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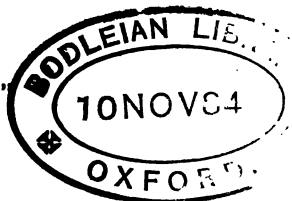
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ENTOMOLOGIST'S
MONTHLY MAGAZINE:

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VOL. XX.

"Twenty Years after."



LONDON:
JOHN VAN VOORST, 1, PATERNOSTER ROW.

1883-84.

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LONDON :

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

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ERRATA.

- Page 28, line 7 from bottom, for "*dodonæata*," read "*abbreviata*."
 " 121, " 11 " top, " "fine," " "five."
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Pages 211-213, for "Nayland," read "Myland."

Page 240, line 29 from top, after "highlands," read "of Guatemala the fauna partakes, &c."

THE

Entomologist's Monthly Magazine

www.libtool.com.cn

VOLUME XX.

PHILIPP CHRISTOPH ZELLER,

BY H. T. STAINTON, F.R.S.

Philipp Christoph Zeller (to quote his own words) "was born April 9th, 1808, at Steinheim, in the Kingdom of Württemberg." (As it appears there are two Steinheims in Württemberg, Hagen, in his "Bibliotheca Entomologica," mentions more precisely that it was at Steinheim on the Mürr; this is only two miles from Marbach, the birth-place of Schiller). "Early in life," he says, "he came to Frankfort on the Oder, so that he had no recollection of the place of his birth. How and when there first arose in him a love for *Lepidoptera*," he, writing in 1851, "had no recollection, but," he adds, "it must have been in very early youth."

"My father disliked this fancy of mine, and I can still very well remember how, on one occasion, I was beaten, when, instead of executing some commission, I went chasing *Pieris brassicæ*, which, as at that time I had no entomological apparatus, must have been by the aid of my jacket or overcoat. But my predilection for Butterflies was not driven out of me, on the contrary, it developed more and more, and when I went to the Gymnasium, I made many excursions after *Lepidoptera* instead of going into the mathematical lecture-room, which was not quite so much to my taste."

"In 1823 I commenced a Lepidopterological Journal, and I also described larvæ and painted butterflies; these descriptions and figures are now mostly lost, as afterwards, I became ashamed of them. At the Gymnasium I received no instruction in Natural History, but I owe much to my old friend Metzner, who lent me books, of which I copied out the greater part. This system of copying, which I continued in after years, has, notwithstanding my limited means, placed me, by degrees, in possession of a more complete literature of my hobby than one finds amongst most Lepidopterologists."

"It was not till I went to the University of Berlin that I had any instruction in Natural History, and even then only in Botany, as I looked upon Natural History only as an object of relaxation, and for

this reason also, I neglected to make the acquaintance of the Entomologists at Berlin, which I now much regret."

"After passing my examination, I returned to the Gymnasium at Frankfort on the Oder, in 1830, and now began to devote all my leisure time to Entomology and Botany; for some years I rather neglected *Lepidoptera* for *Coleoptera* and *Diptera*."*

"In 1833, however, I made the acquaintance of Fischer-von-Röslerstamm, and then returned with eagerness to the study of *Lepidoptera*. I can, however, truly say, that if I have attained any correct views, I do not owe them in any degree to the study of writers on the Order *Lepidoptera*, but rather to the Coleopterologists, and above all things to the Dipterologist, Meigen."

As an instance of an early entry in Zeller's Journal may be given the following, dated July 12, 1829. "In the early morning about 5 o'clock some very pretty moths were flying from fir-trees at Tegel (near Berlin); of these I caught 2, one good and the other bad, the latter I threw away." Many years afterwards the name of the insect was added to this entry "*Cecophora Borkhausenii*."

The earliest printed notice of Zeller occurs, I believe, in Treitschke's "Schmetterlinge von Europa," IX, 2, p. 262, published in 1833; he is there described as "Herr Candidat Zeller in Frankfort an der Oder, a zealous friend of Entomology," the notice refers to the rearing of a number of *Tinea tapezella* from a decayed hoof of a horse.

In the 3rd part of Treitschke's 10th volume, published in 1835, Zeller is three times mentioned, at pp. 141, 153 and 187; in the second of these notices he is spoken of as "Herr Oberlehrer Zeller in Glogau," showing that between 1833 and 1835 he had removed from Frankfort on the Oder to Glogau, and had developed from a "Candidat" to an "Oberlehrer."

Oken, the Editor of the "Isis," had offered a prize for the best essay on the determination of the *Lepidoptera* which were noticed in Réaumur's "Mémoires pour servir à l'histoire des insectes," and of the two essays sent in to compete for this prize, the first prize was awarded to P. C. Zeller, Oberlehrer an der evangel. Bürgerschule in Gross-Glogau.† This "Kritische Bestimmung" extends to 112 columns (56 pages quarto), and revealed at once uncommon powers in the new writer, who, thus in 1838, made his first appearance as an author.

* Between 1840 and 1847, he published several Dipterological papers, and one on a Coleopterous subject, as may be seen in Hagen's Bibliotheca Entomologica.

† The second prize was awarded to C. F. Freyer of Augsburg, the illustrious author of the "Beiträge" and "Neuere Beiträge."

He had, however, been already working for some time at a Classification of the *Tineacea*, and it was no doubt, in some degree, owing to the encouragement derived from his successful determination of so many of Réaumur's *Lepidoptera*, that an epitome of this Classification appeared in the "Isis" of the following year, 1839.

This epitome, entitled "Versuch einer naturgemässen Eintheilung der Schaben" (an attempt at a natural arrangement of the *Crambina* and *Tineacea*), extends to 54 columns (27 pages quarto).

In it the *Crambina* are divided into two groups, the true *Crambina* comprising 4 genera, and the *Phycidæ* comprising 7 genera; the *Tineacea*, not divided into groups, comprise 42 genera, of which two, *Coryptilum* and *Stenoma*, were founded solely for the reception of exotic insects (from Java and North America), so that the European *Tineacea* were comprised in 40 genera.

This classification is such a vast stride on anything that had previously appeared in the pages of Duponchel, Stephens and Treitschke, that one looks upon it with amazement, whilst reflecting that it is really the maiden essay of a new author; for though the determination of Réaumur's *Lepidoptera* had been published a few months previously, and hence appears as the author's first work, this classificatory essay had been the work of Zeller during many previous years.

Unfortunately, in the pages of the "Isis" it remained too little known, for though it may be said without hesitation, that no Entomological Library can be complete that does not contain those volumes of Oken's "Isis" in which Zeller's papers have appeared, yet it is only too rarely they are found on an Entomologist's book-shelves.

The same volume of the "Isis" (1839) contained two other papers by Zeller; one, the determination of the *Lepidoptera* mentioned in De Geer's "Mémoires," the other, a critical notice of Freyer's determination of Réaumur's *Lepidoptera*; for, as may be easily supposed, the two authors had not in all cases concurred in their determination of Réaumur's species.

In the "Isis" of 1841 appeared a treatise on the *Pterophoridae*, and in that of 1844, a Monograph of the genus *Hyponomeuta*; more than half of the year 1844 (from January to August) was devoted to an Entomological expedition to Italy and Sicily, where a rich harvest of observations was made, to be afterwards recorded in the pages of the "Isis."

The "Isis" of 1846, contained two important works from Zeller's

pen.—1^o His notes to the Lepidopterological Fauna of Lievland and Curland, by Madame Lienig. These notes contain a valuable mine of observations, especially amongst the *Geometridæ* and the *Micro-Lepidoptera*. 2^o A treatise on the knot-horned *Phycidæ*.

During the eight years which had elapsed since his first appearance as an author, numerous smaller papers had appeared, either in the "Isis," or in the organ of the then newly-founded Entomological Society at Stettin, the "Stettiner entomologische Zeitung." This Society, in 1846, commenced an important new work, the "Linnæa Entomologica," for the reception of more extensive Monographs, which were in their nature rather too bulky to appear in the "Zeitung," which at that time, and for many years afterwards, was issued in monthly numbers.

The first volume of the "Linnæa Entomologica" contained two elaborate papers by Zeller, on *Lithocolletis* and on *Eudorea*, the two together forming nearly one-third of the volume; each was illustrated by a Plate, and these Plates appealing at once to the eyes of those who were still ignorant of the German language, gave an impulse to its study among the Entomologists of other countries, the beneficial influence of which it seems impossible to exaggerate.

Another result of the publication of the "Linnæa Entomologica" was that it led to a more extended knowledge amongst other Entomologists of Zeller's earlier papers, that had appeared in the "Isis," but which had previously existed too much like a buried treasure.

The discovery in 1847 of "the attempt at a natural arrangement of the *Crambina* and *Tineacea*," which, though published eight years previously, now first became known to English Entomologists, came like a ray of sunlight to those who had hitherto been groping very much in the dark, and had been puzzling and perplexing themselves how they were ever to decide whether an insect was a *Microsetia* or an *Amaurosetia*, names which must sound strange to the Entomologists of the present day, but which were once "familiar in our mouths as household words."

In less than three years from the publication of these Monographs on *Lithocolletis* and *Eudorea* in the "Linnæa," we find Zeller actively in correspondence with three English entomologists: Stainton, Henry Doubleday, and Douglas. But to recur to the works of the author which followed 1846, before this intercourse with English entomologists began, and which was to be continued in a regular and steady stream to the end of his days:—

In 1847 there appeared in the "Isis" his "Remarks on the *Lepidoptera* collected during a journey in Italy and Sicily" (the journey in 1844 to which we have already alluded), and the same year there appeared in the "Linnæa Entomologica," vol. 2, his treatise on *Argyresthia*.

In 1848 there appeared in the "Isis" his treatises: 1st, on the *Galleriæ* and naked-horned *Phycidæ*, and 2nd, on the exotic *Phycidæ*, and in the third volume of the "Linnæa Entomologica" his Monograph of "the Genera of leaf-mining *Tineidæ* with Eye-caps" (*Lyonetia*, *Opostega*, *Bucculatrix*, *Nepticula*, &c.).

Unfortunately, 1848 was the year of Continental Revolutions, and partly owing to the political disquiet of the time the "Isis von Oken" (commenced in 1817) thenceforward ceased to appear. For all naturalists, the discontinuance of this valuable miscellany was a great deprivation, but to Entomologists in particular, who had seen its pages of late years so largely filled with the writings of P. C. Zeller, the loss was immense.

In 1849, Zeller produced, in the 4th volume of the "Linnæa Entomologica," a treatise of more than 200 pages on *Coleophora*; and in that and the following year he gave, in the pages of the "Stettiner entomologische Zeitung," an elaborate notice of the *Lepidoptera* collected by Herr Joseph Mann in Tuscany, in 1846.

In 1851 appeared, in the 5th volume of the Linnæa, a treatise on the three genera, *Incurvaria*, *Micropteryx*, and *Nemophora*, and in the following year, in vol. 6 of the same work, was a Monograph of the other *Tineidæ* with long maxillary palpi (*Euplocamus*, *Tinea*, *Eriocottis*, and *Lampronia*), and also a revision of the *Pterophoridaæ*.

In 1852 it was that Zeller, who had lately received from the King of Prussia a special award of the title of Professor, visited England in company with his friend, Dr. C. A. Dohrn of Stettin. This visit occurred in the month of July and only lasted a fortnight, but during that period he visited four Entomological localities: "Charlton sand-pit, West Wickham Wood, Mickleham and Sanderstead;" he also visited Professor Westwood at Hammersmith, and Henry Doubleday at Epping. It is, however, to be feared that this visit was not one of pure enjoyment, as the worthy Professor's stomach had been more or less disarranged by the transit from Ostend to Dover, and the "sentiment of the water," as he expressed it, still remained with him the greater part of his visit, besides, he had a great aversion to the smell of camphor (a perfume of which English Entomologists,

habituated to it from their earliest boyhood, are utterly unconscious), and was at the same time very unwilling to have a breath of fresh air admitted by an open window.

In 1852 appeared also the 7th volume of the "Linnæa Entomologica," in which Zeller treated of the genera *Lypusa*, *Talæporia*, *Solenobia*, *Diplodoma*, and *Xysmatodoma*; and in the same year he also described Wahlberg's Caffrarian *Micro-Lepidoptera* in the Transactions of the Stockholm Academy of Sciences. The following year the genera *Adela* and *Nemotois* were treated monographically in the 8th volume of the "Linnæa," and a critical determination of the species figured by Clerck in his "Icones" appeared in the "Stettiner entomologische Zeitung."

In 1854, Zeller gave, in the 9th volume of the "Linnæa," the genus *Depressaria*, and several allied genera (including 26 species of the genus *Cryptolechia*). The tenth volume of the "Linnæa," in 1855, contained a postscript on *Cryptolechia*, with descriptions of 13 new species, and also an elaborate Monograph of the very difficult genus *Butalis*. This was, we regret to say, the last of his masterly contributions to the "Linnæa Entomologica." It was towards the end of May, 1855, that the writer of these lines had the pleasure of seeing Professor Zeller in his home at Gross-Glogau, and after spending two days there, of meeting him for several days the guest of Dr. Dohrn at Stettin and at Hökendorf.

In 1855 appeared the first of the 13 volumes of the Natural History of the *Tineina*, by Stainton, assisted by Zeller and Douglas; of this series the whole of the German and Latin letter-press was translated by Professor Zeller from the original English, and he also contributed many valuable remarks.

At the end of March, 1860, Zeller left Gross-Glogau in Silesia, where he had resided for a quarter of a century, for Meseritz, in Posen, where he still continued his scholastic employment. Here, in 1863, he wrote his Monograph of the *Chilonidæ* and *Crambidæ* of 54 quarto pages—this was printed as an Appendix to a "Schulnachricht," and it is a very nice question, whether it was ever published. The date on the Monograph itself was not printed.* In 1865 a troublesome and painful illness necessitated his absence from Meseritz for some weeks, and he spent the greater part of June and July in that year at Frauendorf, near Stettin. In May, 1866, he retired from his school-occupation, and had thenceforward more leisure to devote to Entomo-

* "Dass das Datum der Publikation schriftlich eingetragen worden ist, hat seinen Grund darin, dass die Jahreszahl sich auf dem Titel der hier weggelassenen Schulnachrichten befindet."—P. C. Zeller in *lit.*, 21-7-63.

logy. An intended excursion to Carinthia, contemplated for 1866, was necessarily deferred on account of the war between Prussia and Austria; but, in 1867, June and July were spent at Preth and Raibl in Carinthia, and a few days on the return journey at Bruck on the Muhr, and at Vienna.

Notices of his observations during this excursion appeared in 1868 in the "Stettiner entomologische Zeitung," and in the "Verhandlungen des zoologisch-botanisch Vereins in Wien." At the end of April, 1869, Zeller removed to Grünhof, near Stettin, where he found useful and congenial occupation in the post of Librarian to the Stettin Entomological Society, and here he found himself fully occupied with his extensive scientific correspondence, and in the determination of the *Micro-Lepidoptera* which were sent to him from various parts. From his retreat at Grünhof, he three times made prolonged stays at Bergün in Switzerland, situated at the northern extremity of the Albula Pass in the Grisons; thus, in 1871, he was at Bergün from May 31st to the end of July, in 1873, from June 24th to the end of August, two days (July 5th and 6th) having been spent at Weissenstein, and in 1875 he arrived at Bergün at the end of May, removing to Weissenstein on the 11th July, where he remained to the beginning of August. He had thus collected in abundance the materials for a Lepidopterous Fauna of the Albula district, of which a first instalment appeared in the "Stettin. Entomol. Zeitung" for 1872, followed by a more exhaustive treatment of the subject in the same periodical in 1877 and 1878.

After 1875, Professor Zeller made no extended journey, but he several times went to Swinemünde, accompanied by his daughter, Mrs. Jänicke, to search on the coast sand-hills there for the very singular *Dactylota Kinkerella*; the insect, however, was not to be found by him.

In his later years, Zeller devoted much of his attention to the critical investigation and description of *Micro-Lepidoptera* from various parts of the world, and most valuable papers from his pen on "North American *Micro-Lepidoptera*," and on "Exotic *Micro-Lepidoptera*," appeared in the "Verhandlungen des zoologisch-botanisch Vereins in Wien" in 1872 and 1873, and in the "Horæ Societatis Entomologicæ Rossicæ" for 1877 and 1881.

Zeller, who had been in the enjoyment of his usual health at the commencement of the present year, was actively corresponding and readily answering any queries as to observations he had made fully thirty years ago, and to all appearance there were still years of good scientific work before him.

On Good Friday, March 23rd, he was attacked with a sudden pain of the heart. Doctors were hastily sent for, and the first who reached him (Dr. Sauerhering) found his pulse very faint, but otherwise no symptom of importance; by the time Dr. Schleich reached him the pulse was again normal, and he saw no cause for serious anxiety. The three following days passed without any recurrence of the attack, and on Tuesday, March 27th, he rose at his usual early hour, declaring that he felt quite well, and proceeded to correct a sheet of the "Stettiner entomologische Zeitung," which contained a paper by Heinrich Frey of Zürich. Soon afterwards, his wife brought him some cold meat and bread and butter, on which he set to work with appetite, and Mrs. Zeller retired to an adjoining room; soon after hearing her husband twice groan or cry out, she hurried back—he lay dead on the floor.

Zeller was married in 1833 to the lady who survives him; a son died very young, a daughter, who married in 1864 Dr. Jänicke of Wrietzen (but was too soon left a widow), has two children—the boy, like his grandfather, shows a greater predilection for Entomology than for his severer studies, but this *tendency to atavism* on the part of the rising generation was not viewed with indulgence by the aged Professor, who seemed to have overlooked that his own early life was repeated by his grandson.

It has been well said of Professor Zeller "that he always struck one as a very thorough man in what he did—one who had trained his mind well, and who thought and wrote with fullness and precision."

As might almost have been expected from the date of his birth, and the period of his greatest intellectual growth, Professor Zeller never made any approach to an approval of Darwinism.

His collections are in good hands, having been purchased by Lord Walsingham.

Mountsfield, Lewisham :

May, 1883.

Lebia turcica in the Hastings district.—On April 30th, while working at some birch stumps in a clearing near Guestling, I took a beetle which I did not recognise. When it was set, I at once identified it as *Lebia turcica*, F. In Cox's Handbook this species is merely described as "rare," but I have been informed that it has lately been placed amongst the "reputed" British species, a fact which renders its occurrence in this district doubly interesting. I have again visited the same locality, but so far without success.—W. H. BENNETT, 11, George Street, Hastings, May, 1883.

ANNOTATED LIST OF BRITISH ANTHOMYIIDÆ.

BY R. H. MEADE.

(Continued from Vol. xix, page 220).

21. ACANTHIPTERA, Rond.

Pegomyia, Macq.*Anthomyia*, Meig., Schin.*Anthomyza*, Zett.

Gen. ch.—Head nearly semi-circular; eyes bare, approximate in both sexes; arista long and pubescent; alulets well developed, the lower scale being considerably longer than the upper; abdomen elongated, tapering, and sub-cylindrical in the male, ovato-conical in the female: wings with auxiliary vein armed with spines, and anal vein not reaching the margin: legs yellow, elongated (especially in the males), and with large pulvilli.

A. INANIS, Fall.

Only one European species is known in this rather peculiar genus; it has the head similar in shape to those in the genus *Homalomyia*. The colour is totally yellow, with the exception of a bluish-grey spot on the dorsum of the thorax, and the joints of the tarsi, all of which are nigrescent in the females, but only those of the hind legs in the males. Not common. The larvæ are said to have been found in wasps' nests.

22. PEGOMYIA, Desv., Macq.

Anthomyia, Meig., Schin., Rond., p.*Anthomyza*, Zett.*Chortophila*, p., Rond.

Gen. ch.—Eyes bare, contiguous or sub-contiguous in the males, remote in the females; arista pubescent or bare; abdomen sub-cylindrical or depressed in the males, ovato-conical in the females; alulets variable in size, mostly small, but sometimes with the scales pretty well developed and of unequal lengths: wings with the anal veins prolonged to the margin: legs always partly yellow, and abdomen mostly wholly or partially so, as well.

Sect. 1—*Abdomen wholly or principally black or grey.*

1. BETÆ, Curtis.

sulcans?, Rond.

2. CONFORMIS, Fall.

3. HYOSCYAMI, PANZ.

chenopodii, Rond.

4. HÆMORRHOU, Zett.

Sect. 2—*Abdomen red or yellow.*Div. i—*Alulets moderate in size, with scales of unequal length.*

- | | |
|--------------------|----------------------|
| 5. RUFIPES, Fall. | 7. TRANSVERSA, Fall. |
| 6. WINTHEMI, Meig. | 8. LATITARSIS, Zett. |

Div. II—*Alulets small, with equal sized scales.*

- | | |
|---|---|
| 9. BICOLOR, Wdm. <i>mitis</i> , Meig. <i>strigipes</i> ?, Zett. | 12. VERSICOLOR, Meig. |
| 10. NIGBITARSIS, Zett. <i>fulgens</i> , Schin., non Meig. | 13. FLAVIPES, Fall. |
| 11. EXILIS, Meig. | 14. VITTIGERA, Zett. <i>gilva</i> ?, Zett. |
| | 15. ROTUNDICORNIS, Zett. |

The flies included in this genus are some of them more highly developed than others, having larger alulets and wider bodies; Rondani, therefore, placed them partly in his genus *Anthomyia*, and partly in *Chortophila*; the greater number of them, however, have their principal characters in common, possessing yellow bodies and legs, and form a natural group: to these I have joined a few others which closely resemble some of those in the genera *Chortophila* and *Phorbia*, but differ in having the legs always partially yellow. R. Desvoidy formed this genus to include those flies which feed in the larva state upon the parenchyma of leaves; but though most of the species included in it do thus blotch or mine the leaves of various plants, the habit is not peculiar to them, for some of the species in the genus *Phorbia*, as I have already mentioned, do the same.

P. BETÆ, Curtis.

The male of this species was well described by Curtis in the Journal of the Royal Agricultural Society of England in 1847;* he overlooked, however, one important point, describing the palpi as being black, whereas they are always yellow with black ends or tips. The antennæ are wholly black; the femora and tarsi are all black in the males, the tibiae only being yellow or piceous in dark varieties; in the females the femora of the four posterior legs are usually pale or yellow, while those of the front pair are black or grey on their upper surfaces.

This fly, which was formerly considered rare, and was but little known, has come into rather prominent notice of late years, owing to the injury which it causes in the larva state to the agriculturist, by feeding upon the leaves of the mangold wurzel. It also mines the leaves of other species of beet and *Chenopodium*, and Mr. Inohbald sent me specimens bred from spinach leaves.

P. CONFORMIS, Fall.

This species bears considerable resemblance to the last. The female only has been described, the male being unknown until I received a specimen in May, 1882, from Mr. Inohbald, together with a female, both of which he had bred from the

* Vol. viii, pt. ii, p. 412.

leaves of *Arctium lappa*, upon which the larvæ had fed. The male bears a considerable resemblance to that of *P. beta*: the face is rather prominent; eyes contiguous; antennæ rather short, entirely black; palpi yellow, with black tips; thorax dark grey, very indistinctly striped; abdomen narrow, sub-cylindrical, light grey, with a very slightly marked dorsal longitudinal stripe and large projecting sub-anal processes of a reddish colour; the fore legs have the femora and tarsi black, and the tibiæ only red; the four posterior legs have the femora, as well as the tibiæ, red. The female has the face more prominent than that of the male, and, together with the forehead, cheeks, and basal joints of antennæ, of a bright yellow colour. The thorax and abdomen are both immaculate and light grey; the legs have all the femora and tibiæ yellow. Rare: besides the pair which I received from Mr. Inchbald, I have two females which I captured at Windermere in 1874.

P. HYOSCYAMI, Panz.

In this species the abdomen is usually described as being of a light grey colour, especially in the male; but it will often be found to have a pale testaceous tinge in both sexes, when it corresponds to the *C. chenopodii* of Rondani. The back of the abdomen is marked with a longitudinal row of narrow triangular spots in both males and females, very similar to those seen in *P. beta*. The palpi are yellow with black tips; the basal joints of the antennæ are yellow; and the legs have all the femora and tibiæ pale, with the exception of the fore femora in the male, which are partly grey. This rare species is said to feed in the larva state upon the leaves of the henbane, and Rondani says that he has bred the pale bodied variety from those of the deadly nightshade (*Atropa belladonna*), as well as from some species of *Chenopodium*.

P. HÆMORRHOU, Zett.

The female of this species closely resembles that of *P. conformis*, but differs in having the last two segments of the abdomen red or yellow. The palpi are yellow with black tips; the antennæ are wholly black in all the specimens that I have seen, but Zetterstedt says that they are often red at the base; the fore femora are black or grey, but all the others, as well as all the tibiæ, are yellow. Zetterstedt only knew the female when he published his description in the 4th vol. of the Dipt. Scand.; but in the 14th and Supplementary volume of the same work he gives a very imperfect account of the male. In several specimens which I possess of that sex, the abdomen is sub-cylindrical, entirely grey, having dark reflections, but no distinct markings; the anal segment is incurved, grey, with two projecting processes of a black colour; the eyes are sub-contiguous; the forehead prominent; the antennæ wholly black as well as the palpi; the legs are coloured as in the female, but the fore femora are only black at their bases. This species is not uncommon near Bradford, but the females are more frequently met with than the males.

P. RUFIPES, Fall.

Only the male is known of this species, which is one of the most highly developed in the genus, the scales of the alulets being of considerable size, and the abdomen widened. The antennæ and palpi are black, the latter, however, being sometimes pale at their bases; the legs are entirely rufous, with the exception of

the tarsi, which are black; the fore femora are, however, often darker than the others (piceous). Rare. I have two specimens, one found near Bradford, and the other in Oxfordshire.

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P. WINTHEMI, Meig.

This species, like the last, has the alulets comparatively large. It is characterized by the abdomen, which is yellow, being marked on the lower edge of each segment by a transverse black line; the antennæ are black in the males, but have the two basal joints pale in the females; the palpi are yellow; the thorax is dark grey, the apex of the scutellum and the sides of the thorax being often tinged with yellow, especially in the females; the transverse veins of the wings are oblique and sinuous.

P. TRANSVERSA, Fall.

This species closely resembles the preceding one; it differs from it, however, in having the alulets smaller, the scales being only slightly unequal, and in having the external transverse veins of the wings nearly straight and upright; the femora and tibiæ are all yellow in both species. These two flies, which are quite distinct, have been mixed together. Meigen, in his description of *P. Winthemi*, says, that the external transverse veins are straight and upright, but Schiner states that he had examined specimens obtained from Meigen, which all had the veins sinuous; he, however, thought that there was only one species, and that Fallen's *P. transversa* was the same as Meigen's *P. Winthemi*. Rondani also confounded the two species: his description of the male of *P. transversa* (he does not mention *P. Winthemi*) applying to that species, while that of the female belongs to *P. Winthemi*; for he says of the former, "vena transversa exteriore non rectissima," while he remarks of the latter sex, "alæ vena transversa exteriore distincte sinuosa." Both these species are rare, but I possess two males and two females of each.

P. LATITARSIS, Zett.

I have not seen a male of this species, which closely resembles that of *P. transversa*. The females may be known at once by their having the tarsi of the four posterior legs widely dilated at their extremities. I have two specimens, both captured in Yorkshire.

P. BICOLOR, Wdm.

This common species may be considered as the typical one of the group to which it belongs (those with small alulets). I will, therefore, briefly mention its leading features of distinction, so that it may be easy to note the characteristic points by which the following and nearly allied species may be distinguished from it. The forehead and face are somewhat prominent; the eyes of the male sub-contiguous; the seta bare; the antennæ usually with all three joints black, but sometimes with the first and second rufous; the palpi always entirely yellow; the frontal stripe usually black in the females, and always in the males; the abdomen of males sub-cylindrical; all the tarsi and the fore femora black in the males, the tarsi only black in the females. The larvæ of this species feed on the leaves of several of the common species of dock (*Rumex*), in which they make large blotches.

P. NIGRITARSIS, Zett.

Rondani places this species in his genus *Anthomyia*, but in numerous examples which I have examined I have always found the scales of the alulets very small and equal in size. This closely resembles *P. bicolor* in shape, colour, &c., but differs in being usually rather smaller; in having black tips to the palpi; the eyes of the male contiguous; the frontal space mostly red in the males, and always brightly so in the females; and the fore femora always grey on their upper surfaces in the females. Schiner evidently confounds this species with *A. fulgens* of Meigen, but the latter (of which I have not seen a British specimen) has the scutellum yellow, not grey, as in *P. nigratarsis*. This fly also feeds in the larva state upon dock leaves; I have bred many specimens from those of *Rumex obtusifolius*. On one occasion, several individuals of this species, as well as some of *P. bicolor*, emerged from pupæ formed in the same leaf.

P. EXILIS, Meig.

This closely resembles the two preceding species, but differs from them both by having the palpi entirely black; the antennæ have the basal joints yellow. Rare: I bred a single specimen last year from a leaf of *Heracleum sphondylium*.

P. VERSICOLOR, Meig.

In shape and general appearance this species closely resembles *P. bicolor*, but may be distinguished from it by having the palpi entirely black; the antennæ are also black, by which it may be known from *P. exilis*. Not very uncommon.

P. FLAVIPES, Fall.

This little fly differs from *P. bicolor*, as well as from most of the other preceding species, by having the forehead flat, and the abdomen thin and depressed, instead of being sub-cylindrical. It has the arista pubescent; the palpi yellow (sometimes darkened at the extremities); the thorax sub-testaceous; the abdomen livid, with large sub-anal processes; and the four posterior femora with black rings round their extremities. Rare: only the male has been described.

P. VITTIGERA, Zett.

This species differs from all the preceding by having the thorax always pale, as well as the abdomen. The colour of the former varies from light yellow to rufo-testaceous, and it is marked down the dorsum with a broad grey stripe. This fly closely resembles *P. flavipes* in most points, having among others the posterior femora annulated with black at their extremities. Zetterstedt captured a female in union with a male of *P. flavipes*, and I am inclined to think that they are both varieties of the same insect. Rare: I captured a single female at Windermere in June, 1874.

P. ROTUNDICORNIS, Zett.

This is an aberrant species, peculiar by having the eyes of the male, as well as those of the female, separated by a considerable interval. The antennæ are short, with the third joint orbicular, and with the setæ elongated and bare; the thorax is

grey; the abdomen very narrow, depressed, and reddish-brown. Zetterstedt only knew the male; the female is very similar to it, but has the abdomen fusiform and the metatarsi yellow. A pair of this well marked and peculiar species were sent to me for identification by Mr. Dale, of Glanville Wootton in May, 1877.

(To be continued).

REPLY TO MR. MEYRICK'S OBSERVATIONS ON THE SYNONYMY
OF CERTAIN *MICRO-LEPIDOPTERA*.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

It is a truth which none will question, that no criticism of a man's work (however severe or unmerited) is so distressing as the ignoring of it altogether; and the distress, such as it is, is still more diminished when the critic bases his observations upon an unsound foundation.

When a man can say, as Mr. Meyrick cannot, that he has before him, as he writes, *the types*, or even *good figures*, of several so-called species, referred by their authors to different genera; and, that they are specifically identical, his statements may be accepted, until proved to be erroneous; but when he makes such sweeping statements as that respecting *Rhodaria robina*, it may safely be concluded that he will commit many errors through haste which he will afterwards regret: I will not then repeat this error by asserting that *R. robina* is not one or both of Guenée's species referred to *Endotricha*, since I have neither of that author's types before me, but I will positively maintain that it is neither generically nor specifically identical with any *Endotricha* known to me, nor with the *Pyralis stilbealis* and *P. docilisalis*, of Walker; I will further observe that I do not believe the last two to be varieties of the same species; although on this point I am open to conviction if Mr. Meyrick can show me a series of examples linking them together: on the other hand, Walker's species are referable to his genus *Doththa*, which appears to be congeneric with *Endotricha* (*E. flammealis*); and, therefore, on this head, as in *all but one* of my notes on synonymy, I am able to agree with Mr. Meyrick: whether he is right in stating that *Rhodaria*, Guen., is not separable from *Botys* will depend entirely upon what he regards as the type of the latter genus, a point which, at present, I have not the time to enter into.

I admit that I was over-hasty (in my paper in the *Annals*) in con-

demning Walker's *Crambus impletellus*, coming from Tasmania, whilst *C. pleniferellus* is from Sydney, I ought to have believed its slight differences of pattern (or, rather the additions in the pattern of the primaries) to be constant until the reverse had been proved.

With regard to *Conchylis? auriceps*, which Mr. Meyrick asserts to be allied to *Philobota Arabella*, and concerning the neuriation of which he can speak confidently without examination, I may say that I have just examined it again in conjunction with *P. Arabella*, and that differences in neuriation (such as the distance between the emission of the subcostal branches and the direction and angulation of the discocellulars) do exist between them, and that the "other respects" which I put first (such as the form of wing and fringing) are similar to those of *Conchylis margaritana*, and not *P. Arabella*; nevertheless, our specimen being (as I stated in my description) an imperfect one, I may repeat the words there used:—"I cannot be positive of the correctness of its generic location."

Of *C. Thetis* it is possible that the collector may have sent Mr. Meyrick examples, but it is just as likely (in the case of a type of coloration frequent in the *Micro-Lepidoptera*) that either he, or even Meyrick himself, may have failed to recognise my species, in which case the synonymy will not be burdened; whereas, if the contrary be the truth, it will argue that my descriptions are easier to recognise than those of my critic, for I certainly went through his papers with each Melbourne specimen before I decided it to be new, and that, too, with an effort to obtain an identification if possible, which would have gratified the author had he seen it.

British Museum : May, 1883.

Influence of colour on Insects.—The following extract from the recently published 2nd part of vol. i of "Timehri," the Journal of the Royal Agricultural and Commercial Society of British Guiana, so ably edited by Mr. E. F. im Thurn, may be of interest to our readers. It occurs in an account of a visit to Mount Russell in Guiana, by the editor (p. 223) :—

"That afternoon the Indians of the place, seeing our interest in catching butterflies, exhibited various clever ways of entrapping these insects. To catch those of yellow hue, they picked and laid on the ground the flowers of a yellow *Bignonia* (*B. chicka*); and this proved a most successful plan. Equally successful were they when they laid decaying banana-skins on the ground to attract the large blue *Morphos*; but an attempt to attract certain red species by displaying the ripe red

fruit of the faroah plant (*Bixa orellana*) was not successful. Then, these methods of enticing the insects were completed by inverting a round quake (a wide-mouthed basket of very open wicker-work) over the bait, taking care to raise the quake so that its lower edge was some inches from the ground. The butterflies, attracted by the flowers, made their way under the raised edge of the quake, and when the Indians approached flew, not out under the edge of the quake, but upward into the top, where they were captured."—E. C. R.

Notes on British Ants.—Ernest André, in his *Spécies des Hyménoptères Formicides*, pp. 271, 272, exposes an error into which entomologists have fallen with respect to the supposed males of *Stenamamma Westwoodi* and *Asemorhoptrum lippula*, and clearly shows that at present the ♂ of one species only has actually been described; for my share in this blunder, I must apologize, as I described the ♂ of *Asemorhoptrum* from nature, but borrowed my characters of *Stenamamma* from Smith, Mayr, &c., and did not see the actual type, as I ought to have, which would probably have saved me from the error.

Westwood originally described *Stenamamma Westwoodi*, Stephens, MSS., from the ♂, not knowing any other sex; to this ♂, the ♀ and ♀ of a quite distinct species have been associated, so that what we have known, and F. Smith and myself have described, as *Stenamamma Westwoodi*, has been the ♂ of one species, and the ♀ and ♀ of another. The ♂ of what we have called *Asemorhoptrum lippula* exists in several collections, and it now turns out, from Mons. André's examination, that these two males are identical. As Westwood described his *Stenamamma Westwoodi* before Nylander characterized his *Myrmica lippula*, what we now know as *lippula* will have to be called *Stenamamma Westwoodi*, and the ♀ and ♀ of what we have called *S. Westwoodi* will have to be known as *Formicozenus nitidulus*, Nyl., the ♂ of this latter being as yet undescribed, the synonymy standing thus:

Stenamamma Westwoodi, West.

= *Stenamamma Westwoodi*, F. Smith, E. Saund., &c., ♂ (*nec* ♀, ♀).

= *Asemorhoptrum lippula*, F. Smith, E. Saund., et auct., ♂, ♀, ♀.

Formicozenus nitidulus, Nyl.

= *Stenamamma Westwoodi*, Smith, E. Saund. (excl. ♂), *nec* West.

While on the subject of British ants, I want to say a few words on the Bournemouth ant, which I have referred to *Formica gagates*, and for which Mr. Farren White, in his recent book, "Ants and their ways," has proposed the name "*glabra*."

I think there is no doubt that Forel and Emery are right in uniting *fusca*, *cinerea*, *cunicularia*, and *gagates* as races under the one species, *fusca*, Linn. Of these four races, *fusca*, *cinerea*, and *cunicularia*, have the abdomen clothed with silken hairs, *gagates* has it glabrous with stiff bristles round the apex of the segments; the specimen I have described from has the abdomen glabrous as in *gagates* true, but is undoubtedly smaller and paler than continental specimens. On the continent there are also intermediate forms, known as *fusco-gagates*, *fusco-cinerea*, *cinereo-rufibarbis*, and *fusco-rufibarbis*. Surely, it is more likely that our specimens belong to some such intermediate form (possibly, *cuniculario-gagates*, if there is such a thing), than to a new species "*glabra*," not known on the continent at all, especially as my specimen only differs from typical *gagates* in being smaller and paler, and because

paler, having the bristles at the apex of the segments less conspicuous. I should be only too pleased to add a new ant to our list, *i. e.*, if indigenous and not introduced directly by unnatural means, but I really think a form in the midst of the confusion of *gagates*, *cunicularia*, *fusca*, &c., should not be singled out for that purpose.—EDWARD SAUNDERS, Holmesdale, Upper Tooting: 8th May, 1883.

On the habits of the larva of Eupacilia rupicola.—I have found these larvæ commonly, wherever *Eupatorium cannabinum* grows, *not*, however, in the standing stems of last year's plants, but in old broken and rotten bits, lying prostrate on the ground and covered over with moss and rubbish.

If the old stems happen to have been broken, or mown off, within three or four inches of the ground, there is pretty certain to be a larva spun up in a long cocoon, fastened to the outer wall of the stem, much in the same way as that of *E. udana* is, or else among the half-eaten pith.

Whether the larva at first feeds in the flowers and descends to make up in the rubbish I cannot say, but certainly the pith of the old stems is eaten. Sometimes two or three larvæ may be found, one behind the other, in a very narrow stalk just large enough to hold them. These larvæ are bright yellowish-pink on the back, paler beneath. Very sluggish, and if disturbed, not wandering away as the larva of *udana* does, but contentedly spinning themselves up again in the old spot. Unfortunately they are terribly subject to ichneumons, which are already beginning to appear. I have not found a single larva in a standing stem of last season.—W. WARREN, Merton Cottage, Cambridge: April 20th, 1883.

On the hibernation as full-fed larvæ of some species of Nepticula.—Dr. Wocke has remarked in the Stettin. ent. Zeit., 1871, p. 428, that the larvæ of *Nepticula sericopeza* may be found spinning their cocoons on maple-trunks in spring, and it seems probable that others may have the same habit, ignorance of which is possibly the cause of failure or difficulty in breeding these species. Last autumn I placed a few pear-leaves, with larvæ of *N. minusculella* in their mines, within a glass vessel half-full of earth and rubbish. The top was covered over with a piece of white muslin. I took particular care of these insects, because, though I had bred them easily from the summer brood, I had always failed with the winter one.

Well, I examined the vessel carefully last autumn, and also at times during the winter, without seeing any trace of cocoon or larva in the earth through the glass. Last week, on putting the vessel along with others containing *Nepticula* in the recess of a window, exposed to the sunshine, I was startled to find a fresh yellow cocoon attached to the muslin at the top of the glass. Now, as I have had the covering off many times during the winter, and examined it each time, the cocoon must have certainly been newly spun, so that I cannot help thinking that the larva of *minusculella* hibernates in the ground and spins up only in spring.

In confirmation of this supposition I may mention that, three years ago, I had collected a large number of larvæ of *Nepticula atricollis*, some of which were kept in an ordinary flower-pot half-full of earth, and others in a tin without earth. In the summer following, I bred large numbers of the imago from the flower-pot, but failed to find within the earth the slightest trace of a cocoon; while from the tin I

bred a few, but these were always sitting *outside* on the rim of the tin, or on objects near, and I remember being puzzled at the time to account for their getting out in this way. ~~Here, too, I found no trace~~ of any cocoon *within* the tin among the leaves. I now fancy that the cocoons must have been spun in spring at the top or outside, where, of course, I never thought of looking for them.

If I am right in this conjecture, it is probable that a large number of *Nepticula* larvæ escape from us in spring-time, and spin up at large; for we never think of looking to see if our vessels are tightly closed at *this* time, and our failures may be due to this and not to the death or drying up of the insects.

In the case of *sericopeza*, the larvæ may either remain in the fallen keys during the winter, or emerging therefrom may hibernate in the ground, ascending in spring to spin their cocoons.—ID.

The young larvæ of Coleophora lizella.—Whilst gathering blades of grass containing larvæ of *Elachista stabilella*, I observed a plant of *Dactylis glomerata*, with two white patches, on which were two brown specks. On closer examination, these proved to be each a dry calyx of thyme, and the young larvæ were still feeding within them on the grass-blades, ejecting their "frass" from the end. Though the fact of *Coleophora lizella* feeding at first on thyme has long been known, I am not sure whether this particular habit of the larvæ, after hibernation, feeding in spring *within the old flowers* has been recorded.—ID.

[It being news to me that the young larvæ of *C. lizella* continued to use their thyme-cases whilst actually feeding on the grass, I wrote to Mr. Warren for further details on this point, to which he replied, May 9th, as follows:—"You were quite right in thinking that the young larvæ of *C. lizella*, while still in their thyme-cases, fed on the grass; but on the 30th April, I found that one had left the old case and cut a piece out of the side of a blade of grass, with which it has fashioned a new case, still quite small, and the other has since done likewise." This reminds me that, when, in 1854, I was staying at Box Hill from the 14th to 17th April, I found far more grass leaves mined by the larvæ of *C. lizella* than I could find cases of the larvæ; at that time I was only acquainted with the grass-made cases, and, therefore, looked only for them, had I then known of the thyme-calyx cases and looked for them, I should probably have had a more successful hunt. I remember that I came to the conclusion that the larva of *Coleophora lizella*, unlike its congeners, had a habit of wandering far from the leaves on which it had fed. Now, after an interval of 29 years, with additional information, the matter appears in a different light.—H. T. S.]

Coleoptera from the vicinity of ants' nests, Chobham.—Whit Monday being a warm, more or less rainy, day at Chobham, I established myself under some trees growing on a bank on Chobham common, and hunted for *Coleoptera* under dead leaves, &c., at the base of the bank, I soon found that there were two ants' nests in the vicinity: one of *fuliginosa*, and another of *rufa*; *rufa* seemed to hold entire possession of one part of the bank, *fuliginosa* of the other, on one occasion I saw one of each species meet, and *fuliginosa* had to succumb to the strength of *rufa*.

In the *rufa* quarters I only found *Myrmedonia humeralis* and *Drusilla canaliculata*, but with *fuliginosa* I found these two species equally commonly as with *rufa*, and also *Myrmedonia limbata*, *lugens*, *laticollis*, and *funesta*, as well as a single specimen of *Amphotis marginata* adhering to the base of the stem of a foxglove, and covered by the leaf that sheathed it. I further took a single specimen of *Callicerus rigidicornis*, and several of the little wood-louse, *Platyarthrus Hoffmannseggii*, from roots of grass. Two of our rarer ants occurred in the same locality, viz., *Stenamma Westwoodi* (*Asemorhoptrum*, olim.) and *Leptothorax Nylanderi*, but I do not think either of these were associated with the other species of *Formica*. All these were taken within twenty yards of the same spot, and, as I doubt if it has often fallen to the lot of one person to take six species of *Myrmedonia* in one day, I thought a record of their capture might be of interest.—EDWARD SAUNDERS: Holmesdale, Upper Tooting: 18th May, 1883.

Recent captures of Coleoptera and Hemiptera in the Birmingham district.—Owing to the bad state of the weather during the first four months of the present year, outdoor entomologizing has not been either so pleasant or so profitable as could have been desired; but, nevertheless, I have taken a few good things, and have added several species of insects to our local lists. Amongst my best finds are the following:—

COLEOPTERA: *Bembidium prasinum*, *Hydroporus lepidus*, *Tachyusa atra*, *Orypoda nigrina*, *Myllena intermedia*, *Gymnusa brevicollis*, *Geodromicus nigrita*, *Acidota cruentata*, *Coryphium angusticolle*, *Euplectus punctatus*, *E. bicolor* (in abundance under bark of dead oak trees), *Scydmanus exilis*, *Cephennium thoracicum*, *Ptilium Kunzei*, *Pt. Spencei* (both in hot beds), *Myrmeces piceus*, *Cryptarcha strigata*, *C. imperialis*, *Rhizophagus depressus*, *R. ferrugineus*, *R. perforatus*, *R. parallelocollis*, *R. nitidulus*, *R. politus*, *Aphodius porcus*, *Salpingus castaneus*, *Apoderus coryli*, *Xylocleptes bispinus* (in plenty by beating *Clematis vitalba*, May 15th), *Platyrhinus latirostris* (on ash log), *Donacia comari*, *Gonioctena pallida* (one by beating, May 15th), *Endomychus coccineus* (abundant amongst moss on an old stump).

HEMIPTERA: *Serenthia lata*, *Acalypta brunnea* (also in the young state, amongst moss on oak trees), *Aradus depressus* (flying in the sunshine), *Xylocoris ater*, *Salda c-album*, *S. Cocksii*, *Hebrus pusillus*.—W. G. BLATCH, 214, Green Lane, Smallheath, Birmingham: May 16th, 1883.

A new British Trichopteron (Mesophylax aspersus, Ramb., var.).—While examining a small collection of caddis-flies formed by Mr. Service, of Dumfries, one specimen (a ♂) gave me considerable trouble, as it did not agree in certain details with any of the species described in Mr. McLachlan's "Monographic Revision and Synopsis of the Trichoptera." I submitted the specimen to Mr. McLachlan, who at once informed me that it was *Mesophylax aspersus*, Ramb., variety.

The species has been recorded from the south of Europe, while the variety has been taken at the Lake of Zürich in May and September. Unfortunately, Mr. Service cannot give any date or exact locality where his specimen was captured, but he says that all the insects in the collection were taken within Torqueur parish, Dumfriesshire, he having only collected caddis flies in three localities, so I hope he may

be able to turn up the insect again this year. With his usual kindness he has placed the specimen in my cabinet.—JAMES J. KING, 207, Sauchiehall Street, Glasgow: 17th May, 1883.

[*Mesophylax aspersus*, Rbr., stands in my Monographic Revision and Synopsis as *Stenophylax aspersus*, p. 132, and Supplement, pp. x and xxxiv. The genus *Mesophylax* was created by me subsequently (Journ. Linn. Soc., Zoology, xvi, p. 156, 1882) for the reception of *S. aspersus* and *S. oblitus*, on account of the microscopic condition of the spur of the anterior tibiæ of the ♂, without the first joint of the anterior tarsi being abbreviated, &c. The type form belongs essentially to the South of Europe, and is often found in caves; the paler var. (?) has been recorded from as far north as Bavaria. Whether I am right or not in considering this pale form only a variety remains to be proved; it is usually larger than the type form, but Mr. Service's example is of about the ordinary size. *M. aspersus* is an insect I should not have suspected of occurring in Britain, and especially in Scotland. Most of the allied species of *Stenophylax* and *Micropterna* are very concealed in their habits. There is just a possibility that this example may have worked its way inland from some vessel passing along the Scottish coast, but the chances of its having done so seem infinitesimal. I hope Mr. Service will search for the species diligently, and be enabled to place the matter above all doubt by further discoveries.—R. McLACHLAN.]

Reviews.

ROVÁRÁSZATI LAPOK. We have received what appears to be No. 4 (April, 1883) of a new monthly Entomological Magazine in the Hungarian language, and published at Pesh: we have copied the title. The contents seem to be varied, and probably of great value scientifically, and evidently concern several Orders of insects, according to the scientific names. More than this we cannot say. Beyond these scientific names, the only intelligible matter (to us) is a scale of charges for advertisements (in German) on the cover, and the titles of publications noticed. The editor (according to the signature to the scale) is "Dr. E. Kaufmann," of Szaboles, near Fünfkirchen, Hungary. In another cover-notice (in Hungarian) he appears as "Dr. Kaufmann Ernő," the latter word being evidently the Christian name; we have not the slightest doubt but that the cart thus put before the horse will retain its anomalous position in catalogues and records. If the editor wishes his magazine to be known outside Hungary (and we presume he has this desire, or he would not have sent us the last No.), he should give a résumé of (at least) the contents in some language with which most scientific men are familiar; in that case it would be possible for those who do not understand the Magyar language to obtain a translation of any article that seemed of sufficient interest. Patriotism we look upon as one of the finest attributes of human nature; but Science knows no nationality; therefore, if the notes in the Magazine whose title we give at the head of this notice are of any value outside Hungary (and, no doubt, most of them are so), the editor should not conceal their value by giving no clue to it in a form available to the majority of scientific students.

CATALOGUE OF BRITISH COLEOPTERA, by DAVID SHARP, M.B., &c., 2nd edition. London: E. W. JANSON, 35, Little Russell Street; March, 1883. 39 pp. 8vo.

Dr. Sharp is so justly accepted as an authority among Coleopterists, both in this country and abroad, and his catalogue has been so long in use, and of such service to British students, that it is not necessary for us to say much in its favour, but we may remark that this 2nd edition is in every respect equal to the first, and is of a rather smaller and more convenient form.

There is only one important change made in the arrangement of the families, viz., the removal of the *Erotylidæ*, *Endomychidæ*, and *Coccinellidæ* from the end of the arrangement to a situation between the *Lathridiidæ* and *Mycetophagidæ*. Among the genera the changes are more numerous, especially in the *Dytiscidæ* and *Staphylinidæ*; these families are well known to be favourites of the author, and we think all will acknowledge that the new genera represent very natural groups of species. The alterations in the sequence of the genera at the commencement of the *Staphylinidæ*, the separation of *Drusilla* from *Myrmedonia*, and of *Gnypeta*, *Epipeda*, and *Brachyda* from *Homalota*, seem to us to be most desirable, and the positions assigned to them natural and satisfactory; to adopt all Thomson's divisions of *Homalota* would be perplexing, but we regard these three as well selected, as no one could have considered their representatives as belonging naturally to *Homalota*, notwithstanding the comprehensive nature of that wonderful genus. On the whole, we may say that as few changes as possible seem to have been made in the catalogue, but what have been made, we think, are necessary. In specific names, a great many changes occur in the family *Chrysomelidæ*, and notably in *Donacia*, where "priority" has necessitated the abandonment of many well-known names, still we fully admit the necessity of this rule, although its application often causes considerable temporary inconvenience.

