARIS. He had been great indeed, but checkless power o'erthrew the even tenor of his soul, his mind became inebriate and vague, and mad ambition wasting from within, like some volcano's subterraneous fire, conquered the conqueror of half the world; and worse than this, excludes his soul from heaven.

CUV. Aristoteles, dost thou say that blood erects a barrier betwixt earth and heaven? where then can be that meek, yet noble form, with graceful step, and such a heaven-born brow, engaged in converse with the man who found another world, and that world's glorious child, who, like Prometheus, drew down fire from heaven; has that right hand been never dyed in blood?

ARIS. Washington!

(*Manent.*)

SCENE V.—*Another part of the Wood.*

ARISTOTELES, and other Naturalists.

LATREILLE. Welcome to thee and thine, Fabricius; of all who ever wrote on insect life, whether in scholarship, or deep research, or clear description, thou art far the first; thy matchless page, in graceful language clad, must ever please as much as it instructs. Hail, sovereign of entomology! thou ever welcome one! and welcome to this learned Briton, not to me unknown.

STOM. His name is Lepidopterophilus.

CUV. My Lepidopterophilus, although on earth I never heard thy honoured name—honoured I doubt not but it must have been—so limited my knowledge of my kin, for all in science are of kindred blood, still art thou not less kindly welcome here. Thine was a portion of the great pursuit; and it is by such laboured works as thine, that the great whole is into harmony arranged by others, who decline the task of working out each separate tribe complete: Aristoteles, Raius, and myself, alas! how wide the difference between! range o'er the whole, nor perfect any part; whilst this my dearest friend, Latreille, Fabricius, Stomentomologus, and thou, my Lepidopterophilus, perfect the parts; your part, the insect tribes. But

tell me now, how in that rising land our darling science thrives? Does Swainson write? Swainson, that master of a gifted pen, the first in fame of those I left behind; his country's honour, and his age's pride.

LEP. He writes but little, but his pencil speaks; and to the gazer's eye, the history gives.

CUV. His rest must, then, be as a giant's sleep; he will arise anon, and shake the land.

LAT. And Kirby! my illustrious compeer? how my heart beats to clasp him in my arms!

LEP. His "Introduction" was his last great work, a monument of labour! 'twill endure to distant times. Immortal Cuvier! think on the importance of this noble work! nearly two hundred names unknown before invented in anatomy alone!

RAIUS. Immense! how cramped and limited the store when first I ventured on description's path! but how could these, Fabricius and Latreille, have left two hundred parts unseen, unknown?

STO. Were there two hundred parts unnamed before?

LEP. No! but he gave them more important names—he gave them better names—much better names!

STO. My *Lepidopterophilus*! excuse my doubting of the value of such change; this is the plan that I would recommend: a name once given, let that name abide, for who is to decide which name to use when every publisher invents a new? Thou deem'st his merit what I deem his fault, a too great readiness in giving names; yet is thy Kirby a philosopher, and when he comes into the land of bliss, we shall crowd round, and claim him as a friend.

MARSHAM. So, *Lepidopterophilus*, you stayed to finish up your task before you came?

LEP. Marsham! alas! I was but poorly versed in the concluding part,—the little moths.

CUV. But I must ask you of the Doctor Leach; there lives no man on earth of equal mind—disinterested, pure, and generous; of keen perception, and of judgment sound; his was a task from which all others shrank.

LEP. He is a wanderer in foreign lands.

CUV. And young Mac Leay, the learned man of fives! say,

does he live and write? and also say, does he pursue quarianism still?

LEP. He lives, though in a very distant land: he writes little and seldom; he may read the more; as to the fives, I never hear of them: is there not music on the evening air?

RAIUS. A sound of voices! 'tis the choristers who offer welcome to each happy soul that comes amongst us; yonder they approach.

*(Enter little children, very beautiful, they chant in voices softer than flutes, as they mingle with the spirits, and approach Lepidoptero-philus.)*

CHILDREN. *(Chant.)* Hail! son of science, hail! hail! pilgrim; thou art welcome here, a traveller from yonder sphere, *(they stretch their little hands towards the earth, which is shining between the trees,)* its pains henceforth no more assail thee! yet its blessings shall avail thee! hail! son of science, hail! The fate that bade thee die, worked only for thy good: affection binds us with the tie of holy brotherhood, and though our friends on earth were dear, e'en friendship's bond draws closer here; of friendship pure, like ours, the birth is after spirits leave the earth. Welcome here! each child of clay, who from yon dwelling finds his way to where the spirits of the blest have entered their eternal rest.

*[The children run away laughing.]*

ARIS. How sweet to hear those little voices raised in an according and melodious strain, just when the shades of evening wander forth to cool the air and renovate our frames!

STOM. *(Chants.)* Sweet is the hour of evening, softly blending the hues of golden day and silvery night, when each for empire seems awhile contending, and air is glowing with a purple light, that moment after moment grows less bright, as hope 'gainst reason striving fades away, yet hardly yields to be extinguished quite, so witchingly she holds her cheering ray, to lure misguided wanderers from their heavenward way.

RAIUS. 'Tis sweetly sung, and worthy of thyself; list, while I chant the praises of a smile. *(Chants.)* Bright as the day that breaks anew, bright as the opening flow'ret's hue,

bright as the sky above us, bright as the drop of sparkling dew intensifying heaven's blue, is the smile of those that love us.

LEP. Oh, help me! hold me, friends—I sink—I faint—how hard to bear is perfect happiness!

(*And here I awoke.*)

ART. XLI.—*Remarks on various Insects.* By DELTA.

*Léandre (à Dandin.)*

Il est fort ignorant.

*L'Intimé (à Dandin.)*

Non pas, monsieur, non pas.

J'endormirai, monsieur, tout aussi bien qu'un autre.

RACINE. LES PLAIDEURS.

SIR,—In a former letter to you, I gave a short account of the habits of *Nonagria Typhæ*; but as that was rather imperfect, I beg leave to add a few words to it, trusting that you will not consider me to be trespassing too much on your pages. In that letter I left the pupa shut up in the *Typha* stem, like damsels were in former times in the trunks of trees, and other such localities; and so far as you could judge from my story, the moth had no more chance of escaping than they had, unless some entomologist acted the part of the knights errant, or the magicians of those days. But there is a way opened for it, of which it avails itself in due season. This I will now explain.

When the larva attacks a plant of the *Typha*, it eats downwards just in the centre, until it reaches nearly to the root, often some inches below the water. By this time it has almost attained its full growth; but if it were to undergo its metamorphosis there, how could the moth escape? Upwards it would be impossible; because the larva, when it entered, was very young, perhaps not near half grown, and the opening it made is far too small for the size of the moth; and were it to con-



tinue its downward course, and there make an outlet, it would admit the water, and be drowned; in fact, notwithstanding the precautions of the larvæ, many pupæ were drowned this year, by the sudden rise in the ponds, caused by the heavy rains we had in July. But instinct, or something else, points out to it the course which ought to be followed; and at this stage of its growth it turns round, and proceeds upwards, enlarging its old track; and by the time it has arrived a few inches above the water, it is full grown.

About two inches below the place where it means to spin, it gnaws quite through to the outside of the stem, closing this opening, which is generally of an oval form, with a slight web of silk, to which it glues some of the fragments of leaves or stem which it has detached. It now commences its web, which I have before described. In this the pupa is suspended by a thread, about two lines long, with a small cup-shaped termination, which invests its telum, or last segment. I am at a loss to conceive how the pupa attaches itself to this thread after it has thrown off the skin of the larva. It is a very different case from that of the *Nymphalidæ*, because there the larva covers a considerable space with silken threads; and the pupa, grasping part of the skin of the larva between its segments, can thrust its well-armed telum into any part of this network, with a certainty of gaining sufficient hold. But the telum of our pupa, furnished with only a few slight tubercles, must be inserted into a little cup, not above three-fourths of a line in width; certainly no easy task. I hope to be able to clear up this point next year; but I must beg such of your readers as have an opportunity, to observe for themselves, as I may chance to be unsuccessful. The pupa being thus fixed by its last segment, with its head downwards, the moth easily extricates itself, and a few steps bring it to an opening by means of which it can escape from its confinement in the stem.

Here let me advise such of your readers as are desirous of obtaining pupæ of our insect, not to be guided solely by the yellowness of the younger leaves, but also to observe whether there is a hole at the side of the stem, and whether or no it still remains closed, since, if they neglect this, they will be sure to waste much time in opening stems deserted by the larva, or which the moth has quitted; and it is by no means desirable, even in summer, to stand longer than needful half way up to

the knees in mud. This year I obtained about forty pupæ in three hours; of these some turned in the last week of July, more in August, and a few not until September. I do not remember to have captured half a dozen specimens of the perfect insect in my life, although I have bred scores. From this I infer, that if other localities were well searched, some of the other species of *Nonagria* would be found to be less rare than they are believed to be; at any rate, this is well worth the consideration of entomologists, who have means of examining *Typhæ* and other cognate plants in localities where *N. Crassicornis*, *pilicornis*, &c. have been taken.

As in all probability this is the last letter I shall trouble you with for some time, I will just mention one or two other trivial matters, which may perhaps amuse some of your readers, who, like me, instead of

—— Drinking deep, deep at Philosophy's shrine,  
Their time with the flowers on the margin have wasted,  
And left their light urns all as empty as mine.

Several years ago, I fully resolved that I would make out what the larva of *Meloe* really is. I had read various accounts, not very satisfactory, and felt sure that there was some error, which I could easily detect. I was young then, and had much to learn. It is but rarely that we see a *Meloe* in this neighbourhood (not Colchester), but after diligent search I found a few *proscarabæi* of both sexes. These I placed on some light earth, under a bell-glass, giving them plenty of *Ranunculus acris* to feed upon. The females, in particular, fed well, and grew wonderfully large in the abdomen; therefore I felt sure that I should soon have lots of good eggs, and then of course lots of larvæ, which would not be mere *Acaridæ*, but *bonâ fide* young *Meloes*. Alas! my hopes were too high, and I was doomed to disappointment in this as I have been since in every favourite scheme! One morning I found that something particular was going on amongst them. The old ladies, no doubt, with much exertion, had scooped out places in the earth wherein to bury their eggs; and soon after, a lump of bright orange eggs, about the size of a *Palma Christi* seed, was deposited in each, and carefully covered over. This was just what I had expected, from what I had read about this matter. I now set the mould aside, keeping it a little moist, and covered up so

that nothing could get at it. Thus it remained for about two months, when out sallied a host of little animals, of a light brown colour, having as near as may be the shape of Kirby's figure in the *Mon. Apum*, which ran about the glass as swift as a Yankee pony,<sup>a</sup> allowance being made for their difference in size. If I am not much deceived, I saw some of these actually making their way through the egg shell. I put a lot of them into a glass jar, with some *Ranunculus* leaves and some flies, principally *Syrphi* and *Muscæ*; to these latter they soon attached themselves, just at the base of their posterior legs, remaining fixed so long as their victims lived. I supplied them with fresh food for some days; but with all their feeding they grew none the bigger, and in about three weeks they were all dead. I consoled myself with hoping better things the next year; but hitherto I have been disappointed, not having seen since that year ten living *Meloes*, and not two in this neighbourhood. A friend of mine, not an entomologist, but a lover of natural history, has told me since, that he once tried to rear the larva from the egg, but met exactly with the same fate as myself. This he was much puzzled at; the more so, as he was unaware of any previous attempt of the kind.

The same year I had better luck with one of my schemes: I resolved to raise a *Stylops*, and raised five (*Dalii*), one of which Mr. Stephens now has. I had noticed that many of my specimens of an *Andrena* (*fulvicrus*, I believe) had the heads of the larvæ of *Stylops* very apparent on their abdominal segments. I therefore examined all I could take, and found many which had larvæ in them. These I shut up in a large chip box, with only a piece of gauze for a lid, giving them fresh flowers every morning before they were awake. Judge of my joy, when one morning I found that two *Stylopes* had made their appearance. Two more appeared a few days after, and another soon followed these. Possibly I might have raised more; but happening to leave home for a few days, my *Andrenæ* all died. I fancied myself the only person possessing this *Stylops*, but soon found that Mr. Dale had preceded me by a few days, and that Mr. Curtis was about figuring it from his specimens.

The *Eristalis* I mentioned in my second letter to you, is

<sup>a</sup> Your readers cannot fail to remember the story of the "very severe pony," which was chased three times round a field by a flash of lightning, which at last gave up the chase, "not being able to come within a rod of it."

Mr. Newman's *E. stygius*, which I cannot consider to be identical with *E. æneus*; the uniform colouring of the thorax at once distinguishes them. When at Mersey island the end of last April, I saw *E. stygius* on the flowers near the shore, especially on the daisies, which render the line of turf between the sands and the little wood almost white with their blossoms. I was then attending to birds, but captured a few specimens; none of which had a striped thorax, nor did I see any so marked. A few days after this, I went to Walton with a friend whom I have mentioned in an account of a former excursion to this place, and whose pursuits were ornithological. We took a boat, and proceeded down the creek, occasionally landing to look after the birds. In the banks of the ditches within the salt marshes I found many *Bembidiidæ* and *Octhebiæ*, amongst which were *O. Hibernicus*, and one which appears to me to approach very near to *O. exsculptus* of Germar, if it be not that insect. It certainly does not seem to agree with any of Mr. Stephens' descriptions; but he appears to be in error on some points; therefore I cannot speak with confidence.<sup>b</sup> *O. marinus* was the only species which was abundant. We found the *Lichen Caninus* at Stone Point, covered with larvæ, which, from their evidently belonging to one of the *Lithosiidæ*, we concluded to be those of *Setina irrorella*. I filled my boxes with these to take home with me, but I was unable to rear them, though they fed well. Perhaps their constitutions required sea air. Under the sea weeds we found *Po. chalceus*, several *Amaræ*, *Dromius bifasciatus* and *melanocephalus*, a *Dyschirius*, and many other *Coleoptera*. *Brosicus cephalotes* abounds in deep holes in the sand, where it lies hid all day, as do the *Scaritidæ*, to which it certainly is allied in habit.

When we came nearly to the cliffs we again found *E. stygius*, but not one *æneus*; and although the former is common during autumn at Walton, the latter is not to be found with it, so far as I can learn. We met with nothing particular in the ornithological line; but, nevertheless, returned to the hotel well pleased with our walk. After a short rest, we walked along the base of the cliffs to the right, until the darkening twilight and the rising tide warned us to return home. We then climbed the cliff, intending to return by the footpath, but this we found had been washed away by the sea in the winter. We, however,

<sup>b</sup> Compare his description of *O. bicolor* with that of Germar, whom he quotes.

made our way back as well as we could in the dark, over hedge and ditch; but just before we reached Walton the moon rose in splendour from the sea, not pale and silvery, but of a glorious red; one might have imagined that she saw the flocks of sheep on the cliffs, and blushed to remember that she had loved Endymion. It was a most lovely hour; not a breeze was stirring, and all things were hushed, save the soft murmurings of the sea, which beat gently at the base of the cliff, on whose edge we were standing; nothing was to be seen in the heavens, save the moon and a few stars, “the companions of the chariot of peaceful night.” Truly, at such a time—

There is a rapture on the lonely shore,  
 There is society where none intrudes  
 By the deep sea, and music in its roar;  
 I love not man the less, but Nature more,  
 For these our interviews, in which I steal  
 From all I may be, or have been before,  
 To mingle with the universe, and feel

What I can ne'er express, yet cannot all conceal.

But if such moments are delightful when alone, how much more so are they when we have a friend with us imbued with a poet's feelings, whose thoughts are as our own in our best of moods, and whose bosom glows with the best feelings of which the heart of man is capable! These are moments which indemnify us for years of the toils and cares of life; the recollection of these will—

Run molten still in Memory's mould,  
 And will not cool  
 Until the heart itself be cold  
 In Lethe's pool.

Who is there that, looking back on times like these, will not exclaim, “*L'amitié est l'amour sans ailes?*”

I am going astray from my subject, and must return to Entomology; but before I leave speaking of Walton, let me just record a fact which, though not connected with Entomology, may interest many of your subscribers. On the second of last October, Mr. H. Doubleday, whilst in company with three ornithological friends, killed, on the cliffs near the towers, a specimen of the grey-headed yellow wagtail, (*Motacilla neglecta*, Gould,) a bird which was not before known to occur in this country.

*Dioctria ælandica* does not, I find, feed solely on *Ichneumonidæ*: I have this year seen more than one individual feeding on *Diptera*, but these were all immature.

This letter will appear a little before *Cheimatobia rupica praria*, therefore it will not be out of place for me to remark that I have never found the female of this insect of an evening, although that of *C. brumata* is very easy to be found, in company with the male, on any mild evening in December. But in the morning early, two hours before sun-rise, it may be found in abundance where the males are plentiful, *i. e.* during January and February, on almost every whitethorn hedge. I believe few entomologists to be aware that many autumnal moths hibernate. Besides *Scoliopteryx libatrix*, I am sure that *Gleæ polita*, *Calocampa exoleta*, and *Euthalia miata*, hibernate; possibly many more do the same.

It is now quite time that I ended this long epistle, but I must first just tell you that I am not quite pleased with the communications of Corderius Secundus. I do not so much complain of his turning to ridicule my habit of quoting rather too frequently from those poets, whose pages have delighted me from my early years. I know well my failing; and neither Corde-rius, nor Padre Isla himself, were he to come to life again and ridicule entomologists as severely as he did friars, could cure me of this. I fear even

Hoc siquis vitium poterit mihi demere, solus  
Tantalea poterit tradere poma manu.  
Dolia virgineis idem ille repleverit urnis,  
Ne tenera assiduo colla graventur aqua

What I complain most of is, that Corderius endeavours to identify me with writings in which I had no hand, and opinions which I have never acknowledged, whilst some parts of the colloquy contain so exactly my sentiments, that no one who knows me could mistake the person for whom Erro is meant, without its being stated also that Erro is Delta. Nevertheless, be it known, that Delta and the abstractor of Straus Durekheim are one and the same, and that Erro is the very image of that person, a second self, more like than is my shadow; but as to Rusticus, now again appearing on the stage, I know him not,



his secret is not in my keeping; all the attempts hitherto made to unmask him have been futile:—Vale, Vale!

Yours most truly,

Epping, Nov. 5, 1834.

Δ.

ART. XLII.—*Essay on Parasitic Hymenoptera.*

By A. H. HALIDAY.

(Continued from page 259.)

*Of the Ichneumones Adsciti.*

GEN. VI. LEIOPHRON.

*Palpi maxillares 5-articulati: oculi glabri s. subglabri: alarum anticarum areolæ cubitales duæ; posticarum areola brachialis posterior apice rectâ clausa: aculeus deflexus aut reconditus.*

Os breve: mandibulæ apice bidentes, cuneatæ curvatæ, sub clypeo forcipatæ, cum labro os anticè claudentes: labrum transversum: epipharyngis ligula apicalis attenuata prostans; maxillæ lobus membranaceus obtusus: palpi maxillares 5-articulati: articulus 1<sup>mus</sup>. non perbrevis, 2<sup>dus</sup>. reliquis crassior, 3<sup>tius</sup>. plerumque longior: labii lobus integer obtusus: palpi labiales plerumque 3-articulati, rarius articulo penultimo minutissimo aucti: antennarum articulorum numerus varius: facies supra clypeum bifoveolata: oculi glabri vel pilis raris erectis consiti, quarum discrimini speculo subtiliore opus est: ocelli in triangulum: occiput marginatum parum concavum: thorax oblongo-ovatus convexus: abdominis segmenta 2<sup>dum</sup>. et 3<sup>tium</sup>. vix manifestè discreta: 6<sup>tum</sup>. ventrale haud insigniter productum: aculeus deflexus aut reconditus: pedes mediocres; calcaria parva: alæ diaphanæ; anticarum stigma distinctum, areola disci-antica a cubitali discreta, cubitales duæ nusquam coarctatæ, rarius unâ effusæ:—posticarum areola radialis remota (i. e. a brachiali), brachialis posterior anteriore parum brevior, nervo transverso apicis recto.

Colores sæpius nigri nitidi, rarius flavescentes: magnitudo variat: de vitâ et moribus nihil fere constat: larva speciei cujusdam in larvâ boletophagâ Insecti Coleopteri vixerat.



## Tabula Synoptica Subgenerum.

<i>Areola radialis</i> <i>alarum antica-</i> <i>rum,</i>	{ elongata; an- tica disci	{ remota . . . . . 1. PYGOSTOLUS.		
			{ contigua; Me- sothoracis scu- tum	{ bisulcum . . . . . 2. ANCYLUS.
			{ brevissima semilunata . . . . . 4. LEIOPHRON.	

## Subgen. I.—PYGOSTOLUS.

Labrum quam sequentibus brevius, epipharyngis marginem antice nonnihil retegens: palpi maxillares articulis 1<sup>mo</sup>. et 2<sup>do</sup>. longitudine subæqualibus, 3<sup>tio</sup>. elongato: labiales 4-articulati; articulus secundus crassus obovatus, 3<sup>tius</sup>. minutissimus tuberculiformis, 2<sup>di</sup>. apici exteriori insidens et eccentricus sive cum quarto non connexus, 4<sup>tas</sup>. elongatus utrinque attenuatus: antennæ elongatæ graciles: oculi globoso-prominuli: caput pone oculos angustius: stemmaticum elevatum: occiput distincte marginatum: mesothoracis scutum sulculis ordinariis incisum: abdomen breviter ovatum convexum segmentum 1<sup>mu</sup>m. breve rectangulum, angulis baseos prominulis, 2<sup>dum</sup>. illo plus dimidio longius (re ipsa e duobus conflatum lineolâ subtilissima discretis), sequentia brevia at non recondita: anus obtusus supra aculeum rimâ verticali supernè patulâ fissus: aculeus deflexus, valvulis linearibus, vagina ensiformi, basi subtus squamulâ geminâ conchiformi suffultus: venter contractus, medio carinatus, segmentis apice elevatis, sexto subretuso: tibiæ anticæ subarcuatæ; pedes posteriores breves: alarum<sup>]</sup> anticarum stigma anguste trigonum fere lanceolatum, areola radialis in apicem alæ rectâ excurrens cultrata, antica disci manifeste remota, brachialis posterior anteriorem superans: nervus recurrens areolæ cubitali 2<sup>dæ</sup>. insertus:—posticarum radius prope basin areolæ radialis a costa leniter deflexus.

Sp. 1. L. P. sticticus. Fem. *Testaceus macula verticis margine antico thoracis, metathorace abdominisque basi fuscis.* (Long. corp. 3 lin.; alar. 6½.)

*Ichneumon sticticus* . . . *Fabr. Suppl.*

*Cryptus sticticus* . . . *Fabr. Syst. Piez.* 89.

*Bassus testaceus* . . . *Fall. Spec. Meth. Hymenopt.*

Testaceus palpis pedibus que pallidioribus flavescens: mandibulæ cuspide fuscâ: antennæ circiter 33-articulatæ, corpore paulo longiores, scapo et pedicello testaceis, articulis flagelli pubescentibus et apice longiùs pilosis, interioribus obscure testaceis

apice fuscis, exterioribus fuscis: oculi obscure virides: stemmaticum et declivitas verticis fusca: prothorax immaculatus: mesothoracis scuti lobus medius antice fuscus: punctum fuscum supra radicem alarum: metathoracis scutum et scutellum testacea, postscutellum convexum subtiliter granulatum et lanuginosum, fuscum aut fuscocinereum: medi- et post pectus concoloria: abdominis segmentum 1<sup>mum</sup>, carinulâ elevatâ postice effusâ et obliteratâ, fuscum aut fuscocinereum apice testaceum: reliqua testacea: venter medio infuscatus: aculeus dimidii abdominis longitudine, valvulis fuscis pubescentibus, vaginâ testaceâ: ungues fuscis: alæ hyalinæ stigmatè radice et squamulis stramineis, nervis partim fuscis partim pallidis.

*Variat* metathorace pectore et segmenti 1<sup>mi</sup>. basi summâ tantum fusco-testaceis.

*Variat* item mesothoracis lobis humeralibus fusco maculatis.

*Habitat* in nemoribus femina non infrequens; *mas* adhuc invisus.

### Subgen. II.—ANCYLUS.

Gen. *Ancylus*. Div. 2<sup>da</sup>. *Hal. Ent. Mag.* Vol. I. p. 261.

Trophi fere quales subgeneri 4<sup>to</sup>. (*Leiophron*). Palporum maxillarium articulus 1<sup>mus</sup>. 2<sup>do</sup>. non longior: caput oblatius: antennæ longiores: mesothoracis scutum sulculis ordinariis postice conniventibus impressum: abdomen ellipsoideum convexum; segmentum 1<sup>mum</sup>. breve tuberculis basalibus, 2<sup>dum</sup>. (e duobus conflatum) maximum lævissimum, sequentia brevia non recondita: anus incurvatus compressus integer: aculeus perbrevis incurvatus, valvulis parvis cultratis, vagina faleata: alarum anticarum stigma ovato-lanceolatum, areola disci antica fere contigua, radialis oblongo-ovata apicem alæ accedens, brachialis posterior anteriorem parum superans: nervus recurrens interstitialis.

### SECTIO A.

*Ungues bifidi*: abdominis segmentum 1<sup>mum</sup>. perbreve subquadratum.

Sp. 2. L. A. muricatus. Fem. *Abdominis medio pedibusque rufis; coxis posticis validè dentatis; ventre bifariam spinuloso.* (Long. corp.  $1\frac{2}{3}$  lin.; alar. 3.)

*Ancylus muricatus.* *Hal. Ent. Mag.* Vol. I. p. 261.

*Niger nitidus*: antennæ circiter 31-articulatæ, corpore paulo longiores, basi nonnihil rufescentes supra obscuriûs: palpi rufescentes: abdomen antice rufum segmento 1<sup>mo</sup>. dorsi nigro, postice nigrum:

segmenta ventralia apice spinulis binis instructa posticè obsoletioribus: aculei valvulæ ferruginæ aut piceæ: pedes rufi unguibus fuscis: coxæ posticæ basi fuscomaculatæ, apice in dentem validum productæ: alæ hyalinæ stigmatate fusco, nervis dilutius, radice et squamulis obscure stramineis.

*Habitat* in nemoribus non infrequens: *mas* incognitus.

Sp. 3. L. A. *laturatus*. Fem. *Abdominis lateribus pedibusque rubiginosis; coxis posticis subdentatis; ventre subtiliùs spinuloso.* (Long. corp. 2 lin.; alar.  $3\frac{3}{4}$ .)

Præcedenti simillimus, major, rubedine sordidiore: abdomen longius et gracilius, lateribus rubiginosum, segmenti 2<sup>de</sup>. dorso piceo: ventris spinulæ subtiliores: pedes rubiginosi; anteriorum tarsi apice posticorum coxæ basi, tibiæ apice tarsique fuscescentes: coxæ obsoletius dentatæ.

*Variat*, duplo minor coxis immaculatis adhuc obsoletius dentatis.

Præcedente longe rarior.

## SECTIO B.

*Ungues integri: abdominis segmentum 1<sup>mum</sup>. longius quam latius, antice attenuatum: posteriora breviora.*

Sp. 4. L. A. *excrucians*. Fem. *Pedibus flavo-ferrugineis; segmento 1<sup>mo</sup>. basi sensim attenuato; ventre spinuloso.* (Long. corp.  $1\frac{1}{2}$ ; alar. 3 lin.)

Niger nitidus: antennæ circiter 24-articulatæ, corpore parum longiores; articuli nonnulli baseos flavo ferruginei, dorso fusci: os flavo-ferrugineum, palpi pallidiores: abdominis segmentum 1<sup>mum</sup>. a basi inde sensim dilatatum subtiliter aciculatum tuberculis inconspicuis: aculei valvulæ ferruginæ: pedes flavoferruginei unguibus fuscis: coxæ posticæ inermes, basi supra fuscomaculatæ: alæ fere quales præcedentibus.

*Habitat* in nemoribus ubi fungi scatent: *mas* incognitus.

Sp. 5. L. A. *edentatus*. Fem. *Pedibus flavo-ferrugineis, coxis nigris; segmento 1<sup>mo</sup>. basi angulato.* (Long. corp.  $1\frac{1}{2}$ ; alar. 3 lin.)

Præcedente robustior: antennæ circiter 26-articulatæ basi subtus obscure ferruginæ: mandibulæ flavo-ferruginæ apice fuscæ: palpi pallidiores: abdominis segmentum 1<sup>mum</sup>. aciculatum, latius quam præcedenti, anticè quidem attenuatum, sed tuberculis baseos

magnis prominulis apicis latitudinem fere æquantibus : aculei valvulæ piceæ : pedes flavo-ferruginei, tarsis basi demta fuscis, coxis nigris inermibus : alæ obscure hyalinæ stigmatè nervisque fuscis, radice stramineâ, squamulis piceis : areola radialis basi perpaulo latior apice attenuata, in formam semicordatam (qualis denique in *Sigalphis Neesianis* extat) e longinquo accedens.