There are two small matters we do not like in the catalogue: one is the omission of capitals to names of persons in connection with specific names; the other, and more serious, is the omission of the authors' names to the genera; but these are of small importance where all else is so well and satisfactorily done.

Obituary.

William Alexander Forbes, B.A., F.L.S., died at Shonga on the Upper Niger, on January 14th, at the early age of 28, a victim to his enthusiasm in the cause of Natural History. He was the second son of Mr. J. S. Forbes, the well-known railway director, and was born at Cheltenham on June 24th, 1855; he was educated chiefly at Winchester, and entered St. John's College, Cambridge, as an undergraduate in 1876, where he took high honours in natural science. Forbes was a born naturalist, and for many years devoted himself to entomology with much ardour. During his residence at Cambridge he took a prominent part in resuscitating the entomological society of that university town, and organized a regular series of excursions in connection with it during the season. Moreover, he made many excursions in the Alps in search of insects, an account of some of which will be found in the volumes of this magazine. Perhaps natural predilection for anatomical studies, combined with the magnitude of the subject of entomology, gradually turned his attention

chiefly to comparative anatomy, especially that of birds, a subject on which he had already made his mark in connection with the prosectorship of the Zoological Society, to which post he was appointed after the premature decease of his friend Prof. Garrod. His vacations were always devoted to zoological expeditions; in 1880 he paid a visit to Brazil, in 1881 to the United States. The more extended visit to the Niger was commenced in July, 1882, with the melancholy result we all deplore; that malarious region soon made of him another martyr to the cause of science. All who watched his career saw in him one who was destined, if he lived, to make a great name for himself, and his exceedingly amiable disposition causes his premature death to be lamented by hosts of private friends.

ENTOMOLOGICAL SOCIETY OF LONDON: 4th April, 1883.—J. W. DUNNING, Esq., M.A., F.L.S., President, in the Chair.

L. Hill, Esq., of Ealing, and L. Peringuey, Esq., of Cape Town, were elected Members.

The President, in announcing the death of Prof. Zeller, gave a brief sketch of the career of the late illustrious Honorary Member of the Society.

Mr. W. F. Kirby exhibited specimens of an *Acridium* (believed to be *A. succinctum*, L.), which was stated to be causing great devastation in India.

As an item of "economic entomology," Prof. Westwood stated that the Myriopod *Polydesmus complanatus*, L., had been gravely accused in a Sussex newspaper of being the cause of the potato disease.

The Rev. A. E. Eaton exhibited a revolving "holder," which he had found of great service in microscopic manipulation.

Mr. Fitch exhibited galls of *Cecidomyia violæ*, Löw, found by Mr. Corder on *Viola sylvatica* in Epping Forest; also an *Aphis* gall on *Pistacia* from Cannes; and a curious pouch-like gall of a *Cecidomyia* on Juniper, found at Mentone, by Mr. Thomas Boyd.

Sir S. S. Saunders read further communications respecting fig-insects.

Mr. H. Goss exhibited *Pimelia angulata*, F., from the Egyptian Pyramids.

Mr. Olliff read a paper on new species of Clavicorn *Coleoptera* from North Borneo, collected by Mr. W. B. Pryer.

Mr. Cameron communicated descriptions of new genera and species of *Hymenoptera*, chiefly exotic.

Mr. Kirby read notes on new, &c., *Hymenoptera* from New Zealand.

2nd May, 1883.—The President in the Chair.

This being the 50th anniversary of the foundation of the Society, the President read an historical sketch, in which he succinctly embodied all points of interest concerning its career, and the benefits it had conferred upon entomological science in general. Only six of the original Members still survive, viz.: Prof. C. C. Babington, the Rev. L. Blomefield, Sir S. S. Saunders, Mr. W. B. Spence, Mr. G. R. Waterhouse, and Prof. Westwood. He expressed a hope that the number of Members would be very largely increased before the end of the jubilee year.* In concluding his address, he suggested that Prof. Westwood be elected titular Life-

* A hope we most cordially share.—EDS.

President of the Society, accompanying his suggestion by eulogistic remarks on the career of our veteran entomologist, and his labours in the cause of entomology. This was adopted by acclamation.

The Meeting was then made "special," in order to consider certain proposed alterations in the bye-laws. Some of the propositions were adopted, others rejected. The chief resultant alterations were as follows:—No "Subscribers" will be henceforth elected: the "Transactions" will be sent without further payment to all Members not in arrear with their subscriptions: notice is to be given of names proposed to be substituted for those recommended for officers and council before the Annual Meeting, such proposed substitutions (if any) to be notified by circular to the Members. At the ordinary Meeting, E. A. Butler, Esq., of Hastings, and W. H. Miles, Esq., of Lambeth, were elected Members.

SOME NEW SPECIES AND GENERA OF *COLEOPTERA* FROM
NEW ZEALAND.

BY D. SHARP, M.B.

While investigating a small batch of New Zealand *Coleoptera* received recently from Mr. Helms, of Greymouth, I have found the following new forms that it appeared to me advisable to describe.

Tarastethus, n. g. of *Carabidæ*; *T. puncticollis* and *T. læviventris*, nn. spp.; *Lecanomerus marginatus*, n. sp.; *Pterostichus Helmsi*, n. sp.; *Protoparnus*, n. g. of *Parnidæ*; *P. vestitus*, n. sp.; *Clypeorhynchus* and *Saphorhynchus*, n. g. of *Curculionidæ*; *C. gracilipes* and *S. longicornis*, nn. spp.; *Dorytomus elegans*, n. sp.; *Eugnomus argutus*, n. sp.; and *Tychanus bufo*, n. sp.

TARASTETHUS, n. g.

Form short and convex, surface glabrous. Mesothoracic epimera linear, not reaching the coxæ. Head with two ocular setæ on each side; scrobe with an exerted seta in front. Metasternum excessively short, so that the middle coxæ almost touch the hind ones. Antennæ with the three basal joints glabrous, the others pubescent, but not densely so, so that there is not a very abrupt contrast between the glabrous and the pubescent joints. Elytra not at all truncate, with a slight sinuation near the extremity. Last joint of maxillary palpus longer and rather stouter than the preceding joint, narrowed towards the extremity and acuminate. Second joint of labial palpi short and stout, minutely bisetose, mentum with large acute tooth in the middle. Male anterior tarsi with the two basal joints a little dilated, their inner angles a little produced and acute, squamæ very obscure. Pro-

thorax with a single lateral seta on the side at the middle, and a minute one at the hind angle, none in front; base truncate, reposing on the base of the elytra, which possess a well-marked margin.

This genus of small *Carabidæ* is allied to *Cyclothorax*, from which it differs by the convex form, the remarkably abbreviate metasternum, and by the structure of the male tarsi; the condition of these feet I am not, however, able to ascertain very thoroughly.

TARASTETHUS PUNCTICOLLIS, *n. sp.*

Nigro-piceus, nitidus, antennis palpis pedibusque testaceis; prothorace lateribus sinuatis, basi truncato, utrinque impresso, et crebre punctato, angulis posterioribus fere rectis; elytris profunde striatis, striis fortiter punctatis, interstitiis parum convexis lævigatis: abdomine utrinque fortiter punctato. Long. 5 mm.

Thorax narrower than the elytra, about as long as broad, with an elongate channel along the middle, with an impression at the base on each side nearly equidistant from the middle and the outer margin, the whole of the base punctate, the disc nearly impunctate. Elytra short and broad, convex, the shoulders much curved, the eighth interstice elevated at the extremity so as to form a plica.

I received a specimen found at Greymouth formerly from Herr Reitter, and have now received the insect from Mr. Helms. I have not, however, seen the male.

TARASTETHUS LÆVIVENTRIS, *n. sp.*

Nigro-piceus, nitidus, antennis palpis pedibusque testaceis; prothorace lateribus sinuatis, basi truncato, utrinque bi-impresso, fere lævigato; elytris interne striatis, striis remote punctatis; abdomine lævigato. Long. 5 mm.

This species differs from *T. puncticollis* in numerous respects; the thorax is less sinuate at the sides, and is almost without punctuation, there being only about four or five punctures on each side about the middle of the base; the basal impression is differently formed, so that, viewed in a certain manner, there appears to be a second impression near the outer margin; the outer striæ of the elytra are quite obsolete, but the eighth interstice forms an elevated plica at the extremity.

It is from this insect that my description of the male tarsus in the generic description is taken; one of the front legs, however, being gone, I am not very sure about the details: there is no seta in this species at the hind angle of the thorax. Also sent by Mr. Helms from Greymouth.

LECANOMERUS MARGINATUS, n. sp.

Ovatus, nigricans, palpis, pedibus elytrorumque margine externo testaceis, antennis, tibiis apice tarsisque fuscis, illis basi testaceo; corpore subtus variegato: prothorace transverso, posterius angustato, basi levigato vix impresso; elytris sat profunde striatis, striis haud punctatis.

Long. 6 mm.

This species is distinguished from the other New Zealand *Lecanomeri* by the more variegate surface, in which respect it resembles the New Caledonian *Acupalpus domesticus* (a species which should also be referred to the genus *Lecanomerus*). The antennæ are rather stout, and the basal joint clear yellow; the raised margin of the prothorax is yellowish, as is also the scutellum, and the same colour forms a broad definite border of variable width along the sides of the elytra; on the under-surface the head and the hind coxæ are yellow, and the ventral segments are maculate at the sides. The dilatation of the male tarsi is moderate, the fourth joint being not very short and broad.

This species occurs at Auckland, where it has been found by Messrs. Broun and Lawson: it is probable that Captain Broun's record of the occurrence of *L. latimanus* at Tairua and Whangarei refers rather to this species; Mr. Bates having at first supposed the *L. marginatus* to be a variety of *L. latimanus*, so named specimens, and thus the error has arisen.

PTEROSTICHUS HELMSI, n. sp. (sub-gen. STEROPUS).

Elongatus, niger, superne plus minusve metallico-tinctus; prothorace elongato, posterius angustato, mox ante angulos posteriores sinuato, his rectis, basi utrinque fovea magna, impunctata, impressa; elytris ad apicem acuminatis, lateribus curvatis haud parallelis, profunde striatis, striis haud perspicue punctatis, interstitiis absque punctis impressis, ad apicem leviter transversim depressis itaque subundulatis apparent.

Long. 18, lat. $6\frac{1}{2}$ —7 mm.

Var. *femoribus rufis*.

This is, so I am informed by Mr. Helms, the only Carabideous insect of considerable size that is at all common near Greymouth; it is remarkable that it should not have been detected in other parts of the islands, especially as it belongs to a sub-genus not known before to occur in New Zealand; this sub-genus (*Steropus*) is recorded by Chaudoir (Bull. Mosc., 1865, p. 97), as possessing several species in Australia characterized by their elytra being acuminate at the extremity, and possessing some large punctures on the third interstice. *Pterostichus Helmsi* agrees in the former of these respects with the Australian *Steropi*, but has no punctures on the third interstice, so that it should apparently form a separate section in *Steropus*. From all other New Zealand *Pterostichi* of large or moderate size known to me, *P. Helmsi* is readily distinguished by its more slender form, and the more prolonged apical portion of the elytra. The undulated appearance on the posterior part of the wing-cases is somewhat variable, and the metallic tinting of the upper surface is very variable, and occasionally very slight.

PROTOPARNUS, *n. g.*

Allied to *Parnus*, but the body simply pubescent, without indument, the eyes quite small and coarsely faceted; the antennæ ten-jointed, the second joint not auriculate, joints 4—10 furnished with an elongate process: metasternum short.

The insect, for which I propose this generic name, agrees with the generic characters given for *Parnida* by Broun (*Man. N. Zeal. Coleoptera*, p. 249), except in the structure of the antennæ; but if Broun's description be at all correct, these organs must be very different in *Parnida* to what they are in *Protoparnus*. In this latter genus they are ten jointed, the basal joint is short and nearly triangular, the second joint is short and very broad, quite twice as broad as long, closely applied to the broad end of the basal joint; the third joint is very small, articulated by a very slender process to the posterior angle of the second joint; the fourth and following joints emit each in front a rather long process, so that the six penultimate joints form together a short, very broad mass, the terminal or tenth joint has a less extension in the transverse direction, so as to form an obtuse termination to the mass.

PROTOPARNUS VESTITUS, *n. sp.*

Piceus, sat nitidus, pube molli erecta vestitus, prothorace sat fortiter punctato, intra latera utrinque profunde impresso; elytris leviter striatis, striis internis obsoletis, externis sat profundis; antennis tarsisque rufis.

Long. 3 mm.

Thorax transverse, the sides in front rounded and narrowed, parallel to each a deep impression extending the whole length, but deeper at the base than in front. Scutellum broad, not pointed, impunctate. Striæ of the elytra distinct at the sides and apex, but obsolete towards the suture, some of them deeper at the base, and connected just before the base, so that some of the interstices, more particularly the 5th and 7th, reach quite to the base, while others do not. Legs short and stout. Terminal ventral segment without impression.

I have not received from Mr. Helms any information as to the habits of this little creature, but I do not suppose they are aquatic. Mr. Reitter has also received this from Mr. Helms.

CLYPEORHYNCHUS, *n. g.*

Rostrum not quite so long as prothorax, moderately stout, between quadrate and cylindric, antennæ inserted so as to leave one-third of the length of the rostrum in front of their insertion; the anterior portion of the rostrum separated by a deep irregular suture from the other part, and glabrous, the portion behind the suture being rugose

and clothed with scale-like hairs. Mandibles exposed at apex of rostrum, and laminate, that is, presenting externally and in front a well marked edge: scrobes deep in front, elongate, vague behind, not reaching the eye, this latter oval, contiguous with the margin of the thorax. Antennæ elongate and slender, scape elongate, clavate, extending backwards beyond the eye, 1st joint of funiculus very elongate, but not quite half so long as the scape, club elongate-oval, slender, evidently three-jointed, the three joints of about equal length. Thorax sub-oblong, narrower at the base than the elytra. Legs elongate, tarsi slender, third joint with elongate lobes.

This genus may be placed in the *Rhyarosomides* of Lacordaire, where, however, it is an anomalous form. Having somewhat the appearance of *Phrynixus*, Pascoe, it is abundantly distinct therefrom by the elongate scrobes, and by the slender third joint of the tarsi, which joint, moreover, is divided so deeply as to form two remarkably elongate lobes. It is an interesting fact, that although the scrobes are not terminal, yet they possess a very evident lateral dilatation after the manner of the *Rhynchides*. The remarkable differentiation of the anterior and posterior portions of the rostrum appears to me to indicate that even in the *Curculionidæ* with elongate rostrum, the portion in front of the antennal insertion is made up of the transformed clypeus, although frequently no trace of a division between the epicranium and clypeus can be detected.

CLYPEORHYNCHUS GRACILIPES, *n. sp.*

Convexus, fusco-ferrugineus, setulis haud densis maculatim vestitus, antennis pedibusque gracilibus, setulis erectis tenuibus minutis; prothorace elongato, anterius impresso, posterius ruguloso.

Long., excl. rostr., 6 mm.

Rostrum rugose, in front of the antennæ smooth and shining, the vertex between the eyes with an elongate impression. Thorax longer than broad, its greatest width in front of the middle, slightly narrowed behind, more distinctly narrowed in front, the upper surface rugose and limited on each side by an irregular band of dense sub-depressed pale setæ, and in the middle in front deeply impressed. Elytra oblong-oval, obliquely narrowed at the shoulder, the surface rather uneven, but without distinct prominences, rather vaguely striate, the striae marked with irregular depressions, with irregular spots of pale squamiform setæ. Legs slender, all the tibiæ evidently sinuate internally, and with their inner angle prolonged and acuminate.

Mr. Helms has sent this species as No. 132, and informs me that it was found at Mouri Creek, about sixteen miles from Grey-mouth.

(To be concluded in our next).

STRAY NOTES ON THE LEPIDOPTERA OF PEMBROKESHIRE.

BY CHAS. G. BARRETT.

After such a year as I had never previously known—rain all through the spring until June, when one fortnight of fine weather intervened, then rain again till August, when came another fine fortnight, then rain, rain, rain, through September, October, and November, with only a fine day at rare intervals, and even more and continuously heavier rain through December, January, and the greater part of February, so that no drop of water seemed able to soak into the saturated earth, but all ran off as it fell, in rills, rivulets, and tumbling streams over all this hilly country—after all this, which should surely have washed, drowned, or mildewed all insect life out of existence, then came, at the end of February, such a burst of glorious sunshine as we had well-nigh despaired of ever seeing again, and promptly there appeared in the woods such a host of the lively little *Tortricodes hyemana* as I never saw before, not even in the South of England. It seemed almost magical, after a year of desolation, in which hardly a moth could be found in the woods, to see these swarms of lively little creatures dancing about in the sunshine. Clearly *this* species is able to hold its own against wet weather. Fortunately there was an added element of interest in the occurrence of this common species: among the numbers of males of the usual light brown colour were some in which the ground colour was creamy-white, and the markings dark brown, forming a very pretty and attractive variety, which, with the wings closed, looked wonderfully like *Acrobasis consociella*.

Almost the only other moth obtainable in the woods at the same time was *Hibernia leucophæaria*, which was tolerably common, sitting high up on the trunks of the trees, or among the dead leaves. Nearly all were of the ordinary grey type, and those with blackish fasciæ were not well marked, but I met with an exceedingly pretty variety, of a pale straw colour, without irrorations, and with the transverse lines dark brown.

Before these two species had disappeared, *Eupithecia dodonæata* came out commonly, though from its habit of sitting under the branches of oak trees, and flying higher up when dislodged, it was difficult to secure. Some of the specimens were very light coloured, and prettily marked.

In June, 1882, the pretty larva of *Ceropacha ridens* was tolerably frequent in the woods, the most convenient and successful method of

obtaining them being by looking up at the overhanging oak boughs, when the larvæ could easily be seen lying half curled under outside leaves drawn slightly together. From these a lovely and variable series of the moths emerged this spring. The larva of *Teniocampa miniosa* was common at the same time, but very many were destroyed while small by a parasite, which, on emergence from the larva, formed for itself a queer hard case, like a large caraway seed, and deeply ribbed, within which it made the usual silken cocoon. I suppose I kept these too dry, for no parasite emerged. Between the ravages of these enemies, and the unfortunate propensity of *Teniocampa* for dying in the pupa state, I lost nearly all my hoped-for *miniosa*.

Since the extraordinary invasion of these islands by vast swarms of *Plusia gamma* and *Cynthia cardui* from the continent in 1879, there has been in this district a marked scarcity of the former usually abundant species, and an almost total absence of the latter. I think I may safely say that I did not see a dozen *P. gamma* last year, and certainly not one *C. cardui*. It was, therefore, with no little interest that I noticed in the beginning of May this year, that the whole country had suddenly become lively with *P. gamma*, rising hastily every minute from the road-sides, and dashing wildly about the fields, and ten days later that they were joined by large numbers of *C. cardui*. It seemed curious to see half a dozen of the latter on a patch of *Allium ursinum*, enjoying the nectar of the flowers, entirely unconscious of—or, perhaps, approving—the peculiar fragrance of the plant.

In the case of *P. gamma*, it was noticeable that, although in tolerable condition, the specimens were certainly different in colour from those usually found in this district, being more of a slate colour, and paler beyond the middle of the fore-wings. In this they were very uniform. From this, as well as from their time of appearance in such numbers, I judge that they were not natives. All the *C. cardui* were also rather pale, being worn from evident hibernation, but as there were none here last autumn, nor any larvæ, they could not well have hibernated here. Moreover, on their first appearance, they were exceedingly wild and swift of flight, although it was a full fortnight earlier than they would have, in ordinary course, left their places of hibernation.

All the evidence, therefore, seems to point very strongly to an immigration from some warm climate of a swarm of both these species, just as in 1879. To reach us they must first have visited the south or south-west of England, and information on the subject from those districts would be very desirable. In 1879, *C. cardui* accomplished its

own extermination in a very singular manner. It seemed that its instinct—derived from a country of longer summers—tended towards the production of a second brood in the year, and eggs were laid which produced the young larvæ in October on the young thistles. These larvæ, of course, perished in the wet winter, and the species disappeared, to re-appear after this interval, in obedience to the strange migratory instinct. It is extremely difficult to get at data from which to judge of the cause of this system of irregular migration, but I think we have now a clue to the means by which species are locally destroyed.

Both species are still flying about in the sunshine in plenty. I must have seen scores of *cardui* to-day in the course of a short drive, and hope to see the roads rendered attractive by an abundance of the pretty creatures in far greater perfection at the end of July, if only this lovely weather remains faithful to us ; but I fear that, undeterred by the fate of their kindred, they will lay their eggs in the autumn, to no purpose.

Among the species able to endure a humid climate, *Melitæa Artemis* must certainly be included, though even it, no doubt, appreciates the value of warm sunshine at the time when its hibernated larvæ leave their sheltering tent to feed up in the spring.

I found the butterflies just emerging from the pupa in one of their favourite haunts at the end of May, in rather unusual numbers, and a week later, on a second visit, they were out in hundreds. When freshly out (on the first visit) they were very beautiful, some having a row of white spots along the margin of the hind-wings, and many emulating, though not equalling, the lovely dark markings of the West of Ireland specimens. One or two had a broad pale band across the fore-wings from the obliteration of a dark transverse line, and one of these had also the under-side of the hind-wings ornamented in a similar manner.

On the other hand, *Argynnis Selene* has disappeared from the road-sides, and the little strips of marsh into which it had found its way in recent years, and is only to be found in the woods and down the slopes of sea-cliffs. In the latter localities, a slight tendency to greater richness of marking leads one to hope for some handsome variety, which, as yet, has not turned up.

Such a hope led me the other evening down a charming place, a long slope covered with coarse grasses, furze, heath, wood-sage, violet, &c., running down to where the bare rock, sixty feet deep, was fringed with ivy, privet, wild madder, *Silene maritima*, thrift, and other sea-side plants. Here *Selene* was thoroughly at home, as completely

as in an inland wood, spreading its wings in the gleam of the setting sun, flitting away down to the edge of the precipice, or hanging with closed wings on the heads of the cock's-foot grass. The only other living creatures in sight were two or three pairs of herring-gulls flying about the rocks, and uttering loud cries of defiance at the intrusion.

At the top of this slope I met with one *Syrichthus alveolus*, almost the only specimen seen this year, though carefully searched for in the interests of a local museum. *Lycæna Argiolus*, formerly common here, has also apparently disappeared, a victim to the rain.

Pembroke: 11th June, 1883.

NOTES ON HAWAIIAN MICRO-LEPIDOPTERA.

BY E. MEYRICK.

I am indebted to the kindness of the Rev. T. Blackburn for the specimens on which the following notes are founded. I had the pleasure of making a rough general examination of Mr. Blackburn's collection, from which it appears that the Micro-Lepidopterous fauna of the Hawaiian Islands is highly specialized and very interesting. So far as I could determine, Mr. Butler's identifications of those species described by him are often erroneous; a few of these I have here corrected. The importance of a thorough investigation of this fauna is very great, as bearing on questions of geographical distribution and development.

CONCHYLIDÆ.

HETEROCROSSA, Meyr.

H. achroana, n. sp.

♂ ♀. 18—20 mm. Head, palpi, antennæ, thorax, abdomen, and legs whitish; palpi very long in both sexes, externally mixed with dark fuscous towards base; anterior tibiæ mixed with dark fuscous. Fore-wings elongate, costa moderately arched, apex round-pointed, hind margin straight, moderately oblique; whitish, thinly sprinkled with greyish-ochreous and fuscous, appearing ochreous-whitish; a tuft of raised scales on fold at one-third from base, and two others transversely placed in disc beyond middle; a few scattered raised scales: cilia whitish, sprinkled with fuscous. Hind-wings and cilia whitish.

Distinguished from all the other species of the genus by the entire absence of dark markings. Two specimens taken on Mauna Loa, at an altitude of 4000 feet.

The occurrence of this genus is very interesting. I have described two species from New Zealand, and a third from Australia, and have two other New Zealand species undescribed. It belongs to a very ancient group of the *Conchylidæ*, now in course of extinction, and represented in Europe only by the two species of *Carposina*, H.-S. This genus is specially characterized in the group by the basal pectination of the lower median vein of the hind-wings, a structure otherwise confined to the *Grapholithidæ*, and probably ancestral. The species is closely allied to the New Zealand forms, but as there is in general no affinity whatever between the New Zealand and Hawaiian faunas, it is probably a case of a single persistent type once widely dominant, but now lingering only in isolated situations.

GELECHIDÆ.

Depressaria indecora, Butl., Ann. and Mag. Nat. Hist., 1881, 397, and *D. lactea*, *ibid.*, 398, are respectively ♂ and ♀ of the same species. This is not a *Depressaria*, and does not in fact belong to the *Depressaridæ*, but to the *Gelechidæ*; I cannot, at present, specify the genus, but it is nearly allied to those hereafter following. I am unable to understand why Mr. Butler has stated that this species possesses the true neuration of *Depressaria*, since in fact it differs widely in that respect. The same may be said of *D. gigas*, *ibid.*, 397, which is apparently cogeneric with the preceding. No true *Depressaria* occurs in Mr. Blackburn's collection, nor any allied genus; and it may be observed, that the genus is also wholly absent from Australia and New Zealand. The so-called genus *Chezala*, Walk., alluded to by Mr. Butler as a section of *Depressaria*, is virtually uncharacterized, and, therefore, non-existent; but the species on which it is founded (*C. allatella*, Walk., itself merely a synonym of *Cryptolechia privatella*, Walk., and *Crypt. latiorella*, Walk.) belongs to the *Ecophoridæ*, and is widely remote from *Depressaria*.

THYROCOPA, n. g.

Head smooth, side tufts short, erect; tongue moderate. Thorax smooth. Antennæ moderate, filiform, pubescent; basal joint moderate, simple. Maxillary palpi short, drooping. Labial palpi long, recurved; second joint thickened with appressed scales, somewhat rough beneath; terminal joint as long as second, moderate, acute. Abdomen stout, somewhat depressed, distinctly margined. Posterior tibiæ with short, dense, appressed hairs. Fore-wings elongate-oblong. Hind-wings trapezoidal, somewhat broader than fore-wings, hind margin

very slightly rounded, cilia short ($\frac{1}{2}$); costal edge folded and bent back above, forming a deep furrow on upper surface, in which lies a very long pencil of fine hairs (in ♂ only?). Fore-wings with 12 veins, 2 from considerably before angle of cell, 3 from angle, 7 and 8 stalked, 7 to costa. Hind-wings with 8 veins, 3 and 4 from a point at angle of cell, 5 parallel to 4, 6 and 7 stalked.

This does not nearly approach any described genus, but is allied to the two following genera, which together belong to a peculiar group of the *Gelechidæ*, apparently forming a considerable proportion of the Hawaiian fauna.

Th. usitata, Butl.

Depressaria usitata, Butl., Ann. and Mag. Nat. Hist., 1881, 396.

A variable and obscure looking species, not recognisable from Mr. Butler's description. The normal form has the fore-wings dull, rather light greyish-brown, with two or three dark fuscous dots near base, two transversely placed in disc before middle, two nearer together and almost confluent in disc beyond middle, and posterior half of costa dotted with dark fuscous; hind-wings greyish-white, more greyish posteriorly. It varies principally in size and depth of colouring.

SYNOMOTIS, *n. g.*

Head with appressed scales; tongue long. Thorax smooth. Antennæ slender, filiform, pubescent, basal joint moderate, simple. Maxillary palpi obsolete. Labial palpi long, curved, ascending, second joint clothed with appressed scales, somewhat rough beneath towards the apex, terminal joint as long as second, slender, acute. Abdomen moderate, margined. Posterior tibiæ clothed with short, dense, appressed hairs. Fore-wings elongate-oblong. Hind-wings trapezoidal, slightly broader than fore-wings, hind margin very faintly sinuate below apex, cilia short ($\frac{1}{2}$); with an expansible pencil of long fine hairs at base of costa. Fore-wings with 12 veins, 2 from considerably before angle, 3 and 4 approximated at base, 7 and 8 stalked, 7 to costa. Hind-wings with 8 veins, 3 and 4 stalked from angle of cell, 5 rather bent and approximated to 4, 6 and 7 stalked.

Closely approaching *Thyrocopa* in neuration, and distinguished principally by the free basal hair-pencil of the hind-wings, and the absence of maxillary palpi, as well as several minor differences.

S. epicapna, *n. sp.*

♂. 16-17 mm. Head, palpi, antennæ, and thorax pale fuscous, mixed with

dark fuscous and ochreous-whitish. Abdomen ochreous-whitish. Anterior and middle legs fuscous, with ochreous-whitish rings at apex of joints; posterior legs ochreous-whitish, sprinkled with fuscous. Fore-wings moderate, oblong, costa gently arched, apex almost acute, hind margin slightly sinuate, moderately oblique; pale fuscous, densely irrorated with darker fuscous; an indistinct, short, linear, dark fuscous mark in middle of disc; the three discal dots hardly indicated; faint traces of a paler angulated posterior transverse line: cilia pale fuscous, irrorated with darker fuscous. Hind-wings whitish-grey, more whitish towards base; cilia whitish, with two grey lines.

Two specimens.

AUTOMOLA, n. g.

Head smooth; tongue long. Thorax smooth. Antennæ rather stout, slightly serrate, simple, basal joint moderate, simple. Maxillary palpi rudimentary, short, drooping; labial palpi moderately long, recurved; second joint broadly thickened with dense appressed scales; terminal joint somewhat shorter than second, rather stout, acute. Abdomen moderate, distinctly margined. Posterior tibiæ with dense appressed hairs. Fore-wings elongate; hind-wings trapezoidal, as broad as fore-wings, hind margin markedly sinuate beneath apex, cilia moderate ($\frac{3}{4}$). Fore-wings with eleven veins, 2 and 3 stalked from just before angle of cell, 7 to costa. Hind-wings with eight veins, 3 and 4 stalked from angle of cell, 6 and 7 stalked.

Doubtless allied to the two preceding genera, but differing from them and almost the whole family in the possession of only eleven veins in the fore-wings, this exceptional structure is evidently due to the coalescence of the normal veins 7 and 8, which coincide for their whole length, instead of for a portion only.

A. pelodes, n. sp.

♂. 15 mm. Head, palpi, antennæ, thorax, abdomen, and legs whitish-ochreous, thinly sprinkled with fuscous; second joint of palpi externally densely irrorated with dark fuscous, terminal joint with a slender blackish median ring. Fore-wings moderately elongate, costa moderately arched, apex obtuse, hind-margin obliquely rounded; whitish-ochreous, somewhat suffused with ochreous, and thinly sprinkled with dark fuscous; a blackish dot at base of costa; a small blackish dot in disc before middle, a second rather obliquely beyond it on fold, and a third more conspicuous in disc beyond middle; a row of blackish dots between veins on hind margin and apical fourth of costa: cilia whitish-ochreous sprinkled with fuscous. Hind-wings whitish-ochreous, slightly greyish-tinged; cilia whitish-ochreous.

This is the species considered by Mr. Butler to be synonymous with the Australian *convictella*, Walk. It would be alike unexpected and interesting to find any species native to both Australia and the Hawaiian Islands; but, as a matter of fact, *convictella*, Walk., belongs

to the genus *Eulechria* in the *Cecophoridae*, and differs from the above species in almost every important point of structure; nor is there even any close superficial resemblance.

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Parasia sedata, Butl.

I cannot identify the very insufficient description originally given (Cist. Ent. ii, 560), and do not remember noticing an Hawaiian type. Mr. Butler referred the first specimen to *Gelechia*, but the second to *Parasia*, as if it were a matter of choice, though these genera are widely different. But it is in the highest degree improbable that the species is common to the Hawaiian Islands and New Zealand; and, considering its obscure colouring, the apparent uncertainty as to its structure, and the above-mentioned similar instance of mistaken identity, I think we shall be justified in regarding this identification as unwarranted.

DIPLOSARA, n. g.

Head with appressed scales; tongue strong, scaled. Thorax, perhaps crested (?). Antennæ rather stout, serrate, in ♂ towards base with a fascicle of short cilia ($\frac{1}{2}$) on each joint; basal joint moderate, simple. Maxillary palpi rudimentary, short, drooping. Labial palpi moderately long, recurved; second joint considerably thickened above and beneath with dense, somewhat rough scales, attenuated towards base; terminal joint as long as second, acute, posterior edge from base nearly to apex clothed with long, dense, obliquely projecting scales. Posterior tibiæ clothed with long dense hairs. Fore-wings elongate, narrow, surface with large tufts of raised scales; hind-wings elongate-ovate, as broad as fore-wings, cilia rather long (1). Fore-wings with twelve veins, 3 and 4 closely approximated from angle of cell, 5 and 6 widely remote, 7 and 8 stalked, 7 to costa, 11 from middle of upper margin of cell. Hind-wings with eight veins, 2 and 3 considerably before angle of cell, parallel, 4 and 5 stalked from angle, 6 gradually approximated to 7 at base.

A remarkable and distinct genus, certainly belonging to the *Gelechidae*, but otherwise differing greatly from any other known. It is, however, probable that it has some direct relationship to the genera above described.

D. lignivora, Butl.

Scardia lignivora, Butl., Ent. Mo. Mag., xv, 273.

I am unable to conjecture why Mr. Butler should have referred this singular insect to the genus *Scardia*, with which it has really not a single structural point in common.

TINEIDÆ.

Blabophanes longella, Walk.

This is another instance of mistaken identity. I saw five specimens of the Hawaiian species, and they did not appear to differ perceptibly from the European *B. monachella*, Hb. But in any case it is impossible to admit that the white-headed Hawaiian species (which is perfectly constant) can be identical with the yellow-headed Indian species described by Walker under the above name. If, as I think, the species is truly *B. monachella*, it is no doubt an introduced insect.

Christchurch, New Zealand :

February 17th, 1888.

DESCRIPTION OF A NEW GENUS AND SPECIES OF THE FAMILY
GERRIDÆ (HEMIPTERA-HETEROPTERA).

BY F. BUCHANAN WHITE, M.D., F.L.S.

PLATYGERRIS, n. g.

Corpus oblongum, latiusculum, depressum. Caput oblongum ante oculos subconstrictum. Oculi intus leviter sinuati. Ocelli nulli. Antennæ cylindricæ, 4-articulatæ, corporis dimidio subæquilongæ, articulo primo longissimo. Rostrum 4-articulatum, mesosterni marginem anticum attingens. Pronotum transversum, longitudinaliter trisulcatum, processu postico haud instructum. Mesonotum longissimum. Metanotum brevissimum. Elytra et alæ absunt? Abdomen brevissimum, connexivo erecto instructum. Pedes antici breves, tarsi biarticulatis. Pedes intermedii et postici elongati, ad latera posteriora thoracis inserti, tarsi biarticulatis.

Somewhat, but not very closely, allied to *Hydrobates* and *Halobates*.

PLATYGERRIS DEPRESSA, n. sp.

Nigra subnitida, capillis brevissimis adpressis albidis vestita; capite macula ovali intraoculari, pronoto linea angusta longitudinali obsoleta, rubris; acetabulis anticis anticæ, coxis anticis, trochanterum anticorum vitta anteriore, acetabulorum intermediorum macula triangulari longa inferiore, acetabulorum posticorum macula triangulari brevi inferiore, coxarum posticarum macula inferiore, margine postico inferiore segmenti genitalis primi, necnon spina postica inferiore segmenti genitalis secundi plus minus sordide ochraceis.

♂ Long. 6, lat. 2½ mm.

Habitat, Mexico (Berlin Museum, No. 3351).

The structure of this species is in several respects so interesting, that it merits a longer description than the rather brief diagnosis given above.

Body oblong, rather flattened and comparatively broad; more or less covered with close, short, adpressed pubescence. Black, somewhat shining, but this may arise from the pubescence having been rubbed off in several places. Where the pubescence remains it consists of, in some places, very short, adpressed, scale-like, flattened, white hairs, and in others of less adpressed black hairs. The pronotum and abdomen above have a bluish tinge, and the two pairs of posterior legs are brownish-black. Between the eyes is a large, oval, orange-red spot, and on the pronotum a narrow, rather indistinct, central longitudinal line of the same colour. The front of the anterior acetabula, the front coxæ, and a band on the inside of the front trochanters, a long, narrow, triangular spot on the underside of the middle acetabula, and a shorter triangle on the under-side of the hind acetabula, a small spot on the under-side of the hind coxæ, the middle of the hind-margin of the under-side of the first genital segment, and a conspicuous spine-like process on the hind-margin of the under-side of the second genital segment, are more or less ochraceous.

Head, without the eyes, oblong, with the sides in front of the eyes sinuate; the vertex slightly concave in the middle, and the frons convex and sloping gradually downwards. Hind-margin rounded. The eyes very large and prominent, situated at the sides of the head, and extending a little behind it, and resting on the sides of the pronotum; the inner margin slightly sinuate. Antenniferous tubercles situated at the sides of the head, and near the front, and rather flatly, horizontally, expanded. Antennæ about half as long as the body, moderately stout, four-jointed, with a conspicuous jointlet between the 2nd and 3rd joint, and a smaller one between the 3rd and 4th. First joint the longest, and slightly curved; 2nd about one-third the length of the 1st, somewhat thickened upwards; 3rd about two-thirds the length of the 2nd, and strongly incrassate upwards; 4th longer than the 2nd, and much the thickest joint, thickest in the middle, the apex curved upwards. Several of the joints have erect spine-like hairs, but these are most numerous on the 4th. Rostrum reaching to the front margin of the mesosternum, 4-jointed: 1st joint stout, short, and subquadrate, 2nd ring-like, 3rd the longest, and 4th shorter and thinner than the 3rd.

Pronotum distinct from the mesonotum, much broader than long, longest in the middle, narrower than the head with the eyes. Disc flat, with three rather obsolete, shallow, but wide, longitudinal furrows. Front margin slightly concave, hind margin widely convex, sides rounded. Prosternum smaller than pronotum, disc slightly convex, the outer third on each side occupied by the acetabula of the front legs.

Mesonotum forming nearly one-half of the total length of the body, oblong, widening slightly backwards, wider in front than the pronotum; disc flatly convex, with, on each side, a wide longitudinal furrow, continuous with the lateral furrows of the pronotum. Front margin widely concave, with the anterior angles prominent and rounded, and extending a little forwards on each side of the pronotum. Sides rounded. Hind-margin very distinctly bisinuate, the posterior angles extending considerably backwards and downwards to form the acetabula of the middle legs. Meso-

sternum very slightly convex, front margin nearly straight, the anterior angles slightly tumid, and having within them a rather obsolete furrow. Hind-margin very slightly concave, with, on each side, a shallow longitudinal furrow lying on the inside of the middle acetabula. Metanotum separated from the mesonotum by a distinct furrow; very much broader than long, and consisting of three portions. The central portion is bounded on each side by an elevated ridge, continuous with the connexivum of the abdomen, and lying to the inside of the hind acetabula; front margin concave; hind margin emarginate in the middle, slightly convex on each side; disc transversely convex, with, posteriorly on each side, a narrow, rather deep fovea, external to which is a small tubercle. The lateral portions of the metathorax extend backwards and form the hinder acetabula, hence, perhaps, they should be considered as making part of the metasternum, no part of which is visible below.

The abdomen is very short in comparison with the thorax, and does not extend backwards much beyond the base of the hind legs. Above, the abdomen (excluding the genital segments) consists of five visible segments, but another probably exists, and is covered by the metanotum, the small fovea on each side of the disc of which indicates its situation. The five visible segments are ring-like, and very much broader than long. On each side is the broad connexivum, which is perpendicular to the segments, and is continuous with the ridge that lies between the central portion of the metanotum and the hinder acetabula. Below, the abdomen has six visible segments, of which the 1st is nearly as long as all the others taken together; the 2nd is rather indistinct, but seems to be like the remaining four, ring-like, very much broader than long. The hind margins of all are concave, and the sides of the 6th are prolonged backward a little. At the middle of the hind margin of the 1st is a small tubercle, the exact nature of which in this specimen I have not been able to make out. Similar tubercles occur in species of the genus *Halobates*, and appear to be perforated at the apex, and are probably the opening of some gland.

The genital segments are a little distorted in the specimen described, but appear to be three in number, visible both above and below. The first is, above, similar to the preceding abdominal segment, but rather broader. It has an erect connexivum. Below, it is as long as the four preceding ventral segments; hind margin concave. The second segment forms a cylinder, open at the end. It is about as long as one-third of the abdomen, but narrower. Viewed from above it is oval, convex, rather narrowed at the base, and triangular at the apex; viewed from below it is rather flat, with a strong tooth about as long as the segment itself below, projecting backwards from the hind margin. The third above and the third below are apparently not united. Above, the third is a narrow, triangular plate, with blunt apex and with the sides sloping at the base downwards under the second segment, and giving rise on each side below to a long spine-like tooth. (From the distortion of the parts, only one spine is actually visible, but the other seems to exist.) Below, the third is a very convex, long, narrow, boat-shaped valve.

Front-legs: acetabulum large, cylindrical, with the circular opening looking backwards and downwards; coxa short, ring-like; trochanter large, cylindrical, slightly curved, the base abruptly bent into a narrow neck, the lower posterior part of the apex pointed to articulate with the femur. Femur stout: viewed from the outer side it forms a long narrow triangle, slightly thickened about the middle and again at the apex; the base with an excavation on the posterior side in which the trochanter articulates,

consequently, the femur forms with the trochanter almost a right angle. Viewed from the inner side, the basal half of the femur is somewhat parallel-sided, with a square base; on the under-side it tapers from the middle to the apex. Under-side armed with a few hair-like spines, as is the trochanter. Tibia slender, as long as the femur, nearly equally thick throughout, the apex somewhat dilated, the under-side produced and forming a short straight process. Tarsus less than half as long as the tibia, 2-jointed; 1st joint about one-third the length of the 2nd, slightly incrassate upwards; 2nd slightly incrassate upwards, with an excavation on the under-side before the tip, in which the claws are probably inserted.

Middle-legs: acetabula situated at the hind angles of the mesothorax, large, cylindrical, with a long suture on the under outer side, opening circular, looking backwards. Coxa cylindrical, about as long as broad, apex hollowed, with a semi-circular emargination on the outer under-side. Trochanter with a ball-like base, rather narrow neck and triangular apex to the outer upper face of which the femur articulates. Femur very long and slender, nearly equally thick throughout, but a little incrassate at base and apex, armed with a few hair-like spines, the apex with two teeth, between which the tibia is inserted. Tibia about one-third the length of the femur, slightly curved, narrowing from the base to the middle, the apex rather flatly dilated on the inner side. Tarsus two-thirds the length of the tibia, 2-jointed; 1st joint tapering from just above the base to the apex, rather flat, furrowed on the upper side from base to apex; 2nd joint about one-third the length of 1st, narrower, equally broad throughout, slightly flattened, and with a slight furrow, especially near the base on the upper-side, slightly excavated on the inner side before the tip.

Hind-legs: acetabula occupying the hind angles of the metathorax, consequently the hind-legs are inserted above the middle-legs; similar to the middle acetabula, but longer. Coxa a little longer than middle coxa. Trochanter, like middle trochanter, reaching backwards nearly as far as the apex of the abdomen. Femur rather longer and more slender than the middle femur. Tibia shorter than the middle tibia, about one-fifth the length of the abdomen, cylindrical, tapering from base to apex. Tarsus about one-third the length of the tibia, 2-jointed, joints cylindrical, 2nd about one-half the length of the 1st, slightly excavated on the inner side before the tip.

In many respects, *Platygeris* resembles *Halobates*, and still more *Halobatodes* (a new genus, of which the type is *Halobates lituratus*, Stål), but in the shape of the body, the structure of the genital segments, the form of the anterior trochanters and femora, and of the middle tibia and tarsus, as well as in other characters, it diverges very considerably. To *Hydrobates* the affinity is much less strong, though part of the structure is suggestive of that genus.

I may take this opportunity of mentioning that I think of attempting to monograph the species of *Hemiptera* that dwell on the surface of water (families *Hydrobatina*, *Hydrometrina*, &c.), and will be very glad of the loan of specimens.

Re-appearance of Phosphenus hemipterus, Geoff., at Lewes.—This curious insect has again occurred at Lewes. My friend, Mr. Cecil Morris, of this town, has taken several specimens in his garden, and, by his kindness, I have been able to see the insect in a living state. The locality is not far from the place where Miss Hopley took the first British specimens in 1868. The first specimens were seen this year on the 17th inst., and, so far, only males have been taken. The males are decidedly luminous, the light issuing from two spots on the apical segment of the abdomen both above and below. As in the glowworm, the light is produced at the will of the insect, and when not visible, a little irritation will generally render it so; this fact would make it probable that the light, at least in the male, is not used as a sexual attraction, but as a means of *frightening its enemies, and warding off danger*; perhaps it is the same in all luminous insects. The insect is very active by day, crawling vigorously over walls, &c., but it readily feigns death, contracting the limbs close to the body and falling to the ground.—J. H. A. JENNER, 4, East Street, Lewes: June 20th, 1883.

Lebia turcica.—I am informed that specimens of this species (I believe four in number) are being exhibited in London as having been purchased, with other *Geodephaga*, from Mr. C. S. Gregson, of Liverpool. In the interests of my Coleopterist brethren, will you permit to state, that I know Mr. Gregson's collection very well indeed, and that there was not a specimen of *Lebia turcica*, either British or foreign, in that collection.—JOHN W. ELLIS, 101, Everton Road, Liverpool: May, 1883.

Cicindela maritima in Carmarthenshire.—On May 24th, 1883, four specimens of *Cicindela maritima* were taken by the Rev. Clemell Wilkinson on the Sandhills near Penshire, in Carmarthenshire. I think this is a new locality for this beautiful and very local insect.—A. H. WHEATSLAW, Manorbere Vicarage, Pembrokeshire: June, 1883.

Myrmecophilous Coleoptera in the Hastings district.—I have been working nests of *Formica rufa*, all situated in a wood at Guestling during the spring and early summer, and thought that my captures might be worth recording, especially as the nests are not so very far from the sea. In the beginning of April, *Thiasophila angulata* was by far the most plentiful insect, just now, however, *Homalota flavipes* is the commonest. In addition to these I have found *Dinarda Märkeli*, *Homalota anceps*, *Oxyroda hæmorrhœa*, in some numbers, and *O. formiceticola*, *Monotoma angusticollis*, Gyll., *M. formicetorum*, Th., *Leptacinus formicetorum*, and *Quedius brevis*, sparingly, and a single example of *Myrmedonia humeralis*. I also met with a few specimens of a *Xantholinus*, which I think may be *atratus*, Heer. I was pleased to find *Clythra 4-punctata* in plenty: they were either flying in the sunshine around the nests, or sitting on the bushes overhanging them. On several occasions I have seen specimens crawling about with the ants, and once a ♀ emerging from the entrance to the subterranean cells. Between the 15th May and 12th June, I caught about sixty examples, and saw many others. *Formica fuliginosa* is, I am sorry to say, rare with us; but from a weak nest I obtained four *Myrmedonia*

funesta, one *M. limbata*, one *Drusilla canaliculata*, and one *Thiasophila inquilina*. In a nest of *L. flava*, *M. limbata* has shown itself, and *Myrmica rubra* (*levinodis*?) has only yielded me the common *Drusilla*.—EDWARD P. COLLETT, St. Leonards-on-Sea: June 17th, 1883. www.libtool.com.cn

Further note on Ephestia passulella.—I find my former note on *Ephestia passulella* (Ent. Mo. Mag., xix, p. 142) was not strictly accurate, as the species is evidently only partially double-brooded. As there stated, the larvæ all spun up, and, as at the time, the imagoes were continually emerging, I concluded that all would do so. Many of the larvæ, however, did not change to pupæ, but remained all the winter in their cocoons, and changed to pupæ without again feeding at all, this spring. The imagoes from them are now emerging every day.—GEO. T. PORRITT, Huddersfield: June 5th, 1883.

The oldest name for the Phycita hostilis of Stephens.—Heer P. C. T. Snellen has kindly called my attention to the confusion that has arisen between *Nephopteryx rhenella*, Zincken (described in Germar's Magazine, 1818), and *Pempelia adelphella*, Fischer von Rösterstamm. Both were mixed together by Treitschke under the name of *rhenella*.

The brown larva of *rhenella* feeds on *Populus alba* and *tremula* (I have a specimen from Zeller "on *Populus monilifera*"). The green larva of *adelphella* feeds on willow. The description of *hostilis* in the Manual was made from a Glogau specimen of *adelphella* received from Zeller in 1850.

Mr. Barrett has already pointed out (Ent. Mo. Mag., xvii, p. 179) that the *hostilis* of Stephens is not identical with *adelphella*, for which it had been quoted as a synonym by Zeller in the Isis of 1846. It is, however, really the *rhenella* of Zincken, which being a much older name, must supersede *hostilis*, whilst, at the same time, it will be needful to remove the insect from *Pempelia* to *Nephopteryx*.

The differences in appearance of the two species are well noted by Zeller in the Isis of 1846, p. 777. He says of *P. adelphella*, "anterior wings narrower, with the base always of a much brighter red, the first transverse line forming, at the sub-dorsal nervure, a sharper angle, almost a right angle, the central area is pale red instead of grey towards the inner margin, and the costa beyond the first transverse line is blackish; the hinder transverse line is more faintly toothed, and forms a sharper angle towards the inner margin."

I think it highly probable that both species may occur in this country, though, so far as we know, *adelphella* has hitherto escaped observation.—H. T. STAINTON, Mountsfield, Lewisham: May 21st, 1883.

Occurrence of Ecophora grandis near Burton-on-Trent.—On Saturday, June 2nd, I went out for the afternoon to a part of the Forest of Needwood, about eight miles from here. The place is a very tempting one, but there seemed either to be very little to be had, or else, that the place (which is high ground and cold clay) was very backward; almost my only captures being *Eupæcilia maculosana* and *Incurvaria Ehlmanniella*. About half-past four, from a holly tree I beat out a small thing which flew off sharply, but which I fortunately contrived to secure. My delight was only equalled by my surprise when I saw what I had got:—a very
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fresh, beautiful, and brightly coloured specimen of *Æcophora grandis*. It was quiet in the net and box, and has taken no harm with the journey home.—J. SANG, 181, Horninglow Street, Burton-on-Trent: *June 4th*, 1883.

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Insects from the East Coast of Greenland.—Mr. William Scoresby, Jun., in his "Journal of a Voyage to the Northern Whale Fishery, &c.," Edinb., 1823, 8vo, states, p. 423, the presence of *Col. Palæno* and *Pap. (Argynnis) Dia* on Jameson's Land at Cape Lister and Cape Hope, on the northern shore of Scoreby Sound, 70° 30' Lat., July 24th. Both occurred in great numbers. He mentions also (p. 188) the occurrence of bees and mosquitoes. Prof. Jameson and Mr. James Wilson give, pp. 424—428, a more detailed account of the butterflies. Curiously enough these very interesting statements of insects of the eastern shores of Greenland, which are probably the only ones known, though quoted in Lacordaire's *Introd.*, vol. ii, p. 603, have escaped Mr. Kirby (Richardson's work) and all later publications about the Arctic fauna. The same statements have been repeated by Mr. J. Wilson, in the *Family Library*, No. 53 (I can only consult the American edit., New York, 1836), in Mr. P. F. Tytler's historical view of the progress of discovery on the more northern coasts of America, with sketches of the *Nat. Hist.* by J. Wilson, p. 305.

The hope to find perhaps figures of the two butterflies in Mr. J. Wilson's *Illustrations of Zoology*, Edinb., 1828—31, for which I have noted in my *Bibliotheca two Lepidoptera* on pl. 4 and 28 (I cannot compare this book now), was destroyed by the record in Férussac's *Bull.*, vol. xxvi, p. 287, stating that these *Lepidoptera* are *Noctua (Strix) Erebus* and *Pap. Jasius*. If, by a lucky chance, the two *Papilio*s from Mr. Scoresby should be still in existence in Edinburgh, a detailed scientific examination would be of great interest. It is possible that the so-called *C. Palæno* could be the *Colias Hecla, var. glacialis*, described by McLach., *Linn. Soc. Journ.*, vol. xiv, p. 108, but *C. Palæno* is very common in Labrador, and could as well go higher up in Greenland, as it is a decidedly Arctic species. I remark that the food-plant of its caterpillar, *Vaccinium uliginosum*, is represented in the flora of this part of Greenland. In Scoresby's *Journal*, p. 410, in the list of plants, Dr. Hooker gives No. 13, *Vaccinium pubescens*, Hornem., which he considers to be a dwarf state of *V. uliginosum*.—H. A. HAGEN, Cambridge, Mass.: *May 5th*, 1883.

Note on the appearance of ♂ and ♀ of Formica rufa.—Seeing it generally stated that the winged examples of this ant usually "come out" in July and August, I beg to say that this year, at Guestling, the ♂ began to appear on the 21st May, and ♀ a week later.—E. P. COLLETT, St. Leonards-on-Sea: *17th June*, 1883.

A very small nest of Vespa vulgaris.—I have recently had brought to me from the neighbourhood of Bromley, a very pretty little nest of *Vespa vulgaris*. It has been, unfortunately, a good deal broken from handling, but is of a rounded, semi-conical shape, with a round, central, apical aperture, and its widest diameter is only about an inch and three-quarters. It was found suspended under the roof of an outhouse. I believe such a locality is not a very unusual one for *V. vulgaris* to choose, but the very small size of the nest certainly surprised me. Shortly after receiving it, two worker-wasps emerged from the cells near the

centre, and I observed that nine others were spun-over at the top, the remainder were occupied by larvæ in different stages of growth, those near the centre nearly full grown, those near the circumference quite small: altogether there are about forty cells. I am afraid no more wasps will come out now, as the larvæ have died in their cells, and made the nest smell so strongly that I fear all the spun-up pupæ will be killed. The actual paper-like substance of the nest appears to consist of very fine fibres of wood.—EDWARD SAUNDERS, Lloyd's: *June 17th*, 1883.

Review.

NOUVEAUX SOUVENIRS ENTOMOLOGIQUES: ÉTUDES SUR L'INSTINCT ET LES MŒURS DES INSECTES. par J.-H. FABRE. Paris: Ch. Delagrave, 1882. pp. 319, 12vo.

In 1880, vol. xvii, p. 117, we noticed the work by this veteran author (who has long been celebrated for his minute history of *Sitaris humeralis*) entitled "Souvenirs Entomologiques," and the present volume is a continuation and amplification of his most assiduous and complete observations on the instinct and habits of the objects of his attention. There are 17 chapters, entitled: 1, L'Harmas (the name given to the scene of his researches); 2, L'Ammophile hérissée; 3, Un sens inconnu. Le Ver gris; 4, La Théorie de l'Instinct; 5, Les Eumènes; 6, Les Odynères; 7, Nouvelles recherches sur les Chalcidomes; 8, Histoire de mes Chats; 9, Les Fourmis rousses; 10, Fragments sur la Psychologie de l'Instinct; 11, La Tarentule à ventre noir; 12, Les Pompiles; 13, Les Habitans de la Ronce; 14, Les Sitaris; 15, La Larve primaire des Sitaris; 16, La Larve primaire des Méloés; 17, Le Hypermétamorphose.

Although the author deprecates criticism on the style of his writing by saying that "his pages contain only a narration of facts observed, nothing more, nothing less," yet the charm of it is in this very simplicity and originality of the relation of his numerous experiments and observations. The chapter about his cats, which, at first sight, looks like an interpolation, is given to show that a cat has the same innate faculty to return in a direct line to its home, even when it has been removed therefrom in seclusion, that a Hymenopterous insect in similar circumstances possesses. From the author's points of view, the hypothesis of evolution is not regarded favourably, for the experience of his forty years' observation does not support it. He rejects its theory that instinct is an acquired and transmitted faculty; such a notion being nothing more than a *jeu d'esprit* wherewith an indoor naturalist who fashions the world according to his fancy may amuse himself, but in which the observer who grapples with the reality of things finds no serious explanation of anything he sees.

Every book suffers by translation, especially such an one as this that is so full of graphic individuality; moreover, the nature of the subjects makes it difficult to detach a short extract, yet we would have tried to give in this way an idea of the merits of the work, if we had not been met at the very first page by this notice: "Toute traduction ou reproduction, même partielle, est interdite." All that we can do, therefore, is to recommend this most enticing book of Natural History to the attention of all who read, or wish to read, French.

NOTES ON NEW BRITISH *COLEOPTERA* SINCE 1871 ;
WITH NOTICES OF DOUBTFUL SPECIES, AND OF OTHERS THAT
REQUIRE TO BE OMITTED FROM THE BRITISH LIST.

BY THE REV. W. W. FOWLER, M.A., F.L.S.

(Concluded from vol. xix, p. 270).

RHYNCHOPHORA.

APION OPETICUM, Bach.

Allied to *A. pomona*, F., but differs from it in its smaller size, its invariably black colour, its rostrum being more abruptly contracted a little behind the middle, and less dilated at the base in both sexes, and in having a less elongate club to its antennæ. Two specimens (male and female) were taken by Dr. Power at Hastings (Ent. Mo. Mag., xi, 156).

Apion scrobicolle, Gyll.

There is no authority for this insect, and it must, consequently, be omitted.

APION ANNULIPES, Wenck.

Two female specimens of this insect were taken by Mr. Champion and Mr. Rye at Mickleham in 1870. They differ from the same sex of *A. flavimanum*, Gyll., their close ally, in their entirely black and very much stouter legs and wider tarsi, brilliant and very finely punctured rostrum, &c.; the male appears to have the antennæ testaceous, except the club, and the tibiæ marked with testaceous colour before the base (Ent. Mo. Mag., viii, 159).

APION RYEI, Blackburn.

This species is separated from all the rest in the group with the femora and anterior tibiæ alone yellow, by its short, broad, sparingly punctured thorax, which is scarcely, if at all, longer than broad, and has its sides very evidently rounded; it is most nearly allied to *A. fagi*, L., from which it differs in its shorter and more strongly bent rostrum, and in its antennæ, which have a darker base. Taken by Mr. C. Lilley and Rev. T. Blackburn in the Shetland Islands, in July, 1874 (Ent. Mo. Mag., xi, 128).

CATHORMIOCERUS MARITIMUS, Rye.

Differs from *C. socius*, Boh., in being more robustly built, flatter, darker, and much more strongly punctured, with more prominent eyes, and the funiculus and club of the antennæ (comparing both sexes) distinctly broader and shorter. Taken by Mr. Moncreaff at Portsea (Ent. Mo. Mag., x, 176).

Eusomus ovulum, Ill.

This is, according to Dr. Sharp, an introduced species, and very doubtful as British.

Otiorrhynchus monticola, Germ.

O. blandus, Gyll., must be substituted for this species, as all the Scotch specimens named *O. monticola* really belong to *O. blandus*.

Liosoma ovatum, var. COLLARIS, Rye.

This variety is smaller than the type form, with femora dark at apex, thorax usually red or reddish, and less closely punctured, and the tooth on the femora feebler.

LIOSOMA TROGLODYTES, Rye.

The small size of this insect separates it from our other species, but, apart from this, its untoothed femora remove it from *L. ovatum*, Clair., and its opaque and almost rugose-punctate thorax, shorter and broader build, and more marked striae separate it from *L. oblongulum*, Boh. Taken by Mr. J. J. Walker at Faversham (Ent. Mo. Mag., x, 136).

LIOSOMA OBLONGULUM, Boh.

Differs from *L. ovatum* in being narrower, with rostrum less curved, in having the antennæ inserted nearer the apex of the rostrum, and especially in the fact that, its femora are not toothed. Taken by Mr. Walker near Chatham, and by Mr. Champion at Caterham (Ent. Mo. Mag., ix, 242).

Lixus turbatus, Fab.

This has been considered a doubtful species. Dr. Power, however, has a specimen in his collection taken by himself in the fen district: it is the *L. iridis*, of Olivier, and the *L. gemellatus*, of Gyllenhal.

Smicronyx Reichei, Gyll.

This is not unlike a very large example of *S. jungermannia*, Reich., but it has a thicker and darker rostrum, and much more thickly and coarsely punctured thorax; it is densely clothed, when in perfect condition, with tessellated grey and brown scales. Two specimens taken near Folkestone by Mr. Champion and Mr. E. A. Waterhouse (Ent. Mo. Mag., ix, 11).

BAGOUS BREVIS, Schön.

Of our species, this can only be compared with *B. frit*, Herbst: its thorax, however, is very strongly constricted before the apex, and has a dorsal channel ending in the middle one of three foveæ, situated in the anterior transverse constriction. Taken by Dr. Power in Surrey (Ent. Mo. Mag., ix, 242).

BAGOUS DIGLYPTUS, Boh.

Two specimens of this very distinct species were taken by Mr. Harris near Burton-on-Trent. It may readily be distinguished by its very short broad form, uniform grey colour, rugulose thorax, which is much constricted before the apex, and has a short dorsal channel near the base, its ferruginous tibiæ, which are much curved inwardly and thickened above the middle, and its very short tarsi, which have the penultimate joints simple and not bilobed (Ent. Mo. Mag., xv, 235).

Orchestes scutellaris, var. SEMIRUFUS, Gyll.

This variety is smaller than the type, but exhibits no structural differences, merely having the head and thorax pitchy-black, and the legs darker than usual.

Orchestes decoratus, Germ.

This very doubtful species is included in the second edition of Dr. Sharp's catalogue: it has for many years been alternately inserted in and erased from the British List. In Ent. Ann., 1867, 88, Mr. Rye quotes Mr. Walton as having shown that Stephens' *O. decoratus* is only *O. rusci*, and it is to Stephens that M. Brisout refers for the type-form of the insect.

NANOPHYTES GRACILIS, Redt.

This insect is readily distinguished from *N. lythri*, F., by the fact that all its femora have two small sharp spines on the under-side; it has longer and thinner legs, antennæ, and rostrum, less evident pubescence, and broader and much less acuminate elytra, of which the interstices are flat (Ent. Mo. Mag., ix, 157). Taken in the New Forest and other localities.

Ceuthorrhynchus crassidentatus, Marshall ?.

This insect must be erased from the British list: nothing seems to be known about it.

Ceuthorrhynchus viridipennis, Bris.

This insect comes near *C. chalybæus*. Dr. Sharp told me that he possessed a short series of an insect that he believed to be this species, but he has omitted it from the second edition of his catalogue.

Ceuthorrhynchidius minimus, Walton (Rye).

A very doubtful species, near *C. floralis*, apparently resting on two examples supposed to have been placed by Dr. Leach in the British Museum collection, where, however, they are not now to be found.

Ceuthorrhynchidius Chevrolati, Bris.

This species is apparently only a well-marked and fresh type of *C. troglodytes*, F. Dr. Sharp, however, introduces a new species into the second edition of his catalogue under this name.

CEUTHORRHYNCHIDIUS CROTCHI, Bris.

This insect, which has not been particularly recorded as British, but is described by M. Charles Brisout as from England only, is said to be very like *C. versicolor*, Bris., but may be distinguished by its more depressed prothorax, of which the anterior margin is less reflexed, and by its testaceous tarsi, of which the claws are smaller (Ent. Mo. Mag., ix, 159). It is a doubtful species, apparently, as British.

Cossonus linearis, L.

It is probable that all our insects which stand under this name are in reality to be referred to *C. ferrugineus*, Clairv., and that *C. linearis* may not be British at all (Ent. Mo. Mag., ix, 243; Ann., 1874, 109).

Magdalinus Heydeni, Desbr.

The author of this species mentions it as British in his Monograph of the genus,

stating that he possesses a specimen from England; it appears to be a doubtful species, very near *M. duplicatus*, Germ.; with regard to this latter species there appears to be some doubt whether a true specimen has yet been taken in this country.

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HYLURGUS MINOR, Hart.

Very closely allied to *H. piniperda*, L., but usually somewhat smaller, always with brown elytra, which are more delicately punctate-striate; the second interstice of the elytra (unlike *H. piniperda*) is set with roughened elevated tubercles like the rest; the posterior tibiæ are also differently formed. Taken by Dr. Sharp and Dr. Buchanan White at Braemar (Ent. Mo. Mag., viii, 74).

CISSOPHAGUS HEDERÆ, Schmidt.

Chapuis formed the genus *Cissophagus* for the reception of *Hylurgus hederæ*; in this genus the funiculus of the antennæ is six-jointed, and the third joint of the tarsi distinctly bilobed, whereas in *Carphoborus (Xylechinus) pilosus* the funiculus is only five-jointed, and the third joint of the tarsi is simply cordate; this insect has occurred several times in Britain, and was taken last year near Shere by Dr. Capron (Ent. Mo. Mag., viii, 107; Entomologist, xv, 212).

POLYGRAPHUS PUBESCENS, Fab.

This genus, which is new to the British list, may be readily separated from the other *Hylesinides* by each of its eyes being almost entirely divided into two parts by an extension of the lateral piece from which the antenna springs, by the third joint of the tarsi not being wider than the second, and by the non-articulate club of its antennæ, which is very large, flattened, ovate, and considerably longer than the funiculus, which is four-jointed. Taken under fir bark near Scarborough by Mr. Lawson (Ent. Mo. Mag., viii, 82).

Bruchus atomarius, L.

This ought, apparently, to be inserted instead of *B. seminarius*, L., and *B. lathyri*, Steph., instead of *B. loti*, Payk., the insects being apparently identical in either case, and the question simply one of priority; there is, however, a confusion as to the latter insect caused by Stephens (Ent. Ann., 1874, p. 111).

Urodon rufipes, F.

This is a very doubtful species, and cannot be admitted as indigenous without further confirmation.

LONGICORNIA.

PACHYTA SEXMACULATA, L.

This species is closely allied to *P. octomaculata*, F., but may be readily separated by its narrower and more parallel form, its more shining appearance, much scantier and finer pubescence, and the different maculation of its elytra, which are black with three pale yellow, transverse, angular bands. Taken by Mrs. King at Arimmore, Inverness-shire (Ent. Mo. Mag., xiv, 92).

Monohammus sartor, F., and *M. sutor*, L.

These ought, probably, to be regarded as introduced species, as much as *Cerambyx heros*, Scop., which is now generally omitted.

PHYTOPHAGA.

Clythra læviuscula, Ratz.

This species has a very slender claim, indeed, to be admitted as British, and had better be left out (Ent. Ann., 1865, 77).

CRYPTOCEPHALUS VIOLACEUS, F.

Of this species, which somewhat resembles a large *C. fulcratus*, Dr. Power possesses a specimen taken by himself in Cambridgeshire; it was also taken by Mr. Sidebotham.

Cryptocephalus bipustulatus, F.

This appears to be a variety of *C. lineola*, F., and to bear much the same relation to that species as the *var. bothnicus*, L., bears to *C. decempunctatus*, L.

Lina tremulæ, F.

The true *L. tremulæ* is not British: the *L. tremulæ* of Waterhouse's catalogue = *L. longicollis*, Suffr., a very common British insect.

Gonioctena affinis, Suffr.

This is a very doubtful species, apparently resting on one example, which certainly requires confirmation (Ent. Mo. Mag., i, 278; Ann., 1866, 115).

Crepidodera smaragdina, Foudr.

Dr. Sharp inserts this species in the second edition of his catalogue: it belongs to the *C. aurata* group, and apparently comes very near that species, to judge by Allard's description (Gal. Anisopodes, p. 311).

Several species of the genus *Thyamis* appear to be doubtful, as *T. nigra* and *T. fuscula*; the *T. melanocephala* group requires a careful revision.

THYAMIS DISTINGUENDA, Rye.

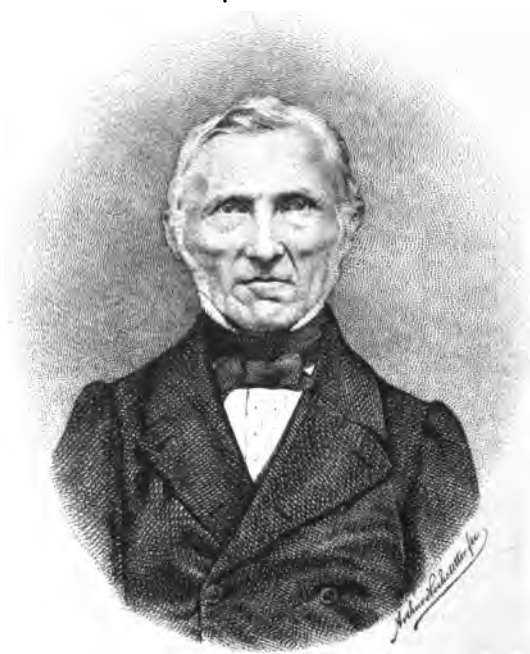
This insect comes nearest to *T. atricilla*, L., in our list, but differs from it in being on an average of rather larger size, without a dark brassy head and thorax; it is of less regularly oval outline, and has more perceptible shoulders to the elytra, longer posterior tarsi, and a longer and stronger spur to the tibiæ. Found by Mr. Champion on Box Hill (Ent. Mo. Mag., ix, 158).

THYAMIS FERRUGINEA, Foudr.

This species was recorded as British by Mr. Crotch, but was afterwards dropped: it must, however, be again inserted, on the authority of one specimen taken by Mr. Champion at Caterham, and two in Mr. Rye's collection. It differs from *T. flavicornis* and *T. pellucida* in its smaller size and much stouter antennæ, of which the five or six apical joints are blackish, and from *T. Waterhousei* (which also has the apical joints blackish) in its smaller size, rather stouter antennæ, and more coarsely punctured thorax and elytra, which are much narrower (Ent. Mo. Mag., xii, 180).

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PROF. P. C. ZELLER.

Kof-Lithograph A. Hochstetter, Stettin.

COCCINELLIDÆ.

Coccinella 12-guttata.

Of this species, which is hardly ever seen in any collection, Mr. Mason and I discovered a specimen in Mr. Griesbach's collection, which passed into the possession of the late Mr. W. Garneys.

SCYMNUS QUADRILUNATUS, Ill.

This insect has alternately been inserted in and omitted from the British list; there is an authentic specimen from Kent in Mr. Rye's collection.

SCYMNUS REDTENBACHERI, Muls.

M. Brisout named a doubtful *Scymnus* from Mr. Wilkinson's collection (now in the possession of Mr. Mason) for me, as this species. It is a small insect ($\frac{1}{2}$ lin.) of long oval shape, with long grey pubescence, sometimes entirely black, but usually with a longitudinal curved band of a red or yellowish-red colour on each elytron; the legs are entirely of a pale yellow colour (Ent. Mo. Mag., xix, 67).

SCYMNUS ARCUATUS, Rossi.

This is a very distinct species, "the elytra having in common two horse-shoe-shaped whitish-yellow lines, open towards the front, of which the lower encloses the upper." One specimen was brushed out of very old ivy at Shenton Hall, near Market Bosworth, Leicestershire, by Mr. Wollaston, on August 24th, 1872 (Ent. Mo. Mag., ix, 117).

SCYMNUS LIVIDUS, Bold.

Smaller, more oval, and much more finely and evenly punctured than *S. discoideus*. It is livid testaceous in colour, and has the head and claws black. One specimen found on the sea-banks near Hartley by Mr. Bold (Ann., 1872, 91).

Lincoln : June, 1883.

THE BRITISH SPECIES OF *DICYPHUS*.

BY DR. O. M. REUTER.

Messrs. Douglas and Scott (Brit. Hem., i, pp. 370—381), as well as Mr. Saunders (Syn. Brit. Hem., pp. 284—285), describe from Britain five species of the heteropterous genus *Dicyphus*, Fieb., Reut. (*Idolocoris*, D. & S.), viz., *globulifer*, Fall., *annulatus*, Wolff, *pallicornis*, Fieb., *pallidus*, H.-Sch., and *errans*, Wolff. One of these species, viz., *pallidus*, is, however, wrongly determined, the British species noted by this name being quite distinct from the true *pallidus*, originally described from Germany by Herrich-Schäffer, and living on *Stachys sylvatica*. The British species occurs on *Epilobium*; and regarding it

as new, I name it after the food plant, *D. epilobii*.* It is also this species, which in the Ent. Mo. Mag., vol. xvii, p. 166, is quoted under the name *D. stachydis*, Reut., according to specimens found by Saunders at Hastings, and wrongly determined by me as my *stachydis*, from which it is easily distinguished amongst other characters by the longer first joint of the antennæ.

As *D. pallidus* I have quoted (Ent. Mo. Mag., vol. xiv, p. 186) a species found at Perth on *Symphytum*, still this species is not the true *pallidus*, H.-Sch., neither is it identical with my new species *epilobii*, but it agrees thoroughly with the typical specimens of *D. constrictus*, Boh., a species referred without reason by Fieber as a synonym of *pallidus*.

A very different species has been confounded with *D. errans*, Wolff. Messrs. Douglas and Scott say (*l. c.* p. 380), "frequently the ♀ has undeveloped elytra." Also concerning *pallidus*, it is said, "♀ with undeveloped elytra without cuneus (!) and membrane." All the females of *epilobii* (= *pallidus*, D. & S.) which I have seen, however, have, like the female of *errans*, completely developed wings. Perhaps the paler specimens of the species, with undeveloped wings, confounded with *errans*, have been supposed to be ♀ of *pallidus*, D. & S., the darker specimens being described as ♀ of *errans*. But the ♀ of *errans* is always macropterous, as far as I know, and I have examined a great many from different parts of the palearctic zone. The species which has been regarded as being a short-winged ♀ of *errans* is, however, in both sexes dimorphous, and easily distinguished by the short first joint of the antennæ, this character allying it to *pallicornis*, Fieb. It lives on *Stachys sylvatica*, and is widely distributed in Europe; it is also found in the west of Siberia. I have named it *D. stachydis*, by which name it has already been recorded from Britain by Mr. Norman (Ent. Mo. Mag., vol. xv, p. 255), by the same author (*l. c.* vol. xiv, p. 166) given in error as *D. errans*. This species is also described by Flor (Rh. Livl., i, p. 483) as *collaris*, Fall., and by me (Hem. Gymn. Sc. et Fenn., p. 128) as the brachypterous form of *errans*.

I am publishing in the third volume of Hemipt. Gymnor. Europæ (now in the press) the more detailed descriptions of the European species of *Dicyphus*, and I shall there give a complete account of their synonymy. As the British fauna, however, now possesses seven species instead of five, and as it is not impossible that two other additional species (*pallidus*, H.-Sch., and *hyalinipennis*, Klug) may yet

* Mr. Saunders has written to me (Dec. 2nd, 1882)—"I have seen a pair of *pallidus* which Mr. Douglas has lent me; they are clearly identical with the pale *Epilobium* form."

be added to it, a synopsis of the species of this genus may not be without interest to British entomologists. From this synopsis I exclude, however, the well and easily known *globulifer* and *annulatus*, treating only of the species characterized by the head being pale above, black behind the eyes at the sides, and marked between the eyes with two brown or black stripes diverging in the front (in *epilobii* the head is mostly entirely pale). As almost all these species, especially *errans*, *hyalinipennis*, *stachydis*, and *pallicornis*, are in a high degree variable as to colour, I will try to employ principally plastic characters, which limit the species more distinctly and accurately.

- 1 (12). Antennæ and legs distinctly pubescent.
- 2 (9). Antennæ always much longer than half the length of the body (with the exception of the hemielytra); the first joint as long as, or very little shorter than, the head seen from above (at least, if the clypeus is not taken with it), and not or scarcely shorter than the posterior margin of the vertex; the second joint linear, always distinctly longer than the pronotum. The head, seen from above, not or only a little transverse, seen from the front, twice as long as margin of vertex; behind the eyes long or rather long, constricted; the front gradually declivous, clypeus rather slightly arcuated, the throat long. Rostrum reaching to, or beyond, the posterior coxæ. Legs long, or very long, the anterior coxæ reaching much beyond the middle of the mesosternum.
- 3 (4). Antennæ and legs very long. Antennæ with the first joint distinctly longer than the posterior margin of the vertex; the second joint as long as the scutellum, pronotum and head together; the last two joints together as long as the second; the second joint fuscous only at the apex. Pronotum with the transverse impression behind the middle. Thighs beneath rather densely provided with somewhat short and rigid black bristles. Posterior tibiæ with long spinulæ, about four and a half times as long as the width of the head (with the eyes). Male and female dimorphous1. *D. PALLIDUS*, H.-Sch.
- 4 (3). Antennæ with the first joint as long, or almost as long, as the posterior margin of the vertex; the second joint (δ) as long as scutellum, pronotum and head to the base of the clypeus (seen from above), or mostly (especially η) shorter. Thighs rather long, pubescent, beneath without black rigid bristles. Male always winged, with completely developed hemielytra.
- 5 (6). Pronotum with the transverse impression in the δ a little behind the middle, in the η very distinctly behind the middle. Antennæ with the second joint at the base and apex fuscous, as long as the scutellum, pronotum and head to the base of the clypeus (δ), or only to the transverse impression of the vertex behind the eyes (η); the last two joints together scarcely (δ) or distinctly (η) longer than the second. Cuneus at the apex narrowly dusky. Posterior tibiæ about four times as long as the width of the head (with the eyes). Female dimorphous2. *D. CONSTRICTUS*, Boh.
- 6 (5). Pronotum with the transverse impression in the middle, or almost the middle.

Antennæ with the first joint in the middle largely red or piceous, the last two joints together as long as (δ) or scarcely longer than (φ) the second joint. Male and female with developed wings.

- 7 (8). Antennæ with the second joint only at the apex fuscous; the second joint as long as the scutellum, pronotum and head until the base of clypeus (δ), or only as long as the scutellum and pronotum together (φ). Pronotum at the base largely and slightly sinuated, and scarcely twice as wide as at the apex, the sides gradually diverging from the collar to the posterior angles, the pronotum being much longer in proportion to its width than in the following species. Cuneus at the apex narrowly dusky. Tibiæ at the base concolorous, the posterior tibiæ about $3\frac{1}{2}$ — $3\frac{3}{4}$ times as long as the width of the head (with the eyes). The body more slender; head almost plain, pale (= *D. pallidus*, D. & S., Saund.).

3. D. EPILOBII, n. sp.

- 8 (7). Antennæ with the second joint, at least at the base and apex, piceous, or entirely piceous, or black, as long as the scutellum, pronotum and head as far as the transverse impression of the vertex behind the eyes (δ), or as long as the scutellum and pronotum together (φ). Pronotum shorter in proportion to its width than in the foregoing species, its base at least 2 — $2\frac{1}{2}$ times as long as the apex, raised, and at the margin more deeply sinuated, the sides diverging rapidly from behind the central constriction. Tibiæ at the base narrowly fuscous or piceous, the posterior ones four or almost five times as long as the width of the head (with the eyes). Cuneus at the apex largely and obliquely brown.

4. D. ERRANS, Wolff.*

- 9 (2). Antennæ not or very little longer than half the length of the body; the first joint always three-sevenths shorter than the head with the clypeus, or half as long as the head, and at least one-fifth to one-fourth shorter than the posterior margin of the vertex; the second joint towards the apex distinctly a little incrassated (in the macropterous specimens), distinctly shorter than the scutellum and pronotum together, mostly as long as the pronotum, the last two joints together distinctly longer than the second. Head seen from above scarcely or very slightly transverse. Legs rather long, the anterior coxæ scarcely reaching behind the middle of mesosternum. Posterior tibiæ about three and a half times as long as the width of the head (with the eyes).

- 10 (11). Pronotum at the base almost more than twice (δ) or scarcely twice (φ) wider than at the apex, the sides sinuated, diverging rapidly from behind the central constriction, the basal part above almost smooth, the basal margin rather deeply sinuated. Antennæ with the first joint one-fifth to one-fourth shorter than the posterior margin of the vertex; the third joint almost one-fourth shorter than the second, and almost twice as long as the fourth. Hemielytra developed (δ φ) 5. D. HYALINIPENNIS, Klug.

- 11 (10). Pronotum of the macropterous form at the base slightly sinuated, and not

* Mr. Saunders has kindly communicated me two specimens (δ φ) from the extreme S. W. corner of England ("Pensance, by sweeping"), which differ from *errans* only by the distinctly longer antennæ. The second joint is as long as the scutellum, pronotum and half the head together, and the last joints together scarcely longer than the second (δ), or the last joints together distinctly longer than the second (φ). This form still remains to be satisfactorily made out. I have not seen it among the large number of specimens from the continent which I have examined. The food-plant is unknown.

twice as wide as at the apex, only a little raised, the sides almost straight, gradually diverging from the collar to the posterior angles; the posterior disc slightly rugose. Antennæ with the first joint almost one-third shorter than the posterior margin of the vertex, the third joint only one-fifth to one-sixth shorter than the second, the fourth two-fifths to three-sevenths shorter than the third. Male and female dimorphous 6. *D. STACHYDIS*, n. sp.

- 12 (1). Antennæ and legs short, smooth, without hairs, pale, only the first joint of antennæ in the middle largely red or piceous, or with two piceous rings, the second only at the base piceous or entirely pale. Antennæ with the first joint only half as long as the head seen from above, the second as long as pronotum and gently thickened towards the apex, the third joint at least one-fourth shorter than the second, the fourth only one-fourth shorter than the third. Head short. Posterior tibiæ only about two and a half to two and two-thirds times as long as the width of the head (with the eyes), sparingly provided with short spinulæ. The body shorter and less elongate than in the preceding species. Male and female dimorphous 7. *D. PALLIDICORNIS*, Fieb.

Helsingfors: *June*, 1883.

DESCRIPTIONS OF SOME NEW SPECIES OF *LEPIDOPTERA*,
CHIEFLY FROM THE ISLAND OF NIAS.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

The species here described were almost entirely selected from two small collections made in Nias, a small island to the west of Sumatra.

RHOPALOCERA.

1. *Elymnias dolorosa*, sp. n.

Dark smoky-brown, the primaries almost black, but the costa, apex, and external border pale, greyish-olivaceous; secondaries with the external border more broadly pale, with six ill-defined ocelli, the fourth of which is largest and most distinct, the last two close together; external margin blackish, fringe white, spotted with blackish at the extremities of the veins and internervular folds: basal three-fourths of the wings, below, dark greyish-olivaceous coarsely and densely marbled with dark red streaks; external fourth paler, that of the primaries whitish towards the costa, irregularly marbled with red striæ, internal area greyish; external fourth of secondaries stone-yellowish in tint, striated with blackish, and crossed by a curved series of six conspicuous black ocelli with white pupils, and a pale blue patch from the pupil to the posterior edge, the first and fourth ocelli large, the sixth small, and the remainder of medium size, a conspicuous white sub-costal spot with black diffused edge below the centre of the costal margin: body brown, anus testaceous: expanse of wings, 70 mm.

Island of Nias.

Nearly allied to *E. panthera*, of Java, but larger, blacker, with the secondaries more strongly dentated, with a decided tail; the streaking below much coarser and less broken up, and the ocelli of the secondaries of four times the size, but the white spot smaller.

2. *Xanthotænia obscura*, sp. n.

♂. Allied to *X. Busiris*, of Sumatra, Borneo, and Malacca, but, for its sex, larger, with longer wings; the basal half of primaries, and whole of secondaries, deep chocolate-brown instead of tawny, the yellow belt of primaries more oblique, and slightly paler; the sub-apical spot smaller; primaries below with all the darker areas decidedly darker, and the sub-marginal belt more ochraceous, crinkled rather than zigzag, the larger sub-apical ocellus black, with white pupil and pale yellow iris, instead of stone-grey with pale yellow iris; secondaries clouded beyond the cell, across the disc and on the border, with chocolate-brown; the irregular lines across the wings more angular, well-defined, dark chocolate-brown; the second and sixth ocelli large and blackish, with white pupil and pale yellow iris, the other ocelli very small; the eighth absent: expanse of wings, 73 mm.

Island of Nias.

3. *Moduza imitata*, sp. n.

Allied to *M. Procris*, but with more nearly the general aspect of *M. libnites*; upper surface mahogany-red; primaries with the apical half black; a white, irregular, oblique, quadrid patch just beyond the middle; three sub-apical white dots in an oblique, slightly incurved series; an irregularly sinuated band of mahogany-red near the outer margin, the outer border brown-edged, and intersected by a marginal and a sub-marginal black stripe; costa at base black; the basal area crossed by the usual black markings, similar markings are also within the cell of secondaries; a transverse, bifid, sub-apical, white spot on the latter wings, two diverging discal series of almost confluent black spots; outer border as on the primaries; fringe spotted with white between the veins; body rufous-brown; primaries below paler than above; the basal area greenish-white; an oblique black dash in the cell, followed by an oblique black-edged tawny spot, below which is a second smaller spot of the same colours; the black apical half is only represented by a black margin to the white patch, followed on the radial and sub-costal interspaces by four longitudinal black streaks, on the upper three of which the white dots of the upper surface appear, but larger than above, oblique, and cuneiform; there is also a series of black spots (which, on the upper surface, are united, and form the outer boundary of the discal red band), some of these are edged externally with whitish; sub-marginal and marginal stripes reduced to black lines, the interval between which is partly white; secondaries with the basal three-fourths pale green, the basal black markings very slender; the double white spot of the upper surface black-edged, and forming the commencement of an irregular series of spots, three of which are also white with black edges, and the other two small and black, these spots are all smaller than the first; discal series of spots much reduced in size, the outer series with whitish lunules immediately beyond them; marginal and sub-marginal stripes slender, with white between them, as on the primaries; body below white: expanse of wings 68 mm.

Island of Nias.

4. *Pandita imitans*, sp. n.

Evidently a copy of the preceding species; distinguishable at a glance from

P. Sinope and *P. sinoria* by the curved patch of four increasing oval white spots just beyond the middle of the primaries; these spots are separated only by the black veins, as in the *Modusa*; the general colour of the insect is darker than in the known species, being the same as in the *Modusa*, the external border is also blacker, and the discal bands of secondaries are less curved and of more equal width; the streak limiting the basal area in these wings is also replaced by two approximated angulated black stripes, which are much nearer to the inner discal band than the streak in the other species, so that the disc is in reality crossed by three equidistant blackish bands: in addition to corresponding differences on the under surface, the external border is tinted with pearly-whitish, the sub-marginal and marginal lines are blacker; the basal half of the wing is bounded by a black line, corresponding with the outer stripe of the central band on the upper surface; the abdominal area is also more broadly greenish than in *P. Sinope* and *P. sinoria*: expanse of wings 54 mm.

Island of Nias.

5. *Hypolimnas antilope*, Cramer.

Olive-brown, the basal half of the wings suffused with darker rufous-brown; this colour on the primaries ends abruptly in an oblique line just beyond the cell; a large bifid, sub-apical, white spot, being the commencement of a series of discal spots parallel to the outer margin, the others are, however, all small, six on the primaries, and five on the secondaries; external border narrowly blackish, and traversed by two series of more or less lunate white spots; body dark olive-brown; under surface more olivaceous than above, not at all rufous; all the white spots larger, the discal series of secondaries consisting of ten spots, the first of which is larger than the others, and cream-coloured, as also is the large sub-apical spot on the primaries; the spots on the external border more sharply cut, and of a purer white than above; primaries with the costa to the end of the cell rather broadly black, interrupted within the cell by five white spots: body brown, palpi and front legs blackish, fringed with white: expanse of wings, 98 mm.

"Paso, Amboina; by a stream, 11th May, 1882" (*H. O. Forbes*).

From two fine examples in the Museum collection, there were others in Mr. Forbes' papers: the species has hitherto been incorrectly identified with a much smaller insect belonging to a different section of the genus: *H. antilope* belongs to the *H. jacintha* group, and, doubtless, has a blue-blotched male; Mr. Wallace's male evidently belongs to the same section of the genus with his "*Diadema anomala*," which follows *H. antilope* in his "Notes on Eastern Butterflies," Trans. Ent. Soc., 1869, pp. 284, 285. The types of Wallace's species passed, with his collection, into Mr. Hewitson's hands; but, I am unable to recognise his male of *H. antilope*; no typical female exists in the collection, and the only female from Amboina is what I believe to be a pale variety of *H. porphyria*, of Cramer, it certainly belongs to that section of the genus.

The following, which was in our collection when Mr. Wallace worked with it (and was regarded by him as one of the varieties of *H. antilope*), must now be named.

6. *Hypolimnias eremita*, sp. n.

Allied to *H. porphyria*; wings above purplish-piceous, with the external fourth of primaries and the external third of secondaries paler and yellower in colour, especially on the disc of secondaries; the paler area on the primaries is bounded internally, from the second median interspace by a curved series of four still paler spots, which, however, are not very distinct; a series of white spots (eight on the primaries, six on the secondaries) crosses the disc parallel to the outer margin; there are two sub-marginal series of buff-coloured spots: wings below a little paler than above; the primaries with three sub-costal, black-edged, white spots in the cell; secondaries crossed beyond the middle by a pale band; otherwise much as above: expanse of wings, 78 mm.

Dorey (*Wallace*).

The male of the above species is, I have little doubt, a form which we have from Dorey, closely resembling that sex of *H. alimena*, of Australia, but differing in the absence of white scales upon the blue band of the primaries above, and of the white sub-apical band on these wings below, also in the much less defined and less lilacine band across the disc of the secondaries on the under surface.

We have what I believe to be the male of *H. porphyria*, from Amboina and Ceram; it is also much like that sex of *H. alimena*, but possesses slight differences which seem to be constant.

7. *Charaxes niasicus*, sp. n.

♂. Allied to *C. Schreiberi*, of Java and Malacca, the upper surface greener throughout, but especially towards the base, the bluish areas having green instead of lilac reflections, and much broader, the outer edge of the belt of this colour on the secondaries sharply defined and zigzag throughout, and the marginal markings more perfectly confluent, so that the sub-marginal black belt becomes a confluent series of decreasing pyramidal spots bearing the usual series of white dots; orange marginal spots barely indicated; white band of primaries of little more than half the width, but that of secondaries the same as in *C. Schreiberi*: primaries below bluer, the green band and border yellower; the central band much wider, the red spots beyond it replaced by olive-green; the black markings with a decided green tinge; the two black spots in the cell larger; green bands of secondaries yellow, the central one much wider; the red lunules on the green discal belt much paler, brick-red: expanse of wings, 90 mm.

Island of Nias.

This species must stand between *C. Schreiberi* and *C. cognatus*.

HETEROCERA.

8. *Amesia Trepsichrois*, sp. n.

♂. Mimics *Trepsichrois Verhuellii* from the same island; allied to *A. stelligera*, of Bhotan and Darjiling (Ill. Typ. Lep. Het., v, pl. lxxxiii, fig. 8), but on the upper-side all the white spots on the primaries, especially of the sub-marginal series, much larger, more elongated; the blue border more brilliant than in any known species, pure ultramarine, without the usual purplish tinge; secondaries uniformly dark pitchy-brown, with a single sub-apical white spot: on the under-side the differences are more decided, the wings being of a uniform sepia-brown colour, with fewer spots, those in the cell of primaries and the last five of the discal series being absent; the other spots are cream-coloured, and, for the most part, much larger than in *A. stelligera*, but the last of the discal series of primaries and of the sub-marginal series of secondaries are reduced to mere points; the blue borders and purple reflections are wholly wanting: expanse of wings, 71 mm.

Island of Nias.

9. *Chalcosia Enone*, sp. n.

Allied to *C. distincta*, Guérin (Delessert, Voy. Ind., pl. 24, fig. 3), but the primaries blacker, with more decided blue shot, the white veins and bands purer, the central band of only half the width; secondaries with the border more decidedly shot with blue: expanse of wings, 45 mm.

Island of Nias.

We have *C. distincta* from "India," Java and Sumatra: it is an interesting fact that, as a rule, the Nias species are not identical with those of Sumatra.

British Museum: July, 1883.

DESCRIPTIONS OF THREE NEW SPECIES OF *CHARAXES*.

BY H. GROSE SMITH.

CHARAXES PORTHOS.

Upper-side black. Anterior-wings with a row of six blue spots, forming a band from near the apex to near the middle of the inner margin, the first spot small, the others gradually larger, the spot on the inner margin being the largest, a blue spot within the cell near the disco-cellular nervules. Posterior-wing with a similar band of spots from the centre of the anterior margin across the middle of the wing to the fold; a sub-marginal row of eight minute bluish-white spots, and a marginal thin blue line extending from the inner angle beyond the tail, which is small.

Under-side resembles *Nesiops* and *Mycerina*. This species differs from *Nesiops* in the position of the blue spots on the upper-side of both wings, and the row of small white spots on the posterior-wing, and from *Mycerina* in the absence of the broad blue band within the cell of anterior-wing, as well as in the position of the band of blue spots on both wings, and on the posterior-wing in the substitution of the row of small white spots and the thin blue marginal line for the band of blue spots on the margin of *Mycerina*.

Exp. 3 in.

Hab.: Camaroons (Fuller).

CHARAXES NICHETES.

Upper-side rich dark brown, paler towards the base. Anterior-wing falcate, crossed from the apex to near the inner angle by a sub-marginal, sinuate, rufous band, narrow at the apex, gradually widening towards the inner angle; cell with a brown spot on the sub-costal nervure in the middle, and a larger spot at the end of the cell. Posterior-wing rufous, from the middle of the wing to the outer margin with a sinuate band of dark brown containing eight small rufous spots, the six upper spots being lunular, with two short tails.

Under-side brown, paler towards the margins beyond the dark brown line, which crosses both wings from near the apex of the anterior-wing to near the anal angle of the posterior-wing, inside of which are numerous brown markings, and outside of which is an indistinct serrated line of same colour, but lighter, beyond which, on the posterior wing, is a row of eight small spots, corresponding with the small spots in the dark band on the upper-side. Exp. 3½ in.

This species has a curious resemblance to some of the male varieties of the eastern species, *Polyxena*, especially in the band and spots on the posterior-wing.

Hab.: Camaroons (Fuller).

CHARAXES NEPENTHES.

Upper-side straw colour. Anterior-wing with the costa and apical portion of the wing, as in *Eudamippus*, dark brown, with a sub-marginal row of small spots, inside of which is another row of larger spots, and two still larger spots between the sub-costal nervules, all straw colour. A quadrangular dark brown spot at the end of the cell, the lower end of the spot, on the outside, extending down the upper and middle disco-cellular nervule. Posterior-wing with a double row of sub-marginal black spots, the outer row elongate, the inner row hastate, distinct from it, not joined as in *Eudamippus* and *Dolon*, two tails bluish-grey, outer margin black.

Under-side silvery-white. Anterior-wing with a fulvous band, irregularly marked outside with black, extending from the costa beyond the middle to near the inner angle; beyond which is a row of indistinct dark marks, and a fulvous band on the outer margin; two black spots within the cell; two black lines on the upper and middle disco-cellular nervules, the inner one sinuate, under which are two black spots: near the costa, about half-way between the cell and the first fulvous band, are two more small black spots. Posterior-wing with the double row of submarginal spots as above, the inner row bordered inside with a fulvous band, which, near the anal angle, joins an irregular fulvous band, extending down the wing along the abdominal fold from the costa, near the base, to the anal angle, where it joins a marginal fulvous band bordered with grey. On either side of the band down the wing are several black lines and spots, and two transverse, black, elongate spots on the abdominal fold, a little above the anal angle. Exp. 3½ in.

Near to *Eudamippus* and *Dolon* but quite distinct.

Hab.: Siam (Bock).

London: June, 1883.

ANNOTATED LIST OF BRITISH *ANTHOMYIIDÆ*.

BY R. H. MEADE.

(Continued from p. 14.)

All the remaining species in this Family have the eyes widely separated in both sexes, and are thus related to the smaller acalypterate *Muscidæ*; their calyptra or alulets are always, however, more or less highly developed, so they must be retained among the *Anthomyiidæ*.

With the exception of those in the peculiar genus *Lispa*, Meigen included almost all the other species in the genus *Cænosiæ*; they differ, however, so much from each other in the size of the alulets, in the degree of pubescence of the arista, and in other characters, that it is necessary to divide them into a number of groups or genera, which I will briefly arrange or analyze in the following table:

- A. Alulets large, with unequal scales.
- B. Palpi with dilated extremities *LISPA*, Latr.
- BB. Palpi of the ordinary shape.
- C. Arista plumose *CARICHA*, Desv.
- CC. Arista pubescent or bare.
- D. Abdomen of ♂ narrow, cylindrical, and with projecting appendages *MACHORCHIS*, Rond.
- DD. Abdomen of ♂ clubbed at the end, and without projecting appendages.
- E. Internal transverse vein of wing opposite the end of the axillary vein.
- F. Forehead and epistome prominent...
MELANOCHELIA, Rond.
- FF. Forehead and epistome unprojecting...
CENOSIA, Meig.
- EE. Internal transverse vein opposite the end of first longitudinal vein *ATHEBIGONA*, Rond.
- AA. Alulets small, with equal sized scales.
- G. Arista plumose, or sub-plumose.
- H. Anal vein prolonged to the margin of wing...
MYCOPHAGA, Rond.
- HH. Anal vein shortened *CHELISIA*, Rond.
- GG. Arista pubescent or bare..... *SCHENOMYZA*, Hal.

23. *LISPA*, Latr.

Gen. ch.—Eyes bare, widely separated in both sexes; arista plumose; palpi with dilated extremities; alulets with the lower scale much longer than the upper one; anal vein elongated, but not reaching the margin of the wing.

1. TENTACULATA, Deg. | 2. LITOREA, Fall.

Only two British species have been recorded of this singular genus, which may at once be distinguished from all the other Anthomyids by the singular spatulate enlargement of the ends of their palpi. Neither of them are common; *L. litorea* is a maritime insect.

24. CARICEA, Desv.

Gen. ch.—Eyes bare, widely separated by a space of nearly equal width in both sexes; arista with long hairs; alulets well developed; tibiæ all armed at their apices with four or five spines; anal vein rather short, only reaching about half-way from the base to the margin the wing.

1. TIGRINA, Fab. | 2. CILIATO-COSTA, Zett.
leonina, Rond. | *pantherina*?, Rond.

C. TIGRINA, Fab.

This very common species has a long arista, which is only plumose along its basal half; the distal part being nearly bare. It has only three bristles seated on black spots, behind the transverse suture, in each of the two middle longitudinal rows of setæ on the thorax. The females closely resemble those of *Spilogaster communis*, but may be at once distinguished from them by the circlets of spines at the ends of the tibiæ.

C. CILIATO-COSTA, Zett.

This differs from *C. tigrina* by having the two basal joints of the antennæ rufous; by the arista being plumose along almost its whole length; by having four instead of three bristles behind the suture in the middle dorsal thoracic rows of setæ; by the costal spine and ciliæ being much more developed; and by the transverse veins of the wings being more clouded. Rare. I only know the male.

25. MACHORCHIS, Rond.

Cænosis, Meig., Schin., &c.

Gen. ch.—Eyes bare, widely separated in both sexes; arista pubescent; abdomen of male narrow and sub-cylindrical, with prominent sub-anal appendages; alulets with unequal-sized scales; anal veins of wings not prolonged to the margin; legs elongated.

1. INTERMEDIA, Fall. | 2. MEDITATA, Fall.
3. MEANS, Meig.

M. INTERMEDIA, Fall.

This, the largest species (5 to 7 mm.), is of a dull ash-grey colour; the arista is sub-plumose; the thorax is marked with two brown lines; the abdomen is long, narrow, cylindrical, and immaculate; the legs are yellow, with the exception of the fore femora, the coxæ, and the tarsi, which are all grey; the hind femora are longer than the abdomen; the pulvilli are large and yellow. Not uncommon.

M. MEDITATA, Fall.

The arista has only short pubescence; the abdomen of the male is shorter and more conical than in *M. intermedia*; marked on the dorsum with four brown spots, and furnished on the under-side of the penultimate segment with a very large projecting process; the legs have the coxæ, femora, and tarsi, all black, and the knees and tibiae yellow. Rare.

M. MEANS, Meig.

This species is very similar in form to *M. intermedia*, but is smaller (4 mm.); the arista is sub-plumose; the abdomen immaculate; alulets rather small, but with unequal scales; the legs are entirely black, with the exception of the knees and the proximal thirds of the fore femora, which are yellow. Not common.

(To be continued).

FURTHER INFORMATION AS TO THE MIGRATORY HABITS OF THE
GALL-MAKING *APHIDES* OF THE ELM.

BY JULES LICHTENSTEIN.

My good and learned friend, Professor Horváth, Director of the *Phylloxera* station in Budapest, is an eminent Hemipterist, well known from his many good works on the *Hemiptera-Heteroptera*. He has now lately entered on the study of the *Homoptera* also, and has made such good progress that he became in a few years the first authority in his country for the knowledge of the *Phylloxera*, and was appointed director to the *Phylloxera* station of Hungary.