Binis exemplaribus quæ sola mihi adsunt, jam vetustate sordidis, abdomen subdepressum est ventre complanato inermi ; sed hoc vi aut casu accidisse suspicor.

### Subgen. III.—CENTISTES.

Gen. *Ancylus*. Div. 1<sup>ma</sup>. *Hal. Ent. Mag.* Vol. I. p. 261.

Trophi et characteres plurimi *Ancyli*. Mesothoracis scutum absolutè lævigatum : abdomen obovatum, segments 1<sup>mo</sup>, longiusculo conico-attenuato tuberculis baseos inconspicuis, 2<sup>do</sup>. longo, reliquis brevissimis, *mari* subdepressum, *femine* convexum ventre compresso : aculeus deflexus subulatus.

Sp. 5. *L. C. cuspidatus*. Mas et Fem. *Pedibus ferrugineo-flavis, posticorum tibiis apice tarsisque fusciscentibus*. (Long. corp. 1½ ; alar. 2⅔ lin.)

*Ancylus cuspidatus*. *Hal. Ent. Mag.* Vol. I. p. 261.

*Fem.*—Niger nitidissimus : antennæ circiter corporis longitudine, (in utroque sexu 24-articulatæ) : articuli basales subtus, clypeus et os ferrugineo-flavi, palpi pallidiores : abdominis segmentum 1<sup>mu</sup>m. aciculatum : aculeus niger, ejusdem segmenti longitudine : pedes ferrugineo-flavi unguibus, posticorum etiam tibiis apice tarsisque fusciscentibus : alæ hyalinæ stigmatè nervisque ferrugineo-fuscis, radice et squamulis obscure stramineis : areola radialis paulo oblongior quam *L. excrucianti*.

*Mas.*—Antennis longioribus.

*Habitat* in umbrosis nemorum *mas* frequens ; *femina* nonnisi rarissime, locis fungiferis.

### Subgen. IV.—LEIOPHRON.

Gen. *Leiophron*. *Nees. Act. Acad.* Tom. IX. (A. D. 1819)  
Lin. 2. Genus 6.

————— *Curtis. Br. Ent.* 476.

Labrum transversum semiovale epipharynga obtegens, hujus ligulâ tantum prostante : palporum maxillarium articulus 1<sup>mus</sup>. 2<sup>do</sup>. parum longior : labiales 3-articulati articulis longitudine subequali-

bus : antennæ breviusculæ : caput transversum sed crassius quam præcedentibus, in formam rotundato-cubicam accedens : occiput subtiliûs marginatum : abdomen subsessile aut subpetiolatum, ovatum convexum, segmento 2<sup>do</sup>. longe maximo (e duobus conflato), 3<sup>ti</sup>o. perbrevis, reliquis plerunque retractis : aculeus reconditus, valvulis minutissimis ovatis, vaginâ decurvâ subulatâ : alarum anticarum stigma trigonum crassum, areolam cubitalem 2<sup>dam</sup>. fere aut reverâ contingens, areola radialis ab apice alæ longè remota, semilunata, stigmatate non longior, antica disci perparum remota, brachiales conterminæ ; nervus recurrens interstitialis.

### SECTIO A.

*Segmento 1<sup>mo</sup>. vix longiore quam latiore.*

Sp. 7. *L. mitis. Niger antennis et pedibus ochraceis.*  
(Long. corp.  $1\frac{1}{2}$  ; alar. 3 lin.)

*Niger nitidus* : antennæ corpore paulo breviores parum teretes 23-articulatæ, obscure ochraceæ : os palpique concolores : mesothoracis scutum sulculis punctatis postice conniventibus, medio læve : metathorax granulatus pubescens : abdominis segmentum 1<sup>um</sup>. aciculatum, tuberculis prope basin sitis, basi ipsâ constrictum : pedes ochracei, postici obscuriores, coxæ nigricantes : alæ hyalinæ nervis et stigmatate dilute fuscis, radice et squamulis ochraceis. Videtur esse *femina*.<sup>a</sup>

### SECTIO B.

*Segmento 1<sup>mo</sup>. elongato attenuato.*

(B.) a.

*Mesothoracis sulculis ordinariis punctatis.*

† Sp. 8. *L. orchesiæ. Curt. Br. Ent. 476. No. 1.*

Sp. 9. *L. pallipes. Mas et Fem. Niger antennis basi et pedibus ochraceis ; thoracis dorso et scutello vage punctatis pubescentibus ; petiolo obconico, striolato, tuberculis inconspicuis.* (Long. corp.  $1\frac{1}{2}$  ; alar.  $2\frac{3}{4}$  lin.)

*Curt. Br. Ent. 476. No. 1.*

*Niger nitidus* : antennæ nigro-fuscæ basi ochraceæ, *femine* 21- 23-articulatæ longitudine capitis cum thorace et petiolo ; *mari* longi-

<sup>a</sup> I have seen but one individual of this species, which appears to have sustained some injury in the pupa, as its wings are not fully expanded. Possibly the unusual shortness of the first segment may have been produced by accident also, as in its other characters the species agrees with those of the following section.

ores et graciliores, 24- 26-articulatæ: facies albido pubescens: tempora parçè punctata et pubescentia: mesothoracis sulculi in foveam confertim punctatam ante scutellum effusi: scutum et scutellum vage punctata pubescentia: metathorax (*i. e.* postscutellum aut propodeon) reticulato-rugosus pubescens: abdominis segmentum 1<sup>mum</sup>. a basi tenui in apicem sensim dilatatum, absque tuberculis manifestis, subtiliter et regulariter striolatum: pedes ochracei nonnunquam ferruginei, postici sæpe brunnei: coxæ vel concolores vel posteriores nigricantes: alæ obscure hyalinæ radice et squamulis brunneis, stigmatè dilute fusco basi pallescente, areolam cubitalem secundam non contingente: areola radialis itaque sub stigmatè non acuminata et magis arcuata est quam in plerisque sequentibus: nervi omnes satis distincti, dilute fusci.

*Habitat* in agris passim satis frequens.

*Obs.*—Thoracis punctura et pubescentia, petioli forma et sculptura concinna speciem prima facie optime designant: non dissimulandum tamen in copiâ exemplarium nonnulla esse obvia, staturæ minoris sed a genuinis non temere dissocianda, quæ sensim immutata characteres illos infirmant: de reliquis igitur quorum tantum unum vel alterum exemplar intueri mihi contigit, dubium oritur an discrimina inde petita satis valeant: his angustiis etsi commotus, nihilominus hic breviter commemorabo species a Cl. Curtisio jam vulgatas et pro solita benevolentia mecum communicatas.

† Sp. 10. *L. nitidus*. *Curt. Br. Ent.* 476. No. 3.

Sp. 11. *L. picipes*. Mas et Fem. *Piceus capite thorace et petiolo nigris; petiolo parum dilatato, ruguloso, obsolete tuberculato*. (Long. corp. 1½; alar. 2¼ lin.)

*Curt. Br. Ent.* 476. No. 2.

*L. pallipedi* affinis: antennæ *feminæ* breviores, piceæ basi dilutiùs, 18-articulatæ: thoracis limbus et scutellum obsolete punctata: metathorax rugoso-reticulatus: abdominis segmentum 1<sup>mum</sup>. apice parum dilatatum, medio obsolete tuberculatum, longitudinaliter rugulosum rugulis confluentibus: pedes antichi dilutius picei aut brunnei, posteriores picei, coxis nigris trochanteribus apice pallidis: pedes breviusculi sunt et crassiusculi; tarsi anteriores præsertim breves: alæ obscure hyalinæ stigmatè piceo basi pallescente, radice et squamulis brunneis.

Sp. 12. *L. accinctus*. *Capite thorace et petiolo nigris, abdomine piceo, antennis basi et pedibus ferrugineis; petiolo fere lineari, ruguloso, tuberculis acute prominulis.* (Long. corp.  $1\frac{1}{4}$ ; alar.  $2\frac{1}{2}$  lin.)

*Mas?*—Antennæ 22-articulatæ graciles corpore parum breviores, fuscæ basi ferruginæ: thoracis sulculi crenati ante scutellum conniventes: scuti intervallum impunctatum: scutellum obsolete punctatum: metathorax subtiliter rugulosus: segmentum 1<sup>mum</sup>. fere lineare longitudinaliter rugulosum, tuberculis circa medium acutè prominulis, ante illa nonnihil coarctatum: alæ hyalinæ radice et squamulis stramineis, stigmatè dilute brunneo basi pallido, areolam cubitalem secundam contingente: areola radialis angusta sub stigmatè acuminata.

Sp. 13. *L. similis*. Fem. *Capite thorace et petiolo nigris, abdomine piceo, antennis basi et pedibus dilute ochraceis; petiolo fere lineari punctato-reticulato.* (Long. corp. 1; alar. 2 lin.)

*Curt. Br. Ent.* 476. No. 4.

*Fem.*—Antennæ 16-articulatæ, capitis cum thorace et petiolo longitudine, fuscæ basi dilute ochraceæ: thoracis sulculi ante scutellum in foveam confertim punctulatam effusi: scuti medium et scutellum impunctata: metathorax punctato reticulatus: abdomen piceum; segmentum 1<sup>mum</sup>. nigricans punctato-reticulatum, gracile apice vix paulo latius, tuberculis inconspicuis: pedes dilute ochracei: alæ obscure hyalinæ stigmatè fusco-pallido, nervis tenuissimis, areola radiali perparva.

### SECTIO (B.) b.

*Mesothoracis sulculis lævigatis aut oblitteratis.*

Sp. 14. *L. intactus*. *Piceus antennis basi et pedibus silaceis; antennis longitudine corporis.* (Long. corp. plusquam 1 lin.; alar. 2.)

*Fem.?*—Caput et thorax nigro-picea nitidissima, abdomen rufo-piceum: antennæ 16-articulatæ graciles filiformes, subfuscæ basi silaceæ: mesothoracis sulculi subtilissimi lævigati, postice evanescentes; metathorax nitidiusculus confertim punctatus: abdominis segmentum 1<sup>mum</sup>. punctato-reticulatum, lineare basi constrictum, circa medium tuberculatum: pedes silacei: alæ obscure hyalinæ stigmatè dilute ochraceo, radice et squamulis piceo-stramineis.



Sp. 15. *L. fulvipes*. Mas et Fem. *Piceus antennis basi et pedibus dilute ochraceis; antennis perbrevibus*. (Long. corp. vix 1 lin.; alar. 1½.)

*Curt. Br. Ent.* 476. No. 5.

Caput et thorax nigro-picea nitidissima, abdomen rufo-piceum: antennæ 16-articulatæ dilute ochraceæ apice fuscæ; *feminæ* crassiusculæ longitudine capitis cum thorace, *mari* paulo longiores et graciliores: mesothoracis scutum lævigatum: metathorax punctato-reticulatus: abdominis segmentum 1<sup>mum</sup>. punctato-reticulatum, paulo brevius quam proxime affinis, basi constrictum, ante medium tuberculatum, apice perparum dilatatum: pedes breviusculi dilute ochracei: alæ obscure hyalinæ stigmatibus dilute brunneo basi pallido, nonnunquam pallide ochraceo, radice et squamulis piceo-stramineis.

*Habitat* circa sepes herbidos satis frequens.

Sp. 16. *L. pallidistigma*. Fem. *Piceus antennis pedibus et alarum stigmatibus silaceis*. (Long. corp. 1; alar. 2 lin.)

*Curt. Br. Ent.* 476. No. 6.

Differt a præcedente statura procera, pedibus et petiolo longioribus et gracilioribus: antennæ 16-articulatæ capite cum thorace parum longiores, totæ silaceæ: abdominis segmentum 1<sup>mum</sup>. punctato-reticulatum, lineare basi nonnihil constrictum, medio tuberculatum: alæ hyalinæ stigmatibus silaceo aut stramineo, radice et squamulis stramineis.

*Habitat* cum præcedente rarius.

†Sp. 17. *L. basalis*. *Curt. Br. Ent.* 476. No. 6<sup>a</sup>.

Sp. 18. *L. apicalis*. Mas et Fem. *Flavotestaceus abdomine postice nigricante, feminæ metathoracæ concolore*. (Long. corp. 1½.; alar. 2 lin.)

*Curt. Br. Ent.* 476. No. 7. et Fig.

Diaphane flavotestaceus: oculi virides: ocelli fusci: antennæ pallidiores apice summo fuscæ, graciles filiformes, longitudine capitis cum thorace et petiolo, 16 aut 17-articulatæ articulo 3<sup>tio</sup>. prælongo: mesothoracis scutum lævissimum: punctum fuscum supra radicem alarum: metathorax punctato-reticulatus in *feminâ* nigricans: abdominis segmentum 1<sup>mum</sup>. elongatum gracillimum planè lineare, ante medium tuberculatum, punctatum: segmentum 2<sup>dum</sup>. basi pallide flavotestaceum, dehinc ut sequentia,

nigrum : pedes graciles pallidiores : alæ hyalinæ stigmatate pallido apice fusco-tincto : areola radialis perbrevis ; cubitalis interior et antica disci apice effusæ.

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## ADDENDA ET CORRIGENDA.

Vol. I. p. 273. Stirps III. Dryini.

Huc referendum Genus *Embolemus* (Westwood, *Philos. Mag.* 3d Ser. Vol. II. p. 444), thorace, abdomine, alis et antemarum articularum numero cæteris congruens : etsi caput globosum, frontis tuberculum cui antennæ insident solito superiùs et harum eximia proceritas faciem alienam imprimunt, et cum Stirpe quinta connexionem quamvis e longinquo pulcherrimè exhibent.—<sup>Duus</sup>. Westwood loco laudato alarum nervos ad typum *Alysiidarum* retulit ; sed hæc observatio nonnisi caute accipienda est : namque ala *Embolemi* typum *Dryinorum* reliquorum sequitur ab *Evaniis* parum discrepantem ; nec inter *Ichneumones* talem obviam esse credo, quorum nervi costalis et subcostalis semper intimè connexi familiæ characterem constantissimum præbent.

Vol. I. p. 274. Gen. XVIII. *Cinetus*.

Bina Genera hic esse confusa seriùs cognovi, viz.

XVIII. *Cinetus* : antennæ fractæ scapo elongato, *mari* 14-articulatæ articulo 3<sup>to</sup>. sinuato, *femine* 15-articulatæ : frons producta : mesothoracis scutum bisulcum. *Sp. C. gracilipes. Curt. Br. Ent.*

XVIII<sup>a</sup>. *Ismarus* : antennæ scapo parum elongato, articulo tertio recto : *mari* 15-articulatæ, *femine* 14-articulatæ : frons lata æquata : mesothoracis scutum lævigatum. *Sp. Cinetus dorsiger Curt. B. E.*

Vol. II. p. 230. *Mirax rufilabris*.

Exemplaribus vivis collatis jam plura corrigenda esse videntur, et nomen triviale immutandum ; legas itaque.

*Sp. M. Spartii*.

Caput rufo-castaneum albido-pubescenti vertice medio nigricante : oculi virides : antennæ nigro-fuscæ pedicello ferruginoso : thorax niger : mesothorax lævis sericeus subtilissime albido pubescens : metathorax lævissimus nitidus : abdomen nigrum nitidum segmentis 2 anterioribus pallide flavis : pedes ferruginei : alæ fusco-hyalinæ, basi flavescens, stigmatate fusco apice summo decolore,

nervis dilute fuscis, squamulis fusco-ferrugineis. (Long. corp. 1 lin.; alar.  $2\frac{1}{2}$ .) Caput thoracis, &c.—(ut antea, descriptionis ulterioris his emendatis.)—Oculi pilis raris subtilissimis erectis consiti: abdomen thoracis fere longitudine et latitudine, ovato-orbiculatum subdepressum læve: segmenta dorsì octo, anteriora longitudine subæqualia, posteriora lineari-transversa: primi scutum gracillimum (adhuc gracilius quam *Microgastri laterali*), apice attenuatum, latera membranacea late resecta: sextum ventrale leviter carinatum et apice productum, aculeum subexertum fulciens.

*Habitat* in Spartis scopario.

Vol. II. p. 252. Sp. 45. Micr. intricatus.<sup>b</sup> Vespa, &c.  
*Ray Ins.* 255. 13.

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ART. XLIII.—*Characters of some undescribed New Holland Diptera.* By FRANCIS WALKER.

MEGISTOCERA.—*Wiedemann.*

*M. dispar.* Mas et Fem. *Mari antennæ longissimæ, fem. brevissimæ.* Propter femina antennas brevissimas *Magistocera* non benè convenit, at vix genus diversum.

*Mas.*—Ferruginea, pubescens: oculi nigro-fusci: palpi nigri: antennæ fuscæ, pubescentes, corpore ferè quadruplo longiores; articuli 1<sup>us</sup>. et 2<sup>us</sup>. omninò 3<sup>us</sup>. que basi ferruginei: thorax subtus pallidior: mesothorax vittis supra 3 pallidis: abdomen utrinque fusco fasciatum, apice obscurius: pedes ferruginei, longi, graciles, pubescentes, femora et tibiæ apice tarsique nisi ad basin fusca: alæ hyalinæ, iridescentes, basi et ad costam fusco-flavæ; squamulæ et nervi flava, hi ad apices plerumque fusci: halteres flavi, apice pallidè fusci.

*Fem.*—*Mari* similis at obscurior, thorax angustior, abdomen longius, pedes breviores, alæ paullò breviores et angustiores: antennæ obscurè fuscæ, capite breviores; articuli 1<sup>us</sup>. et 2<sup>us</sup>. ferruginei:

<sup>b</sup> In the course of last autumn, Mr. Curtis and I found the follicles of this species in profusion, attached to springs of heath, grass, &c. in the Western Isles. The caterpillars of *Mamestra Pisi* were wandering about the same places, and to them probably the "*Eruca viridis lineolis albicantibus*" of Ray should be referred. Two species of *Heniteles*, and one of *Pezomachus*, were produced in abundance out of these follicles, along with the *Microgaster*.

thorax anticè abdominisque segmentorum suturæ fusca: alæ subhyalinæ, basi et ad costam obscurè fuscæ. (Corp. long.  $4\frac{1}{2}$ —5 lin.; alar. 12—13 lin.)

TIPULA.—*Linné.*

*T. ramicornis.* Mas et Fem. *Ad formam non hactenus decretam pertinens, Europæ Tipulis antennis pectinatis et alarum nervis aliter ad apices collocatis discrepans.*

*Mas.*—Ferruginea, lævis, ferè glabra: oculi nigro-fusci: os utrinque et subtus fuscum: palpi nigro-fusci: antennæ flavæ, thorace et capite paullò longiores, apice fuscæ, ramulis ornatae intus 7 extus 14 nigris sat longis: mesothorax anticè fuscus et ferrugineo bivittatus, utrinque fusco maculatus: abdomen supra et subtus nigro vittatum; segmenta basale et apicale omninò ferruginea: pedes ferruginei, longi, graciles, pubescentes; femora apice nigra; tibiæ obscurè ferrugineæ, apice fuscæ; tarsi fusci: alæ hyalinæ, basi et ad costam fuscæ maculis 4 parvis subrotundis hyalinis; margo posticus griseus; nervi discoidales fusco limbati: halteres ferruginei, apice pallidè fusci.

*Fem.*—*Mari* similis; abdomen longius; antennæ breviores, ramulis intus 7 extus 8 ornatae brevissimis: abdomen apice et oviductus rufa. (Corp. long. 8—11 lin.; alar. 14—17 lin.)

LIMNOBIA.—*Meigen.*

*L. vicaria.* Fem. *Limnobiæ geniculatæ simillima, at pedibus omninò pallidis.*

Fusca, obscura: caput fulvo-fuscum, angustum: oculi obscurè fusci: antennæ fuscæ, capite paullò longiores: thorax subtus et posticè fulvus: abdomen obscurè fuscum, longum, gracile: oviductus rufus, nitidus: pedes pallidè fulvi, longi, graciles; femora ferè omnia tibiæ que basi et apice pallidè fusca; tarsi apice et ungues nigri: alæ subhyalinæ, iridescentes; costa fusca, basi pallidior, maculis plurimis subhyalinis; sub costam maculæ 4 majores subfuscæ; squamulæ et nervi fusca; nervi omnes longitudinales punctis fuscis ornati; nervulus transversus discoidalis fusco limbatus; halteres pallidè fulvi, apice fusci. (Corp. long. 7 lin.; alar. 10 lin.)

CTENOPHORA.—*Meigen.*

*C. vilis.* Mas. *Europæ Ctenophoris abdomine plano, alienaque ad alarum apices nervorum structura discrepans.*

Fusca, obscura: oculi nigri: palpi fusci, basi ferruginei: antennæ fuscæ, basi ferrugineæ, capite thoraceque paullò longiores, intus

ramulis 15 sat longis ornatae: thorax supra griseo bivittatus, subtus pallidior: abdomen obscurè fuscum, planum, sublineare, apice latius; segmentorum suturæ maculae que laterales ferrugineae: pedes ferruginei, pubescentes; femora apice nigra; genua ferruginea; tibiæ fuscae; tarsi fusci, apice nigri: alæ subfuscae, maculis duabus costalibus fuscis, una costæ medio parva subrotunda, altera ad apicem propior major in discum producta; squamulae et nervi fusca: halteres flavi, apice nigri. (Corp. long. 5 lin.; alar.  $9\frac{1}{2}$  lin.)

C. bella. Fem. *Præcedentis structura.*

Atra, obscura: antennæ thorace paullò breviores, ramulis plurimis brevissimis ornatae: mesothorax supra vittis 3 griseo-fulvis, utriusque macula magna concolore: abdomen aureum, basi angustius, apice acuminatum; segmentum 1<sup>um</sup>. nigrum; 5<sup>um</sup>. apice nigrum; 6<sup>um</sup>. et 7<sup>um</sup>. nigra, basi aurea: oviductus rufus: pedes nigri, pubescentes; femora aurea, apice nigra; tibiæ aureo fasciatæ: alæ subflavæ, basi flavæ, maculis plurimis nigris vittas 3 irregulares quarum basalem et mediam connexas fingentibus; discus hyalinus; margo posticus et apex grisei; squamulae nigrae; nervi fusci, basi et nonnulli omninò flavi: halteres nigri. (Corp. long. 5 lin.; alar. 9 lin.)

BIBIO.—*Geoffroy.*

B. imitator. Mas et Fem. *Niger* (mas) *aut rufus* (fem.), *pedibus nigris, alis fuscescentibus.* Obs. B. hortulano *simillimus sed halteres pallidi fem.que corpus omninò rufum.*

*Mas.*—*Niger*, nitidus, pilis fulvis hirtus: caput thoracis latitudine: oculi rufi, maximi, supra connexi: ocelli approximati: antennæ capite breviores: abdomen sublineare, parùm nitens: pedes nigri, pubescentes; pulvilli pallidi: alæ subfuscae, iridescentes; costa fusca, basi fulva, macula anteapicalis obscurior; squamulae, nervi et halteres fulva.

*Fem.*—*Rufus*, nitidus, lævis, immaculatus, lanugine fulva vestitus: caput parvum angustum: oculi, ocelli, os et antennæ nigra: abdomen parùm nitens, apice angustius: pedes nigri, nitidi, lanugine nigra vestiti; coxæ et genua rufa; tarsi basi rufi; pulvilli pallidi: alæ fuscae; costa obscurior, basi fulva; nervi fusci, basi fulvi; squamulae et halteres fulva. (Corp. long. 3— $3\frac{3}{4}$  lin.; alar. 5—7 lin.)

PSILOPUS.—*Meigen.*

*P. cingulipes.* Mas. *Cyaneo-viridis, pedibus nigris fulvo cinctis, alis griseo-hyalinis.*

Viridis, nitens, pilis supra sparsis nigris subtus albis hirtus : caput cyaneo-viride, prope os cyaneum et argenteo micans : oculi rufi : antennæ nigræ ; articuli 1<sup>o</sup>. ad 3<sup>um</sup>. brevissimi ; 4<sup>us</sup>. gracillimus, capite duplo longior : thorax subtus argentens ; mesothorax posticè cyaneus : abdomen cylindricum, thorace ferè triplo longius, apice angustum ; segmenta basi apiceque ænea : sexualia fulva : pedes nigri lanugine nigra vestiti, basi pilis albis hirti ; coxæ argenteo micantes ; femora apice, protibiæ et mesotibiæ fulva ; metatibiæ obscurè fuscæ, basi fulvæ : alæ griseo-hyalinæ, iridescentes ; squamulæ et nervi fusca ; nervi transversi valdè arcuati ; halteres fulvi, apice fuscii. (Corp. long.  $3\frac{3}{4}$  lin. ; alar.  $6\frac{1}{2}$  lin.)

*P. tricolor.* Mas. *Cyaneus, abdomine viridi apice cupreo-æneo, pedibus nigris, alis griseo-hyalinis.*

Cyaneus, nitens, brevis, latus, pilis nigris sparsis hirtus : caput viridi-cyaneum : os nigrum : oculi rufi : antennæ nigræ ; articuli 1<sup>o</sup>. ad 3<sup>um</sup>. brevissimi ; 4<sup>us</sup>. gracillimus, capite duplo longior : abdomen viride, apice cupro-æneum, subtus pilis albis hirtum : sexualia nigra : pedes nigri ; coxæ et femora viridia : alæ griseo-hyalinæ, iridescentes ; squamulæ et nervi fusca ; nervus transversus basalis rectus, apicalis valdè arcuatus : halteres nigri. (Corp. long.  $2\frac{1}{2}$  lin. ; alar.  $4\frac{1}{4}$  lin.)

*P. connexus.* Fem. *Cyaneo-viridis, pedibus flavis, alis hyalinis fusco bifasciatis.*

Viridis, nitens, pilis nigris sparsis hirtus : caput argenteum, supra cyaneum : os flavum : oculi rufi : antennæ nigræ ; articuli 1<sup>o</sup>. ad 3<sup>um</sup>. breves ; 4<sup>us</sup>. gracillimus, capite ferè duplo longior : thorax viridi-cyaneus, subtus albo pubescens, utrinque æneo maculatus : abdomen basi et apice cyaneo-viride ; segmenta basi et apice cuprea : pedes flavi, setis nonnullis nigris armati ; coxæ nigræ ; meso- et metatarsi nigri, illi basi fuscii ; protarsi obscurè fuscii, basi fulvi : alæ hyalinæ, iridescentes, ad costam fulvescentes, fasciis duabus latis anticè connexis posticè abbreviatis fuscis ; squamulæ fulvæ ; nervi fuscii ; nervus transversus basalis ferè rectus, apicalis valdè arcuatus : halteres flavi. (Corp. long.  $2\frac{1}{2}$  lin. ; alar.  $4\frac{1}{4}$  lin.)

THEREVA.—*Latreille.*

*T. misella.* Mas. *Argenteo-fusca, abdomine subtus antennis pedibusque fulvis, alis subhyalinis.*

Obscurè fusca, pilosa: oculi nigro-rufi: ocelli nigri: os fulvum, capitis longitudine: antennæ fulvæ, apice fuscæ: abdomen argenteo micans, apice et subtus fulvum; segmenta apice flava: pedes fulvi; tibiæ spinis nonnullis brevissimis nigris armatæ; tarsi apice obscuriores: alæ subhyalinæ, iridescentes, ad costam fulvescentes; squamulæ fulvæ; nervi fusci; nervi transversi fusco sublimbati: halteres fulvi. (Corp. long.  $2\frac{1}{2}$  lin.; alar.  $4\frac{1}{2}$  lin.)

BRACHYOPA.—*Hoffmansegg.*

*B. rufo-cyanea.* Mas. *Rufo-cyanea, antennis fulvis, pedibus rufo-fuscis, alis fulvescentibus.*

Nitens, pilosa: caput et thorax rufa, minimè cyanescentia, illum ad antennarum insertionem supra fulvum: antennæ fulvæ; articulus 4<sup>us</sup>. obscurior: os rufum: oculi nigro-ænei: thoracis discus supra æneo-fuscus: abdomen rufo-cyaneum, subtus cyaneum, lanugine medio utrinque et apice omninò pallida vestitum: pedes obscurè rufi, pilosi; femora supra et metapedum femora tibiæ que omninò fusca; ungues nigri; pulvilli pallidè rufi: alæ subfulvescentes, iridescentes, ad costam fulvæ; squamulæ nigro-fuscæ; nervi fusci, basi fulvi; squamæ sordidè albidæ: halteres obscurè fusci. (Corp. long. 5 lin.; alar. 10 lin.)