When I had the pleasure of seeing him here, I called his attention to my new ideas on the evolution of plant-lice from galls, and asked his good aid to support me against some of my adversaries in Paris, who consider, as a poetical fancy, my theories of migrations from plant to plant, or even from galls on trees, like elms or poplars, to grass roots.

Prof. Horváth is a sharp observer, and deserves more than any one the adjective of "*oculatissimus*," so often employed in entomology. Thus, I had the pleasure, soon after having charged him with that work of observation, to see in a French entomological paper (*Revue Française d'Entomologie*, April, 1883) a note from Horváth announcing that my theories were deserving of full confidence, for he had attentively observed the root-lice of the *Zea mæis* (*Pemphigus zea-mæidis*, L. Dufour, after F. Löw), and had arrived at the conviction that it flew from the maize-roots to the trunks of the elm trees where it deposited the sexual forms.

Of course, I was highly pleased with this discovery, much more

so, indeed, than was M. le Professeur Balbiani, who had on former occasions declared such a migration quite opposed to entomological and botanical laws.

Moreover, as only one species of *Pemphigus* is known on the elm tree, viz.: the *Pemphigus pallidus*, Haliday (sub. *Eriosoma*), I fancied it was now a very easy job to gather galls of that insect when the emigration takes place, to put the emigrant winged-lice on roots of maize, and to notice how they thrive.

Under a bell glass I placed some good clean garden earth, in which I had planted some grains of Indian corn, and I thought, at the same time, I could try also to put besides the *Pemphigus* galls the other four galls of the elm tree.* There is a sixth gall-louse on elm, the *Colopha compressa*, but it occurs only on *Ulmus effusa*, and never on *Ulmus campestris* in which the others are abundant. Well, to my great disappointment, not one of the young *Pemphigus* touched the maize-roots; they were all dead and dried up, in a few days. But, to my still greater astonishment, the young of *Tetraneura ulmi*, the most common of all the elm gall lice, fixed themselves immediately on the tender rootlets of the plant, and went on sucking and growing so satisfactorily, that, in ten days, they had acquired nearly double their previous size, and were covered with the usual white secretion, which we generally see on these insects.

Immediately the idea occurred to me that M. Horváth finding a root-louse on the Indian corn, had jumped to the conclusion that it could be no other than the *Pemphigus zœ-mâidis*, and had never thought that it might be a *Tetraneura*.

Indeed, the difference between the two genera is a very trifling one: *Tetraneura* has but one cubital nervure in the under-wings, while *Pemphigus* has two, and no under-ground species of *Tetraneura* is known up to this time.

Hence, I wrote to Prof. Horváth:—"Please, dear friend, send me at once what you call *Pemphigus zœ-mâidis*." By return of post I had the insect; I put it under the microscope, and saw at once it was a *Tetraneura*, and the very *Tetraneura ulmi* upon which Baron von Gleichen began his well-known observations, in Nüremberg, in 1770, and of which the full biology has also been discovered only in 1882, in Budapest; so now we know exactly:

1st.—That the "*Tetraneura ulmi*" comes out of eggs deposited in the crevices of the trunks of the elm tree, in the beginning of May, and forms a gall on the leaf. It is the *Pseudogyna fundatrix*.

* Vis.: *Schizoneura ulmi* and *lanuginosa*, *Tetraneura ulmi* and *rubra*.

2nd.—That in the gall the *fundatrix* deposits a great number of young, which all acquire wings. They are the *Pseudogynæ migrantes*, which fly away. Elaborate treatises, full of exact observations about those two stages of life, have been published by Baron von Gleichen, in 1770, and by Prof. Kessler, in Cassel, in 1878–1882.

3rd.—The young lice deposited by the *Pseudogyna migrans* have been educated by Lichtenstein, in Montpellier, on roots of maize, for a fortnight. Prof. Horváth, in Budapest, has found them on the roots of the same plant in October, 1881–82; it is the *Pseudogyna migrans*, apterous and subterranean.

4th.—The descendants of these apterous lice get wings and return to the elm; these are the *Pseudogynæ pupiferæ*. Horváth has found them at the roots of maize, and many other observers, Lichtenstein, Kessler, Courchet, &c., have found them on the elm trunks. Here they bring the sexual forms, which copulate and lay the eggs, out of which proceed the *fundatrices*.

And so, as Columbus, when searching for India, discovered America instead, Prof. Horváth, thinking he had discovered the evolution of *Pemphigus zæ-māidis*, has discovered the biology of *Tetraneura ulmi*.

La Lironde, Montpellier :
11th July, 1883.

DESCRIPTION OF THE LARVA, &c., OF *MELIANA FLAMMEA*.

BY WILLIAM BUCKLER.

It is a great satisfaction to have figured the larva of *flammea*, and to be able to offer the following description of it, and of the pupa; as hitherto, so far as I know, it appears as in the Manual to have remained among the “unknown”; a circumstance not very surprising from the fact of its being a fen-haunting species of obscure habit and restricted in its locality.

Here I desire to express my deep sense of thankfulness to Mr. W. H. B. Fletcher, for his great kindness in supplying me with a dozen examples of the larva on the 18th of September, 1882, and on subsequent occasions with their food, which otherwise I could not have obtained for them; also for points of interest connected with the discovery of the larva by his friend Mr. F. D. Wheeler of Norwich, some three or four years ago, who, while collecting in the Norfolk fens, was interested in the appearance of this larva and took some home, where they spun up in the heads of reeds, and yielded the moth in the following spring.

I found, just as I had been instructed by Mr. Fletcher, that the larvæ spent most of their time within the old hollow stems of *Arundo phragmites*, several harbouring together in a stem, wherein they lay stretched out at full length, one beyond another, and came out at night to feed on the leaves of fresh reeds; at first consuming a tolerable quantity, then less by degrees towards the end of the month, when their feeding had entirely ceased; each stem was now stopped up by a diaphragm or plug of pale whity-brown silk, spun across a little within each end; at the same time I became aware of one larva having fastened two stems together that had lain side by side among the leaves, and it had cleverly utilized the situation by loosening a portion of the old sheathing-leaf from one of the stems, and after creeping beneath this had, by means of silk threads, spun it firmly on both stems as the covering and protection of a sufficiently commodious puparium between them.

On the 2nd of October, when about to place them in a cage for the winter, I noticed a larva much contracted in length and fast approaching the pupal change lying loose amongst the leaves; beneath these at the bottom I presently found one had already become a pupa, and was lying there naked and unattached.

The two last mentioned, as well as those spun up in the stems, all disclosed fine and perfect specimens of the insect in this present month of June, the first was bred on the 5th, and the last on the 15th. By means of gentle forcing Mr. Fletcher succeeded in producing the moth as early as the 1st of April, and afterwards quite naturally and freely, rather in advance of mine.

A first view of the larva is very suggestive of an immature *Leucania*, more perhaps of *straminea* than of any other species I am acquainted with, though not in its general colouring, as it differs considerably from that species in having a much dingier appearance, matching fairly well some of the old reed stems; moreover, on a close inspection it is seen to have an extra fine line on either side, in addition to the usual arrangement of fine lines alternating with stripes that are observed on a true *Leucania*.

The full grown larva of *flammea* is 1 inch 2 lines in length, apparently cylindrical, yet it is somewhat flattened beneath and slightly tapering at each end, the skin is soft and smooth, the segmental divisions moderately well defined, and the usual sub-dividing fine transverse wrinkles also, which are more noticeable on the sides, the anal legs rather splayed; the ground colour above is greyish ochreous-brown faintly freckled with a darker fine reticulation, beneath, it is

paler inclining to greyish-drab; the shining head is delicately reticulated with darker grey-brown, the plate on the second segment is a trifle darker than the ground of the back and glistens slightly, and is traversed by the dorsal and sub-dorsal lines; the dorsal line is pale, and very thin, but well defined throughout its course by running between two fine lines of dark grey-brown which rather conspicuously relieve it; a little above the sub-dorsal region the ground is broken by a stoutish paler line, then after an interval or what may be termed a stripe of the ground colour comes the sub-dorsal thin line, of a paler tint, closely followed by two other similar lines though more sinuous in character, *these three are equi-distant*; from thence midway toward the spiracular region runs a stout pale line; the spiracular stripe like the belly is of a pale somewhat greyish-drab tint well defined with an edging line both above and below of still paler tint; the black dots of the trapezoidals are so minute as to almost escape notice, but the single black dots of the row along the side are larger, also the row of two's lower down in line with each spiracle situated between them, this is whitish tenderly outlined with black; other very minute black dots follow beneath, the legs are of the same tint as the belly and have dark brown hooks.

The pupa is $7\frac{1}{2}$ lines in length, of a slender, rather cylindrical figure, the head is rounded above and produced a little obtusely beneath, the thorax is rather the stoutest part, otherwise it is nearly equal in substance throughout; the wing covers of moderate length, wrapped close to the body, the moveable rings of the abdomen are deeply cut, and each with an anterior margin of punctate roughness on the back, the last two rings taper to the anal tip, which is furnished with two very minute thorny points and curly-topped bristles; its colour at first is light brown, and soon grows reddish-brown, and in twenty-four hours the darkest mahogany-brown, later to blackish-brown, the surface rather shining.

After all the insects were bred, an examination of the interior of the stems showed one piece of four and a half inches long having a knot at one-third of the length, and in this shorter division one puparium, and a pupa skin with its tail near the knot, on the other side of the knot in the longer division two pupa skins, one beyond the other, lying reversed so that the tails of all three pointed towards the knot; a diaphragm of silk mixed with gnawed particles from the lining membrane of the stem was at either end of each puparium, which in length varied from nine to eleven lines, and comfortably held the shrivelled-up larval skin, the diaphragm in front of the middle occupant

had been doubled in thickness, and probably this insect had to wait for its escape until the puparium in front was freed. Two other stems, about two and a half inches in length, contained two pupa-skins in each, with their tails towards each other; three shorter pieces of stem had in each one pupa-skin; another stem three inches long was like all the others in being well lined with silk, it held a single diaphragm, but was otherwise empty.

Emsworth : *June 27th*, 1888.

SOME NEW SPECIES AND GENERA OF *COLEOPTERA* FROM
NEW ZEALAND.

BY D. SHARP, M.B.

(Concluded from p. 27).

SAPHORHYNCHUS, *n. g.* .

Antennæ inserted near together, on the front of the sides of the rostrum behind its middle, elongate; scape elongate, reaching considerably beyond the eyes; club elongate and slender. Rostrum longer than the thorax, curved, thickened at point of the insertion of the antennæ, in front of this smooth and cylindrical; parts of the mouth small, mandibles but little exposed: scrobes deep and large in front, visible from the front, short, passing backwards, becoming rapidly vague and not attaining the eye. Eyes oval; thorax in front with ocular lobe, touching and slightly covering the hind margin of the eye. Thorax convex, front margin of prosternum emarginate; no rostral channel; front coxæ quite contiguous; metasternum rather elongate; abdominal sutures straight; tarsi well developed, the three basal joints densely clothed with pile beneath, 3rd joint broad and short, deeply cleft; claws very divergent.

This appears to be another very anomalous form of *Curculionidæ*, and I cannot point out any near ally for it; the insertion of the antennæ far back on the rostrum, but near the front, so that they are less separated than usual, the insertion taking place on an incassation, so that the scrobes, very deep at the insertion, are almost provided with pterygia, together with the elongate scape, seem to suggest that the insect is an isolated form that may be placed between *Glypeorhynchus* and the Australian *Rhinaria*.

SAPHORHYNCHUS LONGICORNIS, *n. sp.*

Angustulus, convexus, piceus, corpore, cumque pedibus, griseo-

squamoso, rostro ante antennis nudo sub-lævigato; prothorace elongato, rugoso; elytris interstitiis alternis, 3°, 5°, et 7°, plus minusve breviter vageque costatis, lateribus ad humeris vix angulatim prominulis.

Long., excl. rostr., 6½ mm.; rostri, 3½ mm.

Rostrum curved, deflexed, above the antennæ rugose and clothed with pale scales, below the antennæ bare. Antennæ with elongate scape, which does not quite equal in length the funiculus, second and third joints very elongate, the following joints gradually shorter, but even the eighth elongate, club elongate, slender, acuminate, evidently three-jointed. Thorax sub-globose, but rather longer than broad, very densely and coarsely sculptured, and bearing numerous pale scales. Elytra elongate, with series of coarse punctures, which, however, are not distinct, the surface being rather uneven, and bearing a clothing of scales, apparently easily removed; at each side, just behind the shoulder, there is a slight angular prominence; they are much declivous behind, and on the curved portion the suture is somewhat elevated, the third interstice is a little elevated near the base, and again about the middle, the fifth interstice is more evenly elevated, but the elevation does not extend to the base or the extremity, and the seventh interstice is slightly elevated from the sub-humeral projection backwards. The legs are elongate and clothed with scales and hairs, the tarsi with hairs alone.

The specimen of this insect sent to me by Mr. Helms as No. 229 was found in the same locality as *Clypeorhynchus gracilipes*, viz., Mouri Creek.

DORYTOMUS ELEGANS, n. sp.

Angustulus, fulvo-testaceus, opacus, squamosus, squamulis pallidis, elytris pone medium fascia valde angulata subnuda, brunnea; prothorace cylindrico, elytris angustiore.

Long., excl. rostr., 3½ mm.

Rostrum opaque, behind the insertion of antennæ with some scales, vertex with a large brown patch on each side; eyes not prominent. Thorax rather longer than broad, narrow, nearly straight at the sides, rather densely clothed with pale scales. Elytra narrow, elongate, and parallel at the sides, till near the extremity, clothed at the base with pale scales, a line of these proceeding backwards from each side to the suture, so as to form a V-shaped mark, immediately precedes a space of darker colour, from which scales are nearly absent, and is very conspicuous; immediately before the apex there is another less definite band of pale scales. The tooth on the anterior femur large.

I have received two specimens of this very distinct species from Mr. Helms. It will probably prove to be entitled to generic distinction when the New Zealand *Erirhini* are thoroughly and critically dealt with.

EUGNOMUS ARGUTUS, n. sp.

Angustulus, rufescens, subtus squamulis albidis (ad humeros densioribus et subochraceis) vestitus; superne pile depressa vestitus, scutello

suturaque ad basin albedo-squamosis, elytris ad basin circa scutellum fasciæ mediali sat arguta nigro-sanguineis. Long. 4—4½ mm.

This species has the surface more densely clothed, and with a rather more definite limitation of the marks than is usual in the allies. The antennæ are pale red, and the rostrum is red, the head behind the eyes more obscure; both are densely punctate, as is also the thorax, and all these parts are clothed with depressed, fine, hair-like scales of a pale flavescent colour, a white line of rather coarser scales running along the middle of the thorax; this white line is continued along the scutellum and on the basal portion of the suture; and around the pale line thus formed at the base of the elytra, there is a patch of colour of a much darker red than the general ground colour, and on the middle there is an irregular sub-angulate fascia of similar dark vinous-red colour: the rest of the elytra have a pale clothing, which is most dense and definite behind the medial fascia: the surface bears a few fine, upright, pale hairs.

Mr. Helms has sent five specimens of this species from Greymouth; and I have a pair in bad condition of a closely allied but distinct species, found by Mr. Wakefield at Christchurch.

TYCHANUS BUFO, *n. sp.*

Latus et brevis, squamulis depressis densissime vestitus, rostro fere nudo, lato, opaco, nigro, antennis ferrugineis; prothorace antice valde angustato, margine anteriore in medio bi-angulariter prominulo; elytris utrinque prope scutellum sub-nodosis, posterius declivis utrinque ante medium fascia albida, cuneiformi.

Long. rostr. excl., 5½ mm.; lat., 3 mm.

The rostrum is scarcely so long as the thorax, is not curved, but is broad, dull above, punctate, but not densely, some of the punctures bearing a depressed seta. The antennæ are entirely ferruginous. The thorax is as broad behind as the elytra; from the base to the middle it becomes slightly broader, and has sharply defined sides, in front of this it is excessively narrowed, the elevations over the head are very distinct, and there are on the middle two transverse, rather ill-defined, sub-angular elevations, the whole surface evenly clothed with rather coarse griseous-brown scales, probably variable in colour. Elytra clothed with scales, finer than those on the thorax, but rather similar in colour, and not variegate, except by a large, pale, very conspicuous, wedge-shaped mark on each, extending from each side towards the suture, which, however, it does not reach; on the basal portion there are some coarse pits. The legs are densely squamose, and the femora have a large angular prominence.

This insect has more the facies of a *Sympedius* than a *Tychanus*; indeed, the limits of these *Acalles* genera are not at present very definite.

Mr. Helms has sent *T. bufo* as No. 134, and informs me it is rare at Greymouth.

Thornhill: *March 22nd, 1883.*

Abundance of Plusia gamma at Hartlepool.—Mr. Barrett desires information respecting this insect from the south or south-west of England. May I be allowed to give an account of its appearance in exactly the opposite quarter, the north-east? From want of time, I have only been able to run out at night to some tufts of *Silene* flowers on the railway side. I first went in the evening of May 21st, and found *Plusia gamma* swarming. They fly rather earlier than most of those insects that frequent *Silene inflata*, and have a hovering habit, very like *M. stellatarum*. From that time to the present (7th July), they have been most abundant. I, too, noticed their fine condition, but do not think that very unusual. Indeed, wherever they came from, they must have hibernated. I think they are generally more slate-coloured in spring than in autumn, the deeper hues probably fading during their winter sleep. I have taken one, and seen several, very small in size, that I took only expanding $1\frac{1}{2}$ inches. I saw none last autumn, and it has been comparatively scarce since 1879, when it occurred in all stages in countless thousands. I have had no opportunity of observing *V. cardui*, but even here, so far to the north, the summer insects in 1879 deposited their eggs, and the larva perished in the autumn for want of food, when the thistles died down.—JOHN E. ROBSON, Hartlepool: July, 1883.

Plusia gamma and Vanessa cardui at Hartlepool.—Since sending note on the abundance of *P. gamma*, I took the opportunity to-day to go in search of *V. cardui*, that I might add my mite of testimony one way or other. I made my way to some waste ground, much overgrown with thistles, as the likeliest spot near here for the insect to be found. Before I had actually reached the place, I saw it on the wing, and found it there in greater abundance than I had ever seen it before. I captured two or three to examine, and found them in good condition, though rather faded in colour, but that seemed more the effect of hibernation than wear. The swarm, therefore, of both these insects, to which Mr. Barrett calls attention, has at least been large enough to extend from Wales to the North-East of England.—ID.: 10th July, 1883.

Description of the larva of Pempelia betula.—On June 2nd last, accompanied by Mr. George Tindall, I visited the Green Farm Wood, Doncaster, to search for the larvæ of *Pempelia betula*. Mr. W. Warren, of Cambridge, had told us he used to take it there, and, following his instructions, Mr. Tindall soon discovered a fine, nearly full-fed specimen; and, before the afternoon was over, we had each the satisfaction of having secured several.

Length, about three-quarters of an inch, and rather slender, but not conspicuously so, in proportion. Head a little narrower than the second segment, it has the lobes rounded, and is, as is also the second segment, polished. Body cylindrical, thickest in the middle, tapering gradually and evenly towards each extremity. Segmental divisions clearly defined, the skin soft and velvety, very sparingly clothed with short hairs. Ground colour dull velvety-black, head black and glossy, but very prettily marbled on the lobes with clear white, and there is also a white streak above the mandibles. Two clear, bright, lemon-yellow (white on the second and anal segments) stripes extend through the centre of the dorsal area, running parallel from the second to the twelfth segment, where they unite and form

one stripe through it and the thirteenth. (When quite full-grown, these stripes become paler, and are then of a warm cream-colour.) The only indication of sub-dorsal lines is in an indistinct and interrupted series of small white dots (more numerous in some specimens than in others), from the second to about the ninth segment. The spiracular stripes are of the clear bright lemon-yellow of those of the dorsal area, and below them is another equally broad, but more interrupted, white stripe. Spiracles black, the hairs grey. Ventral surface and pro-legs uniformly dull black, anterior legs also black, but highly polished. The larva is very pretty, and is a conspicuous and striking object when at rest, stretched along the midrib under a slight web on the upper-side of a birch leaf, the spinning of the slight web draws the edges of the leaf, and turns them up a little on each side.

The bright colours are evidently not assumed until the last moult, but, unfortunately, I have no description of the larva in an earlier stage. Whilst collecting the larvæ, I put in a separate box a number of supposed birch-feeding *Tortrices*, &c., one of which developed into a bright *Pempelia betulæ*, but the only recollection I have of it when found, is a dull uninteresting looking larva, brownish-black, with dingy, pale, double dorsal stripe. This specimen did not spin up until quite the end of June, whereas all the others were enclosed by about June 10th. My larvæ formed their cocoons in the corners of their cage, but Mr. Warren writes me that, in a state of nature, "the larva makes a conspicuous white web in a leaf, or more frequently draws three or four leaves together; these nests are easily seen, and it pupates within them." The pupa is from three-eighths to half-an-inch long, is rough, but highly polished, of the usual shape, except that it has a more pointed appearance, caused by the abdomen tapering rapidly to the anal segment, which ends with a rather sharp point. All the parts are prominently defined, the colour uniformly black. My first imago appeared on July 3rd, but Mr. Tindall had one out on June 29th, and two more the day following, and he captured a female specimen at large in the wood on the 28th.—Geo. T. PORRITT, Huddersfield: *July 11th*, 1883.

Tenthredo testudinea, Klug.—On the 20th May, an espalier apple-tree was covered with blossoms, from which a hundred or more apples set, but on the 20th June, sixty of these, each about the size of a hazel-nut, were lying on the ground. Each was found to have a black hole on one side, and in some, at a little distance, was another larger, from which black matter was exuding. On cutting open the apples, it was seen that they were mere shells, nearly filled with black-brown powdery ejecta, those with one hole containing also a larva, but from those with two holes the larva-tenant had escaped: they have their exits and their entrances, they made the small hole to go in, and the larger one to get out: on the 29th June, the tenements were all vacated. The eggs from which the larvæ came had been laid in the flowers, so that the active, eating-life of the larvæ had existed only for four or five weeks, and yet, during that time, they lived fast, for they were plump, sleek creatures, half-an-inch in length, when turned out of their banquet-halls, though while *in situ* they had been obliged to conform to circumstances, for, what with that which they had eaten and voided, and that which they still had to eat, they had no option but to assume a curved, recumbent position. Then, having fared sumptuously every day (and night, too, doubtless), they turned out into the open world, and, like

their progenitors, will have to brave the perils of their life to come, during a rest of eleven months in ante-natal tombs, whence the perfected survivors will arise next May to continue the yearly round of their race. Not before, not after, the time when apple-blossoms come will they appear; if they came forth at any other period the race would be extinguished. Strange, yet true: a striking instance out of a thousand of the care and prevision of Nature.

To return to the larvæ. I took one in my hand, in order to obtain an observation of its longitude, and it at once obligingly put itself into a straight position. Then I saw that it had twenty legs: six thoracic, long and tapering; twelve ventral, short; and two anal; the head comparatively small, that is, not in proportion to the fat body—not an unusual thing with obese animals—and, except this head, which was of a darker hue, the whole larva was of a pale cream-white. I hope I may be forgiven for mentioning cream in this connection, for there was more than met the eye, the nose being involuntarily brought into requisition by a villainous scent that exhaled from the not uncomely creature, which had thriven despite the defective sanitary state of its dwelling. The smell was more like that of a *Cossus* larva than that of Eau de Cologne (which, in the opinion of a Scotch fish-wife, is a “bonnie stink”), and, like the odour of sanctity, no doubt serves to place the possessors within the cordon of protected creatures, for the bird, beetle, or other aggressive animal that would eat such unsavoury morsels as these, must have a rare and degraded appetite. Will it be argued that the stink is the result of cumulative mimicry, or that it is a property entailed by the remote ancestral proprietor of the protective essence? How did he or she invent or acquire it?

I have been able to identify this species by the account given of it by Professor J. O. Westwood, in his paper on saw-flies, in the “Entomologist’s Annual,” for 1858, page 134.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: *July* 2nd, 1883.

Cleptes semiauratus bred.—As this insect seems uncommon here, I have met with no more than eight specimens; the capture of a specimen a few days ago, sufficed to recall the circumstance of my having once or twice bred the species. I have an impression that I once bred a ♀ from the puparium of a Dipteron, obtained by digging; but, as this occurred when I did not label my specimens, there is no proof forthcoming. A case which admits of no doubt, is my having dug at roots of poplar, in the autumn of 1871, the cocoon of a *Nematus* (probably *N. cæruleocarpus*, Htg.), from which emerged, on June 26th, 1872, a ♀ of *C. semiauratus*. I have the insect and cocoon, both labelled, and lettered in addition, at the time. The exit-hole is at the side of the cocoon.—J. E. FLETCHER, Worcester: *July*, 1883.

Athous difformis.—This insect, which is usually looked upon as a very scarce thing, has been taken near here at Guestling, in great abundance this year. I think that the reason why it has not been found elsewhere for some years is, that collectors have not looked for it at the right time of day, or, rather, night. I find it by sweeping the standing grass in the evening. It is most numerous about 8 p.m. On the 28th June I obtained four dozen specimens: the next night Mr. Bloomfield caught six dozen, and to-night, between us, we took over one hundred specimens. Among all these there were only two or three ♀. I have often swept the same places in the day-time, without getting one of either sex. It has also turned up

sparingly in the same place where I found it last year. It would be well if some Coleopterist, resident in the south, would try elsewhere to obtain this species in the same way.—EDWARD P. COLLETT, St. Leonards-on-Sea: 4th July, 1883.

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Coleoptera at Dulwich.—Notwithstanding the constant encroachment of bricks and mortar, the neighbourhood of Dulwich would still seem to possess some title to its old fame as a productive hunting-ground for the entomologist, at any rate, so far as the *Coleoptera* are concerned. Thus, from faggots this year I have taken, among many others, the following species: *Megacronus cingulatus*, *Phloxopora corticalis*, *Coryphium angusticolle* (several), *Cryptophagus pilosus*, *Lathridius testaceus*, and *Bolitochara bella*, the latter in profusion. Fungi have produced *Scaphisoma agaricinum*, somewhat commonly; *Liodes humeralis* in abundance; *Amphicyllis globus*, *Triplax aenea*, and various *Gyrophanae*, &c. Clinging to the under-surface of branches, &c., lying upon the ground, I have found *Ischnoglossa rufo-picea*, *Aleochara morion*, *Conurus immaculatus*, *Clambus minutus*, *Leptinus testaceus* (one only), *Acalles ptinoides*, *Alexia pilifera*, and *C. vestitus* (several); *Aleochara lata* in some numbers from carrion; *Homalota cinnamomea* from *Cossus* burrows; *Bryaxis Helferi*, *Throsacus dermestoides* (in numbers) and *Apteropeda graminis*, by night, sweeping; and *Megatoma undata*, upon a fence, complete the list.—THEODORE WOOD, 5, Selwyn Terrace, Upper Norwood: July 3rd, 1883.

Obituary.

Dr. Gustav Flor, Professor of Zoology in the University at Dorpat, died there on the 13th May: of his age, or the cause of his death, we are not informed. He is known in England by his great work on Livonian *Hemiptera*, "Rhynchoten Livlands," in two volumes, published at Dorpat in 1860 and 1861, which, in their design and execution, show the mind of a master, the leading characteristic being the importance he assigns to the genitalia in indicating generic and specific differences and affinities: thus he kept to large genera in contrast to the infinitesimal genera founded on the exaggerated importance of microscopic variations of structure in use by the analytical school, of which an example appeared in Fieber's "Europäischen Hemiptera," published in 1861.

He also published: "Zur Kenntniss der Rhynchoten: Beschreibung neuer Arten aus der Familie Psyllodea, Burm." (Bull. Soc. Imp. Nat. Moscou, 1861). "Beiträge zu einer Kritik der von Fieber in den Jahren 1858—61, veröffentlichten Schriften über Rhynchoten" (Wien. ent. Monats., vi, 1862).

Besides these we know not of any entomological work published by Dr. Flor. In 1865 he wrote to us that during the winter of that year the third volume of his "Rhynchoten Livlands," containing the *Aphides*, would be published; but it did not appear, nor, as far as we are aware, were his entomological labours continued. Some years after he excused himself from giving an opinion about some critical questions respecting species, on account of the defective vision with which he had been afflicted: this probably caused the greatly regretted cessation of his entomological work.

NATURAL HISTORY OF *ENDROMIS VERSICOLOR*.

BY WILLIAM BUCKLER.

A long cherished desire of obtaining eggs of this species, for the purpose of watching the larva through all its stages, was gratified on 6th of May, 1881, when a dozen laid on bits of paper and birch twig were sent me by Mr. H. McArthur from Rannoch.

The larvæ began to hatch in the early morning of May 22nd, and continued to appear at intervals throughout that day and up to the next morning, when the two latest were hatched.

At once the young larvæ took readily to birch as their food, and moulted the first time on the 28th—30th of the month; on the 3rd of June, most of them had again moulted, and on the 9th and 10th, for the third time; and their last (the fourth) moult began on the 17th, and concluded within a few following days.

Full growth was attained by some on the 26th of June, and from this date onward the remainder matured at intervals one after another until the 9th of July, when the last larva retired into the moss provided for the purpose.

In 1882, I was prevented from looking into their cage until the 1st of April, when I saw some specimens had already been out some time, as three or four were dead and much shattered; after this, on the 3rd, a male and two females emerged, and another female on the 8th: three pupæ remained over until the present year, 1883, when, on April 12th, a male was bred, followed on the 18th by another, and on the 21st by a female, the males being much finer specimens than those of the previous year.

The egg of *versicolor* is of a good size, about 2 mm. in length, and rather more than 1 mm. wide, in shape much like that of a brick with rounded-off angles, slightly depressed on the upper-side, sometimes on both sides, the surface apparently smooth and very glossy; when first laid, it is of a light green colour, but this, in the course of a few days, changes to dark brownish-purple, much the colour of a fresh birch twig, which lasts for about fifteen days, and then assumes a purplish-violet tint, gleaming like an amethyst, and the interior seems a little cloudy; a few hours later, it is fainter and pinkish, and then the larva soon hatches. The empty shell, with the circular hole of egress at one end, still retains a faint tinge of pinkish-violet after the larva has escaped.

On leaving the egg-shell, the larva is a stout and robust creature of cylindrical figure, the head, as usual at this time, the largest segment,

is of a dull black colour, with greenish mouth ; the body velvety-black, with a dingy olive-greenish plate on the second segment, having a wide black dorsal division ; on the other segments, are olivaceous greenish-yellow tubercular warts, each anterior pair on the back being distinctly larger than the others, which are very minute, all bearing a few weak soft yellowish hairs ; a black dorsal blunt projection is on the twelfth segment ; the anal plate and outer sides of the anal legs are pale olive-greenish-yellow ; the ventral legs are blackish on the outside with greenish innerside, the anterior legs olivaceous yellow and shining. From the first, they at intervals fed on two particular leaves near the top of the birch spray whereon they had all assembled, holding to the twig by their ventral and anal legs only, the fore-part of each body being bent back away from the twig, leaving the anterior legs free ; by the fourth day, their colouring had become dingy blackish-olive, with the mouth orange-ochreous, a blackish dorsal line, black tubercular spots, a conical hump on the twelfth segment, a faintly paler spiracular ridge on the thoracic region, and the anterior legs pale orange, with black bases.

After the first moult, the ground-colour is of a subdued green, thickly freckled with black atoms ; the head and plate on second segment paler, of sober greenish-yellow, as are also the spiracular ridge on the thoracic segments, and a green backward-slanting stripe on the side of each of the others, and this is still paler and yellower on the eleventh and the twelfth, on which last a stripe begins at the top of the blunt eminence ; the anal flap is margined with the same colour ; the head is marked with two black stripes on either side ; a black dorsal line divides the front plate, and continues throughout over the hump as far as the anal flap.

After the second moult, they were an inch long, and then broke up their society and separated for independent existence, yet were sufficiently amiable, whenever they chanced to find themselves near each other, to agree perfectly well at any time ; while resting, they still elevated the front part of their bodies as when younger ; at this stage, the colour of the back is much lighter green, the dorsal line dark green, except at the apex of the hump, where it is black ; the sides are of a fuller green finely dotted with black ; on the back, the dots show greenish, though they have become nearly obsolete there ; the stripes on the head are alternately whitish-yellow and dark green, and on the thoracic segments the whitish spiracular ridge is conspicuous, as also on the other segments are the side stripes of yellowish-white bordered above with deep green, and these also now not only reach

the segmental division in their downward slant, but cross it, and are thence continued narrowly and obscurely below on the segment following.

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After the third moult, their growth was quick, two days' feeding increased the length from 1 inch 3 lines to 1 inch $4\frac{1}{2}$ lines, with greater stoutness also in proportion, the thoracic segments decidedly tapering to the small head ; the relative colouring much as before, paler whitish-yellow-green on the back, with deeper green dorsal line, black at top of the prolonged hump, which is now seen to be slightly divided into two blunt points ; the yellowish side-stripes margined both above and below with deep green, and the sides below them of still deeper green, irrorated with fine black dots, except just where the attenuated continuations of the side-stripes can be traced ; the bases of the anterior legs black.

After the fourth and last moult, their docile behaviour continued to be remarkable, as they showed no disinclination to be handled, but grew quite lethargic, often sleeping side by side contentedly like so many fat pigs ; but when awake, they made good use of their time, consuming a great quantity of birch, and their growth was commensurate, for, by 26th of June, some were 2 inches 3 lines in length, others, later, as much as 2 inches 7 lines, and bulky in proportion ; the head very small, with the thoracic segments rapidly tapering to it, and retractile as in *Chærocampa*, though to a less extent. The middle of the body is rather the thickest, and the twelfth segment, with its humped elevation bluntly pointed and slightly divided, slopes backward at an angle to the anal flap ; the ventral and anal legs are developed much after the fashion of *Smerinthus* ; the other segments are lightly sub-divided into four nearly equal portions by slight wrinkles, the segmental divisions more strongly defined, especially on the belly ; the skin is soft and smooth, glistening on the head, which is green, and has two whitish or yellowish-white stripes beginning on either side, and continuing to the end of the thoracic segments, the uppermost as a sub-dorsal, and the lower as an inflated spiracular stripe ; the back is pale opaque green, slightly inclining to yellowish in the lightest and to bluish in the deepest portions and in the dorsal line ; below the yellow stripes, which are bordered above with green, the ground colour of the sides is of a very deep and rich full green, increased in depth by the close irroration of minute black dots, and relieved by the white oval spiracles delicately outlined with black ; in front of these comes a thin line of quiet ochreous-greenish, as though a continuation of the slanting stripe from the preceding segment, more noticeable on approaching

the ventral feet, which, like the base of the anal pair, are bright crimson; the whitish-yellow stripe on the side of the eleventh segment continues downward beneath the spiracle on the twelfth; from the top of the white horn-like hump, which is divided by a thin line of black, a whitish stripe descends on either side in a slight backward curve, and the anal flap is margined with yellowish; the anterior legs are pale green, sometimes tipped with red, and with a black hook.

When full fed, all the green colours of the larva change to brown, and it becomes restless until it finds the moss and leaves needful for its retirement and the construction of its cocoon.

The cocoon varies in length from 1 inch 4 lines to 1 inch 7 lines, and is of long-elliptical shape, being from 6 to 8 lines in width; it is composed of an open-worked reticulation of coarse black or black-brown silk threads, with round or broad oval interstices; the fabric is extremely strong, tough and elastic, covered externally with moss and birch leaves firmly adherent. About a week or ten days before the time of emergence, the cocoon is pushed by the enclosed pupa from a prone to a vertical position, the upper end is ruptured, and the pupa protrudes its head through the opening and continues by degrees to advance, until it is exposed as far as the end of the wing-covers; fixed in this position, it remains quiet a longer or shorter time until the insect is able to escape, though in two or three instances the pupa had worked itself out entirely free from the cocoon before the moth could be disclosed; on examination, the pupa could be seen to be well furnished with means for facilitating such movements, as described below.

The pupa itself measures in the male a length of 12 to 14 or 15 lines, in the female from 17 to 18 lines, or occasionally a little more; it is very stout, the diameter across the bulkiest part at the end of the wing-covers in the male, ranges from 4 to $4\frac{1}{2}$ lines, in the female, 6 lines; the head has the mouth-parts a little produced in a squarish form, flanked by the curved antenna-cases in high relief; from thence the head is bluntly rounded above in an unbroken swelling curved outline to the end of the wing-covers, including the thorax and upper abdominal rings; the moveable abdominal ring is very deeply cut, and those below are well defined, the last ring ending with a prolonged flattened caudal process tapering a little to the squarish extremity, where it has a margin of hooks and bristles; the surface is remarkably dull, and rough everywhere, except in the divisions between the moveable rings, yet even there it is quite dull; the roughness on the head, thorax, upper rings and wing covers is striated, granulous, or

wrinkled ; the moveable and lower rings of the abdomen have on the back transverse rows of stout and sharp hooks pointing behind ; the colour is a sooty or dingy brown, black in the abdominal divisions.

Emsworth : June 18th, 1883.

NATURAL HISTORY OF *BANKIA BANKIANA*.

BY WILLIAM BUCKLER.

This pretty and active little *Noctua*, of which nothing had been heard for a long interval of time, was last season re-discovered by Mr. G. H. Raynor, who found it in some abundance near Ely, and succeeded in obtaining a good number of eggs, and most kindly sent a liberal supply of them to my friend the Rev. J. Hellins and myself ; those I received, were laid within a glass-topped box, to which they adhered, as well on the glass as on the paper, being sprinkled over both surfaces singly, with occasionally two together.

The eggs arrived on 7th of June, 1882, and began to hatch on the 9th, while yet the exact nature of the proper food-plant for the larvæ seemed somewhat uncertain ; a low plant had indeed been suggested to me by Mr. Raynor for trial, since although Guénée had distinctly stated *grasses* to be the food, he had not mentioned any particular species of grass ; I soon found, however, the low plants refused, and then tried a small *Carex* ; they fed a little on this and on coarse grasses, but the little larvæ began to die off ; when, fortunately, before all had hatched out and died, it was found that *Poa annua*, a common grass growing almost everywhere, was quite to their taste, and the fact was at once kindly imparted to me both by Mr. Hellins and Mr. Raynor.

The larvæ thrive very well on the *Poa* up to the third week in July, when, as often happens with this grass indoors, it was attacked by mould, which caused the death of almost all my larvæ ; however, Mr. Hellins most kindly sent me several of his, which had been kept in the open air, so that I was able to continue my observations until the end of the month, when the larvæ reached full growth.

I kept my pupæ alive through the winter, but suppose I mis-managed them during the month of May, 1883, by keeping them too much exposed to rain, as I bred only one specimen, a male, on 29th of last June.

The egg of *bankiana* is globular in shape, with a slight depression at the base, about $\frac{1}{16}$ " in width, and $\frac{1}{16}$ " in height, with about

thirty-four shallow ribs, and with shallower transverse reticulations; the central space in the top is flat with large shallow reticulations; the shell has a pearly sheen; when first laid, it was said to be of a dull whitish, having the faintest greenish tinge, and then gradually turned to a pale greenish-yellow.

When first hatched, the larva has the ventral legs developed on the ninth and tenth segments, and a small undeveloped pair on the eighth; it is of pale yellowish-green colour, with very fine black dots and hairs. After feeding a few hours, the interior became deeply tinged with dark green, which showed strongly through the clear skin, especially in the middle of the body; when eight days old, the skin became less clear, and of a uniform light yellowish-green with blackish tubercular dots.

In twelve or thirteen days, they moulted the first time, and became less transparent than before; and after the second moult, in five or six days' time, they were long and slender, and of a more opaque velvety green, and faintly showed subdorsal lines of paler green.

After another week, the third moult occurred, when the ground-colour was a little fresher than before, the head very pale green, and a dorsal line of darker green than the ground showed faintly here and there; the subdorsal lines were whitish-yellow, and also the segmental divisions, while the length had increased to $7\frac{1}{2}$ lines.

The fourth moult occurred on 14th of July, and by the next day they had become nine lines long, and the small undeveloped pair of legs on the eighth segment were still to be noticed; the slender proportions of the larvæ, remarkable from the first, seemed now to be even more striking as they attained full growth towards the end of the month, when they measured from eleven to twelve lines in length; they were of a very yellow-green colour, with yellow segmental folds, the round head of a light green colour with upper lip whitish, and mouth black; the dorsal line dark green though faint; the subdorsal stripe primrose-yellow; the roundish spiracles flesh-coloured, placed on the deep yellow thread-like trachea, showing faintly through the skin.

On 1st of August, one larva began to spin its cocoon just beneath the crown of the grass-roots, almost close to the surface of the earth; and others followed in the same way during the next four days, though one larva lingered two or three days longer: this was exactly an inch long as it lay stretched out, according to the habit of this species when at rest among the grass, which it matched in colour remarkably well.

The pupa is very short, stout, and dumpy, $3\frac{1}{2}$ lines in length, the thorax and wing-covers are well defined, the last rather long in pro-

portion, and from them the abdomen tapers obtusely to the tip, which is furnished with two fine points and minute curly-topped bristles; its colour at first is of a light drab, but towards May of the year following, it becomes a dark brownish-green, and is rather shining.

Emsworth: July 24th, 1883.

A NEW SPECIES OF *PELTASTICA*, MANNERH. (*TROGOSITIDÆ*).

BY GEORGE LEWIS, F.L.S.

This genus was formed in 1852, for the reception of an insect from Sitkha, and in 1879, Herr E. Reitter described a second species from the Amur. The type of the latter has been kindly sent to me for inspection, and I find it is specifically distinct from one I have lately taken in Japan, and which I now describe and dedicate to my friend.

P. REITTERI, n. sp.

Oblong, pale testaceous, rather shining, club of antennæ pitchy, head between the eyes, and disc of thorax, black. The thorax is transverse, rounded, and much dilated at the sides, where it is closely and deeply punctured: the disc is rough and irregular, with ill-defined tubercles. The front of the head, anterior and lateral margins of the thoracic disc, and legs, are reddish. The elytra are deeply punctured in regular rows, with the suture and four lines of costæ elevated, having tubercles more or less distinct. The tubercles are black, with several spaces between them, less raised, whitish. Beneath, pitchy-black. Length, 2 lines.

It differs from *amurensis* in being rather less elongate, proportionally broader and more convex. The convexity is most conspicuous in the region of the elytra, and the punctuation of the thorax at the sides, where it is pale and dilated, is close, not scattered as in *amurensis*. The sides of the thorax are also more rounded, and the basal angles less broken in outline.

Suyama, Nikko, and Fukui are localities for it, where it is not rare in May and June at fermenting sap in forests of fair elevation, and I have taken it as late as August.

Wimbledon: 11th July, 1883.

SOME FRIENDLY REMARKS ON MR. BUCKTON'S STANDARD WORK
ON THE BRITISH *APHIDES*.

BY JULES LICHTENSTEIN.

I have just received the 4th and last volume of Mr. Buckton's splendid "Monograph of British Aphides," and cannot sufficiently praise the immense quantity of interesting observations and valuable

reflections given by the author on a subject which he, perhaps, knows better than any one.

Yet, precisely, because it is a work destined to become a classic compendium of Aphidology, I should like to prevent any misapprehension in a question on which I am not in perfect concordance of views with Mr. Buckton: viz., the migrations of *Aphides*.

Mr. Buckton says, page 72: "Whilst fully sensible of the value of much that M. Lichtenstein has written on the *Pemphiginæ* and *Phylloxerina*, I would guard myself from a committal to some of the theories he has put forward, such as the periodic migration of *Aphides* from one food-plant to another, and particularly as to his observations that certain species feed on the leaves of the oak, and subsequently descend to the roots of grasses for hibernation."

Certainly there is an error, as I only spoke (and, precisely, in the Ent. Mo. Mag.) of the gall-lice of the elm, not of the oak, and as the late observations of Prof. Horváth, in Budapest, have put beyond doubt the migration of the maize-root louse to the trunks of the elms in October, I think if Mr. Buckton give a new edition of his book, he will change the word "oak" into "elm," and put in a note that since he wrote the above lines, migration of the elm-lice to maize-roots has been observed.

But, still more in the following page, 74, Mr. Buckton states that Sign. Balbiani, the strongest opponent of the migration theory, has observed the migration of the *Siphonophora millefolii*, as female, on several grasses (?) and plants, as *Cyperaceæ*, *Trifolium pratense*, &c.; but here the migration seems to find an explanation, being in reference to *Aphides* which live on *annual* plants.

Is *Achillea millefolium* an *annual* plant in Paris? Here, and in England, I believe, it is not so, and the roots of that plant last many years; so, if migration were not the rule, there were no more necessity for the *Siphonophora millefolii* to migrate to *Trifolium*, than for *Tetraneura ulmi* to migrate to maize-roots. More explanations are desired, either from Mr. Buckton or from Sign. Balbiani.

But to confirm or destroy the migration theory, how is it that the clever observer of Weycombe, who, in his first volume, speaks of Walker's idea as to the migration of the hop-blight (*Phorodon humuli*) from the hop to the plum-tree, occupies three pages of his 4th volume, 186—188, to, "the extermination of the hop-Aphis," without saying if he has tried to follow the insect from the one plant to the other, after having followed it from the leaves of the hop to the roots on which he could not breed them?

Even if he has no faith in a good result, the essay should have been attempted. As hop is not grown here, I could not make it here easily, but I tried in May, 1880, to bring the plum-tree louse (*Phorodon mahaleb*) on hop-leaves in the botanical gardens, and it lived very well on them, and acquired wings. I was not able to follow it longer.

In his work, Mr. Buckton gives *Phor. mahaleb* as a variety of *Phorodon humuli*; to me, it is the same insect at different stages of its life. Some English entomologist could easily furnish evidence for or against my hypothesis, for I repeat it is merely an hypothesis, up to this day.

These are the only faults I find in Buckton's splendid work, which is, for the present, the best book we have on *Aphides*.

Montpellier: 9th August, 1883.

Occurrence of Argynnis Euphrosyne in Sutherlandshire.—The lower part of the valley of the River Shin is sacred ground in the eyes of the Micro-Lepidopterist, for there, thirty years ago, Mr. E. C. Buxton captured *Chalybe pyrausta*. It was in the month of May, 1853, that this occurred, whilst Mr. Buxton was more intent on the pursuit of salmon than of *Micros*.

The following May (1854) he captured on the same spot *Rasslerstammia pronubella*. Of the habits and food of this latter insect, we are still quite in the dark; but of *Chalybe* (or *Pseudicia*) *pyrausta*, thanks to Baron von Nolcken, we know the whole history (Ent. Ann., 1868, p. 153); it feeds on meadow-rue (*Thalictrum*) in July and August.

I first visited the valley of the Shin in June, 1872, and have since been there in July, 1882, and June, 1883, but I have not yet succeeded in detecting there any *Thalictrum*, though it is very possible that it may occur plentifully in some limited area, as often happens with plants.

It was whilst prospecting for *Thalictrum* a little below the Shin-falls on the 21st June, 1883, that I noticed some specimens of an *Argynnis* on the wing, and found, on capturing them, they were *Euphrosyne*. This being the very first time I had met with that species in Scotland, all my previous captures for more than forty years, and in many different and distant localities, having been *Selene*!

Mr. E. C. Buxton died of fever in the interior of Africa in August, 1878, but his captures of thirty years ago have still an influence upon me, and urge me from time to time to revisit the valley of the Shin, though to do so without a fishing rod is looked upon as a most incongruous proceeding by the anglers I meet with there.—H. T. STANTON, Mountsfield, Lewisham: August 11th, 1883.

Vanessa polychloros distinguished from Vanessa urticae by a structural character.—Last Saturday, I had a visit from the celebrated Dutch Entomologist, Mr. P. C. T. Snellen, of Rotterdam, who was spending a few days with Mr. W. F. Kirby.

Talking, as we did, "de omnibus rebus et quibusdam aliis," I chanced to show, as objects of interest, the Isle of Man form of *Vanessa urtica*. This led to a remark by Mr. Kirby that some people wanted to make out that *polychloros* and *urtica* were only different forms of one species. Mr. Snellen then enquired if I was aware of the structural character by which the two insects might be recognised; on my confessing my ignorance, he pointed out that the basal half of the costa of *polychloros* shows a row of long, strong bristles, which are entirely absent in *urtica*. *Antiopa* shows similar bristles, but *Io* and *Atalanta* have none.—ID.: August 20th, 1883.

The larva of Acronycta alni—a problem for observers.—Dr. A. Speyer, in the Stettiner entomologische Zeitung, 1883, p. 419, has a chapter on this larva, which he calls "an Entomological enigma." In the earlier stages of its larval life, it is well known to have a totally different appearance from that which it presents at its last moult. The younger larvæ might readily be passed for the faeces of birds, even by a tolerably good observer, but the adult larva (blue-black spotted with dazzling yellow, with long hairs terminating in clubs) neither resembles bird's-dung nor any thing else. Has it then, from some cause unknown to us, any special protection in that form?

Dr. Speyer mentions that his friend, Dr. H. Müller of Lippstadt, had once offered a brood of the gaily-marked larva of *Cucullia lactuca*, bright yellow and black, to the numerous occupants of various ages of his chicken yard: most of the old fowls and many of the younger ones made long necks on first catching sight of the larvæ, but took no further notice; a few pecked towards them, but in such a timid, hesitating way, that they did not actually touch them; just a few actually picked up the larvæ, but speedily threw them down again and walked away; only one young and inexperienced chicken picked one up a second time after an interval of some minutes. The story is well told; but it does not say whether this last mentioned larva was eventually eaten.

I doubt whether any Entomologist has ever had the larvæ of *Acronycta alni* in such numbers, as to have tried the experiment of offering them to his poultry; but for all that, the experiment might be worth trying, and if the fowls did not eat them, he would be eventually no loser!

Another question here arises—why is it that this larva always occurs singly? Dr. Speyer says that it has never been his fate on finding one of these larvæ to succeed in finding a second in the same locality, in spite of the most careful search; this seems the more extraordinary as the larva does not conceal itself, but feeds exposed on the upper surface of the leaves. Of its polyphagous habits, Dr. Speyer can testify from his own experience, having found it on alder, birch, oak, beech, lime, cherry, raspberry, dog-rose (*Rosa canina*), and willow (*Salix alba*).—ID.