HELOPHILUS.—*Meigen.*

*H. griseus.* Fem. *Niger, antennis rufis, abdomine subtus fusco, alis griseis.*

Niger, subtilissimè punctatus, parùm nitens, lanugine cana tectus: hypostoma fulvum: antennæ rufæ; articulus 4<sup>us</sup>. niger: oculi nigro-fusci: scutellum ferè glabrum: abdomen subtus fuscum; segmenta basi utrinque albo pilosa: pedes nigri, subtilissimè punctati, pilis nigris et griseis vestiti; tarsi subtus lanugine rufa tecti; pulvilli fulvi: alæ griseæ, iridescentes, ad costam fusco inter nervos secundarium et auxiliarem maculata; squamulæ et nervi nigro-fusca; squamæ sordidè albæ: halteres rufi, apice fusci. (Corp. long. 4 lin.; alar. 7 lin.)



ANTHRAX.—*Fabricius*.

*A. extensa*. Mas. *A. præargentatæ aspectu, obscurè fusca, pedibus alisque concoloribus.*

Obscurè fusca, pubescens, subtus fulva: caput posticè albidum, pilis supra nigris anticè fulvis hirtum: oculi rufo-ænei: os et antennæ nigra: thoracis abdominisque latera pilis fulvis hirta, hoc quoque apicem versus et ille utrinque ante alas-pilis nigris hirta: pedes nigro-fusci, pubescentes; tarsi nigri: alæ longæ, angustæ, obscurè fuscæ, posticè et apice dilutiores, anticè et basi ferrugineæ; squamulæ nigrae; nervi ferruginei, nonnulli nigri: halteres fulvi, ante apices fusco cingulati. (Corp. long.  $5\frac{1}{2}$  lin.; alar.  $13\frac{1}{2}$  lin.)

ART. XLIV.—*Transactions of the Entomological Society of London. Vol. I. Part I. Seven Plates, Sixty-six Pages, and an Appendix.* London: Longman and Co. 1834.

THE first number of the Transactions of this thriving Society has at length appeared, and contains papers by Messrs. Spence, W. B. Spence, Hope, Lewis, Waterhouse, Westwood, W. Christy jun., G. R. Gray, Shuckard, and Saunders: the whole of these are valuable papers, and we think the Publishing Committee have exercised great judgment in the selection. Mr. Spence's paper is one of considerable interest,—we have already given an outline of it,—but those by Messrs. Shuckard and Waterhouse are of high entomological importance; we should be proud to have them in our own pages.

We rather regret that the Society has thought it necessary to preface these Transactions with an attack upon ourselves, indicative throughout of hostility. We do not pretend that we were unacquainted with the existence of this feeling towards us, but *we* had no hostile feeling, and we determined not to see it in others. We hoped that our labours in behalf of the Society would compel our enemies, in common decency, to treat us with *ostensible* good will; and now, even now, we will not abandon a society because at present governed by our foes,—it may be governed by our friends,—and the majority, nine out of every ten, disapprove of this attack. This introductory portion of the work is divided into two parts; the principal object of the first part is to combat Mr. Swainson's masterly and unanswer-

able letter, at p. 190 of this Magazine,<sup>a</sup> on the subject of publishing transactions; the object of the second is —; we will give it entire.

“ It was not till some time after the foregoing introduction was written, that the ninth number of the Entomological Magazine came into our hands. We trust our readers will believe, from their general tenor, that no unkindly spirit dictated one line of the preceding pages; and we preface our further observations, unwillingly extorted by the work just alluded to, by the declaration, that no such feelings actuate us even now. We do feel, however, that we should be liable to the imputation of an abandonment of our duty<sup>b</sup>, if we were to suffer some remarks and unfounded assertions, contained in the number of the Entomological Magazine for October, 1834, to pass unnoticed.

“ We shall make no comment on the sweeping observation, at page 332, that all our entomologists, with only four exceptions, are fools; but content ourselves with thanking the Editors, in the name of the rest, for the compliment.<sup>c</sup> The assertion, however, in the next paragraph, that the Society is going down, requires severer animadversion. This, it seems, is made on the circumstance, that the meeting in September was attended by only twelve members; and it is repeated at page 434, in the following paragraph:—‘ The attendance of members at these sittings has greatly decreased; at the July sitting about twenty members were present; at the August sitting about fifteen; at the September sitting about twelve.’ Now, whatever the Editors of this Journal may please to insinuate, these attendances, considering the time of year, cannot be called bad; and as to their having greatly decreased since the opening, it would have been very extraordinary if they had not, when a large proportion of the members had left London, as always happens in the summer months. But look at the meetings of other societies at the same period,—the Zoological, for instance; the number of members of that body who attended the scientific meetings in September, did not amount, on either occasion, to twelve<sup>d</sup>, although the portion of members in the two Societies is nearly twenty-five to one. Is the Zoological Society also ‘ going down?’

<sup>a</sup> The Entomological Magazine being the “ ELSEWHERE ” alluded to.

<sup>b</sup> The “ DUTY ” of a society to attack a detached paper, published in a private undertaking.

<sup>c</sup> The passage is this:—“ Ambulator, Hanson, Bird, and one other, are the only entomologists to whom I feel bound by any ties of *kindred feeling, affection, or gratitude.*”

<sup>d</sup> Nor, we believe, does it in what is called the season.

“ We have already stated that the Council considered it essential to the credit of the Society, that it should publish its own Transactions, and have given the reasons for their coming to that resolution. If any doubt could have been entertained of their wisdom in so doing, as far as the character of the Transactions might be affected by *association*, it is effectually removed by the conduct of the editors of the Entomological Magazine themselves, in having admitted that farrago of nonsense, which, under the title of *Colloquia Entomologica*, stands as the head of their present number. So miserable an attempt at wit, and so ridiculous a parade of learning, throws even Isla's *Domine* himself into the back ground. ‘ Lord! Lord! it was a very Gabilon (Babylon). More than one full hour were we at it, hand to hand; and to every word I said, he produced, directly, such heaps of proofs and quotations, *all in Latin*, that it seemed for all the world as if he carried them in the breast-pocket of his large cloak.’<sup>e</sup> Why do they not practise the motto they adopted—*γνωθι σεαυτον*?

“ The following passage occurs at page 333 of the *Colloquia* :—

“ ‘ ENT. I am firmly persuaded, from what I see of the working members of its Council, that the Entomological Society will retard, not advance, entomology.’

“ Very civil! However, *spectemur agendo!*

“ As to the hope (p. 332) that ‘ the Entomological Society would have been the means of uniting entomologists into one body, and called forth kindlier feelings among us,’ we are not conscious of its having failed in that desirable object, nor do we know of any unkindly feeling connected with the Society, except those too palpably entertained by the conductors of the Entomological Magazine.

“ And why do they entertain them? We leave them to answer that question as they may, and shall merely state the fact, *that their wish to publish the Memoirs read before the Entomological Society, in their own journal, was not acceded to by the Council*<sup>f</sup>.

“ We have now ended our unpleasant task, and shall not think it necessary to bestow any further notice on the Entomological Magazine,—whether it flatter or abuse, praise or condemn us.”

Is it dignified of a society to sit in committee and solemnly concoct an attack like this on a private undertaking? Admitting that the facts are sound, and the conclusions logical;

<sup>e</sup> This quotation stands as a foot note in the Transactions.

<sup>f</sup> Neither was it ever entertained by the editor of this Magazine. To oblige the Society, we offered to publish gratuitously a few of its early papers, knowing it could not afford a journal of its own.

admitting this, even in the face of our foot notes; yet still is it dignified? Will it benefit the Society? The first number of the Transactions comes to us, not as a simple collection of memoirs, but as a review. Of the justice or injustice of the review let our readers judge; that is not a point on which an interested party like ourselves ought to decide.

Two words on the Colloquia Entomologica: *first*, a magazine is only responsible for opinions conveyed in articles avowedly editorial; *second*, the Colloquia Entomologica are neither really nor avowedly editorial, on the contrary, editorial remarks on them have frequently occurred.

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ART. XLV.—*Monographia Chalciditum.* By FRANCIS WALKER.

(Continued from p. 369.)

“ ——— the green myriads in the peopled grass.”

§§ *Clava elongata, acuminata.*

Femora	{	-gracilia . . . . .	PTEROMALUS.
		-valida . . . . .	CHEIROPACHUS.

GENUS XIII.—PTEROMALUS,<sup>a</sup> *Swederus.*

Corpus pilis sparsis hirtum: thorax posticè utrinque pilis albis hirtus: abdomen apice densè hirtum; segmenta ferè recta, 1<sup>um</sup>. magnum, sequentia minora: oviductus rufus, abdomine occultum aut ejus apicem vix transiens; vaginæ nigræ, pubescentes: femora gracilia, non dilatata; fem. mesofemora subtus apices versus setigera.<sup>b</sup>

The species are very numerous, and the forms of the antennæ and abdomens of the females are almost as various as the species, but correspondent variations are not so apparent in the males.

SECTIO I.—Mas et Fem.

Corpus angustum, sublineare, quasi squameum: caput mediocre, *mari* thorace paullò latius, *fem.* thoracis latitudine: mandibulæ

<sup>a</sup> Πτερόν ala, μάλῶς tener.

<sup>b</sup> The other characters of the genus are detailed under the sections.

subquadratae, dentibus minutis armatae 4; una extus recta, intus arcuata, dentes ferè obtusi; altera subarcuata, dentes paullò longiores et acutiores: maxillae longae, subarcuatae; apices s. laciniae angustae, acuminatae, lobatae; palpi 4-articulati, graciles, ferè filiformes; articuli 1<sup>us</sup>. 2<sup>us</sup>. et 3<sup>us</sup>. mediocres, aequales, cyathiformes; 4<sup>us</sup>. elongato-fusiformis, apice pilosus, 3<sup>o</sup>. plus duplò longior: labium perangustum, lineare, posticè conoideum; ligula parva, brevis, anticè ciliata; palpi 3-articulati, breves, crassi, articulus 2<sup>us</sup>. brevissimus, 3<sup>us</sup>. acuminatus: antennae graciles, subclavatae, *mari* corporis dimidio vix longiores, *fem.* paullò breviores et crassiores; articuli 5<sup>o</sup>. ad 10<sup>um</sup>. mediocres, sublineares, gradatim breviores, vix latiores; clava elongato-ovata, vix acuminata, articulo 10<sup>o</sup>. plus duplò longior et paullò latior: thorax ovatus, minimè convexus: prothorax brevis: mesothoracis scutum, scutellum, paraptera et epimera magna; parapsidum suturae vix conspicuae: metathorax mediocris: abdomen subtilissimè squameum, ferè laeve, quasi excavatum, non compressum nec angulatum, subtus vix carinatum, *mari* sublineare basi angustius thoracis longitudine, *fem.* elongato-ovatum apice acuminatum thorace paullò longius; segmentum 1<sup>um</sup>. magnum; sequentia breviora, subaequalia: oviductus abdominis apicem vix transiens: pedes seorsum graciles: alae angustae; nervus humeralis ulnari multò longior, ramulum rejiciens nullum; cubitalis radiali vix longior; stigma ramulum brevem emittens.

Sp. 1. Pter. cavus. Mas et Fem. *Viridi-æneus*, *mari antennis fulvis abdominis macula pedibusque flavis*, *fem. antennis nigris pedibus fuscis, alis albis.*

*Mas.*—Obscurè viridis: oculi ocellique rufo-fusci: os fuscum: antennae pallidè fulvae; articuli 2<sup>us</sup>. 3<sup>us</sup>. et 4<sup>us</sup>. supra fusci: scutellum viridi-æneum: abdomen cupreo-æneum, basi viride, medium ante flavo maculatum; sexualia flava: pedes flavi; coxae æneo-virides; tarsi apice, ungues et pulvilli fusci: alae hyalinae, albæ; squamulae fuscae; nervi pallidè flavi; stigma minutum.

*Fem.*—Æneo-viridis: antennae nigrae; articulus 1<sup>us</sup>. basi fuscus: thorax subtus cyaneo-viridis: abdomen cupreo-æneum, basi apiceque viridans: pedes fusci: coxae cyaneo-virides; femora obscurè fusca; tibiae apice, necnon meso- et metatarsi basi fulvae: alarum nervi pallidè fulvi. (Corp. long.  $\frac{3}{4}$ — $1\frac{1}{2}$  lin.; alar. 1— $1\frac{3}{4}$  lin.)

*Var. β.*—*Mas*, antennae articulis 2<sup>o</sup>. ad 4<sup>um</sup>. vix fuscis.

*Var. γ.*—*Mas*, caput et thorax æneo-viridia.

*Var. δ.*—*Fem.* femora et metatibiae nigro-fusca.

*Var. ε.*—*Fem.* caput et metathorax viridia.

*Var. ζ.*—*Fem.* antennæ omninò nigræ: mesothorax æneus: femora et tibiæ nigro-fusca: genua et tarsi obscurè fusca: alæ ad costam fulvescentes; nervus humeralis apice et stigma pallidè fusca.

*Var. η.*—*Fem.* antennæ articulo 1<sup>o</sup>. basi fulvo: alarum nervi flavi.

*Var. θ.*—*Fem.* antennæ omninò nigræ: propedum tibiæ apice, basi et subtus fulvæ; tarsi basi fulvi.

Reared from pupæ of *Pontia Brassicæ* in the month of May, by Mr. Davis. June and July; on grass beneath trees, and on decayed wood; near London. June; South of France.

Sp. 2. *Pter. decedens.* Mas et Fem. *P. cavo similis*, mari abdomen immaculatum; fem. antennæ crassiores.

*Mas.*—Obscurè viridis: oculi ocellique rufo-fusci: antennæ fuscæ: scutellum viridi-æneum: abdomen cupro-æneum, basi viride: sexualia flava: pedes fusci; coxæ virides; genua et tibiæ apice flava; meso- et metatarsi flavi, apice fusci; profemora apice et protibiæ flava, hæ fusco fasciatæ: alæ hyaline, albæ; squamulæ fuscæ; nervi pallidè flavi; stigma minutum.

*Fem.*—Æneo-viridis, parùm nitens: antennæ nigro-fuscæ; articulus 1<sup>us</sup>. fulvus, apice fuscus: abdomen cupreo-æneum; segmenta basi viridi-ænea: pedes fusci; coxæ virides; femora et tibiæ apice fulva; tarsi fulvi, basi flavi, apice fusci: alarum nervi pallidè fulvi. (Corp. long.  $\frac{2}{5}$ — $1\frac{1}{4}$  lin.; alar.  $\frac{3}{4}$ — $1\frac{1}{2}$  lin.)

*Var. β.*—*Mas*, meso- et metatarsi fusci, basi flavi.

*Var. γ.*—*Mas*, antennæ fulvæ; articuli 2<sup>us</sup>. et 5<sup>us</sup>. supra fusci: scutellum viride: pedes flavi; coxæ virides; femora supra fusco vittata; tarsi apice pallidè fusci.

*Var. δ.*—*Mas*, antennæ omninò fulvæ: caput et thorax æneo-viridia.

*Var. ε.*—*Mas*, *Var. γ.* similis: antennæ fulvæ; articuli 1<sup>us</sup>. apice 2<sup>us</sup>. que supra fusci: scutellum æneo-viride.

*Var. ζ.*—*Mas*, *Var. ε.* similis: antennæ flavæ, articulo 2<sup>o</sup>. clavaque supra pallidè fuscis.

*Var. η.*—*Fem.* abdomen viridi-æneum, basi apice que viridans.

*Var. θ.*—*Fem.* protibiæ omninò fulvæ.

*Var. ι.*—*Fem.* caput viride: alarum nervi flavi.

*Var. κ.*—*Fem.* proalæ ad costam fulvescentes.

*Var. λ.*—*Fem.* antennæ articulo 1<sup>o</sup>. fusco, basi fulvo.

May to September; on grass beneath trees; near London. September; Isle of Wight.



Sp. 3. Pter. perversus. Fem. *Viridi-æneus, antennis fulvis, basi pedibusque fuscis, alis albis.*

*Æneo-viridis, parùm nitens: antennæ fulvæ, gracillimæ; articuli 1<sup>us</sup>. et 2<sup>us</sup>. obscurè fuscis: scutellum æneum: abdomen cupreo-æneum, basi viridans: pedes obscurè fuscis; coxæ æneo-virides; genua et tarsi fulva, hi apice fuscis: alæ hyalinæ, albæ; squamulæ fuscæ; nervi pallidè flavi; stigma minutum. (Corp. long.  $\frac{2}{3}$  lin.; alar.  $\frac{3}{4}$  lin.)*

August; on grass beneath trees; near London.

## SECTIO II.—Fem.

Corpus breve, latum, quasi squameum: caput magnum, thorace vix latius: mandibulæ subquadratæ, ferè rectæ, similes, intus paullò arcuatæ; dentes sat magni, obtusi, subæquales: maxillæ longæ, subarcuatæ; lacinia angustæ, acuminatæ, lobatæ; palpi 4-articulati, graciles, filiformes; articulus 1<sup>us</sup>. mediocris; 2<sup>us</sup>. paullò longior; 3<sup>us</sup>. 1<sup>i</sup>. longitudine; 4<sup>us</sup>. elongato-fusiformis, acuminatus, apice pilosus, 3<sup>o</sup>. plus duplò longior: labium ovatum, posticè conoideum; ligula parva, brevis, antice ciliata subtus transversè lineata; palpi 3-articulati, breves, crassi; articulus 2<sup>us</sup>. brevissimus; 3<sup>us</sup>. acuminatus: antennæ validæ, clavatæ, corporis dimidiò plus minusve longiores; articuli 5<sup>o</sup>. ad 10<sup>um</sup>. breves, lati, valde approximati, longitudine decrescentes; clava ovata, compacta, acuminata, articulo 10<sup>o</sup>. duplò longior et paullò latior: thorax ovatus, convexus: prothorax brevissimus: mesothorax maximus; parapsidum suturæ vix conspicuæ: metathorax parvus: abdomen rotundum, planum, subtilissimè squameum, ferè læve, subtus convexum, thorace brevius; segmentum 1<sup>um</sup>. magnum; sequentia breviora, subæqualia: oviductus abdominis apicem non transiens: alæ plerumque latæ; nervus humeralis ulnari multò longior, ramulum rejiciens nullum; cubitalis radiali non longior; stigma ramulum brevissimum emittens.

Sp. 4. Pter. patulus. Fem. *Viridi-æneus, antennis nigris, pedibus rufis, alis limpidis.*

*Æneus, parùm nitens: caput æneo-viride: oculi ocellique obscurè fuscis: mandibulæ rufæ: maxillæ et labium nigro-viridia: lacinia flavæ: ligula albida: palpi fuscis: antennæ nigræ; articulus 1<sup>us</sup>. lætè fulvus: thorax utrinque et subtus viridi-æneus: metathorax viridis: abdomen cupreo-æneum, basi lætè æneo-viride fulvescens: pedes rufi; coxæ virides; genua et tarsi flava, hi*



apice fusci: alæ limpidæ; squamulæ pallidè fuscæ; nervi flavi; stigma minutum. (Corp. long.  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.; alar.  $1\frac{3}{4}$ —2 lin.)

August and September; on windows near London; North Devonshire; Isle of Wight, &c.

Sp. 5. Pter. extensus. Fem. P. patulo *similis*; *minor*; *antennæ graciliores, nigro-fuscæ*; *alæ subfulvescentes*.

Æneus: caput æneo-viride: oculi ocellique obscurè fusci: antennæ nigro-fuscæ; articulus 1<sup>us</sup>. rufus; 2<sup>us</sup>. et 3<sup>us</sup>. fusci; thorax subtus et utrinque æneo-viridis; scutellum cupreo-æneum: abdomen cupreo-æneum, basi lætè æneo-viride: pedes pallidè rufi; coxæ virides; ungues et pulvilli fusci: alæ hyalinæ, albæ, sub costam fulvescentes; squamulæ fulvæ; nervi flavi; stigma minimum. (Corp. long. 1 lin.; alar.  $1\frac{1}{2}$  lin.)

June; New Forest, Hampshire.

Sp. 6. Pter. amplus. Fem. P. patuli *statura*; *antennæ graciliores*; *femora nigro-fusca*; *alæ albæ*.

Æneo-viridis, parùm nitens: caput viride: antennæ nigræ; articulus 1<sup>us</sup>. rufus; 2<sup>us</sup>. viridis, apice fulvus: abdomen cupreo-æneum, basi lætè viridi-æneum: pedes fulvi; coxæ virides; femora nigro-fusca; genua et tarsi flava, hi-apice fusci: alæ hyalinæ, albæ; squamulæ et nervi pallidè fusca; nervus humeralis fulvus; stigma minutum. (Corp. long.  $1\frac{1}{4}$  lin.; alar.  $1\frac{3}{4}$  lin.)

June; Isle of Wight.

Sp. 7. Pter. catillus. Fem. P. patulo *paullò minor et angustior*; *antennæ graciliores*; *femora nigro-fusca*; *alæ subfulvæ*.

Æneus, parùm nitens: caput viridi-æneum: oculi ocellique obscurè fusci: antennæ nigræ; articulus 1<sup>us</sup>. rufus; 2<sup>us</sup>. viridi-fuscus: thorax subtus, utrinque et posticè æneo-viridis: abdomen cupreo-æneum, basi lætè æneo-viride: pedes fulvi; coxæ æneo-virides; femora nigro-fusca; tibiæ fuscæ, basi apice que fulvæ; tarsi flavi, apice fusci; protibiæ et protarsi omninò fulva: alæ subfulvæ; squamulæ fuscæ; nervi fulvi; stigma minimum. (Corp. long.  $1$ — $1\frac{1}{4}$  lin.; alar.  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.)

Var.  $\beta$ .—Antennæ articulo 1<sup>o</sup>. apice fusco.

September; on grass beneath trees, near London; North Devonshire.

Sp. 8. Pter. latus. Fem. *Præcedentibus omninò diversus; antennæ breviores; alæ longiores et latiores.*

Viridi-æneus: oculi ocellique obscurè fuscii: antennæ nigræ, subtus fusca; articulus 1<sup>us</sup>. rufus: scutellum cupreo-æneum: metathorax viridis: abdomen cupreo-æneum, basi quasi contractum, apice viridi-æneum; segmentum 1<sup>um</sup>. lætè viride, basi cupreo-æneum: pedes pallidè rufi; coxæ virides; femora et metatibiæ pallidè fusca, apice basi que rufa; ungues et pulvilli fuscii: alæ hyalinæ, albæ; squamulæ et nervi pallidè fulva; stigma minutum. (Corp. long.  $1\frac{1}{4}$  lin.; alar.  $2\frac{1}{4}$  lin.)

May; near London.

Sp. 9. Pter. domesticus. Fem. P. patulo *simillimus; minor; pedes fuscii.*

Æneus: caput viridi-æneum: oculi ocellique obscurè fuscii: antennæ nigræ; articulus 1<sup>us</sup>. lætè fulvus; 2<sup>us</sup>. fuscus: thorax subtus, utrinque et posticè æneo-viridis: scutellum et abdomen cupreo-ænea: pedes fuscii; coxæ virides; femora viridi-fusca; tarsi flavi, apice fuscii; meso- et metatibiæ apice basi quæ fulvæ; protibiæ et protarsi omninò fulva: alæ sublimpidæ; squamulæ fusca; nervi fulvi; stigma minutum. (Corp. long.  $\frac{1}{2}$ — $\frac{4}{5}$  lin.; alar.  $\frac{3}{4}$ — $1\frac{1}{5}$  lin.)

Var. β.—Thorax æneo-viridis; scutellum æneum.

Var. γ.—Antennæ articulo 1<sup>o</sup>. apice fusco.

Var. δ.—Caput viride: thorax æneo-viridis: metathorax cyaneo-viridis: tibiæ omnes fulvæ.

Var. ε.—Thorax viridi-æneus: caput et metathorax viridia.

Var. ζ.—Var. ε. similis: tibiæ omnes fulvæ.

Var. η.—Antennæ articulo 1<sup>o</sup>. fusco, basi et subtus fulvo.

Var. θ.—Thorax omninò æneus.

Var. ι.—Caput et thorax viridia.

On the windows and walls of houses in infinite numbers during July, and more sparingly throughout the rest of the year.

Sp. 10. Pter. sylvicola. Fem. *Viridi-æneus, antennis pedibusque rufis, alis limpidis.*

Æneus, parùm nitens: caput viridi-æneum: oculi ocellique obscurè fuscii: antennæ rufæ; articulus 2<sup>us</sup>. supra pallidè fuscus: thorax utrinque, subtus et posticè viridi-æneus: abdomen cupreo-æneum,

basi lætè viridi-æneum : pedes pallidè rufi ; coxæ æneo-virides ; genua et tarsi flava ; ungues fusci : alæ limpidæ ; squamulæ fuscæ ; nervi fulvi ; stigma minimum. (Corp. long.  $\frac{2}{3}$ — $\frac{3}{4}$  lin. ; alar.  $1-1\frac{1}{4}$  lin.)

June ; grass beneath trees ; Windsor Forest and New Forest.

Sp. 11. Pter. discus. Fem. *Æneus, antennis fuscis, pedibus rufis, alis subfuscis disco obscuriore.*

*Æneus*, parùm nitens : oculi ocellique obscurè fusci : antennæ fuscæ ; articulus 1<sup>us</sup>. rufus, apice fuscus : abdomen cupreo-æneum, basi apiceque lætè viridi-æneum : pedes rufi ; coxæ æneo-virides ; tarsi flavi, apice fusci ; protarsi rufi : alæ subfuscæ ; discus obscurè fuscus ; squamulæ et nervi fulva ; stigma minutum. (Corp. long.  $\frac{3}{4}$ — $\frac{4}{5}$  lin. ; alar.  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.)

*Var. β.*—Abdomen basi cupreo micans.

September ; Isle of Wight.

### SECTIO III.—Fem.

Corpus squameum, ferè glabrum, plus minusve longum, plerumque angustum : caput mediocre, thoracis latitudine aut paullò latius ; mandibulæ subquadratae, similes, extus ferè rectæ, intus arcuatae, dentibus 4 armatae ; dens 1<sup>us</sup>. s. externus acutus, mediocris ; 2<sup>us</sup>. et 3<sup>us</sup>. breviores, minores ; 4<sup>us</sup>. obtusus : maxillæ longæ, subarcuatae ; laciniæ angustæ, acuminatae, lobatae ; palpi 4-articulati, graciles, filiformes ; articuli 1<sup>us</sup>. et 2<sup>us</sup>. æquales, mediocres ; 3<sup>us</sup>. paullò brevior ; 4<sup>us</sup>. 2<sup>o</sup>. longior, acuminatus : labium longi-ovatum ; ligula brevis, lata, anticè ciliata ; palpi 3-articulati, breves, graciles, filiformes ; articulus 2<sup>us</sup>. brevissimus, 3<sup>us</sup>. acuminatus, 1<sup>i</sup>. longitudine : antennæ sat graciles, corporis dimidio nonnunquam longiores sed plerumque breviores, articulo 5<sup>o</sup>. ad 10<sup>um</sup>. gradatim crassiores et breviores ; clava longi-ovata, articulo 10<sup>o</sup>. plus duplo longior sed non aut vix latior : thorax ovatus, convexus : prothorax minimus : mesothoracis scutum et scutellum maxima ; parapsidum suturæ vix conspicuæ ; paraptera et epimera magna : metathorax parvus : abdomen ovatum aut longi-ovatum, supra planum, subtus carinatum, non compressum nec subtus angulatum, thorace plerumque longius, apice acuminatum et nonnunquam attenuatum ; segmenta subæqualia ; 1<sup>um</sup>. 5<sup>um</sup>. et 6<sup>um</sup>. reliquis paullò longiora : oviductus abdominis

apicem non aut vix transiens: alæ sat latæ; nervus humeralis ulnari multò longior, ramulum rejiciens nullum; cubitalis radiali paullò brevior; stigma ramulum brevissimum emittens.

Subdiv. 1<sup>a</sup>.

Corpus angustum, elongatum: antennæ ejus dimidio multò breviores: abdomen longi-ovatum, thorace multò longius; apex attenuatus, alis otiosis non obtectus.

Sp. 12. Pter. gynotelus. Fem. *Viridis aut æneus, antennis nigris, pedibus flavis, alis sublimpidis.*

Lætè viridis, minimè æneo nitens: oculi ocellique obscurè rufi; articulus 1<sup>us</sup>. obscurè fuscus, basi pallidè flavus: abdomen purpureum; segmenta 1<sup>o</sup>. ad 5<sup>um</sup>. basi lætè viridia: pedes flavi; coxæ virides; genua, meso- et metatarsi pallidè flava, hi apice nigro-fusci; protarsi apice fusci: alæ minimè fulvescentes, ferè limpidæ; squamulæ et nervi pallidè flava, illæ anticè pallidè fuscæ; stigma fuscum, minutum. (Corp. long.  $1\frac{1}{4}$ — $1\frac{1}{3}$  lin.; alar.  $1\frac{1}{2}$ — $1\frac{2}{3}$  lin.)

*Var. β.*—Thoracis latera cupreo notata: abdominis segmenta purpurea, basi et utrinque lætè viridia; 1<sup>um</sup>. lætè viride, cupreo varium.

*Var. γ.*—Cupreo-viridis: abdomen obscurè purpureum; segmenta basi viridi-cuprea, 1<sup>um</sup>. lætè cupreo-viride.

*Var. δ.*—Scutellum cupreo-viride: abdominis segmentum 1<sup>um</sup>. æneo-viride; sequentia basi lætè viridia: femora subfulva.

*Var. ε.*—*Var. δ.* similis; tibiæ subfulvæ.

*Var. ζ.*—Caput viridi-æneum: thorax æneo-cupreus; suturæ æneo-virides: abdominis segmentum 1<sup>um</sup>. lætè cupreum; sequentia basi obscurè cuprea.

On laurels and box-trees, and in hay-stacks, &c. throughout the year; near London.

Subdiv. 2<sup>a</sup>.

Corpus angustum, elongatum: antennæ ejus dimidio breviores: abdomen longi-ovatum, thorace longius, alis obtectum.

Sp. 13. Pter. bracteatus. Fem. *Cupreus aut æneo-viridis, antennis nigris, pedibus flavis, alis plus minusve fulvescentibus.*

Lætè cupreus: caput anticè thoracisque latera viridi-ænea: oculi obscurè fusci: antennæ nigræ; articulus 1<sup>us</sup>. nigro-viridis, basi

ad medium albidum: abdomen purpureum; segmentum 1<sup>um</sup>. lætè cupreum; sequentia basi et utrinque æneo-cuprea: oviductus abdominis apicem paullò superans: pedes flavi; coxæ æneo-virides; genua, meso- et metatarsi pallidè flava, hi apice fusci; protarsi apice fulvi: alæ parùm fulvescentes; squamulæ et nervi flava, illæ anticè fuscæ; stigma fuscum, minutum. (Corp. long. 1—1½ lin.; alar. 1¼—1⅔ lin.)

*Var. β.*—Abdominis segmentum 1<sup>um</sup>. cupreo-viride; sequentia basi cuprea.

*Var. γ.*—Caput et thorax viridi-cuprea: antennæ articulo 1<sup>o</sup>. basi flavo: femora, meso- et metatibiæ fulva: alæ vix fulvescentes.

*Var. δ.*—*Var. γ.* similis: scutellum cupreum: abdomen lætè purpureo-cupreum; segmentum 1<sup>um</sup>. viride, basi cupreum.

*Var. ε.*—Æneo-viridis: antennæ articulo 1<sup>o</sup>. basi flavo: abdominis discus purpureus: alæ vix fulvescentes.

Spring and autumn; on laurels; near London. June; Isle of Wight.

Sp. 14. Pter. herbidas. Fem. *Viridis aut æneo-viridis*, P. bracteato *similis*, abdomine latiore, antennis nigris, pedibus flavis, alis limpidis.

Lætè viridis: oculi obscurè rufi: antennæ nigræ, corporis dimidio multò breviores; articulus 1<sup>us</sup>. flavus, apice fuscus: prothorax cupreo-viridis: abdomen lætè æneo-viride; segmentum 1<sup>um</sup>. viride, cupreo varium; sequentia apice purpurea: pedes flavi; coxæ virides; genua, meso- et metatarsi pallidè flava, hi apice fusci; protarsi apice fulvi: alæ limpidae; squamulæ et nervi flava, illæ anticè fulvæ; stigma fulvum, minutum. (Corp. long. ⅔—1¼ lin.; alar. 1—1⅔ lin.)

*Var. β.*—Antennæ articulo 1<sup>o</sup>. nigro, basi pallidè flavo: prothorax viridis: abdominis segmentum 1<sup>um</sup>. omninò viride: stigma fuscum.

*Var. γ.*—*Var. β.* similis: abdominis segmentum 1<sup>um</sup>. cupreo-viride.

*Var. δ.*—Antennæ articulo 1<sup>o</sup>. nigro, basi flavo: thorax æneo-viridis; mesothoracis scutellum cupreo-æneum.

August; near London.

Sp. 15. Pter. lucidas. Fem. *Cupreo aut æneo-viridis*, P. bracteato aut herbido paullò latior, antennis nigris, pedibus fulvis, alis sublimpidis, stigmatè majore obscuriore.

Cupreo-viridis: oculi obscurè rufi: antennæ nigræ; articulus 1<sup>us</sup>. flavus, apice fuscus: abdomen viridi-æneum; discus cupreo-

purpureus: pedes fulvi; coxæ æneo-virides; genua, meso- et metarsi pallidè flava, hi apice fusci; protarsi pallidè fulvi, apice saturatiores: alæ ferè limpidaë, sub costam minimè fulvescentes; squamulæ et nervi flava, illæ anticè fuscaë; stigma fuscum, parvum. (Corp. long.  $1\frac{1}{4}$  lin.; alar.  $1\frac{1}{2}$  lin.)

Var.  $\beta$ . — Æneo-viridis: abdominis segmenta posticè purpurea: propedum tibiæ tarsique flava, hi apice fulvi.

Var.  $\gamma$ . — Antennæ fuscaë; articulus 1<sup>us</sup>. basi flavus.

Autumn; on laurels; near London.

Sp. 16. Pter. aspilus. Fem. *Cupreo-æneus, præcedentibus propter stigma vix conspicuum diversus, necnon P. bracteato alis latioribus, P. herbido et lucido abdomine angustiore discrepans, antennis fuscis, pedibus fulvis, alis subfulvis.*

Cupreo-æneus, nitens: caput posticè thoracisque segmentorum suturæ æneo-iridia, illum thoracis latitudine: oculi obscurè rufi: antennæ fuscaë; articulus 1<sup>us</sup>. fulvus: abdomen cupreo-iride, longum, angustum, apice cupreo-æneum attenuatum; segmenta 1<sup>o</sup>. ad 4<sup>um</sup>. apice purpurea: pedes fulvi; coxæ æneo-irides; meso- et metatarsi flavi, apice fusci: alæ subfulvæ; squamulæ et nervi flava, illæ anticè fuscaë; stigma minimum, vix conspicuum. (Corp. long.  $1\frac{1}{2}$  lin.; alar.  $1\frac{2}{3}$  lin.)

October; on flowers of the ivy; near London.

Sp. 17. Pter. flammiger. Fem. *Rubro-cupreus, præcedentibus gracilior, antennis nigris, pedibus fulvis, alis quàm P. bracteato angustioribus.*

Rubro-cupreus, longus, angustus: caput cupreum, thorace vix latius, posticè æneo-iride: oculi obscurè rufi: antennæ nigraë; articulus 1<sup>us</sup>. flavus, apice nigro-fuscus: abdomen cupreum, nitens, thorace multò longius; discus purpureus; segmentum 1<sup>um</sup>. basi utrinque iride: pedes pallidè fulvi; coxæ æneo-irides; meso- et metapedum genua et tarsi flava, hi apice fusci: alæ subfulvæ; squamulæ et nervi fulva, illæ anticè fuscaë; stigma pallidè fuscum, minutum. (Corp. long.  $1\frac{1}{4}$  lin.; alar.  $1\frac{1}{2}$  lin.)

Var.  $\beta$ . — Cupreus: caput supra rubro-cupreum, posticè cupreo-iride: abdominis segmenta posticè purpurea.

October; on flowers of the ivy; near London.

Sp. 18. Pter. conspersus. Fem. *Cupreus aut viridi-cupreus, antennis nigris, pedibus fulvis, alis fusco maculatis.*

Cupreus, nitens: caput parvum, breve, thoracis latitudine, anticè viride: oculi obscurè rufi: antennæ nigræ, graciles, corporis dimidio vix breviores; articulus 1<sup>us</sup>. fulvus: thorax brevis, ferè lævis; prothorax viridi-cupreus: abdomen non attenuatum; discus obscurè purpureus; segmentum 1<sup>um</sup>. lætè viride, cupreo micans, posticè purpureum: pedes fulvi; coxæ æneo-virides; femora et tibiæ basi supra pallidè fusca; genua, meso- et metatarsi flava, hi apice fulvi: proalæ subfuscæ; maculæ 4 in cunusque disco magnæ diffusæ fuscæ; squamulæ et nervi fulva; illæ anticè fuscæ; nervus cubitalis quàm cæteris plerisque hujus generis longior; stigma pallidè fuscum, minimum. (Corp. long.  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.; alar.  $1\frac{1}{2}$ — $1\frac{3}{4}$  lin.)

Var. β.—Femora et tibiæ omninò fulva.

Var. γ.—Abdomen cupreo-viride; discus purpureus.

Var. δ.—Viridi-cupreus: abdomen viride; discus purpureus: alarum maculæ ferè aut omninò obsoletæ.

May and August; on windows; near London. It resembles *Cleonymus* in some particulars.

Sp. 19. Pter. oxygyne. Fem. *Æneo-viridis, capite quàm præcedentibus majore, antennis nigris, pedibus flavis, alis limpidis.*

Lætè æneo-viridis, nitens, longus: caput thorace paullò latius: oculi obscurè rufi: antennæ nigræ; articulus 1<sup>us</sup>. fulvus, apice fuscus: abdomen lætè viride, angustum, attenuatum; discus purpureus: pedes saturatè flavi; coxæ virides; femora et protarsi fulva; meso- et metatarsi apice fusci: alæ limpidæ; squamulæ et nervi fulva, illæ anticè fuscæ; stigma minutum. (Corp. long.  $1\frac{1}{2}$  lin.; alar.  $1\frac{3}{4}$  lin.)

Var. β.—Caput et thorax viridia: meso- et metapedum tibiæ apice tarsique pallidè flava, hi apice fusci.

July; near London.

Sp. 20. Pter. megachlorus. Fem. *Viridis, antennis nigris, pedibus fuscis, femoribus viridibus, alis griseo-hyalinis.*

Viridis, nitens: caput thorace latius: oculi obscurè rufi: antennæ nigræ; articulus 1<sup>us</sup>. nigro-viridis: thoracis discus æneo-viridis: abdominis segmentum 1<sup>um</sup>. basi cyaneo-viride; sequentia posticè



cuprea: pedes fuscī; coxæ et femora viridia; meso- et metapedum tibiæ apice et basi tarsique pallidè flava; hi ad apices fuscī; progenua et protarsi subtus fulva: alæ griseo-limpidæ; squamulæ et nervi fusca, illæ anticè virides; stigma obscurius, magnum. (Corp. long.  $1\frac{1}{2}$  lin.; alar.  $2\frac{1}{4}$  lin.)

Found near London.

### Subdiv. 3<sup>a</sup>.

Corpus angustum, elongatum; antennæ ejus dimidii longitudine: abdomen longi-ovatum, thorace vix longius.

Sp. 21. Pter. grandis. Fem. *Viridis, antennis fuscis, pedibus flavis, alis limpidis.*

Lætè viridis, nitens: caput thorace paullò latius: oculi rufi: antennæ fuscæ, graciles, ferè filiformes; articulus 1<sup>us</sup>. pallidè fulvus, apice supra fuscus: prothorax mesothoracisque latera æneo-viridia: abdomen viridi-cupreum, thorace paullò angustius; discus purpureus; segmentum 1<sup>um</sup>. cupreo-viride micans: pedes lætè flavi; coxæ virides; femora fulvæ; metatibiæ basi cingulata fulvo; tarsi apice fuscī; protibiæ et protarsi pallidè fulva, hi apice fuscī: alæ albo-limpidæ; squamulæ et nervi flava, illæ anticè nigræ, stigma fuscum, minutum. (Corp. long.  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.; alar.  $1\frac{3}{4}$ — $2\frac{1}{4}$  lin.)

Var. β.—Thorax supra æneo-viridis.

September; near London. Isle of Wight.

Sp. 22. Pter. aurifer. Fem. *Aureo-viridis, antennis nigris, pedibus flavis, alis limpidis.*

Lætè aureo-viridis: caput viride: oculi obscurè rufi: antennæ nigræ, longæ; articulus 1<sup>us</sup>. flavus, apice nigro-fuscus: abdominis discus purpureus; segmentum 1<sup>um</sup>. cupreum, viridè micans: pedes lætè flavi; coxæ æneo-virides; femora fulva; meso- et metatarsi pallidè flavi, apice nigri; protarsi apice fulvi: alæ limpidissimæ; squamulæ et nervi flava, illæ anticè fuscæ; stigma fuscum, minutum. (Corp. long.  $1\frac{1}{2}$  lin.; alar. 2 lin.)

Found near London.

### Subdiv. 4<sup>a</sup>.—Fem.

Fem.—Corpus mediocre, vix elongatum: antennæ ejus dimidio breviores: abdomen ovatum, thorace paullò longius.

*Mas.*—(P. tenuis.) Corpus breve: caput thorace paullò latius: antennæ subfiliformes, corporis dimidio longiores; articulus 1<sup>us</sup>. validus subfusiformis; 5<sup>us</sup>. et sequentes ad 10<sup>um</sup>. gradatim breviores, non latiores; clava longi-ovata acuminata, articulo 10<sup>o</sup>. plus duplò longior et paullò latior: thorax ovatus: abdomen ovatum thoracis longitudine.

Sp. 23. Pter. robustus. Fem. *Cupreo-æneus, crassus, antennis nigris, pedibus fulvis, alis sublimpidis parvis.*

Æneus, parùm nitens, crassus: oculi obscurè fuscii: antennæ nigræ, validæ; articulus 1<sup>us</sup>. flavus, apice niger: thorax anticè et posticè cupreo-æneus: abdomen lætè viridi-cupreum; discus obscurè purpureus; segmentum apicale chalybeum, paullò attenuatum: pedes fulvi; coxæ æneo-virides; femora fusca; meso- et metatarsi pallidè flavi, apice nigri; protarsi flavi, apice fuscii: alæ breves, ferè limpidae; squamulæ et nervi flava, illæ anticè fuscæ; stigma obscurè fuscum, mediocre. (Corp. long.  $1\frac{1}{3}$ — $1\frac{1}{2}$  lin.; alar.  $1\frac{2}{3}$ — $1\frac{5}{4}$  lin.)

Found near London.

Sp. 24. Pter. nubilus. Fem. *Cupreo-æneus, P. robusto gracilior, antennis nigris, pedibus fulvis, alis subfuscis disco obscuriore.*

Cupreo-æneus, parùm nitens: oculi obscurè fuscii: antennæ nigræ, validæ; articulus 1<sup>us</sup>. flavus, apice fulvus: abdomen lætè viridicupreum; discus et apex obscurè purpurei, hic attenuatus: pedes fulvi; coxæ æneo-virides; femora fusca; genua et protarsi flava, hi apice fulvi; meso- et metatarsi pallidè flavi, apice nigro-fuscii: alæ subfuscæ; macula in cujusque disco diffusa fusca; squamulæ et nervi flava, illæ anticè fuscæ; stigma mediocre, fuscum. (Corp. long.  $\frac{4}{5}$ — $1\frac{1}{4}$  lin.; alar.  $1\frac{1}{4}$ — $1\frac{2}{5}$  lin.)

*Var. β.*—Thoracis discus purpureo-cupreus.

*Var. γ.*—Viridi-æneus: abdomen viride, basi cupreo micans; discus et apex obscurè purpurei: femora obscurè fusca; meso- et metatarsi apice fuscii.

March; on laurels; near London. September; Isle of Wight.

Sp. 25. Pter. perfectus. Fem. *Obscurè cupreus, P. nubili statura, antennis nigris, pedibus fulvis, alis sublimpidis.*

Obscurè cupreus, vix nitens: oculi obscurè fuscii: antennæ nigræ, validæ; articulus 1<sup>us</sup>. basi fulvus: abdomen lætè viridicupreum;

discus et apex purpurei, hic paullò attenuatus: pedes fulvi; coxæ æneo-virides; meso- et metapedum genua et tarsi pallidè flava, hi apice nigri: alæ ferè limpidæ; squamulæ et nervi pallidè fusca, illæ anticè virides; stigma obscurè fuscum, mediocre. (Corp. long.  $1\frac{1}{4}$  lin.; alar.  $1\frac{1}{2}$  lin.)

September; Isle of Wight.

Sp. 26. Pter. apertus. Fem. *Æneo-viridis cupreo varius*, P. perfecti *statura stigmatè minore, antennis nigris, pedibus fulvis, alis limpidis*.

Æneo-viridis, nitens: caput thorace paullò latius: oculi obscurè rufi: antennæ nigræ; articulus 1<sup>us</sup>. viridis, basi fulvus: mesothoracis scutellum et metathorax cupreo-ænea: abdomen cupreo-viride; segmentum 1<sup>um</sup>. nitentius; discus purpureus: pedes fulvi; coxæ virides; femora nisi ad apices fusca; meso- et metapedum genua, tibiæ apice tarsique flava, hi apice fusci: alæ limpidæ; squamulæ et nervi pallidè fulva, illæ anticè nigræ; stigma fuscum, parvum. (Corp. long.  $1\frac{1}{3}$  lin.; alar.  $1\frac{2}{3}$  lin.)

June; Isle of Wight.

Sp. 27. Pter. dives. Fem. *Cupreo-æneus*, P. perfecti *statura, antennæ graciliores nigræ, pedes pallidè fulvi, alæ subfulvæ*.

Cupreo-æneus, nitens: caput æneo-viride: oculi obscurè rufo-fusci: antennæ nigræ, graciles; articulus 1<sup>us</sup>. basi flavus: abdominis segmenta posticè purpurea, nonnulla viridi nitentia; apex obscurè purpureus, non attenuatus: pedes pallidè fulvi; coxæ æneo-virides; genua et tarsi pallidè flava, hi apice fusci; propedum genua tibiæ et tarsi flava, hi apice fulvi: alæ ferè limpidæ, minimè fulvescentes; squamulæ et nervi pallidè flava, illæ anticè fuscae; stigma fuscum, parvum. (Corp. long.  $1\frac{1}{4}$  lin.; alar.  $1\frac{1}{2}$  lin.)

Found near London.

Sp. 28. Pter. cuprinus. Fem. *Cupreus, præcedentibus minor et brevior, antennis nigris, pedibus fulvis, alis subfulvis*.

Cupreus, parùm nitens: caput æneo-viride: oculi obscurè fusci: antennæ nigræ; articulus 1<sup>us</sup>. flavus, apice fuscus: abdomen lætè cupreo-viride, basi angustum, apice non attenuatum; segmenta apice purpurea: pedes pallidè fulvi; coxæ æneo-virides; genua,

meso- et metatarsi pallidè flava, hi apice fusci; protarsi apice fulvi: alæ ferè limpidae, minimè fulvescentes; squamulae et nervi pallidè flava, illæ anticè fuscae; stigma fuscum, parvum. (Corp. long.  $\frac{4}{5}$  lin.; alar.  $1\frac{1}{6}$  lin.)

Found near London.

Sp. 29. Pter. obtusus. Fem. *Viridi-æneus*, P. cuprino *laticornis*, *antennis nigris*, *pedibus fulvis*, *alis limpidis*.

Viridi-æneus: caput posticè viride: oculi obscurè rufi: antennae nigrae; articulus 1<sup>us</sup>. flavus, apice fuscus: abdomen laetè viride, apice non attenuatum; discus purpureus; segmentum 1<sup>um</sup>. viridicupreum: pedes pallidè fulvi; coxae æneo-virides; genua, meso- et metatarsi flava, hi apice fusci: alæ limpidae, latae, apice obtusae; squamulae et nervi pallidè flava, illæ anticè fuscae; stigma fuscum, parvum. (Corp. long. 1 lin.; alar.  $1\frac{1}{4}$  lin.)

Found near London.

Sp. 30. Pter. curtus. Fem. *Viridis*, *præcedentibus brevior*, *antennis nigris*, *pedibus fulvis*, *alis limpidis*.

Viridis, brevis, latus: oculi obscurè rufi: antennae nigrae; articulus 1<sup>us</sup>. flavus, apice nigro-fuscus: abdomen laetè viride, apice non attenuatum; segmentum 1<sup>um</sup>. apice cupreum; sequentia apice purpurea: pedes fulvi; coxae virides; meso- et metapedum genua et tarsi pallidè flava, hi apice nigri; protarsi flavi, apice fusci: alæ limpidae, latae, apice obtusae; squamulae et nervi pallidè flava, illæ anticè fuscae; stigma fuscum, parvum. (Corp. long.  $\frac{4}{5}$  lin.; alar.  $1\frac{1}{2}$  lin.)

September; Isle of Wight.

Sp. 31. Pter. pinguis. Fem. *Cupreus*. P. curto *adhuc laticornis*, *antennis nigris*, *pedibus fulvis*, *alis limpidis*.

Obscurè cupreus, latus, brevis, parùm nitens: caput viride, thorace vix latius: oculi obscurè rufi: antennae nigrae, corporis dimidio vix breviores; articulus 1<sup>us</sup>. flavus, apice fulvus: abdomen æneocupreum, nitens, thorace paullo longius; discus obscurè purpureus: pedes fulvi; coxae æneo-virides; meso- et metapedum genua et tarsi pallidè flava, hi apice fusci: alæ limpidae; squamulae et nervi pallidè fulva, illæ anticè fuscae; stigma pallidè fuscum, minutum. (Corp. long. 1 lin.; alar.  $1\frac{1}{2}$  lin.)

September; near Exeter, Devonshire.

Sp. 32. Pter. chaldeus. Fem. *Cupreus aut cupreo-viridis, præcedentibus gracilior, antennis nigris, pedibus pallidè fulvis, alis minimè fulvis.*

Cupreus, nitens: oculi obscurè rufo-fusci: antennæ nigræ, graciles; articulus 1<sup>us</sup>. basi flavus: abdominis segmenta anticè cupreo-viridia, posticè purpurea; apex vix attenuatus: pedes pallidè fulvi; coxæ æneo-virides; genua et tarsi pallidè flava, hi apice fusci; propedum genua tibiæ et tarsi flava, hi apice fulvi: alæ ferè limpidæ, minimè fulvescentes; squamulæ et nervi pallidè flava, illæ anticè fuscæ; stigma fuscum, parvum. (Corp. long.  $1\frac{1}{4}$  lin.; alar.  $1\frac{2}{3}$  lin.)

Var. β.—Cupreo-viridis: caput æneo-viride: thoracis segmentorum suturæ virides: abdominis apex obscurè purpureus.

Found near London.

Sp. 33. Pter. brevicornis. Fem. *P. chalceo similis, capite minore, antennis brevioribus.*

Cupreus, nitens: caput parvum, anticè viride: oculi obscurè rufi: antennæ nigræ, breves; articulus 1<sup>us</sup>. pallidè flavus, apice obscurè fuscus: abdomen lætè viridi-cupreum; discus et apex purpurei, hic vix attenuatus: pedes flavi; coxæ æneo-virides; femora pallidè fulva; genua, meso- et metatarsi pallidè flava, hi apice fusci; protarsi apice fulvi: alæ ferè limpidæ, minimè fulvescentes, apice obtusæ; squamulæ et nervi flava, illæ anticè fuscæ; stigma fuscum, parvum. (Corp. long.  $1\frac{1}{6}$ — $1\frac{1}{4}$  lin.; alar.  $1\frac{1}{3}$ — $1\frac{1}{2}$  lin.)

Var. β.—Thorax cupreo-viridis: abdominis segmentum 1<sup>um</sup>. lætè viride, cupreo micans; sequentia lætè cuprea: meso- et metatibiæ pallidè fulvæ.

Var. γ.—Thorax viridi-æneus: caput viride, posticè æneo-viride: antennæ articulo 1<sup>o</sup>. nigro, basi fulvo.

Found near London; New Lanark, Scotland.

Sp. 34. Pter. despectus. Fem. *Viridis, P. chalcei statura, abdomini fasciis purpureis, antennis nigris, pedibus flavis, alis limpidis.*

Lætè viridis, nitens: caput thorace vix latius: oculi obscurè rufi: antennæ nigræ; articulus 1<sup>us</sup>. flavus, apice nigro-fuscus: abdomen cupreo-viride; segmenta posticè purpureo fasciata, fasciæ in disco marginem anticum attingentes: pedes lætè flavi; coxæ virides; femora, protibiæ et protarsi fulva; meso- et metapedum tibiæ

fulvo cingulatae; tarsi apice nigro-fusci: alae limpidae; squamulae et nervi fulva, illae anticè fuscae; stigma fuscum, minutum. (Corp. long.  $1\frac{1}{4}$  lin.; alar.  $1\frac{2}{3}$  lin.)

July; near London.

Sp. 35. Pter. affinis. Fem. *Cupreo-viridis*, P. despecto *similis, at minor et brevior, antennis nigris, pedibus fulvis, alis sublimpidis.*

Cupreo-viridis, parùm nitens: caput thorace paullò latius: oculi obscurè rufi: antennae nigrae; articulus 1<sup>us</sup>. basi flavus: abdomen viride, nitens; segmenta posticè purpurea: pedes fulvi; coxae aeneo-virides; genua, meso- et metatarsi flava, hi apice fusci: alae vix fuscæ, ferè limpidae; squamulae et nervi flava, hi anticè fusci; stigma parvum, fuscum. (Corp. long.  $\frac{3}{4}$ —1 lin.; alar.  $1\frac{1}{4}$ — $1\frac{1}{3}$  lin.)

Found near London.

Sp. 36. Pter. fumipennis. Fem. *Viridis aut viridi-aeneus*, P. nubilo *minor et brevior, antennis nigris, pedibus fulvis, alis subfuscis disco obscuriore.*

Aeneo-viridis, parùm nitens, angustus, praecedentis statura at minor: caput thorace paullò latius: oculi obscurè rufi: antennae nigrae, corporis dimidio vix breviores; articulus 1<sup>us</sup>. basi fulvus: abdomen viridi-aeneum, nitens, angustum; discus purpureus: pedes pallidè fulvi; coxae aeneo-virides; meso- et metatarsi flavi, apice fusci; protarsi apice saturatè fulvi: alae subfuscae; macula in cujusque disco maxima diffusa fusca; squamulae et nervi fulva; stigma minutum. (Corp. long.  $\frac{3}{4}$ —1 lin.; alar. 1— $1\frac{1}{4}$  lin.)

Var.  $\beta$ .—Caput et thorax viridia.

Var.  $\gamma$ .—Caput et thorax viridi-aenea: antennae articulo 1<sup>o</sup>. fulvo, apice fusco.

Winter; in haystacks; Spring; on laurels; near London.

Sp. 37. Pter. redactus. Fem. *Viridis aut viridi-aeneus, praecedentis statura et magnitudine, antennis nigris, pedibus fulvis, alis subfuscis.*

Aeneo-viridis, parùm nitens: caput thorace vix latius: oculi obscurè rufi: antennae nigrae, corporis dimidio vix breviores; articulus 1<sup>us</sup>. fulvus, apice nigro-fuscus; abdomen nitens, angustum; discus obscurè purpureus: pedes pallidè fulvi; coxae aeneo-virides,

protarsi apice saturatè fulvi; meso- et metatarsi flavi, apice fuscì: alæ subfuscæ; squamulæ et nervi fulva; stigma obscurius, minus. (Corp. long.  $\frac{2}{3}$ — $\frac{3}{4}$  lin.; alar  $\frac{4}{5}$ —1 lin.)

*Var. β.*—Caput et thorax viridia.

*Var. γ.*—Viridi-æneus: antennæ articulo 1<sup>o</sup>. nigro-fusco, basi fulvo: abdominis discus obscurè purpureus.

*Var. δ.*—Antennæ articulo 1<sup>o</sup>. flavo, apice fusco.

September; Lyme Regis, Dorsetshire; Penzance, Cornwall; Linton, North Devonshire.

Sp. 38. Pter. epistenus. Fem. *Æneus, thorace angusto distinctus, abdomine viridi fasciato, antennis nigris, pedibus fuscis, alis fulvis aut limpidis.*

*Æneus*, parùm nitens, præcedentibus abdomine brevior distinctus: caput æneo-viride, thorace vix latius: oculi obscurè rufi: antennæ nigræ, breves, validæ; articulus 1<sup>us</sup>. flavus, apice fuscus: thorax angustus, abdomine vix brevius: abdomen æneo-purpureum, nitens, thorace multo latius; segmenta basi viridia: pedes fuscì; coxæ æneo-virides; femora æneo-fusca; meso- et metapedum genua et tarsi flava, hi apice fuscì; protarsi fulvi: alæ angustæ, subfulvæ, ad costam saturatiores; squamulæ et nervi fulva, illæ anticè fuscæ; stigma fuscum, parvum. (Corp. long.  $1\frac{1}{6}$ — $1\frac{1}{4}$  lin.; alar.  $1\frac{1}{4}$ — $1\frac{1}{3}$  lin.)