Pieris napi, L., versus P. Melete, Mén., and P. megamera, Butl.—I have just succeeded in solving this question by breeding many specimens of *Pieris Melete* from eggs laid by *Pieris napi*, or, as it is named by Mr. Butler, *Pieris megamera*. I fully anticipated this result, as was indicated in my paper read before the Entomological Society in August, 1882.

Pieris napi being a common English insect, I would suggest the experiment of breeding it in a hothouse for several generations, in order to ascertain if it is as susceptible to temperature variations under artificial, as it is in Japan under natural conditions; and in order to show that the experiment is worth a trial, I enclose the wings of two ♀, one taken in March and the other in June.—H. PRYER, Yokohama: June 4th, 1883.

Stridulation of Arctia caja.—Notwithstanding the stray notices scattered over entomological literature, I have been very reluctant to believe in the stridulation of this moth. At the outset, led to look for some startling musical apparatus, it was not until I began to perceive that a majority of butterflies produce distinguishable sounds by means of delicate and minute vein-striae, that I found it possible to entertain the idea; a matter rendered the more difficult, because the auditory cells in this species are so poorly developed that it was difficult to believe that the stridulation, if a fact, played any part in the insect-economy. The late Prof. Zeller remarked ("Isis," 1840, p. 228), "I have observed how one of my three newly-emerged female *Euprepia caja*, when roused up and provoked a bit, so that it was forced to crawl backwards, made an audible crackling noise. The experiment I often repeated for several days. Also, when I held its abdomen fast between my fingers, there was a crackling when it beat its wings." Pursuing the train of thought suggested by the vesicular organ in the allied *podica*, he subsequently adds (Stett. ent. Zeit., 1867, p. 41): "I remark in a male *Caja* an oblique smooth place, almost longish-quadrangular, with a perpendicular depression in the centre that might well serve the same end as in the species of the *Lithosiidæ*;" the allusion being probably to the episternum of the meta-thorax.

A few days ago, I was enabled to renew Prof. Zeller's experience with a crippled female of *caja* that made a great rustling and crackling by jerking its crumpled wings up and down, when disturbed during the deposition of unfertilized ova. After a painstaking investigation of the matter, I myself came to the conclusion that the crackle was owing to the friction of the callosity at the base of the fore-wing on the edge of the hind-wing. (In the instance before me, a notch in the callosity caught the angle of the hinder-wing near the spurs.) I also noticed that the male *caja* links its wings for flight by passing a stout spine over a tuft of hair on the edge of the sub-costal vein of the fore-wing, which is confined by reason of an oblong lappet of hair falling down from the inner costal vein; but that the female, with less capability of aerial locomotion, has four lax bristles, replacing this single spine, which also catch in the tuft of hair, but then there is no little lappet to confine them in their place, as there is in the male. Consequently, by this adaptation, the female has a greater power of moving the wings independently of each other, than the male; and, therefore, I presume the female may have a greater facility for crackling.—A. H. SWINTON, Guildford: July 19th, 1883.

Grapholitha cœcana, Schläger (*cœcana*, H.-S.), a Tortrix new to Britain.—Head pale brownish-grey. Eyes black. Face and palpi pale ochreous-grey. Apical joint of palpi slender, nearly as long as the basal, which is stout and curved upwards; middle joint ascending, curved, more than twice as long as the apical, and as stout

as the basal, being slightly thickened beyond the middle, and clothed with rough projecting scales. Antennæ brownish-grey. Thorax rather slender, ovate, brownish-grey. Anterior wings nearly three times as long as broad. Costa slightly but regularly arcuated, apex rather produced, anal angle rounded. Colour, shining brownish-grey, dusted with ochreous, particularly towards the hind margin. The costa, which is very pale grey from near the base, has about seven black geminations, the first four or five being placed very obliquely. The first streak of the 3rd gemination is much produced, and may generally be traced as a curved line across the wing to the anal angle. The second streak of this gemination also runs with the first to the anal angle, but almost from the costa it changes to a lustrous leaden-blue. The fifth gemination is much produced towards the hind-margin, its second streak being lustrous leaden-blue, and joining another blue streak which comes from the costa nearly parallel with the hind-margin. On the disc are two or three parallel, longitudinal, black lines, and another along the fold to the anal angle. Towards the hind-margin are a few short, transverse, irregular black streaks. Cilia smoky-grey. Posterior wings with the apex obtuse, slightly produced, anal angle rounded. Colour, pale grey, with long, slightly paler, cilia. Abdomen long and slender, grey. In the ♀ the posterior wings are dark brownish-grey, with paler cilia. Expands 6 lin.

The insect may be distinguished at a glance by the elongate anterior-wings, pale costa, and longitudinal black streaks, from any other British *Tortrix*. It occurred locally near Deal in the early part of July, amongst *Ononis spinosa* and *Onobrychis sativa*, and I thought at once it was something new. After exhausting all our works on the group, I showed them to Mr. H. T. Stainton, with whose kind assistance it was proved to be the above species. It is described and figured by Herrich-Schäffer in his "Systematische Bearbeitung der Schmetterlinge von Europa" (iv, p. 253), 257. He places it in his sub-genus, XXIX *Grapholitha*, Tr., Dup., which includes such insects as *Stigmonota Leplastriana*, *Catoptria microgrammana*, *C. albersana*, *Semasia Waberana*, *Opadia funebrana*, *Endopisa nigricana*, &c. By Heinemann it is mentioned ("Die Schmetterlinge Deutschlands und der Schweiz," 2, 180) as occurring among *Ononis spinosa*. In Staudinger's "Catalog der Lepidopteren, &c.," it stands under the genus *Grapholitha*, Tr., section D. *Semasia*, H.-S., in company with *Catoptria citrana*, *C. Wimmerana*, *C. hypericana*, *Stigmonota coniferana*, *Coccyx strobilana*, &c. The *Grapholitha* of these continental authors seems to include a miscellaneous selection from *Coccyx*, Tr., *Stigmonota*, Gn., *Catoptria*, Gn., *Endopisa*, Gn., and *Carpocapsa*, Tr.

From *Grapholitha*, Stephens, it is excluded by the structure of the palpi and the venation of the wings. Its most natural position seems to be between *Endopisa*, Gn., and *Stigmonota*, Gn., resembling the latter genus closely in the structure of the palpi. This, however, is but a crude opinion, and I should be glad to hear some older authority on the subject. Nothing certain seems to be known about the larva: *Ononis spinosa* and *Onobrychis sativa* being mentioned as probable food-plants. On the continent, it occurs in May and June near Jena, Vienna, and Wiesbaden, also in Hungary, Andalusia, and Southern Russia.—GEO. COVERDALE, 24, Fleming Road, Lorrimore Square, S.E.: August 6th, 1883.

Note on Eudorea murana.—This insect is intended to sit on rocks and stone walls, with which its colour well assimilates. In the larval state it feeds in the moss

which grows in the crevices or on the faces of the rocks and stone walls; now this moss is more or less of a green colour, and when *Eudorea murana* first emerges from the pupa state, it reposes for some time after its wings are fully grown on the surface of the green moss. www.libtool.com.cn

In such a position, it is readily seen by even an inexperienced Entomologist, and I should imagine, unless it is nauseous to the taste, it would be readily eaten by many insectivorous birds, for its grey colour, so like that of the rocks, &c., makes it very conspicuous on a patch of green moss, and its instinct is not yet sufficiently developed to teach it to seek *as soon as possible* the concealment of a stone-coloured object on which to rest.

At Lairg, Sutherlandshire, this insect made its first appearance on the 21st of June, and on the following day I met with several. Those I first captured, I at once placed in the killing bottle, but found I had been too hasty in so doing, as the specimens were difficult to set out, owing to the wings, though fully grown, having been still rather limp.

Hence the following moral may be deduced: if you find any species of *Eudorea* reposing on the surface of moss, keep it for some hours after boxing it before placing it in the killing bottle, that the wings may have time to harden.—H. T. STAINTON, Mountfield, Lewisham: August, 1883.

Abundance of Plusia gamma at Deal.—The appearance of this insect in great abundance this spring, and its remarkably pale form, seems to corroborate Mr. Barrett's remarks as to its probable immigration.

These insects, when taken in the spring, were of a pale slate colour, especially beyond the middle of the primary wings, and very unlike the ordinary form. The second brood, which is now equally abundant, is of a very dark colour and reddish-purple on the inner margin; they still continue to swarm at dusk on the flowers of *Ballota nigra* and the different species of *Silene*. *Vanessa cardui* was also very plentiful in the spring, but seems scarcer since the hibernated specimens have been replaced by those newly emerged; perhaps that is accounted for by the very bad weather in July, many species generally complete pests in this part of the coast, as *A. Galathea*, *P. Corydon*, &c., being much diminished in their numbers.—C. HALL, Deal: August 19th, 1883.

Coleoptera in the New Forest.—I spent a week at Brockenhurst in June last with the intention more particularly of working the wood-feeding *Coleoptera*, but owing to the absence of dead wood and the badness of the weather, my success was not commensurate with my, perhaps rather sanguine, expectations. Insects of all Orders, not excepting even the generally common species, were remarkably scarce. The following may be reckoned as my best captures:—*Mycetoporus lucidus*, *Stenus Kiesewetteri*, *Phlæocharis subtilissima*, *Euplectus punctatus*, *Scydmanus exilis*, *Agathidium nigrinum*, *Plegaderus dissectus*, *Cryptarcha strigata*, *Cerylon angustatum*, *Læmophilæus duplicatus*, *Corymbites metallicus*, *Tillus elongatus*, *Conipora orbiculata*, *Sphindus dubius*, *Mycetochares bipustulata*, *Salpingus ater*, *Anisozya fuscula*, *Abdera bifasciata*, *Apion genista*, *Leptura scutellaris*.

I spent part of one day at Lymington, where the only captures worth recording

were:—*Tachys scutellaris*, *Bledius unicornis*, *Trogophloeus halophilus*, *Micralymma brevipenne*, and *Otiorhynchus ambiguus*.—W. G. BLATCH, 214, Green Lane, Small Heath, Birmingham: August 16th, 1888.

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Diglossa mersa, &c., at Weymouth.—During a short visit to Weymouth in June last, on my way to the New Forest, I captured the following amongst many other species of *Coleoptera*: *Aepus Robini*, *Phytosus balticus*, *P. spinifer*, *Diglossa mersa*, *Micralymma brevipenne*, *Otiorhynchus ambiguus*, and *Rhinocyllus latirostris*. The dearth of insect-life was quite extraordinary, the only thing that appeared in any abundance being *Homophlus armeria*, of which local species I could readily have taken thousands, had I felt so disposed.—ID.

Aradus corticalis in the New Forest.—On a fungus-grown beech stump near Brockenhurst, in June last, I found a few specimens of *Aradus corticalis*, both young and mature. This species seems to be very scarce; for although I diligently searched a great number of similar stumps in the same neighbourhood and in other parts of the Forest, my labour was, with the above-named exception, entirely unrewarded.—ID.

A rain of water bugs.—It is known that in Mexico, aquatic *Hemiptera* of the genus *Corisa* are so abundant, that a kind of bread is made of their eggs. If, in the Old World, these insects are much less numerous, they may, nevertheless, be occasionally met with in great abundance under certain circumstances. Thus, in a letter recently received from Captain Balassoglo, I find the following interesting details:

“During a storm near Fort Irguis (Turkistan) the *Corisa*, of which I forward examples, fell from the air in thousands, like rain; they extinguished the fire prepared for cooking my meal; in effect, there was an inundation of *Corisa*, and my travelling carriage was filled with them.”

The *Corisa* in question is *assimilis*, Fieber.—A. PUTON (translated from the “Revue d’Entomologie,” vol. i, p. 23).

Hymenoptera in Hayling Island.—During the last three weeks I have been staying at South Hayling, and although the season has not, so far as I have been able to judge, been a very favourable one for Aculeate *Hymenoptera*, still I have taken several species which I think are worth recording, and amongst them I am glad to be able to add a new species of *Pompilus* to our British list, viz., *Pompilus unguicularis*, Thoms., of which I have taken several males and one female; the male I have taken before both at Chobham and Deal, but without finding the other sex, and I had failed to recognise to what species it belonged.

The fauna of this little Island, at least as far as the *Hymenoptera* are concerned, seems to be a curious one, a good many species being represented, but unusually few occurring in any abundance. In the genus *Bombus*, for instance, ten out of our fifteen British species have occurred, but only two abundantly, one of these (*lapidarius*) is common everywhere, and certainly is in most unusual abundance here, nearly every plant of *Teuorium* having one or many specimens upon it; the other

(*B. cognatus*, Steph., = *venustus*, Sm.) is not generally an abundant species, but on the *Teucrium* on the eastern front of the Island, it is common enough, but apparently local, as it hardly extends over an area of more than half a mile, and seems only to occur on the coast; our other usually very common species, viz., *hortorum*, *terrestris*, and *muscorum*, are distinctly rare, *muscorum* apparently taking the place of *cognatus* inland. Although these two species are so much alike when examined at home, yet on the wing they can be known at once by their general appearance, the black hairs of the legs and the sides of the abdomen of *muscorum*, and the deeper brighter orange band of the 2nd abdominal segment in *cognatus*, shewing as distinct characteristics.

Of the parasitic genus *Psithyrus* I have found four out of our five British species, but only one or two of each, and all males. *Prosopis dilatata*, once looked upon as such a great rarity, may be taken freely, especially in the female sex, and frequents a curious variety of flowers. I have taken it on *Euphorbia segetalis* abundantly, on *Achillea millefolium* abundantly, on *Echium vulgare* frequently, and on small yellow *Compositæ* such as *Leontodon hirtus*, *Crepis virens*, &c., occasionally. It is hard to fancy a selection of plants less alike than those given above, differing widely in colour, and belonging to three distinct natural Orders,—*Achillea*, moreover, being distinct from the other *Compositæ* which the bee frequents in its strong aromatic smell. Five of the other British species have been found in the Island, nearly all frequenting the bramble-flowers along the coast.

In the genus *Halictus*, sixteen of our British species have appeared, and amongst them two of our rarest, viz., *H. brevicornis*, Schenck, and *H. breviceps*, E. S. Of the genus *Pompilus*, I have found six species, two of which are rarities, viz., *unguicularis* and *consobrinus*; *unguicularis* occurring only on the sand hills on the east of the Island, *consobrinus* only on those of the west; the common *plumbeus* occurs on both and in great numbers; of *rustipes*, I have found a very few on thistles to the east, and of *viaticus*, usually so common, I have only found two females. Only one ant of any rarity has occurred to me, viz., *Leptothorax unifasciata*, of which I found a colony under a stone on the green towards the west, it contained about seven females, at least I was able to capture that number, but others might have escaped among the stones, and about thirty or more workers, and a good many larvæ. The following is the list of my better captures:—

Leptothorax unifasciata, Latr., under a stone.

Mutilla ephippium, Fab., on the sandhills to the east of the Island.

Pompilus rustipes, Lin., on thistle heads.

„ *consobrinus*, Dahlb., on sandhills west of the Island.

„ *unguicularis*, Thoms., on sandhills east of the Island.

Ammophila lutaria, Fab., on sandhills east of the Island.

Nysson dimidiatus, Jur., a single specimen on a bank.

Vespa sylvestris, Scop., frequent on *Scrophularia*. I have taken it on the same plant at Chobham.

Odynerus 3-marginatus, Zett., frequent on thistle-heads.

Prosopis dilatata, Kirb., on various flowers.

„ *confusa*, Nyl., on *Rubus*.

Halictus zonulus, Sm., ♂, on *Centaurea*.

„ *brevicornis*, Schenck, ♂, on thistle-heads, very local.

Halictus breviceps, E. Saund., ♀, on *Echium*, &c.

„ *punctatissimus*, Schenck, ♀, on sandhills, east.

„ *leucopus*, Kirb., ♂ ♀, on thistle heads, &c.

Andrena Gwynana, Kirb., on sandhills, east, var. *bicolor*.

Cilissa tricolor, Leach, ♂, on sandhills, east.

Epeolus productus, Thoms., on sandhills, east and west.

Osmia fulviventris, Kirb., on thistle heads.

Bombus cognatus, Steph., = *venustus*, Sm., common on *Teucrium* on the beach.

EDWARD SAUNDERS, Lloyd's, E.C.: 17th August, 1883.

An extraordinary flight of dragon flies.—Prof. Alfred Newton, writing in "Nature" for July 19th, 1883 (vol. xxviii, p. 271) gives the following account of a flight of *Libellula quadrimaculata*, according to the observations of an English gentleman at Malmö in Sweden:—

"On Sunday, June 24th, we had an extraordinary flight of *L. quadrimaculata*, Linn. They passed over, or through, the town or neighbourhood for about half an hour in the afternoon. The next day they re-appeared for more than an hour; but on Tuesday, the 26th, at 7.30 a.m., they again began in millions, and, notwithstanding the wind had shifted to the south during the night, they held the same course from north-west by west, heading south-east by east. The streets, shipping, and every place, were full of them. They did not fly very high, and seemed to avoid going into open doors and windows. Some hundred or so alighted on the gooseberry bushes, apple and pear trees in the garden, but never touched the fruit: I observed one sitting on the dead tip of an apple twig, and pushed it off with my stick *thirteen* times, the insect returning each time after flying away five or six yards. The flight ended that night about 8 p.m., having been incessant for more than twelve hours. On the 27th they appeared again about noon, flying the same course, but in much reduced forces. Each day since I have seen a few, but very few. The papers say they were observed in all southern and central Sweden and in many places in Denmark, and they swarmed about the ships on the Sound. With their disappearance came the hot weather."

[*L. quadrimaculata* occurs over Europe, Northern Asia, Japan, and North America. Migratory swarms of it have often been observed and recorded, but those above noticed appear to have been extraordinary. I am not aware if such swarms have ever been noticed in this country. It would certainly have been very extraordinary had they been found to eat fruit.—R. McL.]

Scutigera (Cermatia) coleoptrata near Aberdeen.—Though I can hardly claim a place in your Magazine for notes regarding *Myriopoda*, perhaps the following may be of interest to some of your readers.

Mr. MacPherson, of Haddon Street, Aberdeen, has kindly supplied me with specimens of *Scutigera (Cermatia) coleoptrata* from Stoneywood paper works, near Aberdeen. They have been established in these works for more than 25 years, and breed there freely. They are found principally in those rooms which are warm and somewhat moist; they have probably been introduced in bundles of rags from the South of Europe. I should be interested to know whether this Myriopod is found in similar situations in other parts of Europe. I have taken numerous specimens of *Lithobius variegatus*, Newp. (the only exclusively British Chilopod as yet described) very generally throughout the West of Scotland.—THOS. D. GIBSON-CARMICHAEL, Castle Craig, Dolphinton, N.B.: August 22nd, 1883.

Reviews.

THE BUTTERFLIES OF NORTH AMERICA. By W. H. EDWARDS. Second Series, Part xi. Boston: Houghton, Mifflin & Co.; London: Trübner & Co. 1883. 4to.

A very magnificent Part of this magnificent work. The three exquisite plates illustrate: (1) three species and varieties of *Pieris*, and contains about twenty figures; (2) *Limenitis Eros*, with about twenty-five figures, a pictorial complete life-history; (3) *Lemonias Nais* and *Palmerii*, with about thirty figures, also forming life-histories. The details of habits and economy are, as usual, of the fullest possible nature. Those for *Limenitis Eros* are especially interesting and singular, the habits of the larvæ of this species (which feed on willow) being extraordinary, they forming "perches" out of the artificially-stiffened mid-ribs of the leaves on which they rest, and making little packets of bits of leaf, the position of which is changed as the leaf is devoured; the object of these packets the author has failed to determine. Part xii, concluding the Second Series, is to be occupied by a revised List of North American Butterflies.

THE TRANSACTIONS OF THE YORKSHIRE NATURALISTS' UNION. Parts 4—6. London: W. Satchell & Co.; Leeds: Taylor Brothers. 1882—1883. 8vo.

Three very respectable Parts, the "Transactions" of this strong and energetic "Union," have just reached us. They entirely concern the Zoology and Botany of Yorkshire, and should be of the greatest service to naturalists generally, and to those of Yorkshire in particular. Entomology is a leading feature, and consists of notes on Yorkshire *Hymenoptera* by Messrs. Bairdow, Roebuck and Wilson, and the commencement of a List of Yorkshire *Lepidoptera* by Mr. Porritt (occupying a portion of Part 5 and the whole of part 6); from this we learn that 1343 of the 2031 British species have been found in Yorkshire. This latter list has evidently been patiently compiled, and the author has apparently sought out every available source of information, both old and recent: moreover, the indications of localities are copious, perhaps sometimes too copious in the case of common species.

THE NATURAL HISTORY OF HASTINGS AND ST. LEONARDS AND THE VICINITY. First Supplement. Pp. 1—53. 1883.

In Vol. xv, p. 72 (August, 1878), of this Magazine, we had occasion to report favourably on the efforts of the energetic body of Naturalists located at Hastings and vicinity, with respect to the publication of a complete Fauna and Flora of their district. During the five years that have elapsed since the publication of their first report, they have evidently not been idle, and this "first supplement" is almost as bulky as the original. Among the contents we find an entirely new and complete List of the *Coleoptera*, compiled according to Dr. Sharp's new Catalogue. *Hymenoptera*, *Hemiptera*, *Neuroptera* and *Diptera* are also catalogued in considerable detail, and the list of wasps and bees may be regarded as tolerably complete (amongst the *Ichneumonidae* and *Tenthredinidae* much evidently remains to be done). About ninety additional species of *Lepidoptera* are recorded, and mostly amongst the Micros; this we regard as a favourable feature. Nearly 3560 species of insects have now been recorded from the district.

The rest of this pamphlet is occupied by subjects not Entomological, including a complete List of Birds, and quite a number of flowering plants not previously observed.

One point strikes us as tending to give these local lists more than ordinary value; this is the evident indications shown of anxiety to obtain the best information from specialists in each department. We congratulate the Naturalists of Hastings on the publication of this record of the results of five years' work.

ENTOMOLOGICAL SOCIETY OF LONDON: 6th June, 1883.—J. W. DUNNING, Esq., M.A., F.L.S., President, and subsequently, Prof. WESTWOOD, M.A., F.L.S., Honorary Life-President, in the Chair.

George Coverdale, Esq., of Fleming Road, Lorrimore Square, was elected a Member.

Professor Westwood thanked the Society for electing him Life-President (a title that had only been bestowed upon the late Rev. W. Kirby in the prior history of the Society), and delivered an inaugural address, in which he succinctly treated upon the history of entomology, and commented upon the revolution occasioned by the popular adoption of the Theory of Evolution.

Mr. J. W. Slater exhibited a collection of insects (chiefly *Lepidoptera*) from Zululand, in which were interesting forms of *Acræa*, *Saturniida*, &c.

Mr. W. F. Kirby exhibited a pupa found in a nest of *Formica nigra*, in Ayrshire, by Mr. Cameron. Baron Osten-Sacken considered it to be that of one of the *Syrphida*.

Mr. E. Saunders exhibited an example of *Lebia turcica*, which had been forwarded to him as having been captured near Hastings by Mr. W. H. Bennett (*cf.* Ent. Mo. Mag., *ante* p. 8).

Mr. Fitch exhibited examples of a "tick" taken from sheep at Maldon, Essex, and commented upon the supposed connection of the presence of the tick with a disease peculiar to sheep, desiring further information on the subject.

Mr. H. W. Bates read a "Supplement to the Geodephagous *Coleoptera* of Japan," in the elaboration of which the new materials obtained by Mr. George Lewis during his investigations in 1880 and 1881 were fully worked out.

Mr. Roland Trimen communicated "Descriptions of new species of South African *Rhopalocera*."

4th July, 1883.—Prof. J. O. WESTWOOD, M.A., F.L.S., Honorary Life-President, in the Chair.

A. E. Shaw, Esq., of Elgin Road, Harrow Road, was elected a Member.

Mr. McLachlan exhibited pieces of vine-roots from a vinery near Accrington, very badly infested with *Phylloxera*; broods of young had hatched on them during the short time they had been in his hands. The vines had been apparently quite healthy until recently, but were now gradually dwindling and dying.

Miss E. A. Ormerod exhibited an enormous mass of *Atherix ibis*, F., found on a branch of alder suspended over the river at Hampton Court. (This fly belongs to the family *Leptida*. Similar masses [to be compared to a swarm of bees] have frequently been observed. They consist entirely of dead females, and M. Perez, of Bordeaux, has recently suggested that these congregate for oviposition, and that the young larvae fall into the water voluntarily when hatched).

Mr. Distant exhibited several species of Lantern Fly, and in connection therewith asked Mr. Champion, who had just returned from Central America, whether he had ever observed any indications of luminosity in these insects. Mr. Champion said he had often kept them alive for a long time, and on no occasion did they exhibit the slightest indication of luminosity. He also stated that he had found larvæ of some insect in the waxy secretion of *Fulgora*. Prof. Westwood suggested they were probably Lepidopterous (*cf.* Trans. Ent. Soc. Lond., 1876; p. 519, 1877, p. 433).

Dr. Sharp communicated a Revision of the *Peelaphida* of Japan, chiefly from the materials collected by Mr. Lewis.

Mr. Lewis read a paper on the *Lucanida* of Japan. This led to detailed remarks by Dr. Leithner, who has been in this country for some time engaged upon a Monograph of the Family, in the course of which he suggested that the genus *Esalus* did not belong to the *Lucanida*.

Prof. Westwood read further notes on the Fig Insects of Ceylon.

Mr. Cameron communicated descriptions of sixteen new species of parasitic *Cynipida* from Scotland.

1st August, 1888.—The President in the Chair.

W. H. B. Fletcher, Esq., of Worthing, was elected a Member.

Mr. Billups exhibited *Pompilus spissus*, Schiödte, ♂ ♀, taken in Headley Lane, a new locality for this rare species.

Mr. H. J. Hoskings, of Brisbane, communicated a paper on Australian Bees, in which the habits, &c., of various species were noticed. *Trigona carbonaria*, and a new species of the same genus, make their nests in hollow trees, and are stingless, but when incommoded, they smear the attackers with a gummy secretion, which glues the eyelashes together, and render themselves annoying by biting the inside of the nose, &c.

Mr. Meldola read notes by Dr. Fritz Müller with regard to the behaviour of inexperienced birds in their attacks on unpalatable butterflies, and on a larva which, before pupation, forms circlets of its spinose hairs, both above and below it, on the twig on which it is about to pupate.

Mr. H. Pryer sent notes on Japanese insects collected by a native of the country, with remarks on the large number of species identical with those found in Britain.

Entomological Collecting on a voyage in the Pacific (Resumed from Vol. xix, p. 278).—We started from Callao on February 11th, our orders being to call at the Marquesas, Tahiti, Oparo (or Rap-á), and Cook's Islands (Rarotonga, &c.), and, after calling again at Tahiti to fill up with coal, to return to Coquimbo by the middle of July, taking Pitcairn Island on the way. For nearly a month we ran before a steady trade-wind, with splendid weather and perfect temperature, very little animal life though, either in sea or air, with the exception of flying fish, which were very plentiful. "Frigate" and "Tropic" birds (*Tachypetes aquilus* and *Phaethon atherius*) were also seen in small numbers; we were not lucky enough to see a whale, although we passed right through one of the principal whaling tracts. We were all very glad to sight land once more on the 10th March, this being the Island of Fatsu-hiva, the most southerly of the Marquesas group. We anchored in "Omoa" or "Bon

Repos" Bay, an open roadstead with heavy swell and bad landing; the scenery here was exceedingly fine, reminding one not a little of Juan Fernandez: we lay about a quarter of a mile from a grand promontory (Venus Point), terminating in a vertical precipice 1900 feet high, the finest cliff I have ever seen, except that of Achill Island in the west of Ireland. We remained here until the evening of the 11th, and I went on shore twice; it is needless to say how delighted I was with my first sight of South Sea Island vegetation, such as the bread fruit, the Pandanus, the Casuarina or iron-wood, &c., &c. From the head of Omoa Bay there runs up a deep narrow valley for several miles, a perfect forest of cocoa-nut or fruit trees; a little cotton is grown here, besides taro root, &c.; the hills are mostly covered with fern, where not wooded. Of course I worked hard for insects, but did not get or even see a single beetle! the most abundant insects were dragon-flies and mosquitoes. Two species of butterflies only occurred, viz., *Danais Archippus* and *Diadema Bolina*, both plentiful. The latter is a splendid insect, the ♂ being black, with a large violet-blue blotch with a white centre in the middle of each wing; the ♀ black, more or less suffused with ferruginous, and with a large white costal spot on the fore-wings—this sex varies a good deal. I found the larvæ in abundance on a common weed, and reared a splendid series. Several species of moths were abundant, one or two being familiar Callao insects, to my surprise; the bulk of them were small *Pyralidæ*, but two or three species of day-flying *Noctuæ* occurred, among them a very pretty *Plusia*. I got a few nice fresh-water shells, which seem to be very scarce in the Marquesas. My proceedings "astonished the natives" a good deal; they were, however, most friendly and civil. They are a very fine race of people (ten times better than Peruvians), scarcely darker than Spaniards or Italians, and many of the men over six feet high; they were nearly all tattooed all over their bodies, some in really elegant patterns. We had numbers of them off to the ship in small outrigger canoes, bringing fruit, cocoa-nuts, a few cowry shells, &c. Old clothes were a great deal in demand, and I got over 100 excellent oranges and a large bunch of plantains for a very old coat.

March 12th.—Arrived in Resolution Bay (so named by Capt. Cook) in the Island of Tau-ata or Santa Christina. We did not remain here a whole day, but I managed to get a run ashore for a few hours. Unfortunately it rained nearly all the time, and I could do scarcely anything in the way of collecting. I got a good way inland, and found the natural vegetation very fine, but it was of course soaking wet: I found one or two Rhizophagoid beetles under the bark of a log of bread-fruit tree.

13th.—Left Resolution Bay at 10 a.m. for the next island, Hiva-Oa, or Dominica: at 1 p.m. we anchored in Tâa-hu-ku Bay, just under the highest summit in Hiva-Oa, or, indeed, in the Marquesas, a very grand mountain, 4180 feet in height. Behind Tâa-hu-ku, is a remarkably fine and extensive valley, terminating in a magnificent amphitheatre of wooded cliffs about two miles inland. This island is one of the principal stations of the French, who possess the Marquesas Islands. I went on shore early the next morning (14th), and had a very enjoyable ramble about the valley, but failed to get any distance up the hills. I met with the usual *Danais*, *Diadema*, and other insects, and on this occasion I got a few beetles by working at dead wood, &c. Among them were two or three specimens of a pretty *Elater*, somewhat like *Corymbites tessellatus* in aspect; one or two spp. of *Tomicus*?, *Rhizophagus* sp.? (several), *Phloeopora*, &c. One of my messmates brought me three specimens

of a remarkably fine *Brenthus*?, which he had found running on a log; it is a long, slender, blackish-brown species, with interrupted longitudinal yellow stripes on the elytra, not unlike, but much finer than, a species which I found not rarely at Panamá.

15th.—Left Taa-hu-ku for Anna Maria Bay or Taiohaie, in Nuka Hiva, the largest of the Marquesas Islands. We arrived there next day, and as we remained until the 22nd, I had a good opportunity of exploring the vicinity of the settlement, on one occasion getting up among the hills to a height of 2800 feet, where, however, I found but little different to what I met with in the low grounds, except some nice little land-shells, and two or three nice Cossonid weevils in dead wood. The general character of the vegetation here is the same as in the other islands, if anything more luxuriant; an introduced species of *Mimosa* is very abundant near the settlement, and on it the half-looper larvæ of *Achæa melicerta*, a very handsome moth allied to *Catocala*, brown with black and white hind-wings, may be found in great numbers, and are very easily reared. I added several nice moths to my collection here, among them two *Sphingidæ* (*Chærocampa erotus* and *Macrosila* sp.), a moth very like *Jiparis salicis*, *Xylophasia* sp.?, a nice *Hadena* (abundant in thatch), and one or two other *Noctuæ*; *Geometra* were very scarce, indeed, I observed only two species, a small *Boarmia* and a *Eupithecia*, in all the islands. *Pyrallidæ* were very numerous as before.

The larva of a very handsome Hadenid (?) moth is abundant on cotton and tobacco, &c., and is sometimes, I am informed, so numerous as to be a great pest. Among the beetles, my best take was a very fine series of *Brenthus* sp., which I found under bark of a log of *Hibiscus*, in company with two or three of a *Cossonus*, and great numbers of very sharp-biting ants. The beetle varied immensely in size, some of the ♀s being only a quarter of an inch long, while some big long-headed, ♂s were nearly five times that length. The oceanic bug, *Halobates* sp. (?), was very abundant in all the harbours, and I caught a fine series with my long-handled net. On the whole, I think I did fairly well in the Marquesas, although insects were decidedly scarce as regards species; indeed, I do not think I took more than thirty species of *Macro-Lepidoptera* (including *Pyræles*), and even fewer *Coleoptera*. We received much attention and hospitality from the French resident in Nuka Hiva (virtually, the governor of the Marquesas); among other things, he got up a grand goat-hunt for us, to which nearly all the officers and a number of the blue jackets went. About forty half-wild goats were surrounded and driven down to the water's edge, where they were caught (not without some difficulty), and taken on board the ship. We lived chiefly on goat flesh for some weeks afterwards: it turned out by no means bad, certainly far better than salt beef, at any rate.

I think we all enjoyed our cruise among the Marquesas Islands, and were sorry to leave so soon, even for Tahiti. We passed through the north-western part of the Paumotu or Low Archipelago, and saw two or three of the islands, which are most curious: huge "atolls," or rings of coral, sometimes many miles in extent, enclosing a large lagoon of salt water, and covered with most luxuriant vegetation, although they are scarcely elevated above high-water mark. I should very much have liked to land on one of them. Tahiti was reached on March 29th, and we went inside the barrier reef and anchored off the town of Papiete, the capital of the island. We

coaled ship, and gave leave to the crew, so we managed to make out eight days here. I had heard a great deal about Tahiti, and may say that, although my expectations were raised very high, I was not in the least disappointed. The island may be said to consist of two peninsulas, each composed of a huge mass of mountains, which, in the main peninsula, or Tahiti proper, attains an elevation of 7321 feet. All round the shore is a belt of low flat land, covered with a forest of cocoa-nut and fruit trees: then come smooth steep hills, seamed with deep ravines, and covered with ferns and wild guava bushes, which latter are quite a pest, covering many square miles of country, and bearing abundance of large and delicious fruit, which, however, is seldom or never gathered, being allowed to rot on the ground in tons. Above these hills, the mountains are rugged, and broken to an extraordinary degree, and are covered with dense and most beautiful forest, composed in a large part of tree-ferns, which I have seen as much as forty feet high; wild bananas or plantains ("faëe," as they are called here) also form a very large portion of the vegetation, growing in patches of many acres in extent. Papiete is a very pretty little town, or, rather, village, but it is so hidden among trees as to be scarcely visible from the anchorage. An excellent macadamized road runs all round the island (100 miles) close to the sea, and is called (why, I know not) the Broom Road. I had several very pleasant excursions on shore, on one occasion getting up into the mountain forests to a height of more than 3000 feet. Insects were a good deal more abundant than in the Marquesas, as well as in greater variety. Besides *Danaüs Archippus* and *Diadema Bolina* (the latter very large and fine), I saw and obtained at least five other butterflies, all more or less plentiful. These were, the large and handsome Satyrid, *Cyllo Leda*, which haunts shady places, and is not often taken in good order; a fine, white-spotted, black *Euplæa*; a little fulvous and brown insect, nearly related to *Argynnis*, &c., which, I think, belongs to the genus *Atella* (the pupa, which I found in plenty on broad-leaved plants in the high forest region, is the prettiest I have ever seen, being bright clear green with golden spots and streaks, and coppery-red bands across the back); lastly, two species of *Polyommatus*, one being nearly related to, perhaps identical with, our *P. baticus*. A very handsome species of *Macroglossa*, very like our British *M. stellatarum*, is common at heliotrope flowers, &c., but is very hard to obtain in good order; however, I found four larvæ, and succeeded in rearing them all to the perfect state. I heard a great deal from the residents about large Sphinges entering their houses at night, but the only one I received was unrecognisable through having flown into a glass of beer! The moths were much the same as at the Marquesas, but one or two nice fresh things turned up, mostly, however, of small size. I got a few *Coleoptera* among the higher woods, as well as a good series of a very fine species of *Clytus*, which I found in plenty running and flying about some dry logs of *Hibiscus* just outside Papiete, but on the whole this Order appeared to be but poorly represented. Some very nice land-shells (mostly small *Bulimi*) occurred to me on foliage at a considerable elevation, and I also obtained a pretty good lot of sea-shells; so that, on the whole, my stay at Tahiti was by no means unprofitable.

We left Tahiti on April 6th, for the neighbouring island of Eimeo or Moorea, twenty miles distant, and anchored in Papetoai Bay, a well sheltered and exceedingly pretty harbour. The general character of Eimeo is the same as Tahiti, but the

mountains are much more abrupt and broken, shooting up into the most fantastic peaks, one, in particular, being very like a church steeple. The vegetation is very luxuriant, and it is difficult to get about, the low ground being rather swampy, with but few paths. I found the usual Tahitian insects in plenty here, and took several hawk-moth larvæ, feeding on a species of *Convolvulus* with very large leaves. These have just produced a moth which I cannot distinguish from our *Sphinx convolvuli*, except in size, it being only about three inches across. Some very pretty land and fresh water shells, different from those found at Tahiti, occurred to me: but the mosquitoes quite spoiled the pleasure of walking in the woods, as they were more numerous than even at Acapulco or San Blas, and quite as venomous.

We left Eimeo on the afternoon of April 9th, for the remote island of Rap-á or Oparo, and thence to Cook's Islands. After a somewhat tempestuous passage, in which the wind persistently headed us, and we had to steam a good deal in consequence, we arrived at Rap-á on the 18th, and anchored in Ahurei Bay, a well sheltered harbour, but full of reefs, and with poor holding ground. Rap-á is a very pretty island, eighteen miles in circumference, and may be described as one mass of jagged and precipitous mountains, running up into remarkable needle-shaped peaks, the highest being 2172 feet in elevation. As we stayed here only twenty-four hours, I was able to get on shore only once, for a few hours, but I greatly enjoyed my brief ramble. The vegetation was not unlike that of the islands we had as yet visited, with the exception of the cocoa-nut and bread-fruit trees, which appeared to be almost, or quite, absent: on the other hand, the screw-pine (*Pandanus*) was abundant, and the tree-ferns remarkably fine. The only butterfly I saw was *Danais Archippus*; the moths were, for the most part, common Tahitian species, with the exception of a very fine large moth (*Ophideres* sp.), brown, with bright orange hind-wings, banded with black, of which I saw three or four specimens, and was lucky enough to catch one. A few beetles, including two or three very nice fresh species of *Cossonida*, and some land-shells of the genus *Helix*, completed my small collections at Rap-á. The inhabitants, about 150 in number, seemed poor, though they had no lack of food, in the shape of goats, pigs, and taro-root, with which they supplied us plentifully.

Leaving Rap-á on the 19th, and again encountering baffling winds, we arrived at Mangaia, one of the Cook Islands, on the 27th. We did not anchor here, as there is no harbour, and only stayed long enough to communicate with the shore, so I did not land. Next day, we arrived at Rarotonga, unanimously pronounced to be the prettiest island we had yet visited: it attains the elevation of 2925 feet, and is covered with most beautiful and luxuriant vegetation. There is no anchorage here, the island being surrounded by a fringing coral reef. We had to lay off and on under steam for about twenty-four hours, but I managed to get a short run on shore on the afternoon of the 28th. I found the productions, animal and vegetable, much the same as at Tahiti; a great deal of coffee and cotton are grown here. Six or seven species of butterflies turned up, viz.: *Danais* and *Diadema* (the ♀s of the latter very handsomely suffused with red, like the East Indian form, I believe), two of *Euplaea* (one new to me), *Cylo Leda*, and a lovely little blue-purple *Polyommatus*; no fresh moths, but about eight species of beetles, among them a nice *Hyletinus*, and several *Cossonida*, one of the latter very minute. Three or four species of land-shells, and about fifty sorts of sea-shells in good condition picked up on the beach, made up a very fair afternoon's work.

May 1st—Arrived at Aitutaki Island at 8 a.m.: this island is comparatively low and flat, but very pretty, with most luxuriant vegetation: no harbour, but a barrier reef all round encloses a lagoon, and there are one or two passages for boats through it. I had a forenoon on shore with pretty fair success, getting a very nice series of *Polyommatus* (two species), *Euplexa*, and some nice fresh moths. I could not, however, find any beetles or land-shells. We stayed here thirty hours, and were most hospitably received by the natives: the chiefs got up a big feast for us (to which I was, unfortunately, not able to go), and sent us off a present of 800 cocoa-nuts, 800 lbs. of yams, several pigs, a bullock, and innumerable oranges, &c. There are about 2000 people on each of the islands, Mangaia, Rarotonga, and Aitutaki, but no Europeans, except on Rarotonga. The chiefs and a good many of the natives came on board us at all these islands, they seemed very much taken with the ship.

May 3rd—Arrived at the island of Atiu (Wateoo, of Cook), at 4 p.m.: this, like Mangaia, consists of upheaved coral, with a central volcanic nucleus, and looks less fertile than most of the islands from the sea. I landed with the captain, not without difficulty (being carried on the back of a native across the reef), and walked about two miles into the interior to the principal village: here we were well received, but I had no time to look for insects, as we were off again at 6.30 p.m. I saw *Danais* and *Diadema*, and some common moths, that was all. A large "stick insect," *Lopaphus cocophagus*, about five inches long, is very destructive to the cocoa-nut trees in these islands.

May 9th.—Arrived at Eimeo: stayed there a day, during which I got a few things, such as a very nice *Boarmia*?, *Chærocampa erotus* (larva on taro), *Sphinx convolvuli*, a good lot of land-shells, &c.; went over to Papiete (Tahiti) next day. We have been coaling, &c., so have had no time to land; have bred some nice varieties of *Diadema Bolina* from Aitutaki larvæ. We leave at the end of next week (about 19th) for Pitcairn Island and Coquimbo, where we ought to arrive about the first week in July.—J. J. WALKER, H.M.S. "Kingfisher," at Sea (between Atiu and Tahiti): May, 1883.

The larva of Saturnia carpini with respect to its edibility by birds.—I cannot discover that any record exists of experiments with this larva respecting its edibility, or otherwise, so far as regards birds; hence the incident I am about to note may be of some interest. About ten days ago I was at Heidelberg, enjoying a walk on one of the hills near the town, under the guidance of Baron Osten-Sacken. A full-grown larva of *S. carpini* was crossing the path, and as a peacock was strutting not far off, it occurred to us to see what would happen if the larva were brought under his notice. At first he eyed the larva with indications both of doubt and curiosity. Then he seized it and, apparently, found the spines disagreeable; but, excepting the spines, everything seemed to be satisfactory, for the larva underwent a process of beating on the ground (much after the style of a thrush with a snail) for about a minute, and was then bolted.

Dr. Weismann, in his "Studies in the Theory of Descent" (Mr. Meldola's English translation), p. 338, notices that this larva was devoured by lizards, with which he experimented.—R. MCLACHLAN, Lewisham: 9th August, 1883.

NATURAL HISTORY OF *PROCRIS GLOBULARIÆ*.

BY WILLIAM BUCKLER.

Before proceeding to transcribe my notes of this species, I am anxious to make a few remarks, which, while bearing on the subject in hand, have also a wider reference, and will apply to other papers, which I am hoping to pen hereafter.

After investigating the life-histories of our *Macro-Lepidoptera*, and figuring their larvæ, since 1858, I have amassed more or less satisfactory notes and figures of about 850 species, beginning with the *Diurni* and ending with the *Crambites*.

Hitherto my friends have been able to supply me with British examples, but it will be evident, from the numbers given above, that the time has come when there arises a yearly-increasing difficulty in obtaining ova or larvæ of the (comparatively) few species yet untouched; whilst the old adage "*ars longa vita brevis*" remains as true as ever; and therefore it is, that in view of these pressing reasons, and after consulting the friends, whose opinion I most rely on, I have, after some little hesitation, resolved to avail myself of continental aid.

This resolve does not lessen my desire to take my notes and figures in all possible cases from indigenous examples; in every case as before, I shall make a point of stating exactly and truthfully the source from whence my information is derived, so that there will be, I trust, no ground for complaint that I have ever attempted mystification, or added to the difficulties of the naturalists who take in hand the onerous and responsible task of settling the extent of our native fauna.

On 25th of June, 1882, I had the pleasure to receive from Herr Heinrich Disqué, of Speier, several eggs of *Procris globulariæ*, together with the parent moth herself, which he had induced to deposit her eggs in a small cylindrical box with glass ends; one egg hatched on July 10th, but the larva was killed in the effort to take it from the cylinder; on the 14th, five or six larvæ were hatched, but I was unable to extract more than two of them uninjured, as they all were much entangled with web or remains of cotton wool obstinately clinging to the box; the remaining eggs hatched next day, but most unfortunately just when my vision became disturbed from a bilious derangement, and the larvæ from them were all fatally injured in my attempts to get them out of the box, as next day with sight restored I saw them lying dead on the leaves of *Centaurea*.

I now looked for the two larvæ that had previously been safely put with a leaf of *Centaurea nigra* in a small tin box, but could discern

neither of them until I held the leaf against the light, then at once I saw them both embedded in its substance, each appearing about the size of a small flea in a semi-transparent spot between the upper and under skin of the leaf; and these spots, when afterwards vacated, became clear blotches on the surface; the larvæ on emerging to the light were seen to have grown a little, and soon made their way into a fresh piece of similar leaf, which began to show several such blotches where the parenchyma was eaten out.

On 25th of July one came out of the leaf, and next day the other, when a fresh leaf was provided, but neither would attack it, and they sat still on the old one until the 3rd and 4th of August, when, after moulting, they entered fresh leaves, which continued to be supplied to them in the box every two or three days; their second moult occurred, after they had left the leaves and sat still for nine or ten days, on 13th—14th of August, when, after an interval of rest, they again mined into the fresh leaves making numerous clear spots on their surfaces, but only for about three or four days, as they were out of their mines again on 18th, and were spinning little mats of silk, on which they fixed themselves to wait for their third moult, which happened on 23rd—27th of the month.

By 3rd of September, the one more advanced in growth than the other had laid itself up on a silken mat, spun on the upper surface of the midrib of a leaf whose sides swelling up made a desirable sheltered situation to be fixed in, while its companion at this time was to be seen in the middle of a comparatively large mined blister, from which as from the very first, the black frass continued to be extruded a day or two longer; the former accomplished its fourth moult September 12th, the latter on the 14th; the first after a three days' rest from what seemed an exhausting operation, again mined into the leaves, and after an interval its companion also, both growing a little, while making larger blister-like mines.

On 9th of October they were out of their mines, had ceased to feed, and seemed to be hibernating, and this I made sure of on the 21st, when I closely examined them and saw that each larva had its feet on a silken mat, and that one of them had a stay of a few threads passed over its back, attached to the stout midrib and to the under-side of the piece of leaf it was on; each of these pieces, already becoming discoloured, with their occupants attached, I then placed at the base of the plant of *Centaurea* from whence nearly all their food had been gathered, and which I had recently dug up and potted for their reception during winter; one being laid on a dry leaf, the other on a radical sprouting

leaf; I looked for them early in November, and saw the pieces of leaf were nearly rotten and deserted by the larvæ, they having entirely gone from view.

On 17th of February, 1883, while noticing the few large leaves on the plant which I kept in a window, I chanced to observe two small watch-pocket-like apertures cut in the upper epidermis of one of them, and two minute black atoms of frass lying near, and in course of a week these hopeful appearances were seen on more of the leaves, and began to increase in number, but all of them were very small, and it was not before the morning of the 25th that I was gratified with the welcome sight of one of the larvæ, the only one it seemed that had survived the winter thus far; it was on the upper surface of a leaf creeping deliberately along the midrib towards the footstalk; in the afternoon I could see it attached to the under-side of a neighbouring leaf; next morning after vainly looking over the plant, I found it had crawled off and was lodged on the rim of the flower-pot, a circumstance that led me to reflect on the roving disposition it had so soon betrayed, there being evidence that it had wandered all over the plant; so now, in fear of losing it, I again took it into the captivity of a box, where for a day or two it mined into a gathered leaf and ate out the parenchyma from a largish area just as it had done in autumn; then I gave it more light and air, but by 6th of March, it had made only five mines, each no bigger than itself, of irregular oval shape, and all through the remainder of this month of cold north-east wind it did not feed, but laid up as though asleep, until the 1st of April, when it removed to a fresh leaf, but without feeding, and again afterwards it moved to one or two other fresh leaves, and even made a small puncture in them, but it did not feed; on 5th of April it seemed unable to keep on its feet, appeared in a moribund state, and was dead by next morning.

I lost no time in communicating this mishap, and sending a pencil sketch of the defunct to Herr H. Disqué, who with most obliging good nature, which I am so glad now to acknowledge thankfully, at some sacrifice of time, sought out the distant spot where he had captured the insect last year, and actually succeeded in finding a larva of *globulariæ* no bigger than the little one so recently lost, an instance of keen sight faculty which astonished as much as it delighted me when I received the larva on the 2nd of May, while it was yet fixed on a leaf of *Centaurea* waiting the next moult; this was accomplished on the 9th, seemingly an exhausting process, as the larva remained quietly resting for two days and a half before beginning to feed; for two days it ate sparingly, but thenceforward more freely, making

larger blotches, until the 22nd, when it left its food to seek a suitable place to lie up in, and after being at a corner of the box for some hours it eventually moved off to another part under the lid, where, on the 24th, it spun a foot-mat of silk threads, and became fixed in them, feet uppermost, until the moult took place on the 30th; and finally it became full-fed on 11th of June, and later entered the earth.

In addition, Herr H. Disqué most kindly sent me on 6th of May, four fine larvæ, at that time a moult in advance of the foregoing, and their last moult occurred on the 18th, 19th, and 20th of the month; they all fed remarkably well, making very large and conspicuous blisters or mines in the leaves, from which they devoured the parenchyma to a great extent, even sometimes abstracting nearly the whole from a leaf; towards the last they were somewhat careless in not extruding all their frass, which could be seen in a long trail within some of the clear blisters, and they often remained within them at night and for many hours at a time, apparently asleep, when their form could be readily seen through the transparent cuticle. In this way they attacked quantities of leaves, but just at the last, and in one instance only, a larva ate a large hole quite through the entire substance of a leaf.