*Var. β.*—Abdominis segmentum 1<sup>um</sup>. lætè viride, apice æneo-purpureum.

*Var. γ.*—Caput et thorax æneo-viridia: antennæ articulo 1<sup>o</sup>. omninè flavo: alæ limpidæ.

Found near London. June; Windsor Forest.

Sp. 39. Pter. purpureus. Fem. *Purpureus, abdomine æneo-viridi, antennis fuscis, pedibus flavis, alis limpidis.*

*Purpureus*, parùm nitens: caput æneo-cupreum, thorace paullò latius, anticè viride: oculi obscurè rufi: antennæ obscurè fuscæ; articulus 1<sup>us</sup>. flavus: thorax angustus, abdomine vix brevius: abdomen æneo-viride, angustum; discus obscurè purpureus: pedes flavi; coxæ æneo-virides; pro- et mesopedum femora et tibiæ fulva; meso- et metatarsi apice fuscì: alæ limpidæ; squamulæ et nervi pallidè flava; stigma minimum. (Corp. long.  $1\frac{1}{6}$  lin.; alar.  $1\frac{1}{2}$  lin.)

Found near London.



Sp. 40. Pter. semifascia. Fem. *Viridi-æneus, antennis fulvis, pedibus fuscis, alis fusco ad stigma maculatis.*

Viridi-æneus, parùm nitens : caput viride, thorace vix latius : oculi obscure rufi : antennæ fulvæ ; articulus 1<sup>us</sup>. pallidior : abdomen basi nitentius ; discus obscure purpureus : pedes fuscii ; coxæ et femora viridia ; meso- et metapedum tibiæ apice tarsique flava, hi apice fuscii ; protarsi fulvi : alæ sublimpidæ, ad cujusque stigma macula fusca in discum producta ; squamulæ et nervi fulva, illæ anticè viridi-fuscæ ; stigma pallidè fuscum, parvum. (Corp. long.  $\frac{3}{4}$  lin. ; alar.  $1\frac{1}{2}$  lin.)

June ; Windsor Forest.

Sp. 41. Pter. venustus. Fem. *Viridi-cyaneus, antennis pedibusque fuscis, alis griseis.*

Viridi-cyaneus, brevis, latus : caput thorace vix latius : oculi obscure rufi : antennæ fuscæ ; articulus 1<sup>us</sup>. fulvus : abdomen æneo-viride, basi nitentius ; discus obscure purpureus : pedes fuscii ; coxæ cyaneo-virides ; genua fulva ; tibiæ apice tarsique pallidè flava, hi apice fuscii ; protarsi supra pallidè fulvi : alæ griseæ ; discus obscurior ; squamulæ et nervi fusca, illæ anticè cyaneo-fuscæ ; stigma obscure fuscum, medioere. (Corp. long.  $1\frac{1}{4}$  lin. ; alar.  $1\frac{3}{4}$  lin.)

*Var. β.*—Caput et thorax cyaneo-viridia : abdomen basi viridicupreum : protibiæ et protarsi fulva, illæ supra pallidè fuscæ.

July ; near London.

Sp. 42. Pter. anticus. Fem. *Cupreo-viridis, antennis fulvis apice fuscis, pedibus fulvis, alis limpidis.*

Cupreo-viridis, parùm nitens : caput viride, thorace paullò latius : oculi obscure rufi : antennæ fulvæ ; articuli 3<sup>us</sup>. et 4<sup>us</sup>. flavi ; 2<sup>us</sup>., 11<sup>us</sup>., 12<sup>us</sup>. et 13<sup>us</sup>. fuscii : abdomen viridicupreum, nitens ; discus purpureus : pedes fulvi ; coxæ æneo-virides ; meso- et metapedum genua, tibiæ apice et tarsi pallidè flava, hi apice fuscii ; propedum genua, tibiæ et tarsi flava : alæ limpidæ ; squamulæ et nervi pallidè fulva ; stigma fuscum, parvum. (Corp. long.  $1\frac{1}{4}$  lin. ; alar.  $1\frac{1}{2}$  lin.)

Found near London.

Sp. 43. Pter. varius. Fem. *Viridi-æneus, antennis pedibusque fuscis, femoribus viridibus, alis subfulvis.*

Viridi-æneus : caput thorace vix latius : oculi fuscii : antennæ fuscæ, graciles ; articulus 1<sup>us</sup>. fulvus : abdomen viridicupreum, acumina-

tum, vix attenuatum, basi lætè viride; discus obscurè purpureus: oviductus rufus: pedes fusci; coxæ et femora viridia; tibiæ apice tarsique pallidè fulva, hi apice fusci: alæ subfulvæ, ad costam saturatiores; squamulæ et nervi fulva, illæ anticè viridifuscæ; stigma fuscum, parvum. (Corp. long.  $\frac{3}{4}$ — $1\frac{1}{8}$  lin.; alar.  $1$ — $1\frac{1}{2}$  lin.)

*Var. β.*—Abdomen purpureum; segmentum 1<sup>um</sup>. lætè viride, apice cupreo-purpureum; sequentia basi utrinque viridia.

*Var. γ.*—Abdominis segmentum 1<sup>um</sup>. cyaneo-viride, cupreo varium. June; New Forest.

Sp. 44. Pter. rufinus. Fem. *Æneo-cupreus, antennis fuscis, pedibus rufis, alis fulvis.*

*Æneo-cupreus*, parùm nitens: caput æneo-viride, thorace vix latius: oculi obscurè fusci: antennæ fuscæ; articulus 1<sup>us</sup>. fulvus, apice nigro-fuscus: abdomen cupreum, basi nitentius; discus obscurè purpureus: pedes rufi; coxæ virides; meso- et metatarsi flavi: apice fusci: alæ saturatè fulvæ, basi apice et posticè dilutiores; squamulæ et nervi fulva, illæ anticè fuscæ; stigma pallidè fuscum, parvum. (Corp. long.  $\frac{2}{3}$  lin.; alar. 1 lin.)

June; Isle of Wight.

Sp. 45. Pter. sequester. Fem. *Cupreo-æneus, viridi varius, antennis pedibusque fuscis, femoribus viridibus, alis limpidis.*

*Cupreo-æneus*, parum nitens: caput viride, thoracis latitudine. oculi obscurè rufi: antennæ obscurè fuscæ, graciles; articulus 1<sup>us</sup>. fulvus: metathorax viridis: abdomen cupreo-purpureum, nitens; segmentum 1<sup>um</sup>. lætè viride, apice cupreo-purpureum; sequentia basi utrinque viridia: pedes fusci; coxæ et femora viridia; genua, protibiæ et protarsi fulva; meso- et metapedum tibiæ apice tarsique flava, hi apice fusci: alæ limpidæ; squamulæ et nervi fulva, illæ anticè virides; stigma parvum, fuscum. (Corp. long.  $1$ — $1\frac{1}{4}$  lin.; alar.  $1\frac{1}{2}$ — $1\frac{3}{4}$  lin.)

*Var. β.*—Antennæ articulo 1<sup>o</sup>. apice fusco.

April; near London. September; Linton, North Devonshire.

Sp. 46. Pter. saturatus. Fem. *Aureo-viridis, antennis fuscis, abdomine cupreo-viride, pedibus fulvis, alis subfulvis.*

Lætè aureo-viridis, angustus: caput thorace paullò latius: oculi obscurè rufi: antennæ obscurè fuscæ; articulus 1<sup>us</sup>. fulvus:

abdomen cupreo-viride, nitens, thorace angustius et paullò longius; segmenta posticè cupreo-purpurea: pedes pallidè fulvi; coxæ æneo-virides; tarsi flavi, apice fuscis: alæ subfuscae, ad costam saturatiores; squamulæ et nervi fulva, illæ anticè fuscae; stigma pallidè fuscum, minutum. (Corp. long.  $1\frac{1}{4}$  lin.; alar. 2 lin.)

Found near London.

Sp. 47. Pter. futilis. Fem. *Viridi-æneus, antennis fuscis, pedibus fulvis, alis subfuscis.*

Viridis: caput thorace vix latius: oculi obscurè rufi: antennæ obscurè fuscae; articulus 1<sup>us</sup>. basi flavus: abdomen viridi-æneum, nitens, thorace paullò longius; discus obscurè purpureus: pedes fulvi; coxæ virides; genua neonon meso- et metapedum tarsi basi pallidè flava: alæ subfuscae; squamulæ et nervi fulva, illæ anticè fuscae; stigma pallidè fuscum, parvum. (Corp. long.  $\frac{4}{5}$  lin.; alar.  $1\frac{1}{4}$  lin.)

New Lanark, Scotland.

Sp. 48. Pter. decorus. Fem. *Viridi-cupreus, P. sequestri similis, antennis crassioribus nigro-fuscis, abdomine viridi nitente, pedibus fulvis, alis sublimpidis.*

Viridi-cupreus, parùm nitens: caput posticè viride: oculi obscurè fuscis: antennæ nigro-fuscae; articulus 1<sup>us</sup>. pallidè fulvus, apice fuscus: abdomen cupreo-viride, nitens; discus purpureus: pedes fulvi; coxæ æneo-virides; meso- et metapedum tibiæ tarsique pallidè flava, hi apice fuscis, illæ fulvo cingulatae; alæ ferè limpidæ, parùm fulvescentes; squamulæ et nervi flava, illæ anticè fuscae; stigma fuscum, parvum. (Corp. long.  $1-1\frac{1}{4}$  lin.; alar.  $1\frac{1}{4}-1\frac{1}{2}$  lin.)

Var.  $\beta$ .—Tibiæ omnes fulvæ.

Var.  $\gamma$ .—Caput posticè æneo-viride.

Var.  $\delta$ .—Abdomen lætè viride; segmentum 1<sup>um</sup>. cupreo et cyaneo micans; sequentium margines postici purpurei, utrinque cuprei.

October; on laurels; near London. New Lanark, Scotland.

Sp. 49. Pter. famulus. Fem. *Viridis aut viridi-æneus, P. decoro similis at paullò brevior, antennis nigro-fuscis, pedibus flavis, femoribus fuscis, alis sublimpidis.*

Viridi-æneus: caput posticè viride: oculi obscurè rufi: antennæ nigro-fuscae; articulus 1<sup>us</sup>. flavus, apice fuscus: abdomen cupreo-viride, nitens; discus purpureus: pedes flavi; coxæ æneo-virides; femora fusca; meso- et metapedum genua et tarsi pallidè flava;

hi apice nigro-fuscæ; protarsi fulvi: alæ limpidaæ, sub costam minimè flavescens; squamulæ et nervi flava, illæ anticè fuscæ; stigma fuscum, minutum. (Corp. long.  $1\frac{1}{4}$  lin.; alar.  $1\frac{1}{2}$  lin.)

*Var. β.*—Caput et thorax viridia: antennæ articulo 1<sup>o</sup>. nigro-fusco, basi flavo.

October; on laurels; near London.

Sp. 50. Pter. perpetuus. Fem. *Viridis aut æneo-iridis, P. famulo simillimus sed angustior, antennis fuscis aut nigro-fuscis, pedibus flavis, femoribus fulvis, alis limpidis.*

*Æneo-iridis:* oculi obscurè rufi: antennæ fuscæ; articulus 1<sup>us</sup>. flavus, apice fuscus: abdomen nitens; discus purpureus: pedes flavi; coxæ æneo-irides; femora fulva, apice flava; meso- et metapedum genua et tarsi pallidè flava, hi apice fuscæ; protarsi pallidè fulvi: alæ limpidaæ; squamulæ et nervi flava, illæ anticè fuscæ; stigma fuscum, minutum. (Corp. long.  $\frac{2}{3}$ —1 lin.; alar.  $\frac{5}{4}$ — $1\frac{1}{2}$  lin.)

*Var. β.*—Viridis: abdominis discus purpureus.

*Var. γ.*—Caput viride: mesothoracis scutellum cupreo-æneum: abdomen viridi-æneum; discus purpureus.

*Var. δ.*—Caput viride: thoracis discus cupreo-æneus.

*Var. ε.*—Tibiæ fulvo cingulataæ.

*Var. ζ.*—Antennæ articulo 1<sup>o</sup>. nigro-fusco, basi flavo.

*Var. η.*—Antennæ nigro-fuscæ.

*Var. θ.*—*Var. ζ.* similis: abdomen basi viridi-cupreum: femora basi fusca.

*Var. ι.*—Femora et protarsi flava, hi apice fuscæ.

*Var. κ.*—Abdomen viride, basi cyaneo-iride; discus purpureus.

Common near London, on the lauristinus, the box, the cypress, &c. throughout the year.

Sp. 51. Pter. viridulus. Fem. *Viridis, P. perpetuo similis sed angustior et plerumque minor, antennis fuscis, pedibus flavis, alis limpidis.*

*Lætè viridis:* oculi obscurè rufi: antennæ fuscæ; articulus 1<sup>us</sup>. flavus, apice fuscus: abdomen cupreo nitens; discus purpureus: pedes flavi; coxæ irides; genua, meso- et metatarsi pallidè flava, hi apice fuscæ; protarsi apice fulvi: alæ limpidaæ; squamulæ et

nervi flava, illæ anticè fuscæ ; stigma pallidè fuscum, minutum.  
(Corp. long.  $\frac{2}{3}$ — $\frac{4}{5}$  lin. ; alar.  $\frac{4}{5}$ — $1\frac{1}{4}$  lin.)

*Var. β.*—Thoracis discus æneo-viridis : femora fulva ; tibiæ fulvo cingulatæ.

*Var. γ.*—Femora basi fulva ; meso- et metatarsi apice nigro-fusci.

*Var. δ.*—Cyaneo-viridis : abdominis discus cupreo-purpureus.

Found with the preceding species ; August ; on windows, &c.

Sp. 52. Pter. tenuis. Mas. *Æneo-viridis, antennis flavis fusco cingulatis et terminatis, abdomine flavo fasciato, pedibus flavis, alis sublimpidis.* Fem. *P. viridulo longior et angustior, antennis fuscis, abdomine immaculato, pedibus fulvis.*

*Mas.*—Æneo-viridis : oculi obscurè rufi : antennæ fulvo-flavæ ; articulus 1<sup>us</sup>. basi flavus, apice supra fuscus ; 2<sup>us</sup>. supra basi, 5<sup>us</sup>. 6<sup>us</sup>. et 7<sup>us</sup>. omninò, 8<sup>us</sup>. basi, 10<sup>us</sup>. et sequentes fusci : abdomen viride, ante medium latè flavo fasciatum ; discus cupreus : pedes flavi ; coxæ virides ; tarsi apice pallidè fusci ; protibiæ et protarsi fulva : alæ ferè limpidæ, minimè fulvescentes ; squamulæ et nervi flava, illæ anticè fuscæ ; stigma pallidè fuscum, minutum.

*Fem.*—Antennæ obscurè fuscæ ; articulus 1<sup>us</sup>. basi flavus : abdomen viridi-æneum, apice paullò attenuatum ; discus purpurascens : pedes fulvi ; coxæ æneo-virides ; genua, meso- et metatarsi flava, hi apice fusci ; protarsi pallidè fulvi, apice saturatiores. (Corp. long.  $\frac{1}{3}$ — $\frac{2}{3}$  lin. ; alar.  $\frac{1}{2}$ —1 lin.)

*Var. β.*—*Mas* et *Fem.* caput et thorax viridia.

*Var. γ.*—*Mas*, antennæ articulis 1<sup>o</sup>. et 8<sup>o</sup>. omninò fulvo-flavis.

*Var. δ.*—*Mas*, antennæ articulis 1<sup>o</sup>. 9<sup>o</sup>. et 10<sup>o</sup>. flavis.

*Var. ε.*—*Mas*, mesotibiæ apice basique necnon metatibiæ basi fulvæ.

*Var. ζ.*—*Fem.* antennæ pallidiores ; articulus 1<sup>us</sup>. nigro-fuscus, basi flavus : abdomen æneo-viride ; discus purpureus : tibiæ pallidè fulvæ.

*Var. η.*—*Fem.* abdomen basi utrinque cupreum.

*Var θ.*—*Fem.* caput et thorax viridi-ænea.

In the spring, summer, and autumn ; on laurels, lime trees, windows, &c. ; near London. September ; Isle of Wight, Isle of Portland.

Sp. 53. Pter. pexatus. Fem. *Viridis, antennis fuscis, scutello cyaneo, pedibus flavis, alis sublimpidis.*

Viridis, *P. perpetuo* simillimus, alæ angustiores: caput thorace vix latius: oculi obscurè rufi: antennæ fusca, subtus flavæ; articulus 1<sup>us</sup>. flavus, apice fuscus: mesothoracis epimera, paraptera et scutellum cyanea; metathorax æneo-viridis: abdomen viridi-æneum; discus obscurè purpureus; segmentum 1<sup>um</sup>. lætè cupreo-viride: pedes flavi; coxæ virides; meso- et metatarsi pallidè flavi; tarsi omnes apice fulvi: alæ ferè limpida, minimè fulvescentes; squamulæ et nervi flava, illæ anticè fusca; stigma minimum. (Corp. long.  $\frac{4}{5}$  lin.; alar.  $1\frac{1}{4}$  lin.)

Found near London.

Sp. 54. Pter. inops. Fem. *Viridi-æneus, P. perpetuo similis, antennis nigro-fuscis, pedibus fulvis, mesofemoribus pallidè fuscis, alis sublimpidis.*

Viridi-æneus, brevis: caput thorace paullò latius: oculi obscurè rufi: antennæ nigro-fusca; articulus 1<sup>us</sup>. niger, basi flavus: abdomen æneo-viride, thorace paullò longius, basi cupreo-varium: pedes fulvi; coxæ æneo-virides; meso- et metapedum genua, tibiæ apice tarsique flava, hi apice fuscis; mesofemora pallidè fusca: alæ ferè limpida, minimè fulvescentes; squamulæ et nervi pallidè flava, illæ anticè obscuriores; stigma fulvum, minimum. (Corp. long.  $\frac{3}{4}$  lin.; alar. 1 lin.)

September; Lyme Regis, Dorsetshire.

Sp. 55. Pter. detritus. Fem. *P. viriduli statura, antennæ graciliores, abdomen latius.*

Æneus, obscurus, *P. innoto* longior, *P. viridulo* thorace brevior distinctus: caput thorace paullò latius: oculi obscurè fuscis: antennæ nigro-fusca; articulus 1<sup>us</sup>. niger, basi fulvus: abdomen cupreum, nitens, basi et utrinque viride, apice paullò attenuatum: pedes fulvi; coxæ æneo-virides; meso- et metatarsi flavi, apice fuscis: alæ parùm fulvescentes; squamulæ et nervi fulva; stigma minutum. (Corp. long.  $\frac{3}{4}$  lin.; alar. 1 lin.)

September; Lyme Regis, Dorsetshire.

Sp. 56. Pter. incitus. Fem. *Purpureo-cupreus, præcedentibus propter antennæ breviores discretus, abdominis segmentis basi viridibus, antennis pedibusque fuscis, alis subfulvis.*

Obscurè cupreus, parùm nitens: caput thorace vix latius: oculi obscurè rufi: antennæ fusca, graciles, corporis triente non lon-

giores; articulus 1<sup>us</sup>. fulvus: thoracis discus cupreo-purpureus: abdomen lætè viride, apice paullò attenuatum; segmenta posticè cupreo-purpurea: pedes pallidè fusci; coxæ æneo-irides; femora viridia, basi apiceque fulva; meso- et metapedum genua et tarsi pallidè flava, hi apice fusci; propedum tibiæ tarsique fulva: alæ subfulvæ, ad costam saturatiores; squamulæ et nervi flava, illæ anticè fuscæ; stigma fuscum, parvum. (Corp. long.  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.; alar.  $1\frac{1}{2}$ — $1\frac{3}{4}$  lin.)

*Var. β.*—Abdominis segmenta viridi-ænea, posticè cupreo-purpurea.

*Var. γ.*—Caput et thorax cupreo-ænea.

*Var. δ.*—Caput viridi-æneum.

Found near London.

Sp. 57. Pter. tristis. Fem. *Viridi-cupreus*, P. inscito *bre-vior, antennis femoribusque fuscis, pedibus flavis aut fulvis, alis sublimpidis.*

Viridi-cupreus, parùm nitens: oculi obscurè rufi: antennæ fuscæ, graciles; articulus 1<sup>us</sup>. flavus: abdomen æneo-iride, nitens; discus purpureus: pedes flavi; coxæ æneo-irides; femora fusca, apice flava; meso- et metapedum genua et tarsi pallidè flava, hi apice fusci: alæ ferè limpidæ, minimè fulvescentes; squamulæ et nervi flava; stigma pallidè fulvum, minutum. (Corp. long.  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.; alar.  $1\frac{1}{2}$ — $1\frac{3}{4}$  lin.)

*Var. β.*—Tibiæ et protarsi fulva.

*Var. γ.*—Viridi-æneus: abdominis segmentum 1<sup>um</sup>. lætè viride, apice cupreo-purpureum; sequentia apice purpurea.

*Var. δ.*—Meso- et metatibiæ fusco cingulatæ.

*Var. ε.*—Abdomen viride; segmenta posticè purpurea.

Found near London.

Sp. 58. Pter. microcerus. Fem. *Cupreo-iridis*, P. inscito *simillimus sed augustior, antennis pedibusque fuscis, femoribus iridibus, alis limpidis.*

Cupreo-iridis, parùm nitens: caput thorace paullò latius: oculi obscurè fusci: antennæ fuscæ, graciles, corporis triente vix longiores; articulus 1<sup>us</sup>. fulvus, 2<sup>us</sup>. viridi-fuscus: abdomen cupreo-iride; segmenta posticè cupreo-purpurea: pedes pallidè fusci; coxæ et femora iridia; hæ apice flava; meso- et metapedum



tibiæ apice tarsique flava, hi apice fuscæ; protibiæ et protarsi sub-  
tus fulva: alæ limpidae; squamulæ et nervi fulva, illæ anticè  
fuscæ; stigma pallidè fuscum, parvum. (Corp. long.  $1\frac{1}{4}$  lin.;  
alar.  $1\frac{1}{2}$  lin.)

*Var. β.*—Meso- et metatibiæ obscurè fuscæ.

June; New Forest, Hampshire.

### Subdiv. 5<sup>a</sup>. Fem.

Corpus mediocre, non elongatum: antennæ ejus dimidio longiores:  
abdomen ovatum, thorace non aut vix longius.

Sp. 59. Pter. repandus. Fem. *Viridis, antennis fuscis,  
pedibus flavis, alis limpidis.*

Viridis: caput thorace latius: oculi obscurè rufi: antennæ fuscæ,  
graciles; articulus 1<sup>us</sup>. flavus: thorax brevis: abdomen nitens,  
parvum, thorace vix longius; discus obscurè purpureus: pedes  
lætè flavi; coxæ virides; genua, meso- et metatarsi pallidè flava,  
hi apice fuscæ: alæ limpidiissimæ; squamulæ et nervi pallidè flava,  
illæ anticè fulvæ; stigma fulvum, minutum. (Corp. long.  $\frac{3}{4}$  lin.;  
alar.  $1\frac{1}{4}$  lin.)

*Var. β.*—Æneo-viridis: abdomen cyaneo-viride; discus purpureus:  
meso- et metatarsi apice fulvi.

*Var. γ.*—*Var. β.* similis: abdomen viride; discus purpureus:  
stigma flavum.

Found near London.

Sp. 60. Pter. latifrons. Fem. *Viridis, antennis nigris,  
pedibus fuscis, alis limpidis.*

Obscurè viridis, parùm nitens: caput thorace paullò latius: palpi  
fuscæ: oculi obscurè rufi: antennæ nigræ, crassæ; articulus 1<sup>us</sup>.  
flavus, apice fuscus: abdomen cupreo-viride, thoracis longitudine,  
angustum; discus obscurè purpureus: pedes fuscæ; coxæ æneo-  
virides; tibiæ pallidè fuscæ, apice basique flavæ; protibiæ, genua,  
meso- et metatarsi flava, hi apice fuscæ; protarsi fulvi: alæ lim-  
pidæ; squamulæ et nervi flava, illæ anticè fuscæ; stigma fuscum,  
parvum. (Corp. long. 1 lin.; alar.  $1\frac{1}{4}$  lin.)

Found near London.

Sp. 61. Pter. quadrinota. Fem. *Cupreo-viridis, antennis  
nigris, pedibus fulvis, alis fusco bimaculatis.*

Cupreo-viridis, brevis, obscurus: caput thorace paullò latius: oculi  
obscurè fuscæ: antennæ nigræ; articulus 1<sup>us</sup>. fulvus apice fuscus:

thorax brevis, convexus: abdomen purpureo-cupreum, nitens, thoracis longitudine, acuminatum, non attenuatum; segmentum 1<sup>um</sup>. cupreo-viride: pedes fulvi; coxæ æneo-virides; femora obscure fusca; meso- et metapedum tibiæ apice basique, genua et tarsi flava, hi apice fulvi: alæ ferè limpidæ, minimè fulvescentes; maculis quæque 2 fuscis, quarum una ubi costam nervus attingit, altera sub stigma; squamulæ et nervi fulva, illæ anticè fuscæ; stigma pallidè fuscum, parvum. (Corp. long.  $\frac{3}{4}$  lin.; alar. 1 lin.)

September; Isle of Wight.

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ART. XLVI.—*Notice on the Entomological Peculiarities of Van Dieman's Land; being Extracts from a Letter by Thomas Winter, Esq. Communicated by WILLIAM SWAINSON, Esq.*

SIR,—Among the circumstances which evince that a more enlarged and philosophic spirit of inquiry has arisen in the minds of our entomologists, is their increased attention to *generals*, rather than an exclusive devotion to *particulars*. The animals of distant regions are not only sought after, but it has at length been found that great interest attaches also to the physical peculiarities of the districts they inhabit, as exercising a powerful influence on the local distribution both of genera and species. Unfortunately, however, this sort of information can only be acquired by personal research; and naturalists, in a foreign country, are usually so absorbed in the fascinating occupation of collecting, that they are generally unmindful of the localities and situations where their different acquisitions are procured. Hence, while our cabinets are daily augmented by new or undescribed species, our knowledge of entomological geography is quite in its infancy. With a view to stimulate the attention of such of our *brethren of the net*, who reside abroad, to circumstances of this nature, and at the same time to contribute something towards so desirable an object, I beg to inclose you the following short notices, written by my friend, Thomas Winter, Esq. now resident in Van Dieman's Land, a gentleman who devoted much of his leisure to entomological pursuits when in his native country,

and from whom I still hope to receive some valuable information upon subjects slightly touched upon in his interesting communication.

Yours, &c.

WILLIAM SWAINSON.

*Tyttenhanger Green, St. Alban's,*

15th Nov. 1834.

“ The southern half of the island of Van Dieman, in its natural state, is a continued series of hill and dale, covered with what is here called *bush*; so that very little level or clear land is to be seen. These hills, moreover, are generally well rounded, and so much alike, that the scene wants variety; besides which, the foliage is invariably of a very sombre hue, approaching nearly to black: this dark colour is to be attributed to the trees, in general, being evergreens, and but few of them have a much lighter shade, even in their spring-shoots. The ‘bush’ varies a good deal in its character in different parts; the most beautiful is when the trees and shrubs are so scattered on hilly ground, as to leave the appearance of a park.

“ In other parts the wildness of the scene (the same that it has been for ages) though cheerless to the settler, is interesting to one unaccustomed to see an inch of ground unoccupied; and this wildness is much added to, by the great quantity of old decayed timber<sup>1</sup> which is lying about in all directions, completely bleached, and assuming all sorts of shapes. In other parts, the bush resembles an old ragged forest thickly timbered with decayed trees. In a wild country like this, for the most part in a natural state, we should expect to meet with trees in the greatest beauty, luxuriating in their natural soil, and growing as if complete lords of the creation; at least, such was what I was led to expect; and I was therefore disappointed and astonished to find that frequently, for many acres together, it would be difficult to find a sound and perfect tree more than ten or fifteen years old. They are generally hollow, ragged, and unhealthy in appearance, while I have seen patches from one to two miles long and perhaps half a mile wide, full of trees standing, but completely dead and white. This is a strange mortality, which has occurred chiefly within the last eight

<sup>1</sup> Surely this “old decayed timber” must contain Coleopterous insects.

years, and cannot be accounted for, unless by the numerous fires that have been made over the whole country in order to help to clear the timber and rough long grass. These dead patches look dreary in the extreme, and one or two which were partially cleared, called forcibly to my mind the sketch of a back settlement in Mrs. Trollop's work. Even where the mortality has not been so general, it is usual to see about one third of the trees dead, while even those which are alive look like ghosts, from shedding their bark each year, which hangs about them in rags, and leaves them always nearly white.