It may be imagined with what admiration I so often about this period perused the graphic account of the discovery of the adult larva, and its interesting habit, by the late most eminent Entomologist, Professor Zeller, in the "Entomologist's Annual" for MDCCCLXIV, pp. 103-7 (originally published more than thirty years ago), and of the great pleasure it was then giving me to be, as it seemed, verifying its perfect accuracy, and not without indulging the hope of future communication with him. Alas! too late!

Their full growth was attained from May 30th to 2nd of June, and then each in turn lingered two, three, or four days on the surface before entering the earth.

From three of the pupæ the perfect insects, two males and a female, were bred on 9th of July, having been preceded a few days by an Ichneumon from the fourth, which I have since learned from a friend has been pronounced by Mr. Bridgman to be an undescribed species of *Anomalon*.

The egg of *globulariæ* is of a long-oval shape, about $\frac{1}{10}$ " long and $\frac{1}{16}$ " wide, having at first a depression on some part of the surface, and adhering lengthway to the substance whereon laid, singly, or sometimes two or three together; the shell is very finely ribbed, and of a deep yellow colour, which changes a few hours before hatching to a dull

pinkish or to a light brownish tint, showing a deeper brown spot at one end, and by that time the egg has become very plump.

The larva, when first hatched, is of a short dumpy figure, with small black and glossy retractile head, the second segment bears a glossy brownish plate having a broad black dotted streak tapering to a point at the front, and on either side a black streak; the other segments of the body are faintly tinted with greenish drab, and covered with a short fine whitish pubescence; after seven days' feeding it re-appears fat and plump, the pubescence less noticeable, more of the skin visible and glistening as it sits still on a leaf.

After the first moult while quietly resting it appears to be a mass of bristly tubercles, and of a fresh light green colour, but by the time it has again ceased feeding and is laid up on a leaf for the next moult, the glistening skin has a greenish-buff tint, as from its plumpness the bristles are farther apart and allow this to be seen.

After the second moult it is still fresher and greener than at any time before, though when its few days of feeding in the mine have passed, and it has again laid up, it is of a deep pinkish flesh-colour.

After the third moult its colour at first is quite dark slaty-green, matching very well that of the leaves of its food plant; between the rows of tubercles down the back can be discerned a thin dingy purplish-brown dorsal line spreading a little at each segmental division; the tubercles are covered with short radiating bristles of a drab colour; but when it is again laid up it is very much lighter and the glistening skin is of an ochreous-green.

After its fourth moult, and it has fed a few days, when seen with the two front segments fully stretched out, it is $3\frac{1}{2}$ mm. in length, but later when fixed for hibernation with the two front segments retracted, it appears not longer than 3mm., its figure a broad oval, like that of a small hemp-seed, and it is covered with closely-set bristly tubercles and a few longer fine hairs; three rows of tubercles are on either side of the body in a longitudinal direction, so that six tubercles of broad oval shape surround each segment except on the belly, which is naked; between the two which occupy the back of a segment is a black arrow-head mark; these dorsal tubercles are very dark dingy brownish-green with yellowish-green outer edges along the subdorsal region, relieved by a fine blackish line beneath; the dusky bristles make the general colouring intensely dark on the upper surface, the smooth belly and legs being of greenish-drab colour.

After hibernation, just at first, the larva appears almost black, but

after feeding a little its dark green colour becomes fresher, and the outer margins of the dorsal tubercles more conspicuously yellowish-green.

Immediately after the next moult it seems to be thickly enveloped with radiating bristles of a tender bluish-green, mixed with whitish as it sits to recover strength, and as soon as it recommences feeding its growth quickly brings the length of 10mm. and a more lively colouring; the bluish-green dorsal tubercles are strikingly defined by a creamy-white subdorsal stripe on which their outer margins encroach a little, a widish stripe of dark green follows, contrasting with the lighter green tubercles and skin below.

After the last moult, full growth being attained, when stretched out the larva measures from 13 to 14mm. in length, the greatest width across the middle of the body 5mm., it tapers a little at either end and is rounded off behind, and also in front when at rest with the first two segments retracted; the head is extremely small and flattened, the segments are plump and very deeply divided, the second is smooth and glossy, the tubercles are slightly raised, large, occupying nearly the length of a segment, except the lowest just above the feet which are rather smaller, in shape they are roundish ovate, the dorsal pair side by side on each segment are set close and obliquely together in front, leaving between them a small central arrow-head-like space behind at the division; the legs are rather short and well under the body, the belly flattened and smooth: in colour the head is black, the antennal papillæ greenish-white tipped with black, the second segment greenish with broad black marking or plate tapering toward the front, the tubercles on the back are of rather bluish light green, the dorsal row of markings black, the white subdorsal marking inclines to creamy-white, sometimes to yellowish-white, this is contrasted strongly below by a broadish stripe of dark green tapering towards the head and a little also to the hinder part of the body; on the smooth skin between the dorsal tubercles at the beginning of each segment, and of the white subdorsal marking are sprinkled some most minute black dots, only a few are on the white where it is broadest but they are numerous on the dark green stripe following it, the side below is entirely green including the tubercles, and the whole of them are studded thickly with short and fine blackish bristles, the spiracles black, anterior legs black, the belly and ventral legs green.

The situation of the cocoons could be detected by very slight elevations on the surface of the deep pot of earth, where, before the larvæ had buried themselves, all had been quite level, and when the

cocoons were removed, from only just below the surface, for inspection after the insects were bred, I found each was of broad oval shape about 9 lines by 7 or 8, exteriorly composed of grains of earth very firmly united to a few fibres of grass-roots, of which plenty were in the turfy soil, and served to bind all together; on removing the earthy particles I reached the inner cocoon of opaque greenish-white soft silk, yet strong and elastic, in these qualities reminding me of that of *O. potatoaria*, and in the softness of its closely-woven interior of that of *B. mori*; it was 7 lines long and 3 lines wide, rounded off anteriorly, widest in the middle, and tapered to a blunt point at the posterior end.

In each instance (except one) the pupa had evidently emerged from the cocoon and travelled away from it a little distance, as I found the pupa-skins thus lying on the bare earth, and only the old larval-skin lay shrivelled up at the bottom of the deserted cocoons; but the one from whence the *Anomalon* had come still contained the pupa-skin only minus a portion of the head and thorax, which lay in fragments, so that the cavity of the pupal body had been the puparium of the parasite.

The pupa of *globularia* is about 13mm. in length and of moderate substance throughout, with prominent thorax, the wing-covers short, but toward their ends projecting a little free from the body, the long antenna- and leg-cases are all free from the body, and seem to be suggestive of locomotion even before disclosure of the moth, the deeply divided abdominal rings have each on the back near their beginning a transverse ridge thickly set with hooks pointing backward, the tip of abdomen rounded off in a blunt point; the colour of the head, thorax, and wing-covers is dark olive-green and very glossy, the leg-cases and abdomen are of lighter shining green and the hooks black.

Emsworth : September 12th, 1883.

Myrmeleon Erberi, Brauer, = *M. inconspicuus*, Rambur.—In the collection of Baron de Selys-Longchamps are a series of a *Myrmeleon* from Corfu (*Erber*) much like *M. formicarius*, L. (*formicalynx*, Burm.), but notably smaller; the species was described by Dr. Brauer (Verh. zool.-bot. Ges. Wien, 1867, p. 190) as *M. Erberi*. On comparing them with the types of *M. inconspicuus*, Rambur (*Névroptères*, p. 406), I find they are specifically identical therewith; hence Rambur's name should take priority. I possess a ♂ indicated "South of France," the same district whence Rambur believed his types were derived. These types consist of two perfect ♀ and one ♂ without head and abdomen; in the latter sex there is a conspicuous "pelote" at the base of the posterior wings. In describing the abdomen both Rambur and Brauer appear to have taken their description from the ♀, in which there are only

narrow yellow sutural rings. In the ♂ there is a large yellow anterior dorsal spot on nearly all the segments (often inconspicuous in dry examples unless brought out by the application of alcohol or benzine). In the Ann. Soc. Ent. Belg., xvi, p. 139 (1873), I stated, regarding *M. incertus*, Rambur, "probablement la femelle de l'espèce suivante" (*inconspicuous*), but Rambur distinctly states that his type of *incertus* is a ♂ without the "pelote" to the wings. I cannot now decide as to sex, for the type has lost its abdomen (there is no "pelote"), but, according to the colour of the head, I now believe *incertus* to be distinct from *inconspicuous*, and otherwise unknown to me. Hagen (Peters' Reise) thought an East African species might be identical with *inconspicuous*. Walker's *M. secretus* is closely allied to *inconspicuous*, but the head and thorax differ slightly, and the abdomen of the ♀ has the large spots which exist only in the ♂ of *inconspicuous*. Attention should also be directed to *M. irroratum*, Olivier (Encyc. Méthod.), but the description is probably too vague for identification.

In the Mediterranean district there exist quite a number of small species of *Myrmeleonidae*, the synonymy of which remains in much confusion, and they are seldom captured in sufficient quantity, owing probably to nocturnal habits. It must have struck all entomologists who attend to these insects that the perfect insect is very seldom seen at large, although the larvæ are very abundant. In the course of my excursions I have never seen the common spotted species (*M. europæus*) at large, and the common plain-winged species (*M. formicarius*) only rarely, yet the larvæ of both abound in suitable localities.—R. MCLACHLAN, Lewisham: 8th September, 1883.

ANNOTATED LIST OF BRITISH ANTHOMYIIDÆ.

BY R. H. MEADE.

(Concluded from p. 61).

26. MELANOCHELIA, Rond.

Gen. ch.—Eyes bare, widely separated in both sexes; arista bare; forehead and epistome prominent; alulets with the lower scale longer than the upper; internal transverse vein of wings opposite to the termination of the second branch of the first longitudinal; (auxiliary*) anal vein shortened; abdomen of male slightly thickened at the apex, and with small sub-anal appendages.

M. RIPARIA, Fall.

The generic position of this species is very difficult to determine, and it has been placed in various genera by different authors. Meigen left it in his restricted genus *Anthomyia*, though on account of the wide separation of the eyes in both sexes, he ought to have removed it into that of *Cænoscia*, as he did with the closely-allied species, *A. litorea*, in which, however, the eyes of the male are more approximated. Rondani originally placed it in the genus whose name I have adopted,

* In the analytical table published at page 59, it is printed *axillary* vein by mistake.

which he formed for its reception; but in his last volume* he removed it into the genus *Limnophora* along with *A. litorea*. Haliday says† "This fly will form the type of a genus allied to *Limnophora* and *Lispa*," but he did not make one. Schiner includes it in the genus *Myopina*, Desv., along with *M. reflexa* (*Musca myopina*, Fall.), but the latter species has very minute alulets, and properly belongs to the acalypterate division of the *Muscidae*, in which it was placed by Meigen. This fly is not uncommon, and may often be found seated on stones in brooks and rivers. Haliday described and figured the larvæ and pupæ, which are aquatic and live among *Conferæ*, to which they adhere by means of hooks with which they are furnished.

27. CÆNOSIA, Meig.

Gen. ch.—Eyes bare, widely separated in both sexes; arista pubescent or bare; forehead unprojecting; alulets with scales of unequal sizes; abdomen of male mostly sub-cylindrical, and thickened or clubbed at the end; anal vein of wings more or less abbreviated.

Sect. 1—*Legs black.*

- | | | |
|--------------------------|--|-----------------------------|
| 1. TRIANGULA, Fall. | | 2. SOLITARIA, Zett. |
| <i>nigripes</i> ?, Macq. | | <i>octosignata</i> ?, Rond. |
| 3. AGROMYZELLA, Rond. | | |

Sect. 2—*Legs wholly or partly yellow.*

- | | | |
|-----------------------|--|-----------------------|
| 4. INFANTULA, Rond. | | 8. SEX-NOTATA, Meig. |
| 5. ELEGANTULA, Rond. | | 9. GENUALIS, Rond. |
| 6. PALLICORNIS, Zett. | | 10. GENICULATA, Fall. |
| 7. ANGULATA, Rond. | | 11. VERNA, Fab. |
| 12. PEDELLA, Fall. | | |

C. TRIANGULA, Fall.

This little species has been placed by Macquart in the genus *Limnophora*, and it possesses more of the characters of that genus than of those of *Cænoscia*, with the exception of having the eyes widely separated in both sexes, for the abdomen is marked with a double row of large, triangular, or quadrate spots, whereas, in the spotted species of *Cænoscia*, the spots are usually small and round or oblong. Not uncommon.

C. SOLITARIA, Zett.

This possesses very similar characters to those of *C. triangula*, the abdomen being marked in a similar manner; it differs from it, however, in being rather larger, and in having the thorax entirely of a light ash-grey colour marked with three narrow indistinct brown stripes; while, in *C. triangula*, the thorax is dark brown or black with grey shoulders, and unstriped. Rare.

C. AGROMYZELLA, Rond.

I have only seen one specimen of this species, which was in the collection of

* Dipt. Italise prodromus, vol. vi. † Nat. Hist. Review, July, 1857, p. 195.

the late Mr. B. Cooke, of Southport; it is characterized by the thorax and abdomen being both of an uniform black colour.

C. INFANTULA, Rond.

This pretty little species has the abdomen of the male laterally compressed, of a pale yellow colour, translucent at the base, grey at the extremity, and indistinctly marked on the second and third segments with two oblong brown spots.* The palpi are yellow with brown tips; the transverse veins of the wings are rather close together, the external one being rather nearer to the internal than to the termination of the fifth longitudinal vein; the legs with coxæ are wholly pale, with the exception of the tarsi, which are more or less nigrescent. Rare. I possess a single male, which was captured by the late Mr. Francis Walker.

C. ELEGANTULA, Rond.

This closely resembles the last, but differs by being rather larger, by having the abdomen of the male wider and flatter, the palpi entirely pale, and the transverse veins of the wings rather further apart. This species is very similar to *C. mollicula*, Fall., but may be distinguished by having the scales of the alulets larger and unequal in size, and by the abdomen of the male being without the large sub-anal appendages which are so characteristic of the latter species. Rare. I captured one male in July, 1883, near Bicester, in Oxfordshire.

C. PALLICORNIS, Zett.

This is a well-marked species, which has yellow antennæ, pale whitish palpi; the abdomen with the first two segments pale and translucent and the legs yellow. The late Mr. B. Cooke, of Southport, sent me a specimen of this fly for examination in 1875.

C. ANGULATA, Rond.

This, like all the three preceding species, has the abdomen partly pale, the first two segments being yellow and translucent; the thorax is ash-coloured and unstriped; the abdomen has the third and fourth segments grey, and is marked down the dorsum by a longitudinal sub-interrupted black stripe, and by two lateral round spots on each segment, which are very indistinct on the basal pale coloured portion. The hinder edges of all the segments are also marked by a narrow white line. The legs have all the femora grey, and all the tibiæ and tarsi yellow, with the exception of the terminal joints of the latter, which are black. The wings have both the transverse veins clouded with black. This pretty and peculiarly marked species appears to be rare. I possess a single male, which I obtained from the late Mr. F. Walker.

C. SEXNOTATA, Meig.

This may be considered the typical, as it is also the most common species in the genus. The thorax and abdomen are both grey; the former is marked with three stripes, and the latter with six spots of a brown colour; the legs are yellow, with the exception of the tarsi, which are nigrescent, and the fore femora, which are often brown or grey, especially in the females.

* These are omitted by Rondani in his description.

C. GENUALIS, Rond.

This rare species closely resembles the preceding one, from which it only differs in some minute points, one of which is that the posterior femora are blackened at their apices, somewhat in the same manner as those of *C. geniculata*, Fall., of which it is, perhaps, only a variety. The only specimen which I have seen belonged to the late Mr. B. Cooke. I have included three other species in my list, viz., *C. geniculata*, Fall., *C. verna*, Fab., and *C. pedella*, Fall., upon the authority of Walker, who records them as British in the "Insecta Britannica." I have not, however, yet seen an indiginous specimen of either species.

28. ATHERIGONA, Rond.

Gen. ch.—Eyes bare, remote in both sexes; forehead prominent; antennæ with the third joint prolonged, the arista bare, somewhat geniculated, and having the second segment a little elongated; palpi short, with dilated extremities; scales of alulets large, and unequal in size; abdomen of male short, subcylindrical, and clubbed at the end; wings with the internal transverse veins, placed near their bases, and opposite to, or in front of, the end of the first branch of the first longitudinal vein; anal vein prolonged, but not reaching the margin of the wing.

A. VARIA, Meig.

The peculiar little fly included in this genus bears some resemblance to a *Tachinid*, by the form of the head and the size of the antennæ and alulets; it is also like a *Lispa*, by the shape of the palpi; it has a yellow abdomen marked by four or six black spots. The description of *Anthomyia varia* by Walker does not apply to this species, though he makes it synonymous with the *A. varia* of Meigen. Rare.

29. MYCOPHAGA, Rond.

Cænosa, Meig., Schin.

Gen. ch.—Eyes bare, remote in both sexes, but much more so in the females than in the males; arista plumose; abdomen oblong and subcylindrical in the male, ovoid and depressed in the female; alulets with small and equal-sized scales; wings with the anal veins prolonged to the margin.

M. FUNGORUM, Deg.

This fly might be placed among the species of *Hylemyia*, if the eyes of the male were not separated by a widish space. It is the largest species in the *Cænosa* group, being often four lines or more (8 or 9 mm.) in length. The arista is furnished with long hairs; the thorax is grey with yellow shoulders; the abdomen and legs are yellow, except the tarsi, which are black. Not very common.

30. CHELISIA, Rond.

Hoplogaster, pt. Rond.*Cænosis*, Meig., Macq., Schin.

Gen. ch.—Eyes bare, remote in both sexes; arista subplumose; abdomen of males narrow, elongated, and subcylindrical, with large, projecting, sub-anal processes; alulets very small, with equal-sized scales; wings with the anal veins abbreviated.

1. MONILIS, Meig.

umbripennis, Zett.

2. MOLLICULA, Fall.

nemoralis, Meig.

C. MONILIS, Meig.

This little fly is of a brownish-grey colour, with brown wings and legs; the thorax is marked down the dorsum with a central black stripe; the abdomen of the male has also an interrupted dorsal stripe in the middle, and a number of small spots or punctures of a black colour on the sides; the sub-anal processes are furnished with two blunt projecting lobes. Rare.

C. MOLLICULA, Fall.

This species resembles *C. monilis* in general form and structure, but is very different to it in colour; having the antennæ (except at the base), abdomen, and legs all of a pale yellow colour, with the exception of the hinder portion of the abdomen in the male, which is sometimes nigrescent, and is marked with two or four black spots. The thorax is grey, and indistinctly striped; the sub-anal male appendages are very large, and furnished with a long apical style, flexed forwards under the belly; and also with two long processes or lobes, projecting backwards. Not rare.

31. SCHÆNOMYZA, Hal.

Ochtiphila, Fall., Meig.*Sciomyza*, pt. Meig.

Gen. ch.—Eyes bare, remote in both sexes; antennæ sub-erect, approximate at their bases, and divergent at their extremities, having the third joints dilated; arista bare, abdomen neither thickened, nor dilated at its extremity; scales of alulets very small and equal; wings with the internal transverse veins placed beyond the termination of the second branch of the first longitudinal veins; anal veins very short.

1. LITORELLA, Fall.

2. FASCIATA, Meig.

I have included these two little flies in my list of British *Anthomyiidae*, on the authority of the late Mr. Haliday, who found them both on the sea coast at Holywood, in Ireland.*

I shall conclude the List of British *Anthomyiidae* with an analytical arrangement of those genera which have the eyes *always more or less approximated in the males*. I have already attempted to tabulate those in which the eyes are remote in both sexes.

* Entomol. Mag., vol. 1, p. 167 (1833).

GENERUM ANTHOMYIDARUM DISPOSITIO.

Divisio prima, oculis in mare contiguus.

- A. Alulæ mediocres squamis inæqualibus.
 B. Femora antica maris subtus dentata7. HYDROTÆA, Desv.
 BB. Femora antica maris simplices.
 C. Proboscis apice acuminata et geniculata8. DRYMEIA, Meig.
 CC. Proboscis apice mollis et plerumque dilatata.
 D. Oculi hirti.
 E. Arista plumata.
 F. Abdomen subrotundum, carinæ faciales ciliatæ1. POLITES, Rond.
 FF. Abdomen ovale vel oblongum, carinæ faciales nudæ.....2. HYETODESIA, Rond.
 EE. Arista pubescens vel subnuda11. TRICHOPTHEICUS, Rond.
 DD. Oculi nudi.
 G. Abdomen maculis discretis signatum.
 H. Arista plumata vel subplumata4. SPILOGASTER, Macq.
 HH. Arista pubescens vel nuda5. LIMNOPHORA, Desv.
 GG. Abdomen sine maculis discretis.
 I. Arista plumata.
 K. Alarum vena analis longa, sed marginem non attingens...
 3. MYDÆA, Desv.
 KK. Vena analis margini posteriori saltem apice spurio producta...
 6. HYDROPHOBIA, Desv.
 II. Arista pubescens vel nuda.
 L. Tibiæ posticæ maris incurvæ10. OPHYEA, Desv.
 LL. Tibiæ posticæ maris rectæ vel subrectæ.
 M. Epistomii margines barbati9. POGONOMYIA, Rond.
 MM. Facies imberbis.
 N. Vena auxiliaris spinosa21. ACANTHIPTERA, Rond.
 NN. Vena auxiliaris inermis18. ANTHOMYIA, Meig.
 KKK. Alarum vena analis satis brevis, venaque axillaris contra apicem ejuadem incurvata.
 O. Arista plumata13. PIEZURA, Rond.
 OO. Arista pubescens vel nuda.
 P. Abdomen ovoidum et depressum.....12. HOMALOMYIA, B.
 PP. Abdomen spatulatum, basi subangustatum...
 15. CÆLOMYIA, Hal.
 PPP. Abdomen angustum, subcylindricum, et maculatum...
 14. AZELIA, Desv.
 AA. Alulæ parvæ, squamis æqualibus.
 Q. Arista plumata16. HYLEMYIA, Desv.
 QQ. Arista pubescens vel nuda.
 R. Oculi hirti17. LASIOPS, Meig.
 RR. Oculi nudi.
 S. Pedes nigri.
 T. Abdomen maris subcylindricum...
 19. CHORTOPHILA, Macq.
 TT. Abdomen maris, angustum, vel oblongum et depressum20. PHORBIA, Desv.
 SS. Pedes toti vel partim flavi.....22. PEGOMYIA, Desv.

NOTES ON THE MIGRATION OF *APHIDES*.

BY G. B. BUCKTON, F.R.S.

The friendly criticism on my fourth volume of British *Aphides*, by M. Lichtenstein, in the last number of the Ent. Mo. Mag. (p. 79), necessitates a few remarks from me in reply, and I may be permitted here to make them.

The subject of migration of *Aphides* is of considerable interest from a scientific, as well as from an economic point of view, and the production of well ascertained facts will at once assert their value, and eventually hold its own against all comers.

First, I will freely admit, and express regret for, a carelessness of memory, in apparently committing M. Lichtenstein to the position, that some oak-inhabiting *Aphides* descend to grass-roots in the autumn. I would gladly make the emendation he suggests, and alter the word oak-*Aphides* into elm-*Aphides*.

Again, from the context of my remarks, it may be supposed that I class *Achillea* and *Solidago* amongst annual plants. Their root-stocks are as clearly perennial in Britain as they are in France. This point does not, however, affect the main question as to what is the destination of the ova of their infesting *Aphides*. The destruction or drying up of the stems and leaves of these plants would seem to preclude their localization of winter-laid eggs in such parts. Prof. Balbiani has done well in making known the true place of oviposition of *Siphonophora millefolii*.

As far back as last November, M. Lichtenstein informed me that he had discovered the "pupiferous form" of *Tetraneura rubra* feeding underground on the roots of *Triticum caninum*, and he said that at the same time other specimens of the species were concealing themselves within the crevices of the elm-bark. He then stated, as he does also now, "that there is no doubt of it being the same insect which wanders from the elm to the grass-roots, and from the grass-roots to the elm."

It would now appear from Prof. Horváth's corroborative experiments at Buda-Pesth, that two European species of *Tetraneura* have underground habits.

In his observations, M. Lichtenstein more than once uses terms which would seem to admit that this question is yet *sub judice*. He several times describes as "my views," "my theories of migration" from plant to plant.

In unexpected phenomena it is clearly permissible to hold one's

judgment in suspension for a while, but in guarding myself through the expressions M. Lichtenstein quotes, I by no means hardly assert the unreliableness of the present published observations on migration. It is from undoubted evidence alone that theory passes into recognised fact.

Peculiar difficulties attach to experiments connected with life-habits, and it is granted to be no easy task to eliminate all sources of error in conducting them. Here we must assume that all possible precautions were taken that the "clean garden earth" contained no underground *Aphides* or their ova; and that the roots of the maize plants were previously as free from such.

The comparatively slight differences of character to be remarked between the larvæ of the *Rhizobiidæ* and other underground forms which are now known to be rather numerous, and the consequent difficulty in making a good diagnosis, render a confusion of species not unlikely.

But let us assume that the larvæ of *Tetraneura ulmi* leaving their galls have been successfully transferred to the roots of the maize plant (*Zea*), and that there they have undergone pupation, and that the imagos have, by their wing venation, &c., proved themselves to be normal forms, identical with those simultaneously producing the perfect sexes on the bark of the elm. Then are we to assume that the maize-root is necessary to the economy of this insect? I think we must answer this question in the negative.

In England and in Belgium *Tetraneura ulmi* is often common on the elm-trees. In the former country the maize is exotic, and one may say it is almost exclusively cultivated for ornament. Certain it is that in parts of Kent the insect is common, where the Indian corn is not be found for miles round.

In June, 1877, I noticed that the elms of the neighbouring districts of Spa, in Belgium, were covered by the galls of *Tetraneura*, yet I did not mark any cultivation of *Zea* in the fields around.

It may be urged that *Gramineæ*, other than the maize, are resorted to, but if the elm-bark be selected for the nidus of the ova, the underground habit would seem to have nothing to do with winter quarters and oviposition.

I would invite the attention of some competent observer, in whose quarters *Tetraneura ulmi* is common, to search the couch-grass, *Triticum repens*, in autumn, and, if possible, to settle this point of habitat.

A similar difficulty suggests itself in the case of *Dryobius croati-*

cus, which M. Lichtenstein thinks oviposits solely (?) on the evergreen oak (*Quercus ilex*). Further, he thinks that the insect leaves the *ilex* for *Q. robur* and *Q. pubescens*, to return to the *ilex* once more. As the latter tree is not indigenous to Britain, to Sweden, and to E. Asia?, it is obvious that in these countries some other nidus is found by the insect.

I am not quite clear as to the gist of M. Lichtenstein's question upon the hop-*Aphis*. He seems to ask why, if I have given three pages on the extermination of this *Aphis*, I have not tried to follow the insect from *Humulus* to *Prunus*. He assumes, hypothetically, that *Phorodon malaheb* is simply a different stage of *P. humuli*.

I conceive that the chief part of a monograph is to gather in one the scattered observations of many, and that if there be incorporated original work, it will appear only as an adjunct, and not as a necessity.

Hitherto, I have regarded *Phorodon malaheb* as a variety of *P. humuli*, but an intelligent correspondent, who is a large cultivator of hops for the market, regards these two insects as distinct, and he states that *Prunus malaheb* and *P. spinosa* (the sloe or black thorn) are often quite absent from the grounds where the hop is grown.

In the few experiments that I have made on *Aphis rumicis* and *Aphis papaveris*, I have failed to cause the *Aphides* previously nourished on one genus of plant to change their food to that of another; and I am permitted, as relevant to this matter, to state the same negative result from observations made during the present year, by Miss E. Ormerod, who watched some hop-plants which had twined round the young suckers of the garden-plum. The hop-plants were much infested by *Aphides*; but the leaves of the plum remained free from their attack to the last.

Though these results are negative, they are good evidence, so far as they go, and they tend rather against than for the theory of periodic migration, or else they would show that these insects are distinct in species.

The processes of science are essentially tentative, that is, they are experimental. Hypothesis accordingly pushes into theory, and theory progresses into ascertained fact. No one more than my friendly critic will deny the value of the scientific *sieve* for the separation of the real fruits of observation. My foregoing remarks are offered in no captious spirit, and I know he will take them as materials for discussing a problem in entomology, to which he has lent so much interest.

Description of the larva of Tortrix Lafawryana.—The full-grown larva is not very active, cylindrical, but slightly attenuated at both ends; segments distinctly divided; of a pea-green colour, with a darker green dorsal line, and yellowish-green between the segments. Spots paler than the ground colour, but rather inconspicuous; hairs moderately long, about four or five on each segment; head dull yellowish-green; jaws brown and eyes black; dorsal and anal plates of a darker green than the ground-colour, and about the ninth segment there is an ochreous-brown internal dorsal vessel; legs green.

On *Myrica gale* (bog myrtle) in June and July, drawing together three or four of the younger terminal leaves, and feeding principally on the apices of its leafy habitation.

Sometimes the larva changes to the pupa in its abode, but far more frequently it descends to the ground to spin up in moss, dead leaves and other rubbish. The pupa is black, and the moth emerges about three weeks or a month after the larva has assumed the pupal state.—E. A. ATMORE, King's Lynn: August 13th, 1883.

[Mr. Atmore has very kindly supplied me with larvæ of this species. From these I have reared a few very satisfactory specimens, one fine red female being the exact counterpart of my French type. Others are decidedly paler, approaching the colour of *sorbiانا*. These are also smaller than the type. In the case of Mr. Atmore's larvæ, as well as of mine, the proportion of females reared is considerably over that of males.—C. G. B.]

The Isle of Man form of Vanessa urtica.—In the Ent. Mo. Mag. for this month, p. 82, Mr. Stainton alludes to "the Isle of Man form of *Vanessa urtica*." There is no Isle of Man form of *Vanessa urtica* as distinct from the ordinary British type of the species. Many years ago Mr. Birchall noticed that all the specimens taken in the island, or bred from larvæ collected there that season, were much smaller than the ordinary type of the species, and he distributed a good many of these specimens amongst British collections. This no doubt caused Newman to believe that Manx specimens were "uniformly much smaller than in England" (Newman's British Butterflies, p. 52); but although since then I have repeatedly been in the Isle of Man in different years, and have reared large numbers of *Vanessa urtica* from larvæ collected there, in the hope of getting the small form, I have never seen or heard of a specimen differing in any respect from the ordinary type. There is no doubt that in the year Mr. Birchall obtained his, the larvæ were either starved, or there was some other exceptional circumstance to account for it. Only this year, indeed, at the end of July, specimens I noticed near Douglas seemed so fine and large on the wing, that I watched them settle, solely to ascertain if they were not *polychloros*!—Geo. T. PORRITT, Huddersfield: September 6th, 1883.

THE BRITISH SPECIES OF *IDIOCERUS*.

BY JAMES EDWARDS.

The British species of *Idiocerus* are now fifteen in number, as against the ten enumerated in my table of the genus at page 52 of

vol. xviii of this Magazine; and I, therefore, propose in the present paper to call attention to the five additional species, and to characterize more exactly some of the species previously recorded.

The following errors in the table above mentioned should be noted, viz.: *lituratus* = *adustus*, ♀; *Heydenii* = *pæcilus*, H.-S.; and *confusus* = *albicans*, Kbm.

As it is frequently necessary to refer to the neururation of the elytra in descriptions of *Cicadina*, it is desirable that some intelligible system should be observed. The following system, based on that of Dr. J. Sahlberg, seems most convenient. The elytron is divided into *corium*, *clavus*, and *membrane*, the latter composed of the apical areas and frequently having a membranous *appendix*. The longitudinal nerves of the corium are the *brachix*, the simple nerve standing immediately above the claval suture, and the *cubital*, the forked nerve coming between the brachial nerve and the costa; the branches of the cubital nerve, which are generally forked at the apex, may be designated as *inner* and *outer* respectively, according to their position. The nerves forming the inner boundary of the apical areas may be conveniently termed *angular* nerves, leaving the term *transverse* to be applied to such other nerves as may occur in such a position as to warrant its application. The longitudinal nerves of the clavus are the *anal* immediately below the claval suture, and the *axillary* standing nearest the scutellum.

It is believed that our British species of *Idiocerus* are exactly characterized in the following table, but one or two of them will admit of some comment.

Id. Herriehii.—In the Catalogue of British *Hemiptera*, published by the Entomological Society of London, this is erroneously given as a synonym of *lituratus*. It is a handsome greenish-grey species, with the nerves of the elytra chequered with black and white. The whiskers of the ♂ are very conspicuous, and the pubescence on the cheeks of the ♀ is easily seen. It occurs on *Salix alba*, and is well described by Dr. J. Sahlberg.

Id. aurulentus, Kbm.—The single example of this species, taken by myself, might well be described as *vitreus*, without the white H, but Herr Paul Löw, who named it for me, says that of seven or eight examples in his collection, no two are exactly alike in point of coloration, and this is borne out by examples which I have from Dr. Puton.

With regard to *fulgidus*, *populi*, and *confusus*, as characterized below, I believe we are at last in accord with continental entomologists.

Id. albicans, Kbm.—Fieber, without reason, puts this species as a synonym of *confusus*, Flor, and most subsequent writers have followed him. It is, however, abundantly distinct.

- 1 (2) First and second apical areas of elytra sub-equal in length, *i. e.*, their bases level, or nearly so *adustus*, H.-S.
- 2 (1) First apical area much longer than second.
- 3 (4) First subapical area triangular, or 5-sided, reaching the costa... *varius*, F.
- 4 (3) " " " parallel-sided, not " " "
- 5 (6) Cheeks pubescent, more conspicuously in the ♂ *Herrichii*, Kbm.
- 6 (5) " bare.
- 7 (12) Elytra brownish, with a pale transverse band or bands.
- 8 (9) " with two pale transverse bands..... *tremula*, Estl.
- 9 (8) " " one " " band.
- 10 (11) First sub-apical area well defined, about one-third shorter than the second. *elegans*, Flor.
- 11 (10) First subapical area not well defined, about half as long as the second... *laminatus*, Flor.
- 12 (7) Elytra without pale transverse bands.
- 13 (18) Anal nerve standing in an oval white patch at apex.
- 14 (15) Inner cubital and brachial nerves with a short black streak reaching as far as the apex of the clavus. First transverse nerve black... *lituratus*, Fall.
- 15 (14) Nerves chequered with black, or rust colour, and white. First transverse nerve white.
- 16 (17) Pronotum with a broad pale stripe. Face with four broad black stripes, ♂, or only two (on the frons), ♀ *pæcilus*, H.-S.
- 17 (16) Pronotal stripe not so broad, nor so well defined. Face without distinct dark stripes in either sex *tibialis*, Fieb., = *Heydenii*, Kbm.
- 18 (13) Anal nerve white at apex, but not standing in an oval white patch, or nerves entirely white.
- 19 (22) Brachial nerve with a white streak near the apex.
- 20 (21) First transverse nerve white ... *virreus*, Fab., = *H. album*, Fieb.
- 21 (20) " " " not white..... *aurulentus*, Kbm.
- 22 (19) Brachial nerve not marked with white.
- 23 (28) Elytra green or greenish-grey, more or less tinged with reddish-brown towards the suture.
- 24 (25) Side margins of face angularly indented below the eyes. Inhabits poplars. *fulgidus*, F.
- 25 (24) " " " " at most faintly sinuate.
- 26 (27) ♂. Face and legs generally much suffused with orange-yellow. ♀. About one-sixth of visible length of ovipositor projecting. Inhabits aspen... *populi*, Lin.
- 27 (26) ♂. Without orange coloration. ♀. About one-third of visible length of ovipositor projecting. Inhabits sallow *confusus*, Flor.
- 28 (23) Elytra greenish-white, or almost milk-white. Nerves entirely white. Inhabits white poplar *albicans*, Kbm.

Swiss Cottage, Rupert Street, Norwich :

18th September, 1883.

Halesus guttatipennis, McLach., as a British insect.—This species was originally described by me in the "Trichoptera Britannica" (1865) from a ♂ example, in the late Mr. Edwin Brown's collection, believed to have been taken in the north of England. After Mr. Brown's death this specimen passed into the collection of the Royal Dublin Society. Nothing more was heard of *guttatipennis* as British. In 1861 Hagen (Stett. Zeit., p. 115) noticed a species of *Halesus* from Switzerland as "*mucoreus*" (Imhoff), which was subsequently (1875) renamed "*helveticus*" by Meyer-Dür. Later on (1874) Stein identified as "*guttatipennis*" an insect captured by him on the Altvater in Silesia. When writing my "Revision and Synopsis" I incorrectly retained the name "*guttatipennis*" for the Altvater species (not having had sufficient confidence in my original description, not being then able to re-examine the type, and being misled by the locality, considering a species from Silesia more likely to occur in Britain than one from Switzerland), and retained the name "*mucoreus*" for the Swiss species, which ultimately proved to be identical with the original *guttatipennis*. In the Supplement to the "Revision and Synopsis" (p. xxxix, 1880) this error was admitted, and the Altvater specimens received the specific name "*nepos*." Still the original *guttatipennis* had received no further confirmation as British. At the recent sale of the late Mr. Benjamin Cooke's collection I noticed a second (♀) example; no doubt he received it from the same source whence came the original male, and I think there can be no doubt as to the right of the species to a place in our list. In fact, any scruples I may have held on this point had been abandoned from the fact that a specimen had occurred in Belgium (*cf.*, Supplement, p. xxxix). But the entomologists of the northern and midland counties of England should endeavour to discover the exact locality of the species, which is probably on one of the moors of their district. *Guttatipennis* and *nepos* are very similar in general appearance, but the latter is smaller, and presents good structural differences, according to the limited material I have worked from. Both are probably autumnal, occurring in October and November, a time when most of our entomologists have ceased outdoor work, and this may account for *guttatipennis* continuing to be almost unknown as British.—R. MCLACHLAN, Lewisham, September, 1883.

The larva of Plusia orichalcea.—In the month of July, 1882, in an outlying part of the Cambridgeshire Fens, eight or ten worn specimens of *Plusia orichalcea* were captured by the aid of a lamp, hovering round flowers of *Eupatorium cannabinum*; one only, the first specimen obtained, was taken flying in the afternoon sunshine. This year I had the good fortune to beat ten specimens of a larva, which, though exactly like that of *gamma*, but a little larger, produced in July nine beautiful *orichalcea*. Three others were obtained, one each by Messrs. Archer, Cross, and Raynor, of Ely, but were not reared. Of the earlier stages of the larvæ I cannot speak, as those beaten were all past, or near, their last moult. As far as I could see, their colour, size, and markings are exactly those of *P. gamma*. There are two fine white lines down the back from the third to the penultimate segment, with the dorsal vessel showing darker green between them; oblique white lateral lines on each of these segments. On the second and third segments, and on the anal segment,

there are five irregular white lines, which unite together in front, in the direction of the head. The spiracles are white and small, except the last, which is conspicuously larger than the rest. But the most striking feature of this larva is its wonderful power of extending and withdrawing the first three or four segments of its body, and reminding one of the larva of *Chærocampa Elpenor*, or of the common earth-worm. When full-fed, the larvæ spun a flat oval pad of white silk on the side of the muslin bag in which they were reared, and thereon remained for twenty-four hours or longer, perfectly motionless, in a horse-shoe-shaped form, the head in close proximity to the tail. After this interval of rest, they proceeded to spin the rest of their cocoons, which were soon completed, being thin and transparent enough to allow of the easy observation of every movement of the larva inside. The cocoon, when finished, is oval, with the longer axis perpendicular, and the larvæ all pupated with the head upwards. They took a week to pupate, after the cocoons were completed; and remained in pupa just a fortnight, the ♀ in all cases emerging twenty-four hours sooner than the ♂. The pupa of *orichalcea* may be at once distinguished from that of *gamma*, which is wholly black, by its having the underneath part and the wing-cases of a lovely pale green, a colour which, three or four days before the perfect insects emerge, gradually changes into a dull pink, foreshadowing the colouring of the under-side of the abdomen and wings of the imago.

The habit of the larva appears to be to eat the young top-leaves of the *Eupatorium*, and work downwards. When not engaged in feeding, it rests on the under-side of a leaf, grasping the midrib.

One larva, in the course of its last moult, failed to throw off its old skin in its entirety: a narrow band of which remained in an oblique position, embracing the eighth segment, the hinder part of the seventh segment on one side, and the former part of the ninth on the other. This band, as it dried, had tightened, constricting the body, till it was only half its normal diameter, and enabling the whole of the internal structure and workings to be plainly seen. As the larva was evidently unable to extricate itself, I carefully inserted the eye of a needle beneath the ligature, and, aided by sundry energetic wriggings of the larva itself, split it asunder. The body soon resumed its usual dimensions, and the larva fed up and turned all right, and the imago emerged apparently perfect: but when I got it on the board, I found the left fore-wing, though not crippled, about one-eighth of an inch shorter than the right.

I think it is quite possible that *Plusia orichalcea* may be more widely spread than is generally supposed. The perfect insect is rarely seen, except at night; and the larva would be easily passed over as only *Pl. gamma*. I hope to be able to give a fuller account of its earlier stages another year.

I take this opportunity of correcting a slight error in Mr. Buckler's account of the larva of *Bankia argentula* in last month's Magazine, for which I am sure he is not responsible. Mr. Raynor was *not* the rediscoverer of that insect. I had taken some half-dozen, and Mr. Cross a couple, before Mr. Raynor arrived on the scene of action, and his delight at our capture was unbounded. Moreover, the insect has occurred in small numbers in Wicken Fen more than once during the last ten or twelve years.—W. WARREN, Merton Cottage, Cambridge: September 17th, 1883.

Obituary.

Edward Sheppard died on the 8th of September, after a short illness, at the age of 67. In his public capacity as Collector of Customs in the port of London, from which office he retired only two months ago, he was widely known and appreciated for his knowledge of business and his uniform courtesy, while his genial disposition and hospitality endeared him to a host of friends in private life. He was unmarried. He was a Fellow of the Linnean and Zoological Societies, a Member of the Entomological Societies of London and Stettin, and one of the eight Members of the Entomological Club. Besides his general love of Nature, he, for many years, devoted considerable attention to *Coleoptera*, of which he formed a collection; but his ardour relaxed, and for a long time he had given up active participation in entomological pursuits, yet to the last he retained an interest in Entomology and Entomologists.

Dr. Hermann Müller, of Lippstadt, died at Prad, in the Tyrol, on August 25th. All readers of Darwin's works will have realized how greatly our illustrious philosopher was assisted by the brothers (Hermann and Fritz) Müller. The fraternal partnership has now been dissolved through the death of the senior, but he leaves a son who has shown himself ready to follow in the footsteps of his father. Hermann Müller, as contrasted with his surviving brother, was probably a botanist rather than an entomologist. But his two principal works ("Die Befruchtung der Blumen," 1873, of which an English translation has appeared this year, and "Alpenblumen, ihre Befruchtung durch Insekten," 1881), belong quite as much to entomology as to botany. He opened up quite a new field of investigation in the intimate relations between insects and plants, and in connection therewith most of his vacations were devoted to excursions to the higher Alps. His investigations on the part played by insects in effecting fertilization and cross-fertilization in plants probably led him to speculations on the origin of colour in flowers. Hermann Müller belonged professionally to that great scholastic element in Germany that has produced so many thorough workers in Natural History.

The Rev. H. Harpur Crewe, M.A., Rector of Drayton Beauchamp, near Tring, died on the 7th September, after a long illness, aged 54. Although Mr. Crewe's Natural History studies neither commenced nor ended with entomology, the best years of his life were devoted to the study of British *Lepidoptera*, and especially to the difficult genus *Eupithecia*, in his investigations of which he made for himself a truly European reputation. The earliest published note by Mr. Crewe with which we are acquainted appeared in the "Zoologist" for 1848 (he would then be 19 years old), on an ornithological subject, and for a few subsequent years he continued to send notes on British Birds. In the same periodical for 1851, he appeared as a contributor of notes on British *Lepidoptera*, and in 1854 (*l. c.*, p. 4370) is a list of species of *Eupithecia* he had reared from larvæ, the first indication of attention to the branch in which he was ultimately to gain considerable distinction. In 1859 he published descriptions of the larvæ of many *Eupithecia*, and thenceforward, until quite recently, he continued to publish the results of his investigations of this genus (varied by notes on other *Lepidoptera*) in the "Zoologist," "Intelligencer," "Ento-

mologist's Annual" (1861-62-63-& 65), the "Entomologist's Monthly Magazine," &c., &c. Probably his last entomological note was the description of a new species of *Eupithecia* (*E. jasioeata*) in this Magazine, vol. xviii, p. 80 (1881). Latterly, however, for a considerable time, he was more especially devoted to Horticulture, upon which subject he was regarded as an authority, especially in connection with the smaller bulbous-rooted plants, in search of which he made more than one long journey to parts of Europe little frequented by English tourists: for some time he was Chairman of the Floral Committee of the Royal Horticultural Society.

Mr. Crewe was never robust; but, until recently, his appearance of health had so vastly improved on that which he bore in comparatively early life, that it was with considerable surprise we heard of his death.

Reviews.

LES ODONATES DU JAPON, par M. DE SELYS-LONGCHAMPS. Bruxelles, 1883, pp. 66, imp. 8vo. (Extracted from the Annales de la Société Entomologique de Belgique, tome xxvii, pp. 82—143).

In his introductory remarks the author states that the idea of a Monograph of the Dragon-flies of Japan was conceived (and carried into effect, in its initial stage, in MS.) in 1841, from an examination of the materials collected by Von Siebold, existing in the Leyden Museum; the number of species was then only 22. At the present time he is acquainted with 67 species. This increase is largely due to the discoveries of Englishmen, and especially to Messrs. H. Pryer, G. Lewis, and J. Milne. The Dragon-fly fauna is a mixture, in which the European and Siberian element forms one-half, the Indo-Chinese a quarter, and the remainder may be considered special. Eight species are truly palaearctic (including *Libellula quadrimaculata* and *Lestes sponsa*, which are British); six others are scarcely distinct from their European (or Siberian) representatives; and sixteen more are of a decidedly European facies. Just as occurs in *Lepidoptera*, the tendency of Japanese forms is to exceed *in size* their European sub-equivalents (thus *Diplax elata* is scarcely to be distinguished from *D. pedemontana*, excepting by its greatly superior size). The number of species of true European Dragon-flies rests (and seems likely so to do) at about 100. The author is of opinion that it will not be possible to record a similar number from Japan. We rather incline to a more considerable estimate. Notwithstanding the very important additions made within the last few years, it must be remembered that no entomologist specially conversant with Dragon-flies has collected in the islands, that many species are so much alike when on the wing as to deceive even the most experienced Odonatists, and that their capture is frequently difficult. Therefore, we predict that at the expiration of another forty years, more than 100 Japanese species will be known, and that the author's opinion as to the Japanese themselves playing an important part in the discovery (and working out) of new forms, will prove to have been prophetic. We have by no means heard the last of "Les Odonates du Japon."

THE ZOOLOGY OF THE VOYAGE OF H.M.S. CHALLENGER. Part XIX. REPORT ON THE PELAGIC HEMIPTERA, by F. BUCHANAN WHITE, M.D., F.L.S. London: Longmans & Co., &c., 1883. 80pp. 4to, 3 plates.

The Pelagic *Hemiptera*, which, indeed, are the only insects having a truly oceanic habitat, forming the subject of this Monograph, consist, as far as at present known, of but few species, and are referable to at most two or three genera, of which only two—*Halobates*, Eschscholtz, and *Halobatodes*, F. B. White, are here adverted to. These very remarkable insects, which are allied to the common aquatic genus *Gerris*, are quite destitute of elytra and wings, have a thorax often occupying three-fifths of the entire length of the body and very broad (the latter indicating great development of the muscles governing the necessarily excessive action of the legs); an extremely small, disproportionate abdomen (also advantageous to the conditions of their life); and an excessive length of the second and third pairs of filiform legs, this structure, as in *Gerris*, being admirably adapted for courising over the surface of water. That some of the species can dive has been observed; it is very probable that all do so on occasion (as we have often seen *Gerris* do), otherwise it is difficult to understand how creatures of such fragile structure could survive storms. They have been found only on the sea in warm latitudes, mostly in the Atlantic, Indian, Pacific and Chinese regions, generally far from land, even as much as 500 miles distant, but sometimes comparatively near the shore.* They are gregarious, but nothing certain is known of the nature of their food. On this point, and also on the manner of their locomotion, especially as to the power of all the species to dive, their enemies and means of defence, the use of several peculiar structures, such as the ocelloid tubercles of the head, the ventral tubercle, and the tarsal process, information is desired by the author. As he says, "A special interest is attached to these animals, as being the only pelagic representatives of their class. It is true that a few other insects are marine, but they are all found in close proximity to the shore, whereas the species of *Halobates* usually, and in some cases only, occur at a considerable distance from any land. Moreover, their structure would seem to indicate that they are archaic forms of very great antiquity, and hence all that can be learned with regard to them is of very great importance."

Of the genus *Halobates* eleven species are described: 1, *H. Wüllerstorffi*,† Frauenf.; 2, *H. micans*, Esch.; 3, *H. princeps*, n. sp.; 4, *H. Streatfieldanus*, Temp.; 5, *H. sobrinus*, n. sp.; 6, *H. sericeus*, Esch.; 7, *H. germanus*, n. sp.; 8, *H. Hayanus*, n. sp.; 9, *H. proavus*, n. sp.; 10, *H. flaviventris*, Esch.; 11, *H. Frauenfeldanus*, F. B. White.

Of the genus *Halobatodes* (n. g.) four species (one doubtfully congeneric): 1, *H. lituratus*, Stål; 2, *H. histrio*, n. sp.; 3, *H. compar*, n. sp.; 4, ? *H. Stali*, A. Dohrn.

All the species, except the last mentioned, are figured by Mr. Edwin Wilson, the excellence of the illustrations being vouched for by Dr. White. The number of specimens extant in the museums of Europe or in private possession is not large, but as far as possible they have been obtained and examined. The bibliographical references are necessarily not numerous, but they have all been consulted, and the most of them are quoted *verbatim*. Altogether the subject has been well and exhaustively treated, as far as the available materials admit.

* c. f., Mr. J. J. Walker's note, p. 93 ante.

† All the specific names derived from proper names are printed without a capital initial letter—more insulao *hujus* *atatis*.

NOTES ON *EUTHEIA CLAVATA*, REITTER,
AND *PTENIDIUM GRESSNERI*, ERICHSON, TWO SPECIES
OF *COLEOPTERA* NEW TO BRITAIN.

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EUTHEIA CLAVATA, Reitter.