“The absence of underwood is another peculiarity here, for I have seen none whatever, although in some parts there are ‘scrubs’ which it is almost impossible for a dog to get through; these, however, are scarce, and only found in wet land.

“When I first came here, I took up my abode a mile out of town, in the midst of a large garden surrounded by a farm, from the edge of which rise uncultivated hills, covered with trees, shrubs, and coarse grass. In such a spot, in the middle of spring, I concluded that I should soon fill my insect boxes; and you may imagine how much I was disappointed when, on making my first evening rambles, I scarcely found a single insect, with the exception of ants and grasshoppers, which, together with flies, always abound. In vain I searched the foliage for caterpillars and beetles, and equally in vain did I illuminate my window for moths; I could meet with nothing, and gave up the attempt in despair. I soon after made an excursion into the country, and was riding about for a fortnight, but noticed a similar scarcity of animal life; and I frequently rode for hours through an uncultivated country without seeing a living thing, although I kept a sharp look out. I attribute much of this scarcity to the fires that rage during our dry season, destroying all vegetation, with the exception of the highest trees, for many miles in extent; indeed, so numerous are these fires, that I have considered it probable that the whole of the inhabited districts are burnt occasionally; and since these occur during the summer, the destruction of insects and of birds' nests must be very great.

“Nevertheless, as the summer advanced, a large quantity of small Coleoptera made their appearance about the trees; of moths and butterflies I still found but few; and such a deficiency was there of large and handsome insects, that my mania for

collecting never rose above the many obstacles that came in my way, and consequently I have done but little: the chief reason is, that the middle of the day has been wholly occupied by business, and, except in the sunshine, I could never find many specimens. As for birds, I believe there is a considerable variety in the interior, but in this neighbourhood there are hardly any."

"All our trees are more or less punctured by small insects, which cause upon the leaves and branches the most extraordinary deformities that I ever saw;—are such formations worth collecting, or of any use to naturalists? Although I at present feel disposed to make botany my principal study, I shall by no means neglect zoology, when I have opportunity of prosecuting that study; for I am fully aware that no one branch of Natural History can be followed up closely without bringing the observer continually in the way of kindred sciences."

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ART. XLVII.—*Private Lives of Insects.* By RUSTICUS,  
of Godalming.

"Once more upon the waters."—BYRON.

SIR,—Here I am, safe and sound, scribbling away in the sanctum, and "once more upon the waters" of public opinion, far more dangerous and deceptive than those of the Mediterranean—your readers don't see the gist of the comparison, and it's quite as well. Dear, delightful readers, how do you all do? In this table-drawer is a packet; ah! there it is. This packet contains eleven newspapers, all folded up so as to exhibit—ah! it is not worth mentioning, only it makes one feel a little somebodyish, that's all; for one of them, three months old, I gave eighteenpence, because the man said it broke a file:

I don't believe it could, for it's as soft as a rag. So you would not have my log? and in lieu thereof, you bestow upon your readers some abominable Sapphics of your own, and try to palm them off on me: it's all very well! About the turnip fly:—the farmers here have tried salt with great success this year, but I believe the crop has failed nowhere, so we must not make too sure. So the Entomological Society is going to

premium-ize essays on the turnip fly. I think mine contains all that is known on the subject;—I don't say this as a boast, but because mine is genuine experiment; and though the Society may write and write till Cockneyland is drained of ink, they can't experiment; they can't live six or eight years in the country; they can't trace the grub upwards from the eggs, as I have done, watching them shift their skins, and go through every process: they can't do this; the essays, though ever so ingenious, must be smoke, because the means—the capability—there's a word!—of observation, is not within their reach. Yet the Society is right in this, right at bottom; but who are to be the judges? I'll tell you, Mr. Editor; the judges will be persons who don't know a turnip flea or a turnip by sight, unless they see the latter at a greengrocer's, or on the table; and these persons will decide on the essays by the length thereof, and the learning thereof, and the one that is most profound, and most above their comprehension, will receive the prize. But gently! the Society means well, and I leave no safe ground for these comments. I know neither the proposer nor the writer, nor the judge of the prize; for decency sake, I suppose these to be two persons at least. I shall certainly come to the Society's meeting when they are to be read; in the mean time, I will hint to the candidate for fame that the eggs are *not* laid on the seed, as I once supposed. All this is a preface to two little stories.

### *Private Life of the Burying Beetle.*

Ever since I first wore that garment, which in this privileged country is supposed to imply that the wearer thereof is, or is to be, one of the lords of the creation, the house and premises situate to the west of Godalming, and extending from the town to the Gill property at Eshing, have been known by the name of Godbold's: before that great era in the affairs of men, when it pleased my mother to clothe me in the noble garb before alluded to, it was denominated Oglethorpe's. On these subjects, bursting, as they seem to be, with all those *factelli*, or little facts, which make a story pleasant, I must be silent for the present; the only object I have in mentioning Godbold's, is to say that it was there I watched the manœuvres of the burying



beetle. Waring Kidd had shot a bulfinch, but it was spoiled for stuffing, and thrown down as useless by the side of the path just by the bath. Waring Kidd, the prince of bird-stuffers, the man who not only puts wires and cotton wool into the birds, but life and sight, and motion and music! that figure of speech is, I believe, termed hyperbole! It was on this bulfinch, and in this situation, that I had the pleasure of seeing the burying beetle at work.

Two days after, I was again in Godbold's; and seeing the bulfinch lie where he had been left, I lifted him up by a leg, intending to make a present of him to a fine colony of ants established a little further on, in the days of General Oglethorpe, and which had maintained their station ever since. They had made many a pretty skeleton for me, and I intended to add that of a bulfinch to the store, but the buzz of a beetle round my head caught my ear; he flew smack against the bulfinch which I was holding up by the leg, and fell at my feet. I knew that the gentleman was a burying beetle, and as I put the bird down for him, he soon found it, mounted upon it, and, after much examination, opened out his wing cases, and flew away. I will profit by his absence, to tell you a bit of his history.

The burying beetle is about an inch in length; he is black, with two bands across his back of a bright orange-colour; these bands are formed by two blotches of orange-colour on each of the wing-cases: he is a disgusting creature, though in such a gay dress, being so fetid, that one's hands smell for hours after handling him; and if he crawls on one's coat, or other garments not often washed, the smell continues for days. The whole tribe of burying beetles lay their eggs in the bodies of dead animals, which, when possible, they bury for the purpose. In Russia, where death itself does not do away with distinctions, the poor people are buried but a few inches under ground, the coffin consisting of four boards roughly nailed together, and not particularly well fitted; the operation of burying is often at the expense of the country, and therefore done from necessity, not love. This mode affords great pleasure to the burying beetles, as it saves them the labours of the gravedigger. They avail themselves of the bodies placed so nicely within their reach, and the graves are pierced with their holes in every direction; at evening hundreds of these beetles



may be seen in the Russian burying-places, either buzzing about the graves, or sitting placidly at the mouths of their burrows, which lead into them.

The burying beetle in this country seldom finds so convenient a provision for him, and he is under the necessity of taking much more trouble; he sometimes avails himself of dead dogs or horses, but these are far too great rarities to be his constant resort. The common objects of his search are dead mice, rats, birds, frogs, and moles; of these a bird is the most commonly obtained. In the neighbourhood of towns, every kind of garbage that is thrown out attracts these beetles as soon as it begins to smell; and it is not unusual to see them settling in our streets, enticed by the grateful odours of such substances. The burying beetles hunt in couples, male and female; and when six or eight are found in a large animal, they are almost sure to be males and females in equal numbers. They appear to hunt by the nose only, their movements being mostly made in the night, when the faculty of sight is of but little service.

Now to the bulfinch: the beetle soon returned with his bride. Neither seemed at first to discover the exact spot; at last the male espied it, and great comfort he expressed, wheeling in circles about eighteen inches above it, in the manner of an eagle, only some half dozen miles nearer the earth: the female settled on it at once, without this testimonial of satisfaction. The male at last settled also, and the bird underwent the scrutiny of four at least of the senses—touch, smell, sight, and taste—for the heads of both were continually diving among the feathers of the bird, and a savoury and ample meal was made before the great work of burying was began. After the beetles had appeased the calls of hunger, the bird was abandoned for a while, both of them examining, with great care, the earth all round, to see whether it was a decent place for the funeral. Being satisfied as to the decorum of the thing, the operation of burying was commenced by the male; the lady mounting the bird, and for a time sitting quietly upon it, then hiding herself among the feathers, and allowing herself to be buried with it. The male began by digging a furrow all round the bird, at the distance of about half an inch, turning the earth outside; his head was the only tool used in this operation; it was held sloping outwards, and seemed prodigiously powerful.

After the first furrow was completed, another was made within it, and the earth was thrown into the first furrow; then he made a third furrow, but this was under the bird, so that I could only see a bit of him now and then, and I could only judge for a long time of what was going on by the heaving of earth, which formed a little rampart round the bird. As the rampart rose, the bird sank. After three hours' incessant labour, the beetle emerged, crawled on the bird, and took a survey of his work. Here he remained about an hour, still as death—he did not stir hand or foot; he then dismounted, dived again into the grave, and kept on pulling the bird down by the feathers for half an hour: its own weight seemed to sink it but very little. The earth then began heaving and rising all round; it was for all the world like a little earthquake: the feathers of the bird were again pulled, and again the bird descended. At last, after about three hours' more labour, he came up, mounted on the bird, took a survey, and then dropped down to rest as though dead, or suddenly fallen fast asleep. When sufficiently rested, he roused himself, trod the bird firmly into its grave, pulled it by the feathers this way and that way, and, having settled it to his mind, began to shovel in the earth: this he did in a very short time, by means of his broad head. He went behind the rampart of earth, and pushed it into the grave with amazing strength and dexterity, his head being bent downward at first, and then the nose chucked up with a kind of jerk, which sent the earth forwards. After the grave was thus filled up, and the earth trodden in, it underwent another keen scrutiny all round, the bird being completely hidden; he then made a hole in the still loose earth, and having buried the bird, and his own bride, next buried himself.

The female burying beetle lays her eggs in the carcase of the bird, in number proportioned to its size; when this operation is over, and the pair have eaten as much of the savoury viand as they please, they make their way out, and fly away in quest of further adventures. The eggs hatch in two days, and produce flat, scaly grubs, which run about with great activity. These grubs grow excessively fast, and very soon consume all that their progenitors had left. As soon as they are full grown, they leave off eating, and, burrowing deeper in the earth, change to chrysalises. The length of time they remain in this state I don't know; but when changed

to beetles, they make round holes in the ground, from which they come forth.

*Private Life of the Coccus of the Vine.*

One of your correspondents asked a question, some time ago, about the coccus of the vine, and in asking, mentioned a circumstance of which I was then ignorant, and of which I believe many are still ignorant, for I have never seen it elsewhere in print; that out of the coccus there comes a multitude of little red spiders. I have since attended to these cocci, and compiled their history. Here it is:—

Our vines are often annoyed, and sometimes rendered barren, by an insect which is called the vine-gall, or vine-coccus. The harm it does the vines is by pricking holes in the rind, and thereby letting out the sap, or, as the gardeners scientifically term it, making the vines bleed. Our climate is not hot enough for this insect to breed very fast out of doors; but in hothouses it thrives and swarms, often doing great mischief. Sometimes there are such hosts of them, that the young shoots are covered with a white cotton, which is in reality a resinous gum, produced by the cocci. The coccus pierces the bark by means of a sharp and long sucker, which goes to the very centre of the shoot, causing the sap instantly to flow in abundance. This piercing apparatus, although, like other insects' mouths, in the head, is bent so far under the breast, that it appears to proceed from that part, and I find has been often so described. The cocci in the young, or larva state, are all alike; they look just exactly like little tiny tortoises fixed to the rind, and sometimes leaves, of the vine. Like other animals, the cocci are males and females; the males are desperate rovers. When they are tired of vegetating, they push a hole through the back of their tortoise-like shell, and fly away; the females undergo no change in form on coming of age, nor do they ever break loose from their moorings.

The male and female coccus are very different not only in size, but make: the male is a small, active, two-winged fly; the female is a large, lazy, and almost lifeless lump, ten times the size of the male, and so closely attached to the rind of the young shoots on which she feeds, that you cannot get her away without killing her. When the female has attained this

immense size, and her whole body is full of eggs, she begins laying them, her body being glued down all round at the edges to the rind of the twig; but between her body and the rind, except just round the edges, is a quantity of cottony gum, spread over the whole space which she covers. The laying of eggs is on a different system to that of any other insect: the first egg is laid in the cottony substance without causing any disturbance to the margin of her body glued to the rind; it does not stick like most other insects' eggs, but lies quite loose in the cotton; then another is laid, which pushes the first a little forwards; and then another, and another, none of them being visible from without; so that all the eggs that the female coccus lays, she sits on, for all the world, like a broody old hen.

The female coccus, like a good many other insects, when come of age, is a complete bag of eggs. Now you will observe, that as she lays them, and then pushes them under her body, they must raise up the under skin of her body into a manifest concavity; so that the body itself daily gets thinner and thinner, while the pile of eggs which it covers gets thicker and thicker. At last the eggs are exhausted; the under skin of the body meets the upper skin, and grows hard and fast against it; then the old lady dies, and her body, like the roof of a house, protects the inhabitants below from the inclemency of the weather. In a few days from the death of the mother, the eggs hatch, and become lively little runners, of a bright red colour. These first devour the cottony stuff among which they were born; then they manage to lift up the edge of their covering, and away they run, helter-skelter. This active life lasts but a short time: they soon get hungry, pierce the rind of the twigs, anchor themselves by the beak, settle down to serious eating, and become fixtures for life. Yours, &c.

RUSTICUS.

*Godalming, 17th Oct. 1834.*

P. S. At one time I resolved not to touch on any subject previously related by Kirby and Spence, and until the present letter I believe I have not. I now have altered my mind. I shall in future draw no such line, but go to work armed with the instructions which they give me: where they have told

all, I shall be silent; where I find they have told but part, I shall add my mite. By a comparison of the two histories above, it will be evident that the excellent "Introduction" has been consulted; or if not evident, I do not desire to conceal the fact.

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ART. XLVIII. — *Entomological Notes.* By EDWARD  
NEWMAN.

(Continued from p. 315.)

CLASS.—HYMENOPTERA.

NATURAL ORDER.—APATHITES, *Newman.*

GENUS.—MELECTA, *Latreille.*

IT is pleasant to create a smile; and I anticipate that many smiles will be accorded me when I coolly assure your readers, that I am going to make six distinct species out of *Melecta punctata*, and that I cannot, for the life of me, tell to which of these the name *punctata* properly belongs, and therefore have given it to neither. It is pleasant to see one's new species given, without comment, as synonyms; and when this happens, and happen it certainly will to my *Melectæ*, I hope I shall take it as good-humouredly as Mr. Waterhouse did, when he beheld his fourteen new *Notiophili* consigned to utter oblivion.

*All my pretty ones?  
Did you say all? What! all?  
What! all my pretty chickens  
At one fell swoop?*

In these cases there is this comfort, that if the new-made species are really species, they will in the course of time be re-admitted: allow a year for each really new species parted from an old one; then the *Notiophili* will be re-admitted by the year 47, and the *Melectæ*—for I reckon them already struck out—by the year 41.

1. Melec. Tisiphone. *Nigra; corpore, lateribus fusco-cinereo obscure punctatis; capite, tibiisque totis nigris.*

Entirely black, with the exception of obscure lighter markings on the side of the metapodeon and octoon; and two minute cinereous spots on the ennaton within its lateral margin.

Taken in the New Forest, Hampshire, by Capt. Blomer, and obligingly lent to me by Mr. Shuckard.

2. Melec. Megæra. *Nigra; corpore, lateribus obscure albido punctatis, capite nigro, meso- et metatibiis extrorsum fusco-cinereo obscure punctatis ad basin.*

Black: head posteriorly is slightly tinged with fusco-cinereous; scutum of the prothorax, anterior portion of the scutum, and the pleura of the mesothorax with a fusco-cinereous pilosity: on the sides of the metapodeon and octoon are cinereous pilosities, two minute cinereous spots on the ennaton and decaton, within their lateral margin; on the exterior part of the middle and hind tibiæ is an obscure fusco-cinereous mark at the base.

Taken in Herefordshire, in company with *Andrena tibialis*.

3. Melec. Alecto. *Nigra; corpore lateribus obscure fusco-cinereo punctatis; capite fusco-cinereo; mesotibiis extrorsum fere omnino fusco-cinereis.*

Black: head with the clypeus, cinereous; the posterior portion adjoining the prothorax clothed with a fusco-cinereous pilosity: prothorax and scutum of mesothorax fusco-cinereous; scutellum of mesothorax, metathorax, and propodeon black, with black pilosity; lateral portions of these segments clothed with fusco-cinereous pilosity; anterior margin and sides of the propodeon, and octoon, clothed with fusco-cinereous pilosity; the ennaton and decaton each with two minute whitish spots considerably within the lateral margin: middle tibiæ, with the exception of a very small space at each end, fusco-cinereous.

Taken at Epping, Wandsworth, Deptford, &c.; discovered by Mr. Shuckard to be parasitic on *Anthophora Haworthana*.

4. Melec. Clotho. *Nigra; corpore lateribus cinereo punctatis; capite fusco-cinereo; meso- et metatibiis extrorsum cinereo obscure punctatis ad basin.*

Black: head, particularly the clypeus, clothed with a cinereous pilosity; scutal and lateral portions of the pro- and mesothorax

cinereous; scutellum of mesothorax, metathorax, and propodeon black; lateral portions of propodeon cinereous; sides of metapodeon and octoon with cinereous pilosity in distinct patches; the ennaton and decaton each with two white spots considerably within the margin; middle and hind tibiæ with a cinereous mark at the base externally.

Taken round London; is parasitic on *Anthophora retusa*.

5. Melec. *Lachesis*. *Nigra; corpore, lateribus albo octo-maculatis, capite nigro, hirsutie cinereo, clypeo argenteo; tibiis extrorsum argenteo maculatis ad basin.*

Black: head with a cinereous pilosity posteriorly, and also between the antennæ; clypeus of a silvery whiteness; prothorax and mesothorax anteriorly cinereous; the portion of the latter between the squamulæ perfectly black; metathorax and propodeon black, the side of the latter cinereous; metapodeon and three following segments with a bright, decided, and somewhat quadrate white spot on each side: all the tibiæ with a bright white spot at the base exteriorly.

Taken at Darent and Birch Woods, Kent; Dinmore Hill, Herefordshire; on a bank, in company with females of *Eucera Longicornis*.

6. Melec. *Atropos*. *Nigra, hirsuta; corpore, lateribus albo decem-maculatis; capite nigro, clypeo argenteo; tibiis extrorsum cinereo punctatis ad basin.*

Black, very hairy: head with a cinereous pilosity; clypeus and basal joint of the antennæ clothed with hair of a silvery whiteness; prothorax and anterior portion of mesothorax clothed with long cinereous hair; metathorax and propodeon black, sides of the latter slightly cinereous; anterior half of the metapodeon cinereous: this and the four following segments have a bright elongate white spot on each side: all the tibiæ, with the basal portion, cinereous externally: body very short and robust, nearly spherical.

Taken at Leominster, Herefordshire; and near London.

Mr. Kirby describes three of these species in his excellent *Monographia Apum*; the one which he has figured appears to me the *Alecto* of the above series; and Mr. Curtis's beautiful figure represents a variety of *Lachesis*.



NATURAL ORDER.—CYNIPITES, *Newman*.

## GENUS.—FIGITES.

Fig. Syrphi. *Niger*; *tibiis, tarsis, antennisque medio piceis*.

Brilliant shining black: antennæ, with the basal and second joint, black; the four following joints pitchy red, and the apical portion black; the tibiæ and tarsi are pitchy red; the wings transparent, slightly suffused with brown, darker across the middle; their expansion is about four lines; the length of the body is about two lines.

This species does not quite agree with Latreille's description of *Figites Scutellaris* of Rossi, and Mr. Walker tells me that he thinks it is not that species; I have therefore ventured to describe it previously to making the following note. I do not recollect ever seeing any printed account of the economy of this genus, and I believe it is generally concluded that *Figites*, like *Cynips*, is a maker of galls, but this conclusion does not seem founded on observation. I was examining a fine bed of stinging nettles with Mr. Ingall, in September last, in order to find the pupæ of *Atalanta*, which abounded there; we observed numbers of the larvæ of *Syrphus Ribesii* feeding very quietly on *Aphites*. Mr. Ingall called my attention to one of the larvæ, which appeared to have something unusual attached to it; in trying to part this *something* from the larva, I drew out a Hymenopterous insect of considerable magnitude, but unfortunately had handled it so roughly as to spoil it for a cabinet specimen. The next day I observed another of the larvæ in the same plight, and determined to watch the progress of events. I had the satisfaction to see a beautiful *Figites* emerge from the back of the larva, its head being towards the larva's tail; when it was quite disengaged, the poor *Syrphus* still retained life, though reduced to little more than skin. As soon as the *Figites* had expanded and dried his wings, and prepared for flight, I secured him.

## CLASS.—LEPIDOPTERA.

NATURAL ORDER.—PAPILIONITES, *Newman*.

## GENUS.—POLYOMMATUS.

From examining specimens of *Polyommatus Agestis* from different localities, I have arrived at a conclusion which will

not, I fear, be coincided with by many of our Lepidopterists. On the South Downs of Sussex and Kent, *Agestis* assumes what may be called its typical form. I have taken it at Ramsgate, Dovor, Hythe, Hastings, Rye, Brighton, Worthing, Little Hampton, Chichester, Portsmouth, Isle of Wight, Dorsetshire, Somersetshire; and throughout this range it is very similar: then, going upwards, I have met with it at Worcester, Birmingham, Shrewsbury; and here an evident change has taken place, the band of rust-coloured spots has become less bright; at Manchester these spots have left the upper wing almost entirely; at Castle Eden Dean they are scarcely to be traced, and a black spot in the centre of the upper wing becomes fringed with white, in some specimens it is quite white; the butterfly then changes its name to *Salmacis*. We proceed further northwards, and the black pupil leaves the eyes on the under side, until at Edinburgh they are quite gone; then it is called *Artaxerxes*. The conclusion I arrive at is this, that *Agestis*, *Salmacis*, and *Artaxerxes*, are but one species.

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ART. XLIX.—*On the Description of Species.* By the Rev. G. T. RUDD, M. A.

MUCH discouragement often impedes the first steps of the young and ardent collector, from the difficulty he experiences in satisfactorily determining the name of an insect he may capture or possess, in consequence of the vague manner in which the description of it is, too often, drawn up:<sup>a</sup> from the same cause, great and constant perplexity in nomenclature embarrasses the more advanced and practised entomologist. Whoever sits down to investigate and “make out” individuals of a genus in which the described species are numerous, will soon discover the unsatisfactory progress he can attain, the uncertainty in which he remains, after the most careful study of his author as to the specific types to which his several specimens are to be referred.<sup>b</sup> And whenever any particular group becomes the subject of a monograph, we find the writer

<sup>a</sup> Kirby's *Monog. Apum Angliæ*. Gyllenhal's *Insecta Suecica* must be excepted.

<sup>b</sup> The Genera *Harpalus*—*Amara*—*Cercyon*—*Aleochara*, &c. of “The Illustrations,” for examples.

of that monograph expressing the difficulties he encountered in assigning to some or many of the previously-recorded species their proper places, in consequence of the insufficient descriptions of the authors who had characterized them.<sup>c</sup> As a knowledge of species is a necessary basis on which a more scientific structure must be raised, and as every writer on species wishes his labours to result in the instruction of those for whose information they were directed, it becomes important that the descriptions employed should be so accurate, and drawn with such care, that the entomologist may gain, with *certainty* and *facility*, an acquaintance with those objects he desires to recognize, and understand fully the distinctions that separate the species of a genus from each other. Whoever, therefore, undertakes to write a monograph, or to describe species, ought to be perspicuous and simple in his descriptions, employing terms generally received and understood, *and defining such characters only as will at once distinguish the individual from which they are drawn from each and all of its congeners*. If he separates his insects, and raises them to the rank of species on trifling differences, which it requires "an empirical tact to discover," it will no doubt be difficult for him to express, in definite terms, such slight modifications of variation; indeed a very fair question will be raised, how far he is warranted in assigning to such slight differences an amount of value sufficient to determine that they are specific; but if, uninfluenced by the paltry desire of detecting new species, he has proceeded with caution, and has divided one insect from another on INTELLIGIBLE *appearances* of dissimilarity of form, sculpture, size, or colour, he can with accuracy define in words what those visible differences are, and thus convey to his reader a clear idea of the *peculiar distinctive* characters which *mark* each supposed species. B will then be easily recognized from A, — C from A and B, — D from E, — F, G, and H from each other, and from A, B, C, D and E. The business of a describer is, I conceive, to "define differences," and that so clearly, that if an entomologist has but a single species in his collection belonging to the genus described, he may be enabled, on referring to the monograph, to identify it, or to satisfy himself it is unnoticed. It not unfrequently

<sup>c</sup> See Entom. Mag. Vol. II., pp. 254—259.

occurs that a writer distinguishes one species from another, in his specific character, by terms of comparison, as “larger or less,” “broader or narrower,” “smoother or more punctured,” &c. &c. “than the preceding,” or than some other; a mode of description vague and unsatisfactory, and obviously useless in all cases where the investigator does not possess “the preceding” or the standard of comparison, a case of constant occurrence. Such a mode of description ought to be avoided. It is no doubt true that perfectly distinct species are so closely allied, that the line of separation is but slender; still, slender as it may be, it must be such as is capable of being expressed in words, and it is the more necessary to use great care in *giving prominence* to the definition of this *slight character*. I am well aware how trite these observations are, and how forcibly they have been expressed in your first volume; but so long as we find they are neglected by writers, it cannot be unnecessary to call their attention to them. A hint may be of value,—it may induce future describers to look carefully to the execution of the task they undertake, so that their labours may be as useful and as highly esteemed as their intentions are laudable. I would entreat them to weigh well the admirable observation—“Character non est ut genus fiat, sed ut genus dignoscatur.” If they desire a model, let them imitate the unequalled *Monog. Apum Angliæ* of the venerable, the beloved Kirby; or the justly popular work of the distinguished Gyllenhal.

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ART. L.—*Descriptions of some British Species of Anacharis.*  
By FRANCIS WALKER.

ANACHARIS,<sup>a</sup> *Dalman*.—(*Hymenoptera Cynipites*.)

Corpus angustum, convexum. atrum, nitens, læve, compactum, parcè et breviter hirtum: caput mediocre, transversum, subquadratum, thorace paullò latius, sulculis posticè transversis; vertex inter ocellos elevatus: oculi mediocres, laterales, globosi, obscurè rufi: ocelli in triangulo supra verticem positi; medius paullulum ante laterales prostrans: mandibulæ mediocres, arcuatæ, dentibus magnis acutis 3 armatæ: maxillæ longæ, graciles, subarcuatæ; lacinia acumi-

<sup>a</sup> Ἄνα, retrò; κείρω, abscindo.

natae, lobatae; palpi 4-articulati, graciles, longitudine mediocri; articuli 1<sup>us</sup>. et 2<sup>us</sup>. mediocres, lineares, subæquales; 3<sup>us</sup>. longicyathiformis, intus apice angulatus, 2<sup>o</sup>. paullò brevior; 4<sup>us</sup>. subfusiformis, 3<sup>o</sup>. longior et gracilior: labium longum, angustum, ferè lineare; ligula brevis, lata, integra; palpi 3-articulati, breves, clavati; articuli 1<sup>us</sup>. et 2<sup>us</sup>. graciles, lineares, hic brevissimus; 3<sup>us</sup>. longi-ovatus, crassus, 1<sup>o</sup>. longior: antennæ articulis *mas* 14, *fem.* 13, corporis circiter longitudine, graciles, filiformes, pilis brevissimis hirti; articuli 1<sup>us</sup>. et 2<sup>us</sup>. nitidi, glabri, hic subrotundus parvus, ille validus basi gracilior; 3<sup>us</sup>. et sequentes ad postremo proximum graciles, filiformes, longitudine gradatim decrescentes; ultimus subfusiformis, paullò longior: thorax ovatus, altus, posticè angustior, subtus et utrinque punctatus striatus parùm nitens: prothorax minimus, supra vix conspicuus: mesothorax maximus; scuti parapsidum suturæ benè determinatæ, punctatæ, posticè mutuo accedentes; paraptera et epimera conspicua; scutellum subrotundum, extans, basi utrinque impressum, apice abruptè declive: metathorax mediocris, obscurus, scaber, declivis: petiolus gracillimus, teres, glaber, metathorace infimo insertus, longitudine varius: abdomen longiovatum, glabrum, acuminatum; segmenta 6 transversa parallela conspicua, basale magnum, sequentia ad ultimum gradatim decrescentia; segmenta ventralia laminâ angustâ occulta: oviductus brevis, abdominis apicem non transiens: pedes longi, graciles, simplices, recti, pilis brevissimis hirti; tibiæ apice bispinosæ; protibiæ spina unica longa valida curva armatæ; tarsi articulis 1<sup>o</sup>. ad 4<sup>um</sup>. longitudine decrescentibus; 5<sup>us</sup>. 4<sup>o</sup>. longior; ungues et pulvilli parvi: protarsi articulo 1<sup>o</sup>. subtus inciso: alæ mediocres, subtilissimè pubescentes, pili inter costam et nervum 1<sup>um</sup>. longiores: proalæ nervis 4; 1<sup>us</sup>. *s.* longitudinalis alæ basi emergens, subcostam spatio excurrans, dein abruptè flexus illam attingens et alæ apicem accedens; 2<sup>us</sup>. *s.* transversus basalis 1<sup>o</sup>. subcostali excurrente decedens, in alæ discum rectè declivis et desinens; 3<sup>us</sup>. *s.* transversus medius 1<sup>i</sup>. angulo progreditur, in alæ discum excurrit ubi 4<sup>o</sup>. *s.* extimo transverso recurrente jungitur et conficitur: metalæ nervo unico subcostali simplici.