Early in the spring of this year, I spent a single day in Sherwood Forest, where, in addition to other interesting captures, I had the good fortune to meet with a few specimens of *Eutheia clavata*, under bark of oak logs. It is a very distinct species, and easily separable from the other three British *Eutheia*. Compared with *E. scydmonoides*, which it somewhat resembles in colour, and in having fine depressions at the base of the thorax, *E. clavata* is larger, flatter, and much less ovate, the elytra being in fact almost parallel-sided: the antennæ are lighter coloured, except the three terminal joints, which are darker (under a glass of low power, they seem quite black), and more decidedly clavate; those of the female are very elongate, being nearly one-fourth longer than those of the male, with the club less pronounced.

This species is described in *Deutsch. Ent. Zeit.*, xxv (1881), p. 206, but Reitter does not appear to have seen the female. It seems to have occurred in Hungary, Germany, and the Central Pyrenees; M. Albert Fauvel, who kindly determined the species for me, informs me that he has a single ♂ from the environs of Luchon.

PTENIDIUM GRESSNERI, Erichson.

Amongst my New Forest captures in June last, were a few things not determined at the time when I sent my previous note (*ante*, p. 85), one, at least, of which turns out to be a species new to Britain, viz.: *Ptenidium Gressneri*, Er. I took a few specimens on a beech-stump, accompanied by *Pt. turgidum*, Thoms.

This species is described by the Rev. A. Matthews (who kindly identified my insect) in his *Monograph of the Trichopterygia*, p. 78. He there says that it is found in ants' nests, but there were no ants, so far as I could see, in or near the stump from which I obtained the beetle. Fungi were growing freely from the crevices between the bark and the wood, and it was after shaking these over the flat surface of the stump (to get *Aradus corticalis*) that I found the *Ptenidia* running about. This would seem to indicate that *P. Gressneri* (as well as its hitherto rare congener, *P. turgidum*) may be found by searching fungi in similar situations.

ON THE SYNONYMY OF CERTAIN *MICRO-LEPIDOPTERA*.

BY E. MEYRICK, B.A.

Just before leaving New Zealand, in August, for a flying visit to England, I received Mr. A. G. Butler's published reply to my corrections of his determinations (see *ante*, pp. 14, 15). As he accuses me of writing without any sound foundation, I ask leave to give the grounds for those conclusions which he disputes.

Before doing so, I take decided objection to the assumption that we are not justified in identifying descriptions as synonymous without reference to the original types. If this were so, descriptions would be superfluous. It would, in my judgment, be more correct to assert that we are not justified in identifying an insect from the type, which is liable to be misplaced, and cannot be published, but that the description is the only reliable authority; if unidentifiable, it should be quashed. That the author of a synonym should have referred his type to a different genus from that to which the species truly belongs, is only of importance in proportion as we can only rely upon his accuracy of investigation.

Respecting *Rhodaria robina*, Butl., I consider the description fairly agrees with the insect to which I attributed it, and is not capable of being referred to any other of the 200 species of *Pyrales* which I possess from Eastern Australia. Further, I had examined previously the whole collection of Dr. Lucas, who sent the specimens to Mr. Butler; it contains extremely few true *Pyrales*, all well known to me (these are comparatively scarce in the more southern latitudes, where he collects, but are abundant in the north), but this species is one, and was among those he sent to Mr. Butler, nor was there any other at all near it. Guenée's descriptions of *Endotricha pyrosalis* and *E. ignealis* are decidedly good, and both undoubtedly referable to this species, in my opinion; it varies considerably, and may well have been described twice. Walker's descriptions of *Pyralis stilbealis* (!) and *P. docilisalis* (!) are not, in my judgment, identifiable, but I saw the types in the British Museum, and considered them identical with this species, of which I had specimens with me at the time for comparison; both are females, the sexes differing superficially, and I noted especially that no male existed in the collection under any name. Finally, I am well acquainted with the species and its limits of variation, having seen probably thousands of specimens, as it is common and widely distributed; and those which I have called ♂ and ♀ are certainly sexes of the one species. This is, without doubt, a true

Endotricha, with the characteristic neuration, and elongate patagia of the ♂; if Mr. Butler's specimen really has the neuration of *Botys* (*Rhodaria*) it must, of course, be distinct.

Next, as to *Conchylis* (?) *auriceps*, Butl. I noted the specimen of this placed amongst *Philobota Arabella*, Newm., in the British Museum (there were also in the same series specimens of *Phil. irruptella*, Z.), and recognised it as a species well known to me previously, but not described; but for this I should hardly have ventured to identify Mr. Butler's description. I do not know why Mr. Butler should assert that I have not examined the neuration; I dissected specimens two years ago, in company with some 300 other species of *Ecophoridae*, and can produce my drawings of their structure. I shall certainly be indebted to any one who will define for me the differences between this species and *P. Arabella*, so as to render them capable of generic distinction. But, at any rate, the fact that veins 7 and 8 of the fore-wings are stalked would have shown at once that it was not a *Conchylis*.

The last remark will apply also to *Conchylis Thetis*, Butl. The species is a rather fine and distinct one, and I recognised it at once from the description; moreover, I saw the species in Dr. Lucas' collection, and learnt that he had sent home the sexes separately. Mr. Butler must be in error in stating that he compared this species with my descriptions before publishing it, and failed to recognise it; my first paper on the *Tortricina*, including this species under the name of *Dichelia isoscelana*, was issued in December, 1881, but I did not distribute my own copies until the issue of the second in March, 1882, when I sent them out together; so that Mr. Butler could not have received them until May at the earliest, whereas his paper was published (if I remember rightly) in February. Further, all his other species are referred to families which I had not then entered upon. He is not justified, therefore, in implying that my description was at fault, as I think he will acknowledge.

I regret the necessary length of this communication. I shall be sorry if my remarks cause any pain to Mr. Butler, against whom I have no personal feeling; and if I should find hereafter that any of my statements are founded on error, I will freely and gladly admit it.

San Francisco, U. S. :
September 7th, 1883.

Catocala frazini near *Culross*, N.B.—The Rev. John McGregor, of Culross, has shown me a splendid specimen of *Catocala frazini*, taken at sugar, on oak, the 22nd September, in Tullyallan Woods.—ALFRED BRAUMONT, Low Valleyfield House, Culross: October 10th, 1883.

MEYRICK'S AUSTRALIAN TORTRICIDS.

BY PROFESSOR C. H. FERNALD.

Mr. E. Meyrick has recently published several papers on the *Micro-Lepidoptera* of Australia, New Zealand, and Tasmania, in the Proceedings of the Linnean Society of New South Wales, vol. vi, and in the Transactions of the New Zealand Institute for 1882.

Before publishing, the author went to England and made a critical study of the types of Walker in the British Museum, which was necessary, if the names of that author were to be respected. He speaks of the work of Walker in much the same strain as every one else who has had occasion to review any of his work, and he is also quite severe in his strictures on the work of Mr. Butler.

Mr. Meyrick had the great kindness to send me a series of his types of the Tortricids, representing most of the genera and a considerable number of the species, else I could not have undertaken a review of this point of his work.

So far as I can judge, he has adopted the Tortricid group as restricted by Lederer and Heinemann, but regards it of higher than family rank, and divides it into three families. My own studies have led me to regard it of family rank only, and what he has given as families I have considered sub-families. (See my Catalogue of the N. A. *Tortricidæ*, Trans. Am. Ent. Soc., vol. x.) Perhaps he is right, but entomologists are not as yet agreed on the rank of certain groups of the *Lepidoptera*. Lord Walsingham, in "Papilio," vol. ii, p. 77, discusses the value of the group *Tineina*, and expresses the firm belief that it is only of family rank, and that we should use the term *Tineidæ* for it. Surely, the Tortricids cannot form a group of higher rank than these, if as high.

Mr. Meyrick found it necessary to create twenty new genera in his family *Tortricidæ*; twelve in his *Grapholithidæ*; and six in his *Conchylidæ*. Later, he suppressed his genus *Cryptotila*, which was founded on characters existing in the female only. I should not be surprised if he found good reason, upon the study of further material, to re-establish this genus for the species which he placed under it.

I was at first entirely unwilling to believe that so many new genera could exist in nature, in the territory mentioned, but when I had given the insects a critical examination, I became convinced that we have to deal with a Tortricidian fauna, as distinct and diverse from other parts of the world as is the mammalian fauna of that country.

I certainly agree with the author in regard to most of the genera,

but of some I had no examples for examination, and, therefore, cannot express an opinion on them. Some have been separated on the differences occurring in the origin of veins 3 and 4, and also 6 and 7 of the hind-wings. In some North American species, there is so much variation in the origin of these veins, that it would not be safe to establish a genus until a large number of individuals had been examined, and the question settled whether the venation in that species was variable or not. Mr. Meyrick may have done this, and in that case his genera will, without doubt, be retained. In some cases genera have been separated on slight palpal differences, the desirability of which is doubtful.

Of the European genera of Tortricids, only representatives of *Capua*, Steph., *Dichelia*, Guen., *Cacoecia*, Hüb., *Tortrix*, Linn., *Antithesia*, Steph., *Penthina*, Tr., *Eudemis*, Hüb., *Aphelia* = *Bactra*, Steph., *Stigmonota*, Guen., *Carpocapsa*, Tr., and *Crociosema*, Zell., have thus far been found.

There hardly seems to be good reason for the use of the two names *Antithesia* and *Penthina*. The latter name was first proposed by Treitschke, in 1829, with *salicana*, S. V., and several other species following. In 1830, the same author characterized this genus and enlarged it, putting *Revayana* the first under it, but he does not specify any particular one as the type. *Revayana* has since been removed, and put into the genus *Sarrothripa*, and *salicana* has been taken as the type of *Penthina*, which, I think, is correct.

The name *Antithesia*, was first proposed by Stephens, in 1829, in his "Systematic Catalogue of British Insects," with the type *corticana*, and in his "Illustrations," 1834, where he characterized the genus, he suppressed the name *Penthina*, not because of the priority of *Antithesia*, but because Treitschke had introduced a species belonging to another genus, which Stephens was disposed to regard as the type of *Penthina*. Meyrick credits *Antithesia* to Guenée, but Guenée, in his "Index Methodicus," gives *corticana* as the type.

Now, *salicana* and *corticana* are structurally alike, and cannot possibly represent two different genera; therefore, I see no good reason for using both of these names; and as they were both proposed in the same year, and as *Penthina* was characterized four years earlier than *Antithesia*, I prefer to adopt *Penthina*, and allow the other to fall as a synonym of Treitschke's genus. Mr. Meyrick thinks he finds generic differences in the species he has placed under these two genera. Whether that be so or not, I do not think he can be justified in using both these generic names.

Eudemis botrana, S. V., that cosmopolitan pest of the grape, is

one of the few introduced species, as well as the wide-spread *Bactra lanceolana*, Hüb. Our author adopts the generic name *Aphelia* for this species. *Aphelia* was first proposed by Hübner in his "Verzeichniss," to include *viburnana*, S. V., and four other species, all belonging to the genus *Tortrix*, as restricted by modern authors. Stephens had not seen Hübner's Verzeichniss in 1829, when he published his Catalogue, and by mere coincidence proposed the name *Aphelia* with *egenana*, Haw., and four others, all synonyms of *lanceolana*, Hüb. Stephens became acquainted with the Verzeichniss, of Hübner, before he published his Illustrations, and finding that Hübner had previously used the name *Aphelia* for *viburnana*, and some allied species, he suppressed the name as he had proposed it, and established the genus *Bactra* instead, and, because of this, Zeller and some others have used *Bactra* instead of *Aphelia*.

The European genus *Stigmonota*, Guenée (*non* Haworth), is represented by five species, two of which are noteworthy on account of their bright orange hind-wings with a dark border.

Mr. Meyrick first referred *obliquana*, Walk., to the genus *Cacoecia*, but subsequently referred it to *Padisca*, because of the pectination of the median vein of the hind-wings. The genitalia are totally unlike the species of *Padisca*, but would place the species in the sub-family *Tortricinæ*. Against this Mr. Meyrick would urge the pectination mentioned above, but *Ænectra Pilleriana* has this pectination, yet no one would refer it to the *Grapholithinæ*. I think Mr. Meyrick will change his opinion when he re-examines this species.

The omnipresent *Carpocapsa pomonella*, L., has been introduced along with the apple, and that singular South European species, *Crociosema plebeiana*, Zell., occurs there, probably introduced also.

Of the *Conchylinæ*, Mr. Meyrick finds seven new genera, including *Bondia*, of Newman, which has been referred to this group, but, quite singularly, no species which could be referred to the known genera of this division.

The author promises to monograph all the *Micro-Lepidoptera* of New Zealand, a work which he seems to be admirably qualified to do.

These papers have pleased me very much, and while there is much in them to commend, there seems to be little to censure, and any errors which exist will become apparent to the author in his further studies, and be at once eliminated.

In all, Mr. Meyrick has given us 51 genera and 178 species from Australia, Tasmania, and New Zealand, but, without doubt, many more will be discovered when the country shall have been more fully explored by collectors.

TWO NEW SPECIES OF *ANAX*, WITH NOTES ON OTHER
DRAGON-FLIES OF THE SAME GENUS.

BY ROBERT McLACHLAN, F.R.S., &c.

ANAX WALSINGHAMI, *n. sp.*

Length of abdomen (*cum appendic.*), ♂, 86 mm., ♀, 77 mm. Length of posterior wing, ♂, 60 mm., ♀, 58 mm. Expanse, ♂, 128 mm., ♀, 120 mm.

Wings hyaline (slightly tinged in the ♀). Neuration black or blackish; costal nervure yellow externally. Membranule blackish, white at the base. Pterostigma narrow, rather short (5 mm.), brown. 19 ante-cubital and 10 post-cubital nervules in the anterior wings in ♂, 15 and 8—10 in the ♀.

Face and mouth parts wholly yellow (? green in the living insect). Top of front with a circular (or slightly oval) black spot placed in a dusky (or slightly bluish) ring, the anterior portion of which becomes merged in a fine blackish line margining the groove. Vesicle blackish behind, yellowish in front, with a crest of black hairs; basal joints of antennæ black. Occiput very small, yellow, triangular, flat, scarcely emarginate. Back of head yellow, with a narrow blackish margin.

Thorax uniformly pale yellowish-green (in the dry insect), the double dorsal crest, and crests of the posterior cavities, brownish with black tubercles; there is a fine clothing of cinereous pubescence.

Legs black; femora pitchy-brown merging into black, the anterior yellowish beneath: length of posterior femora, ♂, 13½ mm., ♀, 11½ mm.

Abdomen slender and very long, slightly depressed in the ♂, shorter and more cylindrical in the ♀; third segment laterally constricted in the ♂; median transverse suture on the 2nd segment scarcely complete; 3rd to 6th segments very long, with the supplementary transverse suture placed considerably behind the base of each: colour greenish (or bluish) in life, with a dorsal longitudinal brown band, which becomes somewhat dilated at the supplementary sutures, and occupies the whole of the posterior portion of each segment from the 3rd, extending in an oblique manner along the sides of the segments, so that the pale colour is really indicated by long lateral spots enclosed in dark ground, but on the 3rd segment the sides are nearly wholly pale; 1st segment brownish at the base; 2nd with a large triangular posterior brown spot, and brown sutures; 7th to 10th nearly wholly brown, with pale lateral spots. Lateral depressions extending from the 3rd segment to the 9th, but only faintly indicated on the 3rd to 6th in the ♂ (more strongly so in the ♀). 9th and 10th segments more depressed, and somewhat widened in the ♂; 10th segment in the ♂ slightly broader than long; sides slightly dilated and rounded; rather more than the basal half of its upper surface slightly elevated, on which portion are three raised sinuate parallel keels, the median separated from the outer by a deep cavity on either side of it; beyond this portion there is a depression, but the apical border is raised, shining and blackish, with a faint central keel, the margin being nearly straight.

Superior appendages in the ♂ short (5½ mm.) and broad, brown, flattened and foliaceous, their apices upturned if viewed laterally; each is narrow at its base, but gradually expands, so that it is widest and sub-truncate at the apex; the inner

portion is piceous and is limited by an elevated blunt ridge, but before the apex this inner portion has a deep *grooved* excision, yellow within, each edge of which ends in a broad tooth directed inwardly and upwardly, whereof the upper is shorter than the lower; inwardly below the lower of these teeth is a very deep excision, followed more inwardly by a long and strong acute tooth, slightly curved and directed inward and downward, with small tubercles on its inner edge. (Thus these appendages are trifid at the apex inwardly if viewed from above, but only bifid if viewed from beneath, the shorter of the two outer teeth not then being visible; the whole arrangement is exceedingly complex). Inferior appendage one-half shorter, slightly longer than broad, and slightly narrower at the apex, which is shallowly excised, with upturned angles if viewed laterally. In the ♀ the appendages are short (5 mm.), long-oval, flattened, obtuse, brown plates, with a raised central longitudinal keel extending from base to apex. Valvules scarcely exceeding the 9th segment, ending in short, curved, cylindrical appendages, each of which has a bristle-like second joint.

Habitat: North California (*Walsingham*), and Guatemala.

Several examples were captured by Lord Walsingham, and the description has been made from a pair which have long borne the above name in my collection, but the species has never been described. A ♂ from Guatemala has been still longer in my collection; it is mutilated (wanting the apical half of the abdomen), but agrees entirely with the Californian ♂, excepting that there are only 16 antecubitals in the anterior wings (10 postcubitals); the size is the same.

This very fine insect agrees somewhat with the American *A. Junius* and *amazili* in the design of the top of the front, but there all resemblance ceases, its excessively long slender abdomen, and very peculiar anal parts in the ♂ (which have no parallel), being especially characteristic.

N.B.—Hagen, in his "Synopsis of the *Odonata* of America" (Proc. Bost. Soc. Nat. Hist., 1875), indicates an *A. validus* from San Diego, California. This I strongly suspect of being identical with *A. Walsinghami*, but no description has ever been published.

ANAX RUTHERFORDI, *n. sp.*

I possess two males of a reddish-brown *Anax* from Sierra Leone (*Rutherford*) so similar to *A. speratus*, Hag. (Verh. z.-b. Ges. Wien, 1867, p. 46), from the Cape of Good Hope, that I was at first disposed to identify them therewith, according to the description of the latter; but there are certain discrepancies which induce me to retain my specimens as distinct, and I propose for them the above name. It appears to me that a tabular view of the discrepant points will suffice, and in giving this I retain Hagen's original words.

A. speratus.

Unterlippe, Oberlippe, und Rhinarium schwarz.

Kopf hinten schwarz.

Obere Appendices. Die obere Fläche durchsetzt ein gewulsteter breiter Mittelkeil, der sich gleich an der Basis vom Aussenrande ablöst, und schräge gegen die Spitze geht. An seinem Ende am Innenrande im breitesten Theile des Ausschnittes vor der Spitze endet er seitlich in einen kleinen scharf nach innen gebogenen Hakenzahn.

Unterer Appendix kurz vor der Spitze etwas eingezogen.

Schenkel röthlich mit schwarzer Spitze.

Geäder bräunlich.

Pterostigma gelbbraun.

Membranula schwarz mit weisser Basis.

18 Antecubitales.

Hab.: Cap der guten Hoffnung.

A. Rutherfordi.

Front and mouth parts (excepting the black tips of the mandibles) uniformly pale yellowish.

Back of head brownish-yellow.

Superior appendages. The keel of the upper surface ends at the extreme portion of the dilated apex, and there forms a small, nearly obsolete, tooth; there is no tooth in the excision of the inner margin in the place indicated.

Inferior appendage gradually narrowing from base to apex.

Femora entirely red.

Neuration reddish-brown up to the nodus, merging into black beyond the nodus.

Pterostigma dark brown.

Membranule grey, whitish at the base.

20 antecubital nervules.

Hab.: Sierra Leone.

In size, general coloration, and other points, *A. Rutherfordi* quite agrees with the description of *speratus*, but it appears to me impossible to believe that long immersion in alcohol could so have changed the coloration of the front as described for *speratus*, and the structure of the appendages appears to be also different, although the general peculiar plan is the same in both. Some points compared in the above table are of slight importance; the coloration of the face and the discrepancies in anal structure are the principal.

N.B.—Notes by the late Mr. Rutherford on the living insect say: "Head coffee-brown. Eyes blue. Thorax: front brown, sides testaceous, beneath paler. Abdomen: ridge and margins of joints blackish-brown, otherwise light brown, shining. Taken in a marsh at Sierra Leone."

ANAX LONGIPES, Hagen. In the Ent. Mo. Mag., x, pp. 227, 228 (March, 1874), I published some notes on a male *Anax* in the collection

of the Royal Dublin Society (now Science and Art Museum, Dublin), which I was then inclined to refer to *A. longipes*, described from a ♀ in the Zürich Museum from Georgia (Abbot). Through the kindness of A. G. More, Esq., F.L.S., Curator of the Museum, I have been able to again examine this insect. I find one serious error in my original notes (p. 228); the length of the posterior femora is there given as "19 mm.," it should have been "14 mm." The other measurements and notes agree. I omitted to notice the membranule; it is *entirely yellowish-cinereous*, with no indication of having originally been particoloured. The top of the front is utterly without markings, and concolorous with the face. Upon re-comparing Hagen's detailed description of the ♀ (Verh. z.-b. Wien, 1867) I note the following special discrepancies not previously alluded to: the neuration is said to be black, here the nervures are mostly pitchy-brown and the network reddish; the membranule is said to be black with white base, here it is uniformly pale as above stated; the markings on the abdomen there noticed are here absent, or have become obsolescent. Therefore, I now do not feel quite confident as to the identity of this example with *A. longipes*, which latter should rest on the authority of the ♀ in the Zürich Museum (which I have not seen). I thought it advisable to compare the Dublin mutilated ♂ with a ♂ of *A. Junius* of the same expanse of wings. Putting on one side the obvious discrepancies in the design of the top of the front, &c., I find structural differences of importance: in *Junius* the top of the front is narrower and more produced; the occiput is more extended between the eyes (hence the eyes are less contiguous); the posterior legs are perceptibly shorter; the abdomen (to the end of the 6th segment) is shorter; in the Dublin insect the transverse supplementary median suture on the 2nd segment is interrupted in the middle (as is stated by Hagen for *longipes*), and the space between is filled-in by a somewhat triangular coarsely-granulose plate (in *Junius* this suture is not interrupted, but is strongly angulose in the middle). If, therefore, this Dublin example be not *longipes* (and there are reasons why it should not be so), I do not know what it is. I have shown that other Dragon-flies in the Dublin collection *apparently* came from Abbot, but no record exists to that effect.

ANAX TRISTIS, Hag. (Verh. z.-b. Ges. Wien, 1867, p. 35), and A. GOLIATH, De Selys (Rev. et Mag. d. Zool., 1872, p. 178). I incline to the opinion that these represent ♀ and ♂ respectively of one species. So far as I am aware, Hagen has only seen the ♀, and De Selys and

I have only seen the ♂. Hagen's ♀ (*tristis*) was from Guinea, De Selys' ♂ (*Goliath*) from Madagascar: I have three ♂, one from Abyssinia, one from "West Africa," and one from Jellah Caffee (West Africa), indicating a very wide African distribution (such a powerful insect as this must be *very* difficult to capture). My three ♂ agree specifically, and also with the description of the type from Madagascar (excepting unimportant *slight* differences in size, &c.), but that from Jellah Caffee is evidently immature, having the brown margining of the membranule in the posterior wings only faintly indicated, and the large yellowish-brown space near the middle of the wings is undeveloped; nevertheless, it is only this immature specimen that shows what is no doubt the natural green colour of the body (which has become much changed in the others). The labium (as well as the labrum) is bordered with black as is indicated by Hagen, but not noticed by De Selys. The length of the abdomen given for *tristis* is much less than that given for *Goliath*, and than in my specimens (82—87 mm.), but this is a usual condition in *Anax*. Most other points agree sufficiently, and I think the only discrepancies are due to sex and change of colour through desiccation. This is one of the largest and most powerful Dragon-flies in existence.

Lewisham, London :

October, 1883.

The butterflies of Cambridge.—The following is a list of the *Rhopalocera* I have noticed or captured here. I say noticed, as I am always loath to exterminate rare or uncommon insects, and, as a rule, let a butterfly or moth of that description enjoy its liberty when I have satisfied myself as to its identity. By Cambridge, I mean the immediate neighbourhood of the town itself. I have frequently seen insects reported as having been taken here that have really been captured at places ten or fifteen miles away. I think such loose description should be avoided, or we may for ever despair of seeing the insect fauna of Great Britain correctly mapped out. *Argynnis Aglaia*, *Euphrosyne*, *Selene*; *Vanessa urtica*, exceedingly abundant this year, *polychloros*, *Io*, very abundant this year; *Pyrameis Atalanta*, abundant, *cardui*; *Apatura Iris* (one); *Melanargia Galathea* (one); *Satyrus Semele*, not common; *Epinephela Janira*, *Tithonus*, abundant, *Hyperanthus*; *Canonympha Pamphilus*, abundant; *Lycæna Ægon*, *Icarus*, abundant, *Corydon*; *Colias Edusa* (one); *Rhodocera rhamnii*; *Papilio Machaon*; *Anthocharis cardamines*; *Pieris napi*, *rapæ*, exceedingly abundant, *brassicæ*, exceedingly abundant; *Hesperia malvæ*, *Sylvanus*.—ALBERT H. WATERS, Mill Road, Cambridge: October 8th, 1883.

NOTES ON BRITISH *TORTRICES*.

BY CHAS. G. BARRETT.

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(Continued from Vol. xix, page 136).

Tortrix icterana.—Larva three-quarters of an inch in length; cylindrical, active. Colour smoky-black, with the spots pure white, large, and prominent; head and both plates jet black, collar of second segment white. These larvæ were sent by Mr. Dunsmore, formerly of Paisley, and fed on *Centaurea nigra*, in the middle of June, emerging in July.

The larva of *paleana*, Hb. (*flavana*, H.)—of which, *icterana*, Fröl., is made by Wocke a variety—is said by Zeller to be “dull black, with the incisions of the segments paler, with *deep black raised dots*.”

Tortrix viburnana, Schiff.—Larva cylindrical, extremely active. When young, pale grey or dark olive-green, changing to pale olive-green or greenish-black, and having a paler or yellowish line above the legs. Spots distinct, white, with white hairs; head light brown with two triangular black spots behind; dorsal plate very pale brown, edged at the sides with black, and with a triangle of black dots in the middle; anal plate pale brown edged with black. Feeding at the end of May and early in June on *Vaccinium myrtillus*, *Erica cinerea*, and other plants on heaths. Pupa black, in a white silken cocoon loosely made among heath-twigs.

Wilkinson describes the larva as “white, with black spots”—a remarkable looking larva apparently!! Zeller’s description agrees very nearly with mine. He gives as food-plants, “*Viburnum*, *Vaccinium*, *Andromeda*, and *Ledum palustre*.”

Tortrix viridana, L.—Larva not very active, plump, and tapering behind. Colour, pale green, or pea-green, with the spots distinct and black; head and legs shining black; dorsal plate green or grey, with a white collar and black dots behind; anal plate green or pale yellowish. A far too well known larva, feeding generally on oak, but sometimes on maple, rolling the leaves into cylinders; Hofmann says also on willow and *Sorbus*, and that there is a brown spot on the eighth segment. This is not always visible.

Tortrix Forsterana, Fab.—Young larvæ were found on January 15th feeding between united leaves of ivy (*Hedera helix*), gnawing away the surfaces of both leaves, but leaving the external skin untouched, apparently indifferent to severe frost, from which they were

doubtless protected by a habitation of white silk between the leaves. These young larvæ were of a dull yellowish-green, greyer on the back, with a visible, internal, broad, green dorsal vessel, interrupted between the segments; spots of the body-colour, but shining, and having distinct hairs; head black, with light brown jaws; dorsal plate blackish-brown; anal plate hardly visible, yellowish; anal prolegs extended, yellowish.

In June, full-grown, and nearly one inch long, plump, not very active, nearly cylindrical, dirty pale green, greyer on the back, spots shining green, indistinct—or, dull whitish, with the whole dorsal region slate-grey, and the spots whitish. Head black, with the eyes brown; dorsal plate pale yellowish-brown with two large black spots near the posterior corners; anal plate yellowish or grey, with two black spots. Feeding on many plants, generally those with firm thick leaves. Pupa blackish, in a rolled leaf. Zeller's description of the larva is very brief, but agrees with the above as far as it goes.

Tortrix heparana, Schiff.—Larva cylindrical, active, bright pea-green, with slightly darker dorsal line, and sometimes bluish-green sub-dorsal lines; under-parts pale green; spots invisible; head variable, pale green, pale yellowish, or very light brown, and when full-fed, dotted behind with black, plates green; the dorsal having two black dots behind. In June, on elm, sallow, blackthorn, dewberry, &c., drawing leaves together. Pupa blackish, in the larval habitation.

Zeller says of this larva: "light green, tinged on the back with darker or lighter grey, with *dirty white* raised dots. Pupa slender, brown, black in front."

Tortrix ribeana, H.—Young larva active, slender, cylindrical, pale green, or pale yellow, with broad, dark green, internal dorsal vessel; head yellowish-brown, with four wedge-shaped black spots on the hinder edge; dorsal plate yellow, with a broad, black, hind margin; anal plate yellow, feet black. When older, pale green, with straight, deep green, dorsal line, and the divisions of the segments very pale; sides paler green; spots shining; head very light green, with the wedge-shaped spots smaller, but some additional spots laterally of a dark brown; plates green. When full-grown the head seems to lose the spots and become green. This variable larva has been repeatedly described, and Zeller mentions small black spots. In feeds in June on all sorts of trees, and becomes a brown pupa in the rolled or drawn-together leaf.

Tortrix sorbiana, H.—I have repeatedly attempted to rear a larva which, from its large size, must be that of *sorbiana*, but with the invariable result of obtaining a bunch of ichneumon cocoons. This larva measures one and one-third inch, and is very active and stout—thickest in the middle—with swollen segments. Colour, dark olive-green, tinged on the back with smoky-black, spots white with white hairs; head flattened, black; dorsal plate light olive-brown, spotted with blackish, and divided down the middle, and having a white collar; anal plate greenish; feet black. Rolling up leaves of oak in the first half of June.

Zeller says: “dark grey or bluish-grey, with white dots, head glossy black, neck brown, pupa black-brown.”

Tortrix costana, Sch.—Larva not very active, cylindrical, but rather tapering at both extremities, dorsal region of a dark, smoky, olive-green colour, below the spiracles greenish-white, spots distinct, whitish, with short hairs; head and dorsal plate black; anal plate greenish-grey. This larva was found on a *Centaurea* in the garden, but it is also found, not commonly, in the neighbouring marshes in June.

The pupa is blackish, enclosed in a white loose cocoon.

This larva (evidently, when younger) is described by Moritz as grass-green, with darker internal dorsal vessel; head yellow-brown, dotted with darker brown; dorsal plate with a brown spot on each side.

Tortrix Podana, Scop.—Young larva active, cylindrical, pale yellowish; head and plates black; anal plate very small. Full-grown larva nine or ten lines in length, stout, but rather attenuated at anal extremity, yellowish-green with a tinge of pea-green on the hinder part of each segment, spots invisible, hairs rather long; head shining brown, with darker jaws; dorsal plate black, with a white collar; anal plate green. April to June.

According to Tischer, it is “glossy green-grey, with raised spots of the same colour, having black central dots; head and anterior feet black, and a little black shield above the anal feet; dorsal plate black-brown, suffused with pale brown in front.”

Wilkinson's description differs from both the above in part, and in part agrees with both, demonstrating the variability of the species.

Tischer says that the pupa is brown, with beautiful grass-green wing-sheaths. This I have not observed.

Tortrix xylosteana, L.—When young the larva is slender, and

slightly flattened, with segments deeply divided; it is rather pugnacious, discharging a reddish fluid from the mouth, with a threatening action when touched. Colour pale slate-colour, with black spots on the 3rd and 4th segments, and faintly whitish spots on the segments behind these. When full grown, it is plump, tapering to each extremity, of a whitish-grey; sometimes tinged with bluish-green, head and plates shining black; the dorsal plate with a white collar, and sometimes edged with white behind; legs black, claspers pale greenish, dotted with black. Rolling up leaves of oak, elm, and other trees. June.

Pupa dark brown, in the rolled leaves.

Zeller says of the larva: "blue-grey above, with four pale spots on each segment, pale grey beneath, head, dorsal and anal plates black."

Pembroke: 17th August, 1883.

DESCRIPTIONS OF TWO NEW SPECIES OF BRITISH ACULEATE
HYMENOPTERA.

BY EDWARD SAUNDERS, F.L.S.

The two species which I am about to describe, viz., *Pompilus unguicularis*, Thoms., and *Tachytes lativalvis*, Thoms., will probably be found to exist in many localities when looked for, as they bear such a close general resemblance to other allied species, that they have probably been hitherto confounded with them in this country. In *Pompilus* especially, the general resemblance which the small red-bodied species bear to one another is most perplexing, and yet the structural characters will be found to be well defined, and can be relied on with safety when once realized. The following short description will give the chief characteristics of the new species.

POMPILUS UNGUICULARIS, Thoms., Opusc. Ent., p. 221; Hym. Scand., iii, p. 194.

Like all the other small red-bodied species in colour; metathorax not pilose; prothorax sharply and angulately emarginate posteriorly; third submarginal cell sub-triangular; anterior tarsi with long spines in the ♀, posterior tibiae simple in the ♂; ventral segments in the ♂ not longitudinally impressed, apical dorsal valve of the ♀ finely pilose, clypeus in the ♀ with its anterior margin somewhat thickened, and with a row of stiff bristles above it; apical ventral valve in the ♂ flat, with a distinct central carina widening towards the base, and destitute of a pendant spine or spine-like apical hairs. The spines between the claws of the tarsi in the ♀ are very long and curved, considerably passing the apex of the pulvillus, posterior-wings with the cubital furcature situated some distance beyond the apex of the anal cell.

Hab. : Hayling Island, Deal, Chobham.

Sir Sidney Saunders possesses a ♀ without note of locality. In the long unguicular spines the ♀ of this species resembles *chalybeatus*, but the finely pilose dorsal valve of the 6th abdominal segment, the row of many bristles above the margin of the clypeus, and the position of the cubital furcature of the hind-wing will distinguish it at once.

TACHYTES LATIVALVIS, Thoms., Opusc. Ent., p. 242.

♂. Black, punctured, abdomen with the base red, face densely clothed with brilliant golden pubescence.

This species, of which I have only at present seen the ♂, is very closely allied to our common species, *pectinipes*, but may be distinguished in the ♂ by having the eyes more closely approximating on the vertex, by having the face, right up to the ocelli, densely clothed with bright, almost orange-gold pubescence, the meso-thorax more strongly punctured, and more or less clothed at the sides with very short golden hairs, and the anterior femora and tibiæ pale in front. It is also a rather larger insect than *pectinipes*. Thomson says that the ♀ may be easily known by the much broader dorsal valve of the 6th abdominal segment, which is hardly one-half longer than the width of its base, and by the unequal claws of the anterior-legs.

Hab. : Sandhills, Deal: August, 1882.

Lloyd's, E.C. : September, 1883.

ON *HYPONOMEUTA ROSELLUS*, A GREGARIOUS "ERMINE"
WHICH FREQUENTS THE COMMON WILLOW (*SALIX ALBA*).

BY H. T. STANTON, F.R.S.

This insect, which, in the perfect state, might readily be mistaken for the common *H. padellus* of our hawthorn-hedges, is distinguished at once in the larva state by its food: *Salix alba* (the common willow).

Its general distribution throughout Germany had long been known to me, but of late my attention has been drawn to its occurrence in various localities in Holland. The geographical position of the Low Countries, our nearest neighbour on the eastern coast, between the latitudes of London and Hull, seems to render it extremely probable that any *Micros*, which are widely scattered about Holland, should also occur with us.

In June, 1829, Heer Ver-Huell noticed that many of the willow-trees near Rotterdam were disfigured by a great many webs of some small gregarious larvæ; these larvæ were full-fed early in July, and the moths began to appear on the 23rd of that month. This notice by Ver-Huell appears in the 5th volume of Sepp's work, p. 124.

In the 1st volume of the "Bouwstoffen voor eene Fauna van

Nederland," p. 123, is a "Bijdrage tot de Soortkennis der Hyponomeutæ," by H. W. De Graaf, here, at p. 132, the author mentions that he had in that year (1852) found the nests of the larvæ of *H. rorellus* on many willow-trees in the neighbourhood of Woerden during the month of June, when the larvæ were nearly full-grown.

In the third volume of the "Bouwstoffen," p. 221 (the article appeared in 1864), De Graaf informs us that in 1853, when riding along the road by Gouda, near Rotterdam, he noticed that the willow-trees along the road-side had many of the webs of these larvæ on them; he afterwards also noticed them near Leyden. He mentions as other localities where the insect had been observed, Amsterdam, and Gontum, in Friesland.

P. C. T. Snellen's great work on the *Micro-Lepidoptera* of the Netherlands (De Vlinders van Nederland, Microlepidoptera, 8vo, pp. 1196) appeared last year, and we there, p. 508, find mentioned two additional localities: the late van Medenbach de Booy having observed the insect in Gelderland, and van den Brandt had met with it at Venlo, in Limburg.

A point of interest in the habits of the insect is at present not clear, and it would be very desirable to ascertain which of the observations recorded is the correct one.

Zeller, in the *Isis*, 1844, p. 219, says that the cocoon of the pupa is slight and transparent, like that of *variabilis* (our *padella*), but Ver-Huell says that the larvæ make no separate cocoons, and De Graaf says even more distinctly that the pupæ hang naked in the main larval web; if so, it would show an affinity in habit to *Scythropia cratægella*, but I confess I should like to have further precise information on this subject.

There are, no doubt, many entomologists amongst us, who, though probably indifferent as to adding a species to their collections, would still find a pleasure in proving the erroneous nature of some observation recorded by a previous writer, and here they are certain to have that pleasure, as the pupa cannot *both* be naked and enclosed in a slight cocoon, so that there must be error somewhere.

As noticed at the commencement of this article, the perfect insect can hardly be distinguished from many forms of *H. padellus*, though the more distinctly white costa on the *under-side* of the anterior-wings is indicated as a good character.

Mountsfield, Lewisham:

August 17th, 1883.

A NEW *PHYLLODES* FROM CEYLON.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

In a collection of *Lepidoptera*, from which a selection was recently purchased for the Museum, I found a single example of the interesting genus *Phyllodes*, which, undoubtedly, is distinct from its nearest congener *P. consobrina*, of Silhet; the differences are as follows:—

PHYLLODES MALIGERA, *sp. n.*

Primaries of a uniform pale olive-brown, the areas which are shining slaty-grey in *P. consobrina* being sub-opaline and sericeous, but not distinctly grey; the sigmoidal marking (on the discocellulars of primaries) less angulated and broader at its inferior extremity, so as more nearly to approach that of *P. roscigera*; secondaries with the rose-red patch longer than broad, instead of broader than long, the white spots slightly smaller than in *P. consobrina*. Expanse of wings, 132 mm.

Ceylon (*Thwaites*).

The smallest examples of *P. consobrina* measure about 140 mm. in expanse: this Ceylon species will stand between it and *P. roscigera*.

The pupa, also in the collection, is 44 mm. in length, cylindrical, with the head slightly prominent, and the caudal extremity longitudinally corrugated; the colouring is dull metallic-bronze, partly encircled behind the thorax and above the wing-coverings (on the dorsal surface), and entirely encircled beyond the wing-coverings, by shining metallic-bronze hoops; in front of these shining zones the segments are spotted with patches of impressed rounded black spots; the head, thorax, leg-, and wing-coverings are rugose, the last-mentioned being most finely so, and the leg-coverings most coarsely; the back of the abdominal segments, when drawn out, is smooth and reddish immediately behind the metallic zones; the tail is hooked into a small web of sandy-testaceous silk.

The chrysalis of this species is one of the most singularly beautiful, and almost artificial-looking, pupæ that I have seen.

British Museum: *October*, 1883.

ON THREE NEW SPECIES OF JAPAN *EROTYLIDÆ*, AND NOTES OF OTHERS.

BY GEORGE LEWIS, F.L.S.

ENCAUSTES PRÆNOBILIS, *n. sp.*

Nigra, nitida, thorace supra rufa, margine maculisque decem nigris. Elytris subtiliter punctato-striatis, interstitiis tenuissime alutaceis,

maculi parva humerali, singulis cum fasciis transversis subapicalibus rufis. Long. 16—36 mill.

Black, shining; head coarsely and rather unevenly punctured, with a smooth irregular disc between the eyes; thorax with lateral margins raised, and so continuing round both angles, and then gradually smoothing down in the medial region, punctured like the head at the sides, but on the disc the punctures become almost obsolete; above red, with the margin and ten spots black, three basal, three frontal, and two lateral confluent with margin, two discoidal and isolated. Elytra finely punctate-striate, interstices very finely wrinkled, humeral angle raised and red, the sub-apical fascia is small, with an outer and sutural margin of equal breadth, black. The abdomen is sparingly punctured. The ♂ has a tooth or process on the anterior margin of the fore-tibia.

The red markings of the elytra are almost identical with those in *cruentata*, Macleay, while the spots on the thorax are less confluent, and the thoracic margins more sinuate and raised.

This species is fairly common in all the islands where there are beeches in the forests, and they are to be seen in warm weather crawling on large *Boleti*, often twenty feet overhead. Out of forty examples the most measure 27 to 31 mill., extreme sizes being as given above.

MEGALODACNE BELLULA, n. sp.

Nigra, nitidissima, capite thoraceque sparse, elytris seriatim, punctatis; interstitiis obsoletissime punctulatis; transversim bifasciatis, annulo humerali integro, interne ramoso. Long. 13—16 mill.

Black, shining; head and thorax with scattered punctures. On the head two punctures are large at the base, and small and even on the forehead. The canthus of the eye is well marked above. The thorax has a large cluster of punctures formed in a fovea at the base, and then extending in a broken way to a second cluster in a depression behind the eye. The lateral margin is elevated and rather thick. Elytra punctate-striate, with a humeral fascia posteriorly tridentate, and a black spot quite isolated in its centre. The fascia nearly touches the base of the elytra for about two-thirds of its breadth; on the outer edge the elytral emargination is black. At the suture, it leaves a black margin equal to about the breadth of two striae and two interstices. The sub-apical fascia has anteriorly two obscure outer denticulations, then three well-marked, and posteriorly three distinct.

The ♂ is distinguished by dilated tarsi, and two arch-shaped depressions on the last segment of the abdomen, with the space between them raised.

I sent specimens to Herr E. Reitter, who informs me this is not his *flavosignatus* from Siberia. I obtained plenty of examples in the elevated beech-forests of all the islands in May and June.

EPISCAPHA PERFORATA, n. sp.

Nigra, sat nitida, capite thoraceque fortius punctatis, scutello rotundato, laevi. Elytris seriaticim punctatis, interstitiis sub rugoso-punctatis, fasciis E. Fortunei simillimis. Long. 6—7 mill.

Black, rather shining, head and thorax very strongly and evenly punctured, the latter with a smooth transverse space before the scutellum; scutellum round and smooth, elytra punctate-striate, with punctures in rows down the interstices, the whole surface of which appears finely rugose, but under the microscope this rugosity is seen to be owing to exceedingly fine punctures.

This species is near *cordata*, Gorham, and its small size, and round scutellum, separate it from any other Japan species. I obtained only two examples: Oyayama and Yuyama, in Higo, are the localities.

Episcapha taishoensis, Lewis. — In addition to the characters given before, a longer series enables me to distinguish it from *Gorhami*, its nearest ally, by the broader and more transverse head, and by a remarkable angulated projection in the canthus of the eye behind the antennæ, which is seen easily from above. I obtained it in South Yezo.

Episcapha Gorhami, Lewis, is exceedingly abundant in all the forests.

Episcapha Fortunei, Crotch, is local, and attached to the fungi growing solely on fir; all the other species avoid conifers, and occur on deciduous trees.

Episcapha hamata, Lewis, I did not meet with; the type was taken by Mr. Maries, and is still unique in my collection. This and the preceding are pubescent.

39, High Street, Wimbledon:

September 25th, 1883.

Variety of Hepialus hectus.—I have met with a lovely variety of *hectus* here this season. The under-wings have, on each of the marginal spaces between the veins, a broad streak of gold, nearly the whole width of the space, softened into the ground-colour at the edges. The upper-wing has much more of the gold markings than usual, and altogether it is a very brilliant form. There seems to be a variety of the female to correspond; it has the upper-wings barred with rather ill-defined silvery fasciæ, giving it a very different appearance from the ordinary form. It is certainly rare, and apparently very restricted in locality. *Velleda* is rather abundant here, also some forms of it very similar to those from Shetland.—J. SANG, 181, Horninglow Street, Burton-on-Trent: October 19th, 1883.

Crambus ramosellus: change of nomenclature.—The name *ramosellus*, applied by Zeller in his Monograph to a species of *Crambus* from Sicily, cannot stand, as there is another *Crambus ramosellus*, from New Zealand, described by Doubleday some twenty years previously. Both species are truly referable to *Crambus*; and as Zeller's Sicilian species has not, so far as I am aware, been described under any other name, it becomes necessary to rename it. I called the attention of Prof. Zeller to the case in a letter written to him shortly before his death, being desirous that he should himself make the requisite alteration, but he had not replied to me, nor am I aware that he had suggested any name. I therefore propose the name of *Cr. epineurus* for the Sicilian species.—E. MEYRICK, Ramsbury, Hungerford: October 6th, 1883.

Panorpa germanica, var. *borealis* (Leach), Steph.—Towards the end of last July I captured at Tongue, Sutherlandshire, examples of a *Panorpa*, which differed from anything with which I was acquainted. They are, on an average, smaller than *P. germanica*, and the wings are without dark spots, save that in the females there is sometimes a small pterostigmatic spot, and a few minute dark dots. I submitted specimens to Mr. McLachlan, who informed me that it was described as *P. borealis*, by Stephens, and that, in his opinion, it was a variety of *P. germanica*, L. It is interesting to note that the type-form of *P. germanica* does not occur in the district, nor does any other species of the genus, so far as I could discover by diligent search during nine weeks' sojourn.

If any Neuropterist requires specimens, I will be happy to supply him with them.—J. J. KING, 207, Sauchiehall Street, Glasgow: October 8th, 1883.

[*P. borealis* was described by Stephens in the "Illustrations," Mandibulata, vi, p. 53 (1835). With regard to the wings, he says, "hyaline, with the nervures and a spot on the costa towards the apex brownish," adding, "this may probably be a variety of the preceding species (*apicalis*). Found in the neighbourhood of Edinburgh." In Curtis' "British Entomology," pl. 696 (dated 1838), we find "*borealis*, Leach., MSS.; wings hyaline, stigma and nervures fuscous. In the British Museum: it was found by Dr. Leach, near Edinburgh." Stephens does not allude to Leach., but there can be no doubt that both notices refer to the same insect. The locality given, viz., "near Edinburgh," may, or may not, be precise; half a century ago entomologists did not attach so much importance to these matters as they now do.

It appears to me impossible to discover any structural differences between "*borealis*" and the ordinary form of *germanica* (and in *Panorpa*, structural characters are of primary value). But Mr. King's observations are of real importance, because they prove that at a point on the extreme north of the mainland of Scotland, this form "*borealis*" alone occurs, and I believe he found nearly 100 specimens of it. The form is well worthy of retaining its name, as a variety. Presumably it is the same form that Wallengren (Skand. Neuropt., p. 71) indicates as var. A of *germanica*, with the remark, "Vingarne nästan utan alla fläckar."

P. apicalis, Steph. (referred to above), is a form of *germanica*, in which the markings of the wings are absent, excepting an apical dark border; this is found (rarely) with the typical form, irrespective of locality.—R. MCLACHLAN.]

Elipsocus cyanops, Rostock, in Scotland.—On June 26th, 1880, I took a few specimens of this species at Kilmun.—Id.

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Occurrence of *Cacilius picus*, Kolbe, in Britain.—On the 25th July, 1881, I had a day's collecting at Box Hill, on which occasion I captured three examples of a *Cacilius*, which proves to belong to the above-named species, described by Herr Kolbe in 1882.—Id.

[Mr. King kindly presented one of these specimens to me; the identification of the species has been confirmed by Herr Kolbe. It belongs to the difficult "obsoletus group" (cf. Ent. Mo. Mag., xix, p. 183), and is to be separated from the (apparently) three or four other species of the group known as British, by its dark colour, combined with some structural characters to which Kolbe directs attention. The original examples were from Saxony; I believe it also occurs in Finland.—B. McLAORLAN.]

Occurrence of *Æcetis furva*, Ramb., and other Trichoptera in Co. Monaghan, Ireland.—I recently received from Miss A. B. Freeland, of Uddingston, a number of Trichoptera collected in the neighbourhood of Glaslough, Co. Monaghan, Ireland, during July last. Amongst these are three ♂ examples of *Æcetis furva*, Ramb., an insect that has as yet been rarely taken in these islands, the only recorded localities, so far as I know, being Norfolk, near London, and the English Lake district.

As the locality is somewhat out of the way, it may be well to mention the other species included in the collection. These are: *Phryanea striata*, L. (? the single specimen is mutilated), *P. obsoleta*, McL., *Limnophilus marmoratus*, Curt., *Leptocerus aterrimus*, Steph., *L. cinereus*, Curt., *Mystacides longicornis*, L., *Polycentropus flavomaculatus*, Piot., *P. multiguttatus*, Curt., *Holocentropus picicornis*, Steph., *Cyrnus trimaculatus*, Curt., *Ecnomus tenellus*, Ramb., *Tinodes Wæneri*, L., and *Lype phæopa*, Steph.—KENNETH J. MORTON, Carlisle, N. B.: October 1st, 1883.