*Fem.* antennæ breviores articulo ultimo crassiore, petiolus brevior, abdomen longius et acutius.

*Anacharis* has many characters, which together distinguish it from the other genera of *Cynipites*; among these, are—the filiform and slender antennæ, about as long as the body; the scutellum smooth and shining, neither gibbous nor acuminate, perpendicular behind, so as to form a right angle when viewed sideways; the long slen-

der polished petiole; the oval compact abdomen; the short concealed ovipositor, and the few and clearly defined nervures of the wings. It differs very much from *Cynips* in the structure of the abdomen, and the nervures of the wings, and has more resemblance to *Figites*; but the latter has the antennæ formed differently, the scutellum tuberculate, the petiole very short, the abdomen compressed, and the nervures of the wings generally more developed. There are some species which will form a new genus: they have thicker antennæ than *Anacharis*, and a rough, punctured, and much shorter petiole, &c. The latter are not uncommon on hedges and lime trees, &c. during the summer and autumn; they run very rapidly, and are probably parasitic.

Sp. 1. *Ana. tinctus*. Mas et Fem. *Petiolo abdominis circiter longitudine, pedibus fulvis aut flavis, alis minimè fulvo tinctis, nervis ferrugineis, extimo piceo.*

Ater aut æneo-ater: antennæ nigræ, subtus nigro-piceæ: petiolus *mari* abdominis longitudine, *fem.* paullò brevior: pedes fulvi; coxæ nigræ; metatrochanteres piceæ; metafemora a basi ferè ad apicem ferruginea; unguis, pulvilli et metatarsi fusci: alæ hyalinæ, minimè fulvotinctæ; squamulæ et nervi ferruginea; nervus extimus transversus crassus, piceus. (Corp. long.  $1\frac{3}{4}$ —2 lin.; alar.  $2\frac{1}{4}$ — $2\frac{1}{2}$  lin.)

*Var. β.*—*Mas.* antennæ nigro-piceæ, subtus ferrugineæ; articuli 1<sup>us</sup>. et 2<sup>us</sup>. nigri: metafemora omninò fulva.

*Var. γ.*—*Fem.* antennæ piceæ, subtus ferrugineæ; articuli 1<sup>us</sup>. et 2<sup>us</sup>. nigri.

*Var. δ.*—*Fem.* antennæ fulvæ, apice fuscæ; articulus 1<sup>us</sup>. niger, 2<sup>us</sup>. piceus: pedes flavi; coxæ nigræ; tarsi apice, unguis et pulvilli fusci; metatarsi fusci, basi fulvi: alæ nervo longitudinali basi flavo.

July; near London. September; Isle of Wight; Machynlleth, North Wales.

Sp. 2. *Ana. typicus*. Mas et Fem. *A. tincto similis, petiolo brevior.*

Ater aut æneo-ater: antennæ nigræ, subtus piceæ: petiolus longitudine  $\frac{2}{3}$  abdominis: pedes flavi; coxæ nigræ; metatrochanteres picei; *fem.* metafemora basi ferruginea; tarsi apice ferruginei; metatarsi *mari* ferruginei, *fem.* fusci: alæ subhyalinæ, nonnunquam minimè fulvo tinctæ; squamulæ et nervi ferruginea; nervus

longitudinalis basi flavus; nervus extimus transversus crassus, piceus. (Corp. long.  $1\frac{1}{2}$ — $1\frac{3}{4}$  lin.; alar. 2— $2\frac{1}{4}$  lin.)

*Var. β.*—*Mas*, metafemora basi ferruginea; metatarsi fusci: alæ nervo longitudinali omninò ferrugineo.

*Var. γ.*—*Mas*, antennæ piceæ, subtus ferrugineæ.

*Var. δ.*—*Mas*, metatrochanteres ferruginei.

*Var. ε.*—*Fem.* antennæ nigro-fuscæ, subtus pallidiores: metafemora omninò flava; metatarsi ferruginei.

July and August; near London. June; Isle of Wight.

Sp. 3. *Ana. eucharoides*. *Mas* et *Fem.* *A. typico similis sed brevior, alæ albo-limpidæ.*

*Cynips Eucharoides*. *Dalman Act. Holm.* 1818. I. 78. 2.  
*Anacharis Eucharoides*. *Dalman Analecta Entomologica*, 95. 6.

Ater aut æneo-ater: antennæ nigro-piceæ, subtus pallidiores; articuli 1<sup>us</sup>. et 2<sup>us</sup>. nigri: petiolus abdominis dimidio longior: pedes flavi; coxæ nigrae; metatrochanteres picei; tarsi apice ferruginei; metatarsi fusci, *fem.* basi flavi: alæ albo-limpidæ; squamulæ et nervi ferruginea; nervus longitudinalis basi flavus; nervus extimus transversus crassus, piceus. (Corp. long. 1— $1\frac{1}{4}$  lin.; alar.  $1\frac{3}{4}$ —2. lin.)

*Var. β.*—*Mas* et *Fem.* antennæ articulo 2<sup>o</sup>. piceo: metapedum trochanteres et tarsi fulvi.

*Var. γ.*—*Fem.* *Var. β.* similis: antennæ articulis 3<sup>o</sup>. ad 13<sup>um</sup>. fulvis.

June; near London; Windsor Forest; Isle of Jersey. September; Isle of Wight.

Sp. 4. *Ana. immunis*. *Mas.* *Præcedenti similis; petiolus multò brevior.*

Ater: antennæ nigro-piceæ, subtus pallidiores; articulus 1<sup>us</sup>. ater: petiolus abdominis dimidio brevior: pedes flavi; coxæ nigrae; metatrochanteres piceæ; metafemora basi ferruginea; tarsi apice et metatarsi omninò pallidè fusci: alæ limpidæ; squamulæ et nervi ferruginea; nervus longitudinalis basi fulvus; nervus extimus transversus crassus, piceus. (Corp. long.  $1\frac{1}{4}$  lin.; alar. 2 lin.)

*Var. β.*—Abdomen subtus fuscum: pedes flavi; coxæ nigrae. Nuper perfectus?

July; near London.



Sp. 5. *Ana. ensifer*. Mas et Fem. *Præcedentibus omninò diversus; petiolus brevior; abdomen compressum.*

Ater: antennæ nigræ, subtus nigro-piceæ; articuli 1<sup>us</sup>. et 2<sup>us</sup>. omninò nigri: petiolus abdominis triente brevior: abdomen fem. præsertim angustum, compressum: pedes rufi; coxæ nigræ; metapedes picei, tibiis rufis apice ferrugineis; fem. mesopedes et profemora rufo-picea: alæ albo-limpidæ; squamulæ et nervi ferruginea; nervus extimus transversus mediocris, piceus. (Corp. long.  $1\frac{1}{4}$ — $1\frac{1}{2}$  lin.; alar.  $2$ — $2\frac{1}{6}$  lin.)

*Var. β.*—Fem. pedes rufi; coxæ nigræ; metapedes ferruginei; trochanteres et tarsi picei.

June; near London; Windsor Forest.

It resembles a *Figites* in the shape of its abdomen.

#### ART. LI.—*Notice of Entomological Works.*

1. *British Entomology, by John Curtis. Nos. 127 to 132. July to December, 1834.*

2. *Illustrations of British Entomology; by J. F. Stephens. Nos. LXV. to LXVIII.*—The author, on the wrapper, announces his intention of completing the work in 24 additional numbers, making the whole work to consist of 14 volumes. In the 9 volumes already before us, the *Coleoptera* and *Lepidoptera* are not yet complete, and no other class is begun. We hope that Mr. Stephens will allow at least an equal space to *Hymenoptera* and *Diptera*, which contain as many species as the two classes he has described; and the *Orthoptera*, *Hemiptera*, and *Neuroptera*, cannot be completed in less than one volume; appendix and tables must take another small volume, thus allowing 20 volumes for the whole work. We assert, without hesitation, that the subject cannot be *well* treated in less, and we are very sorry to hear of this proposition for curtailing the part which is to come. The plan of the work may probably have been too diffuse; but we think it should be continued in the present style, or otherwise the work abandoned when the classes in hand are completed. In the latter case, it will be a

complete and invaluable work; and if not perfect, it is at least as perfect as the present state of the science can make it: it will be a monument of industrious research, and a credit not merely to the individual, but to the country which has produced it.

3. *The London and Edinburgh Philosophical Magazine and Journal of Science. Third Series. No. 25. July 1834.*—In this number are characters of several undescribed species, and of one new genus (*Neriene*) of *Araneidæ*; by John Blackwall, Esq.

4. *Etudes Entomologiques; par M. de Laporte. Livraison 1. Paris, 1834.*—In this work the author proposes a new arrangement of insects, of which the following is the outline:—

A. Mandibulata.

- 1 Order Isoptera (part of Neuroptera of Authors).
- 2 — Hymenoptera.
- 3 — Strepsiptera (Stylops).
- 4 — Neuroptera (part of Neuroptera of Authors).
- 5 — Arkiptera (part of Neuroptera of Authors).
- 6 — Dermaptera (Orthoptera of Authors).
- 7 — Coleoptera.

B. Haustellata.

- 8 — Hemiptera (Hemiptera Heteroptera).
- 9 — Homoptera (Genus Cicada, *Lin.*).
- 10 — Gynaptera (Genus Aphis).
- 11 — Phauloptera (Genus Coccus).
- 12 — Aptera (Anoplura, *Leach*).
- 13 — Siphonaptera (Genus Pulex).
- 14 — Diptera.

5. *Recherches pour servir à l'histoire et à l'anatomie des Phryganides; par François Jules Pictet. Genève, 1834.* 20 Plates.

Our illustrious countryman, the late Sir Humphry Davy, instituted a prize for the encouragement of the physical and natural sciences at Geneva; this prize is allotted to the work before us, which has our unqualified approbation. It contains a history of all preceding works on this tribe; also, figures and descriptions of their external and internal anatomy, and of the species, with many of their larvæ and pupæ, &c. found in the *basin* of Geneva.

6. *Abbildungen zur Berichtigung und Ergänzung Schmettenlingkunde, besonders der Microlepidopterologie, &c. herausgegeben von J. E. Fischer. 1 Heft. mit 5 illuminirten Kupfern. Leipzig, 1834.*—Intended for a supplement to Treitschke's and Hübner's European Lepidoptera, and containing illustrations of the *Tortricites* and *Tineites*, with their larvæ and pupæ: the figures are well coloured.

7. *Die Schmetterlinge von Europa (Fortsetzung des Ochsenheimerschen Werks), von Friedrich Treitschke. Neunter Band. Leipzig, 1832 & 33.*

8. *Deutschlands Fauna, &c. von Jacob Sturm. V. Abtheilung, Die Insecten. Achtes Bündchen. Käfer. Mit 18 illuminirten Kupfertafeln. Nürnberg, 1834.*

9. *De Gammari Pulicis Fabr. Historia Naturali atque sanguinis circuitu commentatio, auctore J. C. Zenker. Accedit Tabula ænea. Jenæ, 1832.*

10. *Beiträge zur Naturgeschichte der Rankenfüßler (Cirripeda). Von Hermann Burmeister. Mit zwei Kupfertafeln. Berlin. 1834.*

11. *Jahrbücher der Insectenkunde, mit besondern Rücksicht auf die Sammlung im Königl. Museum zur Berlin herausgegeben von Dr. F. Klug. Erster Band. Mit 2 illuminirten Kupfertafeln. Berlin, 1834.*

12. *Coléoptères du Mexique; par A. Chevrolat. Fascicules 1 et 2. Strasbourg, 1834.*

13. *Histoire Naturelle des Lépidoptères Rhopalocères ou Papillons diurnes, des départemens des Haut-et Bas-Rhin, de la Moselle, de la Meurthe et des Vosges, publiée par L. P. Cantener. Livraisons 1 et 2. Paris, 1834.*

14. *Abhandlungen der Königlichen Akademien der Wissenschaften zu Berlin. Aus dem Jahre, 1832. Bericht über eine auf Madagascar veranstaltete Sammlung von Insecten aus der Ordnung Coleoptera. Von H<sup>n</sup>. Klug. Berlin, 1834.*

15. *Faune Entomologique de Madagascar, Bourbon et Maurice. Lépidoptères, par le Docteur Boisduval. Avec des notes sur les mœurs, par M. Sganzin, Livraisons 1—8, Paris.*

16. *Hymenopterorum Ichneumonibus affinium, Monographiæ, Genera Europæa et species illustrantes. Scripsit C. G. Nees ab Esenbeck Dr. Volumen Primum. Stuttgartiæ et Tubingæ, 1834.*

17. *Catalogue des Coléoptères de la Collection de M. le Comte Dejean, Livraison 3. Paris, 1833.*

18. *Die Wanzenartigen Insecten. Getreu nach der Natur abgebildet und beschrieben von D. Carl. Wilh. Hahn.; Erster Band, 5, 6 Hefte. 1833. Zweiter Band, 1—4 Hefte. Nürnberg, 1834.*

19. *Die Arachniden. Getreu nach der Natur abgebildet und beschrieben von D. Carl. Wilh. Hahn.; Zweiter Band, 2, 3 Hefte. Nürnberg, 1834.*

20. *Genera et species Curculionidum, cum Synonymia hujus familiæ; a C. J. Schœnherr, &c. Tomus II. Pars 2. Parisiis, 1834.*

21. *Iconographie du Règne Animal de M. le Baron Cuvier; par M. F. E. Guérin. Paris. Livraisons 35 et 36. Insectes, pl. 32, 33, 34, 35, 49, bis, 50 et 66.*

22. *Monographie des Cétoïnes, et Genres voisins, &c.; par M. H. Gory, et M. A. Percheron. Livraisons 4—6. Paris, 1833.*

23. *Iconographie, &c. des Coléoptères d'Europe; par M. le Comte Dejean, et M. le Docteur J. A. Boisduval. Tome IV. Livraisons 3, 4, 5 et 6.*

24. *Magasin de Zoologie; par F. E. Guérin. Paris, 1833, 1834.*—With figures and descriptions of several insects; among them *Trochalonota* and *Malagocaster*, two new genera

of *Colcoptera*; also observations on the *Melasomata*, by M. Guérin, who announces that he is about to publish a complete monograph on that family of *Coleoptera*.

25. *Revue Entomologique, publiée par Gustave Silbermann. Strasbourg. Livraisons 9 et 10. 1834.*—The Chief essay in these numbers is entitled “Observations critiques sur la synonymie des Carabiques, par M. Aug. Brullé.”

26. *Annales des Sciences Naturelles. Tome Premier. Zoologie Février et Mars. Paris, 1834.*—Among the entomological articles, are continuations of the two essays which we mentioned in p. 317 of our last number.

27. *Annales de la Société Entomologique de France. Tome III. Trimestres 1, 2 et 3. Paris, 1834.*—The classification of *Cerambycidæ*, by M. Audinet Serville, is here concluded. These numbers also contain, 1. A long essay on the *Serricornes*, or *Elateridæ*, and neighbouring genera, by the late Latreille. 2. On the species of *Coccus* which inhabit the environs of Aix, by M. Boyer de Fonscolombe. 3. Observations, by the same author, on the genera *Lithurgus* and *Phylloxera*; the latter a new genus allied to *Aphis*. One species is described (*P. Quercus*) which is gregarious in all stages of growth, beneath the leaves of oak trees in Provence. 4. An excellent monograph of the *Rhipiceridæ*, by M. F. de Laporte, whose Monograph of the *Diaperidæ* and Essay on the *Hemiptera*, &c., have already placed him high among all entomologists. 5. Catalogue of the *Lepidoptera* of the department of Lozère, by M. Duponchel. 6. Observations on the tribe of *Hydrophilidæ*, by M. Solier. 7. On two new species of *Ichneumonidæ*, the one parasitic upon the larva of *Myrmeleon formicarium*, the other on *Barynotus elevatus* and *Otiorhynchus lignarius*, by M. Boudier. 8. On the *Platyomidæ*, or *Tortricites*, by M. Duponchel. 9. An essay on the *Coleoptera Heteromera*, by M. Solier, &c.

28. *Histoire Naturelle des Lépidoptères, ou Papillons de France, par Godart, continuée par M. Duponchel. Tome IX. Nocturnes; Tome VI., livraison 2. Supplément, &c.; Tome I. livraisons 15 et 16. Paris.*

29. *Iconographie des Chenilles, &c.*; par M. Duponchel. Tome I. Livraison 10. Paris.

30. *Icones Historiques des Lépidoptères nouveaux ou peu connus*; par le Docteur Boisduval. Livraisons 25 et 26. Paris.

31. *Collection Iconographique et Historique des Chenilles, &c.*; par MM. Boisduval, Rambur et Graslín. Livraisons 23 et 24. Paris.

32. *Nouveaux Mémoires de la Société Impériale des Naturalistes de Moscou. Tome III. Moscou, 1834. Notice sur quelques Lépidoptères des Antilles, avec la description de plusieurs espèces nouvelles, par M. Menetries.*

33. *The management of Bees,; &c. by Samuel Bagster, jun. Bagster: London, 1834.*—This is the most complete, concise, and interesting history of bees that we have ever met with: the author gives us no great deal of his own, but in his selections and quotations from the highest authorities in apiarian lore he has shown great judgment. The work is illustrated with numerous *good* wood-cuts, and an excellent coloured plate, from a drawing by Mr. Charles Curtis. We have lately been so talkative on bees that we must not say more at present, or our readers will think us infected with a bee-mania.

34. *Sketch of the Natural History of Yarmouth; by C. J. and James Paget. Longman: London, 1834.*—An interesting and meritorious publication, and one which has given us much pleasure. All *local lists* are very valuable, but—we wish we had never to use *buts*—there is a fault in all *local lists* that we have seen; it is this: there is a difficulty in getting the rarer species named at a distance from London, and therefore these go unnamed, and make no appearance in the list. The same objection we made to Mr. Wilson's *Entomologia Edinensis*, and in making it we were a little misunderstood. Mr. Wilson, doubtless, in his researches, met with many species which it was difficult or impossible to identify; now these were the very insects about which an entomologist would have felt interested.

we doubt not that the insects described are natives of the Edinburgh district, but they are, nearly all of them, distributed over the kingdom, and, probably from the greater number of entomologists, seem to be remarkably abundant in the London district: we therefore felt disappointed. We perfectly agree with *all* of Mr. Swainson's remarks at p. 439.

35. *The Grammar of Entomology; by Edward Newman. Westley and Davis: London, 1835.*—This work has long been the chief *desideratum* in Entomology. We have seen it in sheets, and shall simply announce the plan on which it is written, by giving its contents. It is divided into four books; each book is introduced with an engraving by Mr. Ingall.

#### BOOK I.—HISTORY OF INSECTS.

Chapter I. History of Insects in general.—II. Silkworm.—III. Apple-Moth.—IV. Mosquito.—V. Bot.—VI. Bee.—VII. Ichneumon.—VIII. Burying Beetle.—IX. Apple Weevil.—X. Earwig.—XI. Locust.—XII. Coccus.—XIII. Hop-fly.—XIV. Ant-lion.—XV. White Ant.—XVI. Concluding Observations.

#### BOOK II.—PHYSIOLOGY OF INSECTS.

Chapter I. Physiology of Insects in general.—II. Organs of Support in general.—III. Organs of Support in the Head.—IV. Of the Wings and Legs.—V. Of the Characters of Surface.—VI. Of Muscles.—VII. Of Nerves.—VIII. Of the Alimentary Canal.—IX. Of the Organs of Circulation.—X. Of the Organs of Respiration.—XI. Concluding Observations.

#### BOOK III.—CLASSIFICATION OF INSECTS.

Chapter I. Classification of Insects in general.—II. Classification of Lepidoptera.—III. Diptera.—IV. Hymenoptera.—V. Coleoptera.—VI. Orthoptera.—VII. Hemiptera.—VIII. Neuroptera.—IX. Concluding Observations.

#### BOOK IV.—PRESERVATION OF INSECTS.

Chapter I. Apology for the Collector of Insects.—II. Dress and Instruments of the Collector.—III. On Capturing Insects.—IV. On Killing and Setting Insects.—V. Entomological Cabinets.—VI. Entomological Books.—VII. Entomological Investigations.—VIII. Entomological Societies.



36. *Lardner's Cabinet Cyclopædia*. No. LIX. *A Preliminary Discourse on the Study of Natural History*, by William Swainson, Esq. London: Longman, 1834. Every naturalist should possess this work.

ART. LII.—*Varieties*.

47. *Addendum to Mr. Bird's communication at p. 39*.—SIR, In looking at my contribution to the volume of the Entomological Magazine completed with the present number, poor as the contribution is, it may be worth while to correct what is wrong, and to add something to it.—P. 42, line 1. “Those which I do not take by the lamp.” I intended to limit this to the class, *Lepidoptera*.—P. 43. In the list of *Coleoptera*, *Callistus lunatus* should be omitted; I take it at Caversham, seven miles off, on chalk. In the list of *Diptera*, I ought to have inserted *Chironomus æstivus*. ♂ During the present year, I have added to the Burghfield insects *Tipula nigra?* *Notodonta perfusca*, *Clostera reclusa*, *Sesia Bombyliformis*, and *Nonagria crassicornis*. I have taken a few specimens of *Grammesia bilinea*, *Argyrolepia Turionella* and *Sargus Reaumuri*. *Cynthia Cardui* has been very common here. We have seen a few specimens of *Colias Electra*.

Burghfield,  
13th October, 1834.

Yours, &c. C. S. BIRD.

48. *Capture of Deilephila Celerio and D. Galii*.—I have had the good fortune to procure this autumn a specimen of each of these rare British *Sphingites*. *Galii* was taken on a major convolvulus about the middle of the ninth month (September), in a sort of court-yard; there was no other plant near it. *Celerio* was taken on a heap of stones early in the tenth month (October), and brought to me alive. Four specimens of *Colias Hyale* have been taken here this autumn by different collectors.

Brighton,  
24th Nov. 1834.

ISAAC GRAY BASS.

49. *Query respecting Hyale and Lathonia*.—SIR, Can you inform me what authority Mr. Standish has for saying that

*Hyale* and *Lathonia* have been taken this year in Northumberland? I am pretty sure that I know all the collections in the county, and have never heard of such captures; indeed, I think them extremely improbable. I have both insects from the south of England.

Newcastle,  
14th October, 1834.

GEORGE WAILES.

50. *Colias Europome* again.—SIR, In a list of Worcestershire *Lepidoptera*, prepared by an excellent and most indefatigable naturalist, Mr. Edwin Lees, of Worcester, and recently published in the appendix to a lecture by Dr. Hastings, occurs the following notice of this insect: “*Colias Europome* has been noticed in the meadows near the confluence of the Avon and Severn, flying with great swiftness in August, but is a rare insect.” The following notices, from the same list, seem worthy of a corner in your Magazine. “*Colias Chrysothème*.—Rare. Near Worcester, in the cabinet of Mr. A. Edmonds.” “*Vanessa Antiopa*.—Very uncommon; but has been captured at Barbourne, near Worcester.” “*Lycæna dispar*.—Very rare in this county: a solitary individual has been taken.” “*Polyommatus Acis*.—Taken at Hawford, near Worcester, and in the Trench woods.” “*Deilephila Livornica*.—Near Worcester; but rare. *D. Celerio*.—Rare.” In addition to these, I may add, that a fine specimen of *Argynnis Lathonia* was taken some years back by my friend, Samuel Alexander Burlingham, of Worcester, not far from the town.

Deptford.

EDWARD NEWMAN.

51. *Nyssia zonaria*.—My brother, Benjamin Cooke, found a pupa in the sand in September, 1832, in the same locality where I have captured the moth, from which he hatched a female on the 27th of February, 1833. About the same time, a considerable number of moths were found; and during the same month of the present year I found them so abundant, that I could scarcely walk without treading on them. I have only observed them about one locality; but I think it is very probable they may be found on other parts of the coast.

Leicester,  
17th Nov. 1834.

NICHOLAS COOKE.

52. *Curious economy of Gyrimus Villosus*.—The Memoirs

of the Belfast Natural History Society for January, 1834, contain a notice by Mr. Robert Patterson, V. P. of the discovery of an unusual inhabitant in a fresh water shell (*Limnæus pereger*). When the shell was taken out of the pool, its mouth was stopped with what appeared a mass of clay; but proved to be a fragment of some aquatic plant of suitable length, the space between it and the margin of the aperture being filled with slime. The interior of this mass was lined with a soft, whitish, silky substance, which extended to the margin of the aperture. The chamber was occupied by a living individual of *Gyrinus villosus*. Nothing was observed by which the object of this occupancy might be explained. A member of the Society, Mr. G. C. Hyndman, referring to the habits of *G. natator* which is transformed in a silken cocoon, suggested that the larva of *G. villosus* might have taken possession of an empty shell in which to undergo its change, and that the beetle found in it might be recently disclosed; but the fact, that the cocoon of the former is suspended above water, is unfavourable to this view.

*Quære?* Is this an accidental occurrence, or does it indicate a peculiarity in the habits of this Subgenus?

A. H. HALIDAY.

53. *Psychoda nervosa*.—I have bred this insect in great numbers from putrescent Boleti.

A. H. HALIDAY.

54. *Chlorops lineata*.—This insect is always very abundant in houses during the spring and autumn; but in September and October last it quite darkened the ceilings and windows in Middlesex and Hertfordshire with its innumerable hosts, and is common, even now, in December. The larva is unknown.—N.

55. *On the Husk in Cattle*.—SIR, Having a disease among my young cattle which appears but little understood, at least in this part of the country, and which threatens to be somewhat formidable in its effects, I am induced to communicate, as far as my observations enable me, although the results have not been satisfactory, some account of it; partly for the benefit of those who may have seen less, and partly to solicit information through your useful columns, from those who may have seen more of the disease than myself. It first made its

appearance among my weaning calves, from two to nine months old, twenty of which were weaned off, and seven younger ones still fed from the pail, and kept near home; both lots became affected about the same time, which is about a month since; the whole twenty-seven have had it, eight have died, some have got better, scarcely any have quite recovered; some have died in a few days, others linger for weeks. They are reared on milk, hay tea, linseed jelly, gruel made from wheat meal and pot liquor, with salt mixed, and fed three times a day.

The symptoms are, cough, (particularly when driven,) short breathing, with a discharge of frothy saliva at the mouth, dullness, and hanging of the head and ears. I first treated it for inflammation on the lungs, by bleeding, blistering the sides, and opening drenches of Epsom salts with oil. When one or two had died, I recollected having seen in the "Farmer's Journal," some years ago, an account of a disease with symptoms somewhat similar, caused by worms in the throat, and which was stated to have been cured by pouring turpentine into the nostrils. On opening those that had died, I found the worms inside the windpipe, and down into and throughout the lungs, from one to three inches long, and very white, so that when the lungs were cut open, they had the appearance of being interwoven with white thread; I examined them with a microscope, — they are somewhat like a common earthworm, but whiter. I tried several experiments as to what would kill them quickest. I found lime, salt, and spirits of turpentine, all effectual, even mixed with water; but the difficulty is getting any thing to the part so as to come in contact with the disease, the stomach and lungs being so completely separate.

Mr. White, of Wells, in Somersetshire, in his Treatise on Cattle Medicine, says, — the "hoarse or cough generally attacks calves in winter, and is caused by very small worms being engendered in the branches of the windpipe. It is sometimes cured when attended to early, but if neglected at this period, more commonly proves fatal. The remedy that has been found most effectual is a drench, composed of a tablespoonful of oil of turpentine, a little sweet oil, with six ounces of warm water, poured into the nostrils; probably the worms would be destroyed if the calf were made to breathe the vapour of oil of turpentine, or a mixture of turpentine and tar. I succeeded in one case, that was rather recent, by giving two

ounces of common salt, dissolved in water, and a moderate quantity of good hay, morning and evening. The cause is, probably, a cold moist atmosphere, and an insufficient quantity of wholesome food."

In the "Complete Grazier," a work of considerable merit, the "Cough" in calves is treated on merely as a common cough, arising from frequent colds caused by vicissitudes of the weather, and the cure recommended is "half a table-spoonful of spirit of turpentine poured into the nostrils."

Mr. Green, of Westerham, who is an experienced and practical man, says he has frequently had the disease in his cattle, and has never found any great difficulty in curing them, by giving about a quart of decoction of walnut leaves as a drench; he termed it the "Husk;" and had observed it to have been caused by worms in the lungs and windpipe. I have been trying this remedy, among others, for the last fortnight, but without the slightest appearance of success. The manner in which I did it was, to fill a copper with walnut-leaves chopped fine, then as much water as the copper would hold, boiled it for five or six hours, and gave the liquor warm to the calves; some drank it readily from the pail. I allowed some to drink from two to three quarts, and repeated it every other morning. I have persevered with the turpentine and oil, both as drenches and in the nostrils, (having plenty of subjects to experimentalize upon.) To some I have given grains of calomel; to others strong doses of sulphur; rubbing in oil of turpentine on their sides, thinking it possible it might do good by absorption, tarring the noses of all, sick or well, every two days, and giving salt frequently.

Having ascertained that a small quantity of lime would kill the worms when taken out, it struck me that if the cattle were made to inhale the particles of it when fresh slaked, it might be beneficial. I accordingly put them in a close building, put a quantity of lime on the floor, and threw a little water over it, keeping their heads over it during the emission of the gas, as long as they could bear it, and when run to powder swept and buffeted it about till some were ready to drop of suffocation; this I repeated every two days, but, (although I still have as much faith in the efficacy of this as in any remedy I have heard of,) I cannot boast of any very evident benefit from it; I think it may be possible that a sufficient quantity of the particles of lime may be inhaled, the caustic properties of which may

destroy the worms without destroying the life of the animal. I have consulted several veterinarians, most of whom appeared to think the disease in some measure infectious, but are not very well agreed as to the cause and cure. Mr. Coleman, who is perhaps considered at the top of the profession, advises the affected ones to be separated from the healthy, and recommends the smoke of tobacco to be inhaled, and to allow them oilcake to eat; he is of opinion that being kept in close stench places is likely to cause it; but this could not have been the cause with mine, which were weaned in April, May, and June, and have been in the fields entirely. Some think they have taken the worms from something which may have engendered them in the water they have drunk; but this could not have been the case with those still kept to the pail. Others think the worms originated from a fly, perhaps taken in with the breath; and some, even at the present day, are superstitious enough to attempt to keep off the husk by twisting a hazel withe round the necks of their cattle; this shows it to be a disease not much understood.

I have understood the disease is more prevalent this year than usual; and, as far as I am able to judge, it will not only affect the young, for I find several of my yearling heifers and milch cows have the same kind of cough; but it does not appear to take so great an effect on them as on the calves; they appear healthy, except the cough, and keep their condition.

Should any of your readers be able to furnish information as to the cause, prevention, or cure, through the medium of your paper, I feel confident it would be esteemed a favour by many, but particularly so by

Yours respectfully,

GEORGE COLGATE.

*Brockley, Lewisham, Sept. 22, 1834.*

[We have transferred this to our pages from the Maidstone Gazette, in order to elicit the remarks of our contributors.]—  
ED.

56. *Copy of a Letter addressed to the Secretary of the Entomological Society of London.*—SIR, I beg to hand you my resignation of membership in the Entomological Society, and to state, that the reason for my doing so, is the appearance of that Society's official attack on the Entomological Magazine, in the Introduction to the Transactions. That *any* Society should deliberately and officially attack a private undertaking,



under *any* circumstances, I conceive to be a degradation to itself, and a departure from sound principle; but that a Society, which the Entomological Magazine has invariably advocated, through good report and through evil report, should turn round and attack its most *faithful* and most *sincere* friend, appears to me the height of injustice, and renders it any thing rather than an honour to be enrolled among its members. That the Society should avail itself of a jocular article published in the Entomological Magazine as the reason for the attack, makes a weak cause weaker still.

I am, Sir, your obedient servant,

Deptford.

EDWARD NEWMAN.

57. *Notes on Deilephila Euphorbiæ*.—SIR, When I presented the plates of *Deilephila Euphorbiæ*, you expressed a wish for some particulars as to its localities, &c., although these have already been given by Mr. Curtis and Mr. Stephens. In the autumn of the year 1806, I first visited the north of Devon; and at the village of Instow, opposite Appledon, the first caterpillar was brought me by a fisherman. I forwarded it to the late Professor Fuseli, keeper of the Royal Academy, &c., who considered it to be *Sphinx Kæchlini*; indeed, it is very like that insect, as figured by his brother, both in the larva and chrysalis state. See Plate 4, *Fuesly's Archives*. The larva died without changing. I know not if it may be considered foreign to my subject, if I here state, that the late Mr. F. was an enthusiastic entomologist, and had a fine collection of drawings and books of natural history, and I recollect his once chiding me for apathy, and concluded by saying, "When I was of your age, I often went, at two and three o'clock in the morning, into the corn fields and woods to collect for my brother, and many of the insects figured by him were from my drawings." And to show you that it was not quite lost in the decline of his life, I will here mention, that on the conclusion of his last Lecture, and when descending the rostrum, Mr. Cooper kindly offered his assistance, he said, "I thank you; O, is it you, Cooper? Well, where is Raddon? Has he taken *Atropos*?" He was then upwards of eighty. *Deilephila Euphorbiæ* is a very difficult insect to rear, as the following extract from a letter received from Mr. Fuseli, dated December 26, 1815, will verify:—"Of the



numerous pupæ (upwards of twenty) which you left with me, and I with Lady ——, one only has given the Sphinx, and that was a very beautiful one, of a rose-coloured hue, a variety rarely met with. The remainder of the pupæ are *in statu quo*, and I believe are well. They often take two years before they arrive at their last evolution." [The remainder died.—W. R.] About the same time, I gave Dr. Leach a number of chrysalides; but I learnt that not one] produced the perfect insect. I have neither taken, nor been able to procure, a single insect, in any state, since 1819, until this year a single chrysalis, which was captured on the 3d of October, and spun itself next day into a place of rest, by attaching the dried leaves of its food together. The person who sent me this, says, "The valley in which you desired me to search is completely filled up by the sand, and the whole surface quite altered by the winds." Captain Blomer, who resided for some years near the locality, and visited it often, was not able to capture one, and Mr. Cocks, an able and very zealous entomologist of that vicinity, says, in a letter dated August last:—"It is now ten years since I took the larva; and although I have regularly been in the habit of visiting the locality every year several times, I have never been fortunate enough to take it since." That you may imagine how plentiful they were in the year 1814, I would not then capture any but what were full fed; and after one day's pursuit, I had forgotten to take any food, and was in the boat, on my return home, when I begged the boatman to put back. It was nearly dusk; I jumped ashore, and hastily cut an arm full of spurge, and at night put it into water. The next morning, on going to feed the larvæ I had brought home, I found the food was covered with, I should suppose (for I did not count them), not less than a hundred minute larvæ about a day or two old. I have thus given you my rough notes on this insect. If you think them worth an insertion in your valuable Magazine, they are at your service; and I remain

Yours most truly,

4, Trafalgar-square, Queen's Elms,  
20th October, 1834.

W. RADDON.

58. *Death of Mr. Say, the American Entomologist.*—The death of this illustrious man took place on the 10th of October, 1834, in the forty-seventh year of his age, at

Harmony, in the state of Indiana. He was throughout life one of the most simple and retiring of men; his habits, mode of address, and clothing, seem to carry one back to the patriarchal ages, yet he was well informed on all subjects, and perfectly acquainted with the scientific and political events of the day. He inquired, with an eager interest, of every person capable of affording him information, and was equally willing to communicate, in the most pleasing and easy manner, any information which he possessed. He took a peculiar pleasure in instructing the young, and so managed his discourse, that even children considered him as a kind and agreeable friend, and an enjoyable companion, rather than a tutor. The *Athenæum*, of 20th December, noticing his death, gives the following extract from the *United States National Gazette*:—

“To his native genius, supported by untiring zeal and indefatigable research, the Academy of Natural Sciences of Philadelphia is indebted for its opening reputation. Mr. Say was among the earliest members, if not one of the founders, of this institution. His original communications to the Society alone, in the most abstruse and laborious departments of Zoology, Crustacea, Testacea, Insecta, &c. of the United States, occupy more than 800 printed pages of their journal. His Essays, published in the Transactions of the American Philosophical Society, the Annals of the Lyceum of Natural History at New York, in Silliman’s Journal, &c. are equally respectable, perhaps equally numerous. His contributions to the American Encyclopedia, though highly valuable, are not so generally known. His separate work on American Entomology, and another on Conchology, have met with the approbation of the learned. With the brilliant results of his laborious exertions, as naturalist to the two celebrated expeditions by the authority of the United States Government, under the command of Major, now Lieut.-Colonel S. H. Long, the reading public is already familiar. Some years previously, he accompanied Mr. M’Clure, and other kindred spirits, on a scientific excursion to the Floridas. The pages of the Academy’s Journal were subsequently enriched by the fruits of this undertaking. These expeditions, with occasional excursions made with similar views, in the vicinity of Philadelphia, constitute the only interruptions to a laborious course of studies, steadily and unostentatiously pursued in his native

city, in which many departments of natural science were successfully cultivated, and extensively enriched by his observations and discoveries. Our lamented friend had recently devoted much of his time to the publication of his work on American Conchology, elucidated by expensive plates. He might have continued thus usefully employed for many years, had not the climate on the Wabash proved injurious to his health. He repeatedly suffered from attacks of fever and dysenteric affections, by which a constitution originally robust and inured to hardship materially suffered. A letter announcing the sad catastrophe, which deprived society of one of its worthiest members, and science of one of its brightest ornaments, informs us, that Mr. Say suffered another attack of this disorder similar to that by which his constitution had already been shattered, about the 1st of October; on the 8th, the hopes of his friends were flattered by a deceitful calm; on the day following, these hopes were chilled; he appeared sinking under debility; when, on the 10th, death came over him like a summer cloud. He died intestate, and without issue, but left with his wife verbal directions relative to the final disposition of his library and cabinet of natural history." Our readers who are acquainted with the present state of society in America, who know that the spirit of the United States is essentially commercial, not scientific, will see much to admire in the course of Thomas Say, and will not fail to join with us in shedding a tear of sympathy on his early grave.

59. *Brachinus crepitans*.—I was wandering with Mr. Marshall over the chalky fields in the neighbourhood of Box-hill, in September last, when we found that almost every flint contained beneath it specimens of *Brachinus crepitans*. As I put them, one after another, into my spirit bottle, the little bombardiers fired away, as they sank in the spirits, each about four "pops," every pop being easily felt, like a slight electric shock, by the hand which grasped the bottle; a small bladder of air ascended with every pop. We hunted most assiduously for *Licinus*, without finding a single specimen of either species. Mr. Bennett, who had been over the ground a fortnight before, was equally unsuccessful in this respect.

E. N. D.

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# LIST OF THE GENERA AND SPECIES

DESCRIBED IN THIS VOLUME.

## LEUCOPSIS *Fabr.*

- gigas Fabr.*  
*nigricornis Del.*  
*intermedia Ill.*  
*varia Klug.*  
*Biguetina Jur.*  
*dorsigera Fabr.*  
**SMIERA** *Spin.*  
*nigrifex Sulg.*  
*sispes Linn.*  
*subpunctata Guild.*  
*fulvescens Guild.*  
**EPITRANUS** *Walk.*  
*fulvescens Guild.*  
**CHALCIS** *Fabr.*  
*femorata Panz.*  
*flavipes Latr.*  
*distinguenda Del.*  
*tibialis Del.*  
*annulipes Del.*  
*cingulata Del.*  
*minuta Linn.*  
*podagrica Fabr.*  
*vicina Del.*  
*parvula Del.*  
**HALTICELLA** *Spin.*  
*pusilla Fabr.*  
**HOCKERIA** *Del.*  
*bispinosa Fabr.*  
*bifasciata Del.*  
*hetera Del.*  
*nigra Del.*  
*nigripes Fons.*  
*rufipes Oliv.*  
*unicolor Walk.*  
**NOTASPIS** *Walk.*  
*formiciformis Guild.*  
**DIRHINUS** *Dalm.*  
*cornigerus Jur.*

## APHIDIUS *Ess.*

- Crepidis Hal.*  
*constrictus Ess.*  
*pictus Hal.*  
*Pini Hal.*  
*infulatus Hal.*  
*Laricis Hal.*  
*Rosæ Hal.*  
*lutescens Hal.*  
*Arenæ Hal.*  
*Ervi Hal.*  
*Urticæ Hal.*  
*Asteris Hal.*  
*Ribis Hal.*  
*Cirsii Hal.*  
*Eglanteriæ Hal.*

## Salicis *Hal.*

- leucopterus Hal.*  
*Matricariæ Hal.*  
*Arundinis Hal.*  
*fumatus Hal.*  
*exiguus Hal.*  
*ambiguus Hal.*  
*ephippium Hal.*  
*dissolutus Hal.*

## PSILUS *Jur.*

- fucicola Walk.*  
**FIGITES** *Latr.*  
*subapterus Walk.*

## CEROCEPHALA *West.*

- cornigera West.*  
*formiciformis West.*  
**MACROGLENES** *West.*  
*oculatus West.*

## ASAPHES *Walk.*

- vulgaris Walk.*

## ISOSOMA *Walk.*

- flavicolle Walk.*

## SYSTOLE *Walk.*

- platytera Walk.*

## EURYTOMA *Ill.*

- acuminata Del.*

- squamea Del.*

- rufitarsus Del.*

- Salicis Del.*

- flavipes Del.*

## DECATOMA *Spin.*

- semifasciata Del.*

- flavicollis Walk.*

## MONODONTOMERUS *West.*

- obsoletus Fabr.*

- cereus Del.*

## DIOMORUS *Walk.*

- nobilis Walk.*

## CALLIMOME *Spin.*

- inconstans Del.*

- lateralis Del.*

- rufipes Del.*

- compactus Del.*

- confusus Del.*

## ORMYRUS *West.*

- tubulosus Fons.*

## PERILAMPUS *Latr.*

- nitens Del.*

- antennatus Del.*

- violaceus Panz.*

- auratus Panz.*

- splendidus Dalm.*

- lævifrons Dalm.*

## DIPARA *Walk.*

LIST OF GENERA AND SPECIES.

- cinetoïdes *Walk.*  
 MERISUS *Walk.*  
 splendidus *Walk.*  
 ORMOCERUS *Walk.*  
 latus *Walk.*  
 simplex *Walk.*  
 vernalis *Walk.*  
 maritimus *Walk.*  
 MICRADELUS *Walk.*  
 rotundus *Walk.*  
 GLYPHE *Walk.*  
 autumnalis *Walk.*  
 GASTRANCISTRUS *West.*  
 fuscicornis *Walk.*  
 compressus *Walk.*  
 tenuicornis *Walk.*  
 vagans *West.*  
 viridis *Walk.*  
 atro-purpureus *Walk.*  
 laticornis *Walk.*  
 tenebricosus *Walk.*  
 fumipennis *Walk.*  
 unicolor *Walk.*  
 obscurellus *Walk.*  
 vulgaris *Walk.*  
 terminalis *Walk.*  
 annulipes *Walk.*  
 crassus *Walk.*  
 angulus *Walk.*  
 acutus *Walk.*  
 MEROMALUS *Walk.*  
 flavicornis *Walk.*  
 RHAPHITELUS *Walk.*  
 maculatus *Walk.*  
 PSILONOTUS *Walk.*  
 adamas *Walk.*
- 
- MELIGETHES *Kby.*  
 nigra *Newm.*  
 CATHERETES *Kby.*  
 glabra *Newm.*  
 MICROPEPLUS *Latr.*  
 obtusus *Newm.*  
 TRICHOPTERYX *Kby.*  
 Titan *Newm.*  
 ATOMARIA *Kby.*  
 gutta *Newm.*  
 CRYPTOPHAGUS *Herb.*  
 scutellatus *Newm.*  
 TETRATOMA *Herb.*  
 picta *Newm.*  
 RHYZOPHAGUS *Herb.*  
 collaris *Newm.*  
 RHYZOPERTHA *Steph.*  
 cincta *Newm.*  
 RIPIPTERYX *Newm.*  
 marginatus *Newm.*
- 
- LEUCOSPIS *Fabr.*  
 gigas *Klug.*  
 Shuckardi *West.*  
 subnotata *West.*  
 Hopei *West.*
- Spinolæ *West.*  
 assimilis *West.*  
 Sicelis *West.*
- 
- MIRAX<sup>7</sup> *Hal.*  
 rufilabris *Hal.*  
 ACÆLIUS *Hal.*  
 Germanus *Hal.*  
 subfasciatus *Hal.*  
 MICROGASTER *Latr.*  
 Mediator *Hal.*  
 spectabilis *Hal.*  
 ingratus *Hal.*  
 infumatus *Hal.*  
 russatus *Hal.*  
 globatus *Linn.*  
 annulipes *Cur.*  
 Spinolæ *Hal.*  
 meridianus *Hal.*  
 messorius *Hal.*  
 luctuosus *Hal.*  
 alvearius *Fabr.*  
 consularis *Hal.*  
 flavipes *Hal.*  
 calceatus *Hal.*  
 equestris *Hal.*  
 albipennis *Hal.*  
 infimus *Hal.*  
 candidatus *Hal.*  
 xanthostigma *Hal.*  
 lacteipennis *Cur.*  
 annularis *Hal.*  
 decorus *Hal.*  
 hilaris *Hal.*  
 contaminatus *Hal.*  
 arenarius *Hal.*  
 sodalis *Hal.*  
 dilectus *Hal.*  
 Coniferæ *Hal.*  
 exilis *Hal.*  
 umbellatarum *Hal.*  
 lateralis *Hal.*  
 vitripennis *Hal.*  
 callidus *Hal.*  
 exiguus *Hal.*  
 fulvipes *Hal.*  
 popularis *Hal.*  
 immunis *Hal.*  
 glomeratus *Linn.*  
 placidus *Hal.*  
 lineola *Cur.*  
 præpotens *Hal.*  
 intricatus *Hal.*  
 vestalis *Hal.*  
 ruficus *Hal.*  
 gracilis *Cur.*  
 rubripes *Hal.*  
 prætextatus *Hal.*
- 
- PIPUNCULUS *Latr.*  
 maculatus *Walk.*  
 sylvaticus *Meig.*  
 geniculatus *Meig.*

LIST OF THE GEERAN AND SPECIES

flavipes Meig.  
 pratorum Fall.  
 campestris Latr.  
 modestus Hal.  
 ruralis Meig.

auctus Fall.  
**CHALARUS** Walk.  
 spurius Fall.  
 holosericeus Meig.

---

**SELADERMA** Walk.

lætum Walk.  
 bicolor Walk.  
 convexum Walk.  
 breve Walk.

**SEMIOTUS** Walk.

mundus Walk.  
 clarus Walk.  
 tarsalis Walk.  
 Scoticus Walk.

variatus Walk.  
 præstans Walk.  
 diversus Walk.

quadratus Walk.  
 mærens Walk.

**SYSTASIS** Walk.

encyrtoides Walk.  
 tenuicornis Walk.

**EUNOTUS** Walk.  
 cretaceus Walk.

**MERAPORUS** Walk.

graminicola Walk.  
 alatus Walk.

exiguus Walk.

**METASTENUS** Walk.

concinus Walk.

**METOPON** Walk.

atrum Walk.

**PLATYTERMA** Walk.

nobile Walk.

laticorne Walk.

teliforme Walk.

prasinum Walk.

cincticorne Walk.

terminale Walk.

**AMBLYMERUS** Walk.

amænus Walk.

dubius Walk.

validus Walk.

---

**ERISTALIS** Fabr.

stygius Newm.

**PSEUDOPSIS** Newm.

sulcatus Newm.

---

**PLATYTERMA** Walk.

incultum Walk.

comptum Walk.

femorale Walk.

decorum Walk.

remotum Walk.

**AMBLYMERUS** Walk.

ruralis Walk.

campestris Walk.

latus Walk.

truncatellus Walk.

fulvipennis Walk.

modestus Walk.

fuscipes Walk.

humilis Walk.

albitarsus Walk.

nitescens Walk.

pusillus Walk.

tenuicornis Walk.

hebes Walk.

tenellus Walk.

fulvipes Walk.

stupidus Walk.

manus Walk.

linearis Walk.

temperatus Walk.

iners Walk.

trossulus Walk.

stenomerus Walk.

tenebricus Walk.

mirus Walk.

**PLATYMESOPUS** West.

tibialis West.

**MESOPOLOBUS** West.

fasciiventris West.

**EUTELUS** Walk.

dilectus Walk.

immaculatus Walk.

signatus Walk.

pygmæus Walk.

diffinis Walk.

jucundus Walk.

placidus Walk.

ocellus Walk.

eximius Walk.

platycerus Walk.

bicolor Walk.

platynotus Walk.

sobrinus Walk.

catenatus Walk.

inornatus Walk.

fulvicornis Walk.

flavipes Walk.

æquus Walk.

planus Walk.

gracilis Walk.

helvipes Walk.

posticus Walk.

elevatus Walk.

intermedius Walk.

semotus Walk.

altus Walk.

chlorospilus Walk.

fuscipennis Walk.

politus Walk.

vagans Walk.

---

**PYGOSTOLUS** Hal.

sticticus Fabr.

**ANCYLUS** Hal.

muricatus Hal.

## DESCRIBED IN THIS VOLUME.

lituratus *Hal.*  
 excrucians *Hal.*  
 edentatus *Hal.*  
**CENTISTES** *Hal.*  
 cuspidatus *Hal.*  
**LEIOPHRON** *Nees.*  
 mitis *Hal.*  
 pallipes *Cur.*  
 picipes *Cur.*  
 accinctus *Hal.*  
 similis *Cur.*  
 intactus *Hal.*  
 fulvipes *Cur.*  
 pallidistigma *Cur.*  
 apicalis *Cur.*  
**EMBOLEMUS** *West.*  
**CINETUS** *Sur.*  
**ISMARUS** *Hal.*  
**MIRAX** *Hal.*  
 Spartii *Hal.*

---

**MEGISTOCERA** *Wied.*  
 dispar *Walk.*  
**TIPULA** *Linn.*  
 ramicornis *Walk.*  
**LIMNOBIA** *Meig.*  
 vicaria *Walk.*  
**CTENOPHORA** *Meig.*  
 vilis *Walk.*  
 bella *Walk.*  
**BIBIO** *Geof.*  
 imitator *Walk.*  
**PSILOPUS** *Meig.*  
 cingulipes *Walk.*  
 tricolor *Walk.*  
 connexus *Walk.*  
**THEREVA** *Latr.*  
 misella *Walk.*  
**BRACHYOPA** *Hoff.*  
 rufocyanea *Walk.*  
**HELOPHILUS** *Meig.*  
 griseus *Walk.*  
**ANTHRAX** *Fabr.*  
 extensa *Walk.*

---

**PTEROMALUS** *Swed.*  
 cavus *Walk.*  
 decedens *Walk.*  
 perversus *Walk.*  
 patulus *Walk.*  
 extentus *Walk.*  
 amplus *Walk.*  
 catillus *Walk.*  
 latus *Walk.*  
 domesticus *Walk.*  
 sylvicola *Walk.*  
 discus *Walk.*  
 gynotelus *Walk.*  
 bracteatus *Walk.*  
 herbidus *Walk.*  
 lucidus *Walk.*  
 aspilus *Walk.*

flammiger *Walk.*  
 conspersus *Walk.*  
 oxygyne *Walk.*  
 megachlorus *Walk.*  
 grandis *Walk.*  
 aurifer *Walk.*  
 robustus *Walk.*  
 nubilus *Walk.*  
 perfectus *Walk.*  
 apertus *Walk.*  
 dives *Walk.*  
 cuprinus *Walk.*  
 obtusus *Walk.*  
 curtus *Walk.*  
 pinguis *Walk.*  
 chalceus *Walk.*  
 brevicornis *Walk.*  
 despectus *Walk.*  
 affinis *Walk.*  
 fumipennis *Walk.*  
 redactus *Walk.*  
 epistenus *Walk.*  
 purpureus *Walk.*  
 semifascia *Walk.*  
 venustus *Walk.*  
 anticus *Walk.*  
 varius *Walk.*  
 rufinus *Walk.*  
 sequester *Walk.*  
 saturatus *Walk.*  
 futilis *Walk.*  
 decorus *Walk.*  
 famulus *Walk.*  
 perpetuus *Walk.*  
 viridulus *Walk.*  
 tenuis *Walk.*  
 pexatus *Walk.*  
 inops *Walk.*  
 detritus *Walk.*  
 inscitus *Walk.*  
 tristis *Walk.*  
 microcerus *Walk.*  
 repandus *Walk.*  
 latifrons *Walk.*  
 quadrinota *Walk.*

---

**MELECTA** *Latr.*  
 Tisiphone *Newm.*  
 Megæra *Newm.*  
 Alecto *Newm.*  
 Clotho *Newm.*  
 Lachesis *Newm.*  
 Atropos *Newm.*  
**FIGITES** *Latr.*  
 Syrphi *Newm.*

---

**ANACHARIS** *Dalm.*  
 tinctus *Walk.*  
 typicus *Walk.*  
 Eucharoides *Dalm.*  
 immunis *Walk.*  
 ensifer *Walk.*





E R R A T A.

---

- Page 14, line 10, 14, 15, page 22, line 10, 14, for *cæteri propedum read cæteris ut propedes.*
- 21, — 22, for *in-canaliculo read in canaliculo.*
- 24, — 18, 21, for *nigrificis read nigrifice.*
- 26, — 8, for *maris read mari.*
- 93, — 18, for *posticè read postici.*
- 96, — 18, 37, } for *substigmatè read sub stigmatè.*
- 97, — 14, }
- 149, — 6, for *Cerophala read Cerocephala.*
- — 9, for *nigro-fuscus, nitens, ferè glaber read nigro-fusca, nitens ferè lævis.*
- 151, — 32, for *cozæ read coxæ.*
- 163, — 30, page 164, line 27, page 165, line 29, for *sub-costam read sub costam.*
- 166, — 9, for *per ejus read ejus.*
- 177, — 4, for *cupreum, breve, crassum read cupreus, brevis, crassus.*
- 179, — 14, for *proalæ subcosta, fusco read proalæ sub costam fusco.*
- 194, — 30, for *immutable read inimitable.*
- 222, — 20, for *Ediniensis read Edinensis.*
- 231, — 25, } for *5-annulatum read 6-annulatum.*
- 232, — 16, }
- 232, — 17, for *totum read totius.*
- 233, — 37, for *cubitali read radiali.*
- 234, — 6, after *retogens insert*,
- — 17, for *cuique read quæque.*
- 235, — 13, for *nigro-fusca read nigro-fusci.*—"A similar error recurs frequently."—*Mr. Haliday.*
- 245, — 2, for *latius; read latius,*
- — 27, 28, for *nigra, intermedia summo apice; read nigra; intermedia summo apice,*
- 248, — 9, for *variis; read variis,*
- 254, — 22, for *vix read viz.*
- 259, — 15, after *Mer. Ins. II. insert 43.*
- 264, — 14, }
- 269, — 24, } for *connecti read connexi.*
- 287, — 16, for *radialis read cubitalis.*
- 288, — 29, for *quæque read quæque.*
- 305, — 23, for *claro read nobili.*
- 306, — 26, for *dimidio read dimidii.*
- 308, — 28, for *metafemora read mesofemora.*
- 386, — 18, for *Cecidomya read Cecidomyia.*
- 401, — 14, for *Rhpalum read Rhopalum.*
- 402, — 38, for *Xyocopa read Xylocopa.*
- 410, — 34, for *Trichissoma read Trichiosoma.*
- 415, — for *labium, wherever it occurs, read labrum.*
- 421, — 1, for *Cacicula read Cacidula.*
- 438, — 30, for *Ediniensis read Edinensis.*

DIRECTIONS TO BINDER FOR PLACING THE PLATES.

PLATE VI.	. . .	to face	. . .	p.	66
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— IX.					
— X.	. . .	—	. . .		373









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Z. F. METCALF



PROPERTY OF  
Z. P. MITCHELL