Captures of Coleoptera near Pitlochry, Perthshire.—Having collected beetles from the beginning of April to the end of August, within a radius of five miles of Pitlochry, I send you a list of the rarer species I took. The majority of the species were named by the Rev. W. W. Fowler, M.A. *Bembidium stomoides*, one under a stone by river-side; *Hydroporus celatus*, in a small loch, hot sunshine, *monticola*, small loch, *congener*, curling pond, *arcticus*, not uncommon, *nitidus*, small loch; *Sphærites glabratus*, three, one flying, one under a dead rabbit, one on a broken birch; *Tachinus pallipes*, sheep's droppings, *elongatus*, sheep's droppings; *Mycetoporus lucidus*, in fungus, *punctus*, in moss; *Quedius laevigatus*, dead bird; *Philonthus succicola*, dead birds, &c., *scutatus*, dead birds, &c.; *Xantholinus ochraceus*, under bark of decaying Scotch fir; *Geodromicus nigrita*; *Anthobium sorbi*, in flowers; *Trichopteryx seminivens*, sheep's droppings, *volans*, dry refuse in farm-yard; *Omosita depressa*, dead animals; *Ips quadripustulatus*, under bark of Scotch fir; *Corymbites impressus*, on Scotch fir; *Telephorus obcurus*, by beating;

Edemera livida, three, by sweeping; *Rhinomacer attelaboides*, by beating various trees, only three; *Otiorrhynchus septentrionis*, beat from birch, *maurus*, one, under a stone; *Eriirrhinus athiops*, river-side, after a spate; *Trypodendron lineatum*.
—ALFRED BEAUMONT, Low Valleyfield House, Culross, N.B.: October 15th, 1883.

Some garden-visitors in 1883.—Having been kept within doors from the middle of May until the end of June, I am unable to say what sort of insect aristocracy or rabble visited the garden during that period; but on the evening of the 6th July, and for a week after that, there were a great many *Plusia gamma* flying about, and these may have been the remnants of a large invasion or migration, respecting which our friend Barrett is curious (p. 21, *ante*), but this is information of a character too restricted to aid his hypothetical research.

On the 6th July I also saw at one time two *Vanessa cardui*, a butterfly rarely visiting our garden. These "painted ladies" were surely belles of last year; their paint was nearly all worn off, yet in their faded charms they were as lively as if they had just come out in their first season, and they made such a vigorous attack on the old-fashioned, modest Sweet Williams, that these blushed a deeper red,—at least I might well believe they ought to have done so. Not in the least abashed, these *belles dames sans merci* then gaily departed on their tour of flirtation.

On the 10th July a *Macroglossa stellatarum* came suddenly, and paid frantic attention to the geraniums standing close to my chair, giving me good opportunity to see that it was a female newly disclosed, in splendid plumage. This is an insect that I have never seen here before, nor, indeed, have I since had such a beatific vision. To plagiarize Wordsworth:—

"She was a phantom of delight,
When first she gleamed upon my sight;
A lovely apparition, sent
To be a moment's ornament:
A dancing shape, an image gay,
To haunt, to startle, and waylay."

I was but an accidental spectator of the elfin evolutions; none the less was I delighted with the flying visit of a representative of one of the earliest illustrators to me of the poetry of insect-life.

On June 30th a male *Lucanus cervus* swung himself with leisurely flight into the garden, sailed about majestically for some time, and received my congratulations. I had feared, in consequence of not seeing any of his family last year, that the race had become extinct in these parts, by the destruction of trees which continually goes on to make room for builders' "improvements," and so I was happy to find that I had yet one old friend on visiting terms, although he was in the guise of "such small deer."

Speaking generally, all kinds of insects—that is, the ordinary *habitués*—have been scarcer than usual. *Abraxas grossulariata* has been a failure, only two or three individuals having been seen, instead of the multitude generally apparent. *Nematus ribesii* has been very rare. The *Aphides* on the roses were at one time tolerably common, but not harmful. *Schizoneura lanigera* just visible here and there, but not persistent. *Leocanium ribis* ordinarily common on the red currant

(*Ribes rubrum*), I observed for the first time on the gooseberry bushes (*R. grossularia*). *Rhizotrogus solstitialis* kept its time at the end of June, but only in small number. A *Thrips*, which I take to be *Phlaothrips ulmi*, Fab., abounded as larvæ, from September last all through the winter, under the bark of large branches of Acacia cut off four years ago; from the 20th to 30th June most of them had become perfected, some, however, then still remained larvæ.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: 2nd August, 1883.

Obituary.

Professor Oswald Heer died at Lausanne, on the 27th September, in his 75th year. He was born at Nieder Uzwy, Glarus, Switzerland, August 31st, 1809. Intended by his family for the church, his predilection for natural history studies induced him to abandon that idea, and, at a comparatively early age, he became Professor of Botany and Natural History at the Polytechnic University of Zürich, to which institution he remained attached up to his death. Heer's early reputation was made as an entomologist, and from 1834 forwards, he published many works and papers on entomology, chiefly on Swiss insects, and more especially on *Coleoptera*, most of which treated exhaustively on the vertical distribution of species in the Alps. Possibly he is best known (as an entomologist) in this country by his monographic work on the Beetles of Switzerland, which appeared in 1838—41. In this work he did for the *Coleoptera* of that country what Frey has more recently done for the *Lepidoptera*, but, of course, lapse of time has rendered Heer's labours out of date, as compared with Frey's. This monograph appeared in two forms, but that which is best known was styled, "Fauna Coleopterorum helvetica," and extended to over 600 pages.

Latterly, Heer's earlier labours, as an entomologist, have, to some extent, been forgotten, eclipsed by his later devotion to palæontology, of which the first evidence appeared so long ago as 1847, when was published the first part of his memoir on the fossil-insects of the celebrated tertiary formation at Oeningen. It is not necessary for us to detail his palæontological works; suffice it to say that he had long been regarded as the first authority on fossil insects and plants of the tertiary epoch in Europe.

Sometime about 1850, Heer fell into bad health, and visited Madeira and the Canaries. We believe we are correct in stating that his malady developed itself to such an extent as to soon render him a confirmed invalid, incapable of self-locomotion, but his intellect developed to such a degree that all his best palæontological and professional work was carried on while he laboured under the greatest physical disadvantages. His labours received due acknowledgment in this country. In 1871, he was elected one of the fifty Foreign Members of the Linnean Society, and in 1877 he was awarded one of the Royal Medals by the Royal Society.

SOME FURTHER OBSERVATIONS ON THE PARTHENOGENESIS OF
ZARÆA FASCIATA, AND ON THE EMBRYOLOGY OF THAT
 SPECIES AND OF *RUMIA CRATÆGATA*.

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 BY J. A. OSBORNE, M.D.

During the past summer I have continued my observations on *Zaræa fasciata*, and confirmed most of those of which an account was given in this Magazine, in the number for Oct., 1882 (p. 92). Before passing to points of fresher interest, I wish first to mention some facts newly noticed, which modify or extend particular statements in my last paper. And to take them in the order in which they there occur, I have to say, in the first place, that the colour of the cocoon is influenced by the food. The "dark brown (resinous-looking) cocoons" are made by larvæ fed on snowberry leaves alone; whilst those whose sole or chief diet is honeysuckle make cocoons much lighter in colour, pale dirty greenish, which, though they look slighter seem to be not less efficient than the others. When comparing the great difference in size of the full-fed larvæ to that of the larvæ of *Nematus ribesii*, my supposition at the time was, that the smaller larvæ might yield male flies next season. This supposition did not prove correct. I have noticed differences of size in the ratio of about 2:1 in the fresh-laid eggs, in the newly-hatched larvæ and larvæ full-grown, and in the flies themselves, without any difference of sex. The peculiar bands connecting the saw with its back were the subject of some correspondence with a gentleman in Eton, and I think it right now to state that I have not since been able to procure any separation of the saw from its back or sheath, without at the same time bringing away these processes, in the form of little tufts or brushes adherent to the latter. Their connection with the saw itself appears to be extremely slight, and their nature and use I cannot conjecture.

Besides steadying the leaf with the apical spines of the posterior tibiæ when about to insert its ovipositor, the fly further makes use of the hinder angles of the valves (with which it subsequently pinches and closes the orifice), to hold the leaf firm at the very point where the extremity of the saw is to be first introduced. The mine is mostly beneath the upper surface, but instances are not infrequent in which it is found immediately under the lower cuticle.

Last year I was not able to say positively in which end of the egg the head of the embryo develops. As the result of numerous observations I am now in a position to state, that the head of the embryo is found in the upper and the lower pole of the egg with about

equal frequency. Often we meet with two eggs lying together, evidently laid by the same fly with the same orientation, in which the heads of the embryos lie in opposite directions. This is in direct contradiction to the dictum of Leuckart: "Der obere Pol des Eies beherbergt in allen Fällen das Kopfende des Thieres" (Ueber die Micropile, &c., *Müller's Archiv.*, 1855, p. 102). Rare exceptions to the rule occur also, as I have already shown, in the eggs of *Gastrophysa raphani*. The position of the dorsum and venter of the embryo, as pointed out in my former paper, is itself abnormal in these eggs; development commencing on what should be (according to Herold, &c.), the "dorsal" side of the egg, and the dorsum of the embryo facing, and lying along the "ventral" side of the egg, if the orientation of the latter is determined with reference to the parent fly. To this regular abnormality in *Zaræa* I have, however, in last summer's observations, seen 3—or at any rate 2—decided exceptions, in which the dorsum and venter of the embryo occupied the reverse positions in the egg. The bilateral symmetry of this egg is so decided that it is not easy to make any mistake. In one instance I found an egg in the mine, not lying on its side as usual, with its transverse, shortest, diameter, but with its dorso-ventral axis, vertical to the plane of the leaf, and therefore causing much more distension of the mine, but without any other irregularity. A more striking irregularity I shall perhaps best describe in the words of the note made at the time: "June 3rd, I have just opened a marked mine of *Zaræa* in which I suspect something unusual in the position of the embryo. It appeared to be curved round the inner convex side of the egg, with the head and tail meeting or approximating on the marginal or straight side. And so it is; but the incurvation of head and tail is *dorsal*, the venter of the embryo lying along the inner convex side of the egg. The embryo appears to be dead. I have taken it quite out of the mine, and the position of the mandibles and of the thoracic legs leaves no doubt concerning its very unusual position." Unless this position of the embryo can be explained as an exaggeration of what is sometimes met with in a minor degree, viz., a sort of spiral twisting of the larva upon its axis, it would indicate a mode of development the reverse of what was observed in all other cases, in which the doubled-up position of the embryo in the egg is brought about by the *ventral* incurvature and growth forwards (*i.e.*, towards the head) of the posterior extremity. In this connection I may mention that, having obtained some eggs of *Rumia cratægata* (114 from one moth) in June last, I took special notice of the development of the embryo with reference to this point, and to the theory

of Kowalevski mentioned in my former communication. The earliest eggs were laid on or about the 15th June. On the 28th, I noticed the first appearance of the eye-spots, and the first hatching took place on 2nd July. My note on 30th June runs as follows: "The eyespots from their earliest appearance occupy the same position relatively to the sharp end of the polar oval as they do in these advanced embryos (and which is their position up till hatching): consequently the aspect and orientation of the dorsal and ventral surfaces is constantly the same." That is, unless the embryo makes, more than four days before hatching, that revolution in the shell, asserted by Kowalevski for the Lepidopterous embryo in general, and which would necessarily bring its head from the one side of the shell to the other. The presumption, then, would be that the embryo of *B. cratægata* gets into the loop-form by such a ventral incurvature and forward growth of the tail-end as we have seen already in *Zaræa*, and as is described by Huxley in *Astacus*.

From the cocoons made last year by parthenogenetic larvæ (and of which I had 26 remaining over winter), I had this year, in the middle of April and beginning of May, three flies which were all females, and of which the first two (excluded in April), laid eggs abundantly, from which again I bred doubly parthenogenetic larvæ, that yielded me in June some 32 cocoons. Why I had no more than 3 flies from 26 cocoons may have been probably owing to the larvæ perishing in the others from being kept in too dry and warm a situation during winter. In *Nematus ribesii* the parthenogenetically-bred flies being all males, agamic reproduction in the case of that saw-fly is brought to a speedy termination in the second generation. The case is, from what appears so far, very different with *Zaræa*, which may possibly be capable of continuing the species agamically for an indefinite time. This is so much the more likely as the males of this saw-fly appear to be very rare. I have only met with one hitherto, excluded 8th June, out of 181 flies (and nymphs), 173 of which were bred from larvæ beaten out of snowberry in 1882. This male paired with a female much larger than itself immediately afterwards, and I have at present a few cocoons the result of this union.

Ichneumons, apparently of two species, made their appearance as usual, on the average a good deal later than the saw-flies, so that the larvæ of the latter might be grown enough to receive their eggs, a *Zaræa* larva nourishing only one ichneumon by which it is entirely consumed. Besides the Hymenopterous parasites, I found also one Dipterous cocoon, which, however, has not excluded any fly hitherto.

There is just one more circumstance I may mention regarding the *Zaræa* larva, and that is, that at all stages pressure causes it to eject a clear liquid, apparently from the spiracles or that neighbourhood, which appears as a row of clear beads along the side of the larva, and is not, I should say, a mechanical result of the pressure, but a voluntary re-
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signment of it.

Milford, Letterkenny, Ireland :
22nd Oct., 1883.

A PROPOSED ARRANGEMENT OF THE BRITISH *JASSIDÆ*.

BY JAMES EDWARDS.

In the Catalogue of British *Hemiptera* published by the Entomological Society of London, the *Jassidæ* are divided into seven genera. Three of these, namely, *Gnathodus*, Fieb., *Graphocrærus*, Thoms., and *Doratura*, J. Sahlb., are intelligible, but the remainder seem to be capable of some improvement in the definition of the characters to be assigned to each, and the species to be included therein. So far as I can make out, most recent authors have agreed that the genus *Athysanus*, Burm., is chiefly to be distinguished by the suture of the elytra being straight throughout, not, or scarcely, overlapping at the apex, and the appendix to the membrane either entirely wanting or extremely narrow; but of the fifteen species given in the Catalogue above quoted, only eight possess these characters, five of the others having the elytra distinctly overlapping at the apex, and an ample appendix to the membrane, while *nervosus*, Fall., pertains to the genus *Paramesus*, Fieb., and *canescens*, D. and S., I propose to treat as the type of a new genus of equal value with *Graphocrærus*, Thoms. The more important characters of this new genus are as follows:

GLYPTOCEPHALUS, *g. n.*

Broad, parallel-sided. Head, including the eyes, wider than the pronotum. Vertex sub-angularly produced, its length down the centre rather more than twice that of the inner margin of the eye, its disc distinctly but shallowly punctured, the interstices very finely scratched; just within, and running parallel to, the anterior margin is a distinct groove, and beyond this the surface is raised, and strongly rugose, parallel to the anterior margin. Frons extremely finely punctured, with regular rows of coarse punctures running parallel with its upper margin, especially in its upper part. Length of the side margin of the frons below the antennæ a trifle shorter than the clypeus. Loræ each as wide as the clypeus. Pronotum strongly transversely rugose, except near its anterior margin, its sides very short. Elytra (♂)

leaving the apex of abdomen uncovered, not overlapping at the apex, sub-corneous with an irregular, very shallow, punctuation, membrane with an extremely narrow appendix. Wing-nerves as in *Thamnotettis*.

My view of the generic distribution of our British species may be concisely expressed in the following table :

JASSIDÆ.

- 1 (22) Vertex not angular in front.
- 2 (9) „ impressed.
- 3 (8) „ sub-angularly produced.
- 4 (7) „ with one transverse impression.
- 5 (6) Impression straight, reaching from the anterior angle of one eye to that of the other *Doratula*, J. Sahlb.
- 6 (5) Impression parallel with the anterior margin throughout ..
Glyptocephalus, g. n.
- 7 (4) Vertex with three impressions, two (oblique) at the posterior margin, and one (transverse) in front *Graphocerarus*, Thoms.
- 8 (3) Vertex sub-lunate, transversely rugulose in front *Paramesus*, Fieb.
- 9 (2) „ plane or slightly convex, not impressed.
- 10 (19) Elytra overlapping at apex.
- 11 (16) Outer cubital nerve well defined.
- 12 (15) Side margins of pronotum of moderate length, separated from prosternum by a sharp keel.
- 13 (14) Elytra with several irregularly disposed white transverse nerves...
Allygus, Fieb.
- 14 (13) Elytra without irregularly disposed white transverse nerves...
Thamnotettis, Zett.
- 15 (12) Side margins of pronotum extremely short, keel obsolete or wanting ..
Limotettis, J. Sahlb.
- 16 (11) Outer cubital nerve obsolete or wanting.
- 17 (18) First wing-nerve and upper branch of the second separate at their junction with the sub-marginal nerve *Cicadula*, Zett.
- 18 (17) First wing-nerve and upper branch of the second concurrent near the apex, and running into the sub-marginal nerve as one nerve...
Gnathodus, Fieb.
- 19 (10) Elytra not overlapping at apex.
- 20 (21) Side margin of frons below the antennæ nearly straight, as long as, or longer than, the width of the frons between the antennæ...
Stictocoris, Thoms.
- 21 (20) Side margin of frons below the antennæ curved outwards, much shorter than the width of the frons between the antennæ ... *Athysanus*, Burm.
- 22 (1) Vertex angular in front.
- 23 (24) Frons flat, very narrow, at least three times as long as its width between the antennæ *Platymetopius*, Burm.
- 24 (23) Frons convex, not more than twice as long as its width between the antennæ *Deltoccephalus*, Burm.

With regard to the genus *Allygus*, Fieb., it may be remarked that the characters given in Ent. Mo. Mag., xii, p. 170, require amendment,

with reference to the genitalia, because in *commutatus*, Fieb., the genital plates so far from being elongate, are very short, so short in fact as to leave the inner genital processes exposed.

The species to be included in the genera *Thamnotettix*, *Limotettix*, and *Athysanus*, as defined above, will be as follows:—

THAMNOTETTIX: *dilutior*, Kbm., *prasinus*, Fall., *subfuscus*, Fall., *stupidula*, Zett., *striatula*, Fall., *cruentata*, Panz., *torneella*, Zett., *splendidula*, F., *crocea*, H.-S., *attenuata*, Germ.

LIMOTETTIX: *striola*, Fall., *intermedia*, Boh., *nigricornis*, J. Sahlb., *4-notata*, Fab., *virescens*, Fall., *frontalis*, H.-S.

ATHYSANUS: *brevipennis*, Kbm., *griseus*, Zett., *sordidus*, Zett., *russeolus*, Fall., *irroratus*, Scott., *piceus*, Scott., *obsoletus*, Kbm., *plebejus*, Fall., *obscurus*, Kbm., *melanopsis*, Hardy.

Preysleri, H.-S., belongs to a group which differs so much from all the other species that I have thought it better to retain it in Thomson's genus *Stictocoris*, rather than to tack it on to *Athysanus*. I may shortly send a descriptive notice of *T. stupidula* to this Magazine.

Swiss Cottage, Rupert Street, Norwich:

9th November, 1883.

NATURAL HISTORY OF *ZYGÆNA EXULANS*.

BY WILLIAM BUCKLER.

When Dr. F. Buchanan White, in company with Prof. J. W. H. Traill, in July, 1871, discovered this to be a British species located on a hill in Braemar, as related in this Magazine (vol. viii, p. 68), he very kindly sent to the Rev. J. Hellins, and to me, some eggs at the beginning of August following.

The larvæ hatched on August the 8th, and in absence of any knowledge of the nature of their food, were tried with heather and other low plants, but they chose to eat only of *Lotus corniculatus*, and throve on it, moulted once, and fed on again till the 8th of September, when they fixed themselves for hibernation; but in course of the ensuing winter they were unfortunately attacked by mould, and perished one after another, the latest in February, 1872; and I have since learned from Mr. Hellins that his had met with a similar fate.

Naturally enough, as time went on I hoped the full grown larva would eventually be found, and its local food plant ascertained with certainty, in its northern habitat, by some enterprising collector who would perhaps afford me the opportunity of figuring it; although this has not happened from Braemar, yet now, after the lapse of eleven

years, I find myself in possession of sufficient materials for completing what I had, through the kindness of Dr. Buchanan White, so long ago begun.

For most of ~~what follows I have been~~ indebted to the very kind help I have had the pleasure to receive from Mr. George T. Baker, and his friend Dr. Jordan of Edgbaston, both having supplied me with numerous examples of the larva of *exulans*, in different stages of growth, together with their observations of its habits, taken in 1882-3 during their summer visits to the Swiss Alps.

Two series of the larvæ in fours reached me on July 13th, 14th, and a single larva on the 16th; these were forwarded by Dr. Jordan from Zermatt, having been found by him at an altitude of about seven thousand feet, at the Schwarzen See near by, feeding, while nearly buried in the tufts of leaves of *Silene acaulis*, and often quite buried in the fleshy mass of *Cherleria sedoides*, where they seemed to have eaten out their own shape, some weré also seen to be feeding on *Trifolium alpinum*, *Geum montanum*, *Sibbaldia procumbens*, and *Alchemilla alpina*.

Some of these larvæ had spun themselves up, and their cocoons got ruptured, and the half-formed pupæ had fallen out during their journey hither, while others arrived in very perfect and lively condition, from which I secured figures and descriptions; two much smaller than the others fed but very little, and in August, laid up motionless for hibernation; one of these became attacked with mould in September and died, but the smallest of the two slept safely through autumn and winter until the 19th of April, 1883, when it began to crawl about rather feebly in quest of food; it was then supplied with a small spray of *Medicago lupulina* and a leaf of *Rumex acetosa*; next day I could see it had partaken of both, though sparingly; afterwards it ate of *Trifolium repens* and *pratense*, lapsing occasionally into slumber until the end of the month, when it died, probably from the necessity of changing the leaves having disturbed it while waiting to moult; thus, in one state or another, all the above mentioned died off.

This year, in June, the same two friends were in Switzerland together, and while walking over the south side of the Great St. Bernard, where some of the snow had melted (later than usual), they found hundreds of the larvæ of *exulans* feeding in the sunshine on *Silene acaulis* and *Alchemilla alpina*; a great number of them were brought home by Mr. Baker, who most kindly sent to me on 6th of July seven very fine larvæ in perfect condition, besides three that had already spun up in cocoons in boxes before his return, and mentioned

then the apparent liking of the larvæ for water, as he had watched them closely, and seen instances of their approaching water and drinking it, and one larva actually crawling in a tiny pool, as though enjoying its miniature bath in the hot sunshine; this of course led to the experiment of my sprinkling an occasional drop or two of water over the food of four of my larvæ for a few days, but only with disastrous result, as the four water drinkers died from an efflorescence of mould on their coats; the remaining three lived some days longer and fed but sparingly, chiefly on leguminous plants, until each in turn died, the last on the 15th of July.

On 17th of July I bred the moth from one of the three cocoons, one only, a poor specimen and slightly crippled, yet not enough to interfere with its identification, and I hailed its appearance with great satisfaction.

Here I think I may be allowed to mention, that with Mr. Baker several of his larvæ of *exulans* spun their cocoons, but died within them unchanged; while from a few that succeeded in effecting their change to pupæ he only obtained three moths, and all dwarfed, in fact, one of them was scarcely more than half the size of a fine Swiss specimen.

Possibly such poor results, with larvæ having the reputation of being polyphagous, may yet have been from the want of their accustomed alpine plants, or else must be attributed to the great difference of our climate from that of their habitat in Switzerland at so great an altitude, and though this is not more than half as great in Scotland, it should be borne in mind that Braemar is a little more than eleven degrees of latitude farther north, and the habitat of *exulans*, as Dr. Buchanan White has said,* "is probably covered with snow from November to April each season."

The egg of *exulans* is of large size for that of the insect, and of long cylindrical round-ended shape, having a depression bending inward rather irregularly on one side, the shell is very thin and very slightly reticulated all over, in colour ochreous-yellow, changing to orange-ochreous, and finally to dark greenish-slate colour, very shining from the first to last.

When first hatched, the larva is a plump sausage-shaped little creature of yellowish olive-green colour most minutely dotted with black, having a row of sub-dorsal dull orange blotches, a black shining head, the usual warts black, each with a longish rough but pointed black bristle, the skin rather pubescent.

* The Entomologist's Annual for MDCCLXXII, p. 118.

After moulting, the minute dots being not so black, it appears much paler coloured, more of a drab tint showing dark sub-dorsal markings, but as the larva grows, and becomes about three weeks old, it is then dark olive-green on the back, a lighter green on the sides, and has a sub-dorsal row of dark brown tubercles and beneath them a faint stripe of yellowish, the bristly hairs blackish-brown.

Just before it begins to hibernate about the 10th of September, it has grown to a length of nearly two lines, and of very stout proportion, the colour dark olive-green having an interrupted black sub-dorsal stripe, and below this at the end of each segment is a transverse oval spot of orange-yellow, the surface of the skin generally is much covered with little fascicles of black hairs.

In the following spring, after moulting, it soon is of the length of three and a half lines, and its colouring is a little fresher and darker; by the time its length has come to measure from four to five lines the back and sides are very dark green, and so much covered with black bristly hairs radiating from tubercular eminences as to appear blackish-green in comparison with the belly which is olive-greenish-yellow, the dorsal marking is velvety-black, the deep yellow side-spots enlivening the general darkness.

Towards the end of June and beginning of July it has reached its blackest stage, for it is then intensely and beautifully black which gives additional brilliancy by force of contrast to the light greenish-yellow side spots, the head is black and shining, the second segment green and smooth in front, the segmental divisions when stretched out show greenish and glisten a little, but all the rest of the upper surface is thickly covered with black hairs.

The full grown larva is from 7 to 8 lines in length, sometimes more, and nearly 3 in breadth, of elliptical figure, but with the head small and retractile within the second segment, and this also being in part retractile is twice as long as any of the others and tapering in front, the anal segment is slightly tapered and rounded off behind; all the segments are plump and cut extremely deep; the head is black and glossy, with green upper lip edged with black, the antennal papillæ whitish tipped with black, the front retractile half of the second segment is green and naked, the other half and on all the other segments of the body the ground colour of the back and sides is very dark green, along each side is a broken velvety-black stripe interrupted at the end of each segment beyond the second or third by a bright yellow elliptical transverse spot, each segment bears a series of ovate tubercular eminences thickly studded with short black radiating bristles

and a single long and fine hair, these almost or quite hide the green ground of the upper surface of skin, the spiracles are black, the smooth naked belly is of a green, rather less dark than that of the back, the anterior legs are black and shining with light green joints on the outer side and light green inner surface, the ventral and anal legs are of a lighter green than that of the belly and semi-transparent.

The cocoon is about 7 or 8 lines in length, and from $3\frac{1}{2}$ to 4 lines in width, somewhat fusiform, rising convexly in the middle, bluntly rounded off and rather flattened at each end to the surface on which it is spun (generally some rock or stone); it is usually very smooth, though sometimes a few slight longitudinal wrinkles are towards the front or roundest end; it is of a light pearly-greyish tint having more or less of a silvery lustre, and after the moth has escaped is semi-transparent.

The pupa, is from $5\frac{1}{2}$ to $6\frac{1}{2}$ lines long, and sometimes works its way quite out of the cocoon before the moth is disclosed; it is of the usual *Zygæna* form, with long antenna- and leg-cases free nearly their whole length, the shortish wing-covers with nervures in strong relief have their margins prominent from the body, the abdomen tapers just towards the rounded-off tip, and across the back of each ring anteriorly is a narrow ridge thickly set with most minute hooks pointed backward; the colour is blackish-green on the abdomen and all the other parts black, and with rather a dull surface.

Emsworth : October 30th, 1883.

DESCRIPTION OF THE LARVA OF *CRAMBUS INQUINATELLUS*.

BY G. T. PORRITT, F.L.S.

At the end of April last, Mr. W. H. B. Fletcher sent me about two dozen larvæ of a *Crambus* he had found about grass-roots, at Worthing, but the species he did not know. I placed them in a pot of growing grass, where they formed slight silken galleries near the roots on the surface of the soil, in which they lived during the day, and apparently coming out and feeding on the grass stems only at night. During May, I lost sight of them, and judged they had all gone below the soil to pupate. Through June and July, I anxiously awaited the emergence of the imagos, but none appearing, I quite gave them up as all dead, and was, therefore, very agreeably surprised at quite the end of August and early in September, to breed from them a nice and varied series of *C. inquinatellus*.

Length, about three-quarters of an inch, and fairly stout in proportion; head narrower than the second segment, the lobes full and rounded, and both it and the

frontal plate highly polished. Body cylindrical, and tapering a little towards the extremities: there is a slight transverse depression on each segment, and these, together with the deeply cut segmental divisions, give the skin a wrinkled appearance. Tubercles very large and prominent, and are, as well as the whole surface of the body, rather glossy, though not so much so as the head and frontal plate.

The ground-colour varies in different specimens from dull purplish-brown, to an equally dingy greyish-green, but the purple-tinted forms predominate; head very dark sienna-brown, the depth of colour varying in different specimens; frontal plate paler, and partaking more of the colouring of the dorsal surface; the dark pulsating alimentary canal forms the dorsal line, but there are no perceptible sub-dorsal or spiracular lines. The large tubercles correspond to the ground-colour, but are much darker in tint; spiracles very small, black.

Ventral surface and pro-legs of the ground-colour of the dorsal area, but the legs, until towards the base, very dark sienna-brown.

Huddersfield:

November 7th, 1883.

DESCRIPTIONS OF NEW SPECIES OF *HETEROCERA*.

BY HERBERT DRUCE, F.L.S., F.Z.S.

The following descriptions are all from specimens in my own possession. The collection lately sent home by Mrs. Monteiro contained, besides those that I have described as new, several interesting species, such as *Darapsa rosæ*, *Saturnia Wallengreni*, &c.

Family AGARISTIDÆ.

ÆGOCERA AFFINIS, *sp. n.*

Primaries the same as *Æ. fervida*, Walker, excepting that the costal margin is broadly white nearly to the apex, and the fringe white instead of yellow. Secondaries pale chrome-yellow, the apex broadly bordered with reddish-brown, head and thorax reddish-brown, abdomen yellow. Expanse, 1½ inch.

Hab.: Manboia, East Central Africa (*Last*).

A very distinct species, easily separated from *Æ. fervida*, Walker.

ÆGOCERA TRICOLOR, *sp. n.*

Primaries black, thickly speckled with greyish scales, a large, cream-coloured, oval-shaped band beyond the middle, extending from the costal margin to the anal angle, a cream-coloured stripe from the base to the middle of the wing, parallel with the inner margin, both the pale markings bordered with a narrow black line, and on the outer margins by faint metallic lines. Under-side orange, with the costal, outer and inner margins, also a central band, all black, a small black dot at the end of the cell. Secondaries deep chrome-yellow, with a broad marginal black band, the fringe white. Head and antennæ black, thorax black, striped with grey and yellow bands. Abdomen black, the sides deep chrome-yellow. Expanse, 2¼ inch.

Hab.: East Africa (*Mrs. Monteiro*).

This fine insect is allied to *Æ. Trimenii*, Felder, but it is very distinct.

PHÆGORISTA FALLIDA, *sp. n.*

Primaries dark brown, the costal half pale brown, a straight white band crossing the wing from the end of the cell to the anal angle, dividing the dark brown patch which extends almost to the apex. Secondaries bright orange-red, with a broad marginal brown band, widest at the apex, the inner margin pale brown, speckled with reddish scales. Head, antennæ, thorax, and abdomen brown. Under-side of primaries blackish-brown, crossed beyond the middle by a wide white band. Secondaries the same as above. Expanse, 2¼ inch.

Hab. : Ogowai, East Central Africa.

Family CHALCOSIIDÆ.

ANOMÆOTES THYMIATHIS, *sp. n.*

Primaries and secondaries semi-transparent yellowish-white, the apex of the primaries and the nerves dusky, the fringe pale brown. Antennæ of the male black, deeply pectinated. Head, thorax, and abdomen yellowish-brown. The female does not differ from the male excepting that the antennæ are not nearly so deeply pectinated. Expanse, 1¼ inch.

Hab. : East Africa (*Mrs. Monteiro*).

This species is allied to *Anomæotes levis*, Felder, from South Africa.

Family PERICOPIDÆ.

ALETIS MONTEIRONIS, ♂, *sp. n.*

Primaries pale buff, with the apical half black, including a large transverse white patch, and three posterior white spots, the third very minute. Secondaries with a broad marginal black band, which includes a series of white spots. Head and antennæ black, the antennæ very deeply pectinated. Palpi pale yellow, very small and erect. Thorax and abdomen black, with three rows of white spots, the under-side of the abdomen pale yellow, the legs brownish-black. The female only differs from the male by having simple antennæ. Expanse, ♂, 2¼ ; ♀, 2½ inches.

Hab. : East Africa (*Mrs. Monteiro*).

Family LITHOSIIDÆ.

BIZONE RUBRIFASCIATA.

Primaries dark red, crossed by three bands of white, bordered on each side by narrow black lines, the first band is close to the base, the second crosses the middle of the wing, enclosing a black dot at the end of the cell, the third band close to the apex is much dentated on the outer margin. Secondaries brownish-black, with the fringe white ; head white ; thorax bright red ; abdomen black ; legs brown, speckled with white. Expanse, 2 inches.

Hab. : North Celebes (*Curtis*).

This fine insect is the largest of this genus ; it is very distinct from any that I am acquainted with.

Family NYCTEMERIDÆ.

NYCTEMERA FULLERI, *sp. n.*

Primaries dark brown, with all the nerves pale yellow, excepting near the apex, a wide transverse white band crossing the wing beyond the middle, from the costal margin to near the anal angle; under-side the same as above, with the basal third pale yellow. Secondaries pale yellow, shading to dark orange-red at the base and inner margin, the outer margin broadly banded with black at the apex. Head, thorax, and abdomen yellowish-brown, the abdomen with a central row of black spots. Antennæ black; legs brown.

Expanse, 2½ inches.

Hab.: West Africa, Cameroons.

London: October, 1883.

ON THE SPECIES OF EUROPEAN CRAMBI MORE OR LESS ALLIED
TO *C. MARGARITELLUS*.

BY GEORGE T. BAKER.

Continuing my former notes on this group of the *Crambi* (vol. xix, pp. 239—244), I will now conclude by describing those European species with the white longitudinal stripe undivided, first shortly tabulating them as before.

C. Longitudinal stripe widening perceptibly hindwards.

margaritellus and *pyramidellus*.

Ground-colour more or less shaded with dusky markings...

margaritellus.

Ground-colour unicolorous, stripe reaching almost to the hind-margin

pyramidellus.

D. Longitudinal stripe of almost uniform width.

latistrius, *vectifer*, *furcatellus*, *radiellus*, *fulgidellus*.

Hue of ground reddish-ochreous, stripe extending through the fringe

latistrius.

Hue of ground dusky brown, stripe very thinly divided near hind margin

vectifer.

Ground-colour uniform olive, stripe shorter and narrower...

furcatellus.

Ground-colour uniform ochreous, stripe nearly reaching hind margin

radiellus.

Hue of ground pale reddish-ochre, stripe extending up to hind margin

fulgidellus.

MARGARITELLUS, Hb. (21—22½ mm.).

Fore-wings pale fuscous-yellow, lighter beneath the stripe, which is shining white, widening perceptibly outwards, with its posterior margin slanting very obliquely from the apex towards the base of the wing; in some specimens the anal

angle of this stripe is visibly toothed, but this is not constant. The hind-margin of the fore-wing has a distinct dark brown border, and the fringes are grey, slightly shining, with a dark dividing line. The hind-wings are pale grey, having a darker border with almost white fringes. Head and central part of thorax white. Palpi brown; white above. Patagia very pale buff. Body similar to hind-wings.

British specimens of this insect often differ considerably from those taken on the continent, insomuch, that in his "Genera et Species Chilonidarum and Crambidarum," Zeller says, "Varietas anglica tam singularis est, ut pro specie distincta habuerim; Stainton (Manual ii, p. 183) eam non distinguit," the hue of the fore-wings being almost unicolorous ochreous-brown, with the hind-wings much darker grey, this latter feature being particularly noticeable in some specimens I have from the English lakes. I have, however, some sent me from Perthshire, which present very little difference from continental examples. This species is very generally distributed throughout Switzerland: we have taken it at Aigle, in the Rhone Valley, on June 24th, 1880, and it is by no means uncommon in a little salt-marsh near the lake of Thun.

PYRAMIDELLUS, Tr. (27—30½ mm.).

This very fine *Crambus* is the largest of Divisions C and D. The ground-colour is ochreous-cinnamon, almost unicolorous, with a shining, white, longitudinal stripe, increasing in width as it approaches the hind-margin, the basal half being of moderately uniform width, but near the middle it suddenly diverges towards the inner margin and widens very considerably to its termination, which is less oblique than in *margaritellus*, being of a rather rounded form; its anal angle is also sometimes toothed. Above this stripe, near the apex of the wing, there is an indistinct dark dash, above which, on the costa, is an indication of a light tooth. The basal half of the inner margin of the wing is bordered by a fine white line, reaching nearly to the centre. The hind-margin is darkly dotted, and the fringes are brown, intersected with white, and having a dark dividing line. The hind-wings are brownish-grey, lighter towards the base, the outer margin is bordered by a darker line. The fringes are whitish, with the usual dividing line.

Head, collar, and central thoracic line white. Palpi brown, white above. Patagia same hue as fore-wings, body similar to hind-wings.

I have never taken this handsome species myself, but it is by no means uncommon among the Swiss Alps, whence all my specimens were sent me.

LATISTREIUS, Hw. (24—26 mm.).

The fore-wings are shining ochreous-brown, tinged with red, with the shining white stripe reaching to the extremity of the fringe, bordered above by a dark line, the ground-colour is paler by the inner margin, and the hind margin is darkly dotted. The fringes are grey, intersected with white, having a darker divisional line. The hind-wings are greyish-white, with white fringes that have an indistinct dividing line.

The head, palpi, collar, and central part of thorax are whitish, the patagia are similar to fore-wings, but paler, and the body as the hind-wings.

This local insect is commoner in England than most parts of the continent.

I have this from Canterbury, and it is, or, perhaps, I should say, was, not uncommon in some marshy ground by the Warren, near Teignmouth.

VECTIFER, L.

This is an insect of very restricted range, being, according to Dr. Staudinger's catalogue, confined to Sicily and Dalmatia, and I have not been fortunate enough even to see a specimen of this rare *Crambus*. I can, therefore, only give a translation of the description in Zeller's "Chilonidarum and Crambidarum Genera et Species," which is as follows:

"Collar and fore part of the thorax snowy-white, with the palpi on the outside grey, and irrorated with dusky (*fusco*), anterior-wings elongated, rather acute (*subacutis*), brown, with the middle stripe of nearly equal width, thinly divided before the posterior margin, not extending into the fringes, fringes shining grey, hind-wings pale grey, ♂."

"Very like *bisectellus* (a New Zealand species), but it has the wings not acuminate, and the stripe only once divided. From *monotæniellus* (a species from Asia Minor) it differs in this, that the stripe besides being divided is not prolonged into the fringes; from *sublicellus* (a New Zealand species), in the stripe not being toothed above, and the fringes not tessellated. Collar snowy-white, palpi scarcely as long as the thorax, attenuated, grey above, sprinkled with dusky, with the base white beneath. Antennæ serrated, scarcely setaceous. Fore part of thorax white in the middle, but the remainder yellowish-grey. Legs on the side from (the body) white, on the side next (the body) dusky grey. Tibiæ and tarsi of the hind-legs grey. Abdomen bluish (*lividum*), at the base white. Anterior-wings dusky-brown, 5—5½" long, elongated, posteriorly widened gradually, moderately acute, with the hind margin rounded. The central stripe rather narrow, snowy-white, until it arrives at the very posterior margin, and touches it above the centre. The upper margin (of the stripe) straight and narrowly bordered with fuscous, lower border less straight; but the shape of the upper part is not constant: for in one specimen it is somewhat narrowed before the margin. Not far from the margin a narrow brown line (in that specimen ending in a point) cuts its obliquely, and with its direction so changed that it would form an acute angle, ascends to the costa. There are little black dots on the posterior margin, the fringes are shining grey, and have on the base at the end of the stripe three scarcely perceptible small black dots. Posterior-wings pale grey, somewhat dusky towards the apex, fringes greyish-white. On the under-side the fore wings are dusky grey, with the dorsal portion paler, and with the posterior part of the costa narrowly edged with ochreous. Hind-wings even paler than upper-side."

FURCATELLUS, Zett. (22—24 mm.).

The fore-wings are uniform olive-brown, much darker in some specimens than others. The white stripe is narrower and shorter than in the rest of Division D, in

which (stripe) there is a slight depression just beyond the centre, whence it rises somewhat towards the hind-margin. Sometimes this stripe is scarcely more than a line, at others it widens a little beyond the depression, and its posterior edge is very jagged. The fringes are paler brown, in the ♀ white, and have an indistinct dividing line. The hind-wings are uniform greyish-brown, with rather lighter fringes, which also have an indistinct dividing line.

Head, collar, thorax, palpi, and antennæ of same colour as the fore-wings, body as the hind-wings.

This is one of the rarest of our British *Crambi*, and is taken at a considerable altitude, being recorded from Snowdon, the lake district, and the Scotch Highlands. In Switzerland it is by no means uncommon, and most of my specimens were taken there; it is not rare on the G6rner Grat at Zermatt.

RADIELLUS, Hb. (25—27 mm.).

The fore-wings are ochreous-brown, slightly suffused with a greenish lustre, the white stripe is of moderate width, reaching nearly to the hind-margin, and being toothed several times on its inner edge, in some specimens it terminates in a fine point. There is a short, fine, white line on the fold, and the inner margin of the wing is edged with white from the base to about the centre. The fringes are brownish, slightly shining, intersected with white, and have a darker dividing line. The hind-wings are grey, with paler fringes with a darker dividing line.

Head and palpi pale brownish-white. Antennæ, collar, patagia, and thorax similar to the fore-wings. Body as the hind-wings.

This can easily be distinguished from the preceding species by the lighter colour, and the lustre of the anterior-wings.

In Switzerland, this insect is not rare, last year we found it flying about a meadow bordering the pine woods on the Riffel, at Zermatt, in the beginning of July.

FULGIDELLUS, Hb. (24½—28 mm.).

In this beautiful *Crambus*, which I have not seen alive, the ground-colour is pale ochreous-brown, slightly tinged with rufous. The white longitudinal stripe is of uniform and moderate width, somewhat curved, and reaches up to the hind-margin, it is also perceptibly toothed several times on its inner edge beyond the middle; there is a white line just below the fold, extending from near the anal angle to rather beyond the middle of the wing, the inner edge is also edged with white from the base to about the centre; the hind-margin is dotted with dark brown, and the fringes are pale brown, intersected with white, having a dark dividing line. The hind-wings are shining white, with a slight tinge of reddish ochre by the apex, and have white fringes with an indistinct dividing line.

Head, collar, and central thoracic line white, palpi brown, edged above with white. Patagia and antennæ same colour as fore-wings. Body greyish, almost white.

I have specimens of this from North Germany, and also from Spain, where it is by no means uncommon.

Augustus Road, Edgbaston:
September 10th, 1883.

THE DISTINCTIVE AND SEXUAL CHARACTERS OF *CHRYSOPA FLAVA*, SCOPOLI, AND *CH. VITTATA*, WESMAEL.

BY ROBERT McLACHLAN, F.R.S., &c.

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I have more than once been asked by friends, interested in European *Neuroptera*, whether I did not consider it possible that the two species of *Chrysopa* above-named (both tolerably common in Britain) might not be only *sexes* of one species distinguished by the form of the costal margin of the anterior-wings. My reply has always been to the effect that I believed them to be distinct, and that I had the sexes of both. This I felt sure of; but it is only this moment that I have become aware of a remarkable difference in wing-details in the sexes of *Ch. flava*, and in calling attention to this I will allude to the specific characters:—

CH. FLAVA.

Costal margin of anterior wings *excised* in both sexes. In the ♂ the margin is much elevated at the base, and then *almost suddenly depressed*, so that the costal area is wide at the base and then becomes *almost suddenly very narrow*. In the ♀ the excision is *shallow and very gradual* (sometimes almost imperceptible), so that the costal area *narrows gradually*, and not suddenly.

In the ♂ the costal nervules are *much incrassated* from the point where the costal area becomes suddenly narrowed. In the ♀ these nervules are *slender* the whole length of the area.

Superior anal appendages of ♂ long and stout, subcylindrical, the obtuse tips curved upward and inward; *they are as long as, or longer than, the inferior appendage*, which latter is in the form of a very broad triangular plate, concave within, the apex somewhat suddenly acuminate, turned upward between the tips of the superior appendages, and ending in a tuft of stiff hairs.

I am not able to give anal characters for the ♀, but distinctive points probably exist in the fresh insects.

The nomenclature is that adopted by Hagen, and I think it would be unwise to alter it, but it seems to me impossible to exactly define

CH. VITTATA.

Costal margin of anterior wings *nearly straight* (or slightly convex) *in both sexes*, the costal area narrowing gradually.

In *both sexes* the costal nervules are *all slender*.

Superior anal appendages of ♂ *much shorter* (only about half the length of the inferior appendage), stout, irregularly sub-cylindrical, dilated externally in the basal portion, with a constriction before the apex, the tips turned inward but scarcely upward. Inferior appendage similar to that of *flava*, but narrower, the acuminate apical portion longer.

what Scopoli intended by his "*Hemerobius flavus*," and Wesmael's *Ch. vittata* apparently included both species according to the types, but his description applies to the species now so-named.

It appears to me that the two species were generally confused by authors up to, and including, Schneider. The latter author, in describing and figuring *Ch. vittata* (which is now considered a synonym of *flava*) alludes to the excised costal margin as a sexual character of the ♂, and says nothing about the condition of this margin in the ♀, leaving it to be inferred that it is *not* excised in that sex. His description agrees with the condition seen in the ♂ of *flava*, but his figure appears to have been taken from a ♀. Neither he, nor any other author, so far as I am aware, has noticed the *thickened costal nervules* that form so prominent a feature in the ♂ of *flava*. Rambur, in describing his *Hemerobius proximus* (= *vittata*) well describes the anal part of the ♂ of *vittata*.

Ch. flava and *vittata* are two good and distinct species. *Ch. flava* differs from *vittata* in the excised costal margin of both sexes, but the amount of excision is much greater in the ♂ than in the ♀, and in the ♂ most of the costal nervules are thickened. The two species also differ conspicuously in the length and form of the superior appendages of the ♂. Some other points, such as length of basal joint of antennæ, &c., alluded to in my "British Neuroptera-Planipennia," are probably too vague and uncertain to be of much service. The coloration of the nervules is not sufficiently stable to be of much use in definition; in three examples (1 ♂, 2 ♀) of *Ch. flava* from Central Italy, the two series of gradate nervules are conspicuously black.

I am of opinion that the ♂ of both species is much less common than the ♀.

Ch. flava is recorded by Hagen (Neurop. N. America) from Philadelphia; I have never seen an American specimen. A species somewhat intermediate between *flava* and *vittata* occurs in Japan.

This article owes its origin to an examination of the examples of *flava* from Central Italy, in the course of which I was struck by the black gradate nervules in those specimens, and by the thickened costal nervules of the ♂, which, together with the different form of the costal margin in that sex, I had not previously noticed, and, as is often the case under similar circumstances, my first impression was that I was dealing with a new species.

The anal appendages of the ♂ are probably more developed in

the group to which these species belong than in any other, and if the present unwieldy genus "*Ohrysopa*" be hereafter disintegrated (as I think it most undoubtedly will), it is possible that the importance of the fact will not be overlooked.

Lewisham, London :

8th November, 1883.

NOTES ON DIPTERA.

BY J. E. FLETCHER.

Some time ago, Mr. J. B. Hodgkinson kindly sent me a few specimens of a small yellow *Trypeta*, which was new to me, with the information that they were bred from larvæ which mined the leaves of *Impatiens noli-me-tangere*. I submitted a specimen to Dr. Meade, who obligingly informed me that he could detect no difference between it and *Trypeta alternata*, Fall., the hip-feeder. I have recently had the means of comparing the *Impatiens*-feeder, with the hip-feeder, having bred the latter last May, and need not say that where Dr. Meade detected no difference I fail to see any. As these are diverse foods for the larvæ, I should be glad if observers, having access to the *Impatiens*, would ascertain and make known the time during which the larva feeds ; the kind of mine it makes ; whether it pupates in the mine or descends to earth ; and the time of emergence of the imago.

As I walked in a country road near here, about the middle of August, I was struck with the sight of a small insect with what seemed a long straw-coloured tail, flying slowly and deviously about four feet above the road. Slackening my pace, and watching the creature, I observed it turn towards the foot-path, and alight some three feet in front of me, dropping its "tail" when about three inches from the ground. Approaching sufficiently near, I stooped down, and could then see that the creature was a large *Sarcophaga*, but having no means of capturing it, I am unable to indicate the species. Its "tail" was a piece of hay-stem, some $2\frac{1}{4}$ inches long.

For several years past I have grown a patch of shallots, being uniformly successful with them until last year, when they were moderately attacked by *Diptera*, which, however, I was glad to find, as I was desirous of breeding them. I noticed two species of larvæ, one much larger than the other, and when the imagos appeared in the autumn and following spring, they proved to be *Cyrtoneura stabulans*, and *Phorbia cepetorum*, Meade. This year, about a peck of shallot

were planted, which should have yielded a crop of, say, seven pecks; instead of which they yielded little more than a quarter of a peck, the rest having been utterly spoiled by larvæ of the Dipterous insects named.

Worcester: October, 1883.

The butterflies of Huntingdonshire.—No. 234 of this Magazine contained a list of Cambridge *Rhopalocera*. I beg to supply a list of those found in Huntingdonshire by myself and friends within the years 1882-3. 1, *Argynnis Paphia*, common; 2, *Aglais*; 3, *Adippe*, rare; 4, *Euphrosyne*; 5, *Selene*; 6, *Melitæa Artemis*, rare; 7, *Grapta c-album*; 8, *Vanessa urtica*; 9, *polychloros*; 10, *Io*; 11, *Pyrameis Atalanta*, very abundant; 12, *cardui*, not common, very abundant in 1879; 13, *Apatura Iris*, several in Monk's Wood; 14, *Melanargia Galathea*, common; 15, *Pararge Egeria*; 16, *Megara*; 17, *Epinephele Janira*; 18, *Tithonus*; 19, *Hyperanthus*; 20, *Cæonympha Pamphilus*; 21, *Nemeobius Lucina*; 22, *Thecla quercus*, common; 23, *W-album*; 24, *pruni*, rather rare; 25, *betula*; 26, *Polyommatus phloas*; 27, *Lycæna Egon*; 28, *Icarus*, common; 29, *Adonis*, first time recorded, I believe, in this shire, captured by myself in 1882; 30, *Colias Edusa*, rare, very abundant in 1877, also variety *Helice*; 31, *Rhodocera rhamni*; 32, *Leucophasia sinapis*; 33, *Anthocharis cardamines*, common; 34, *Pieris napi*; 35, *rapæ*; 36, *brassica*; 37, *Aporia cratagi*, some time since; 38, *Hesperia malvæ*, common; 39, *Tages*; 40, *Paniscus*, not common; 41, *Sylvanus*, abundant; 42, *linea*, everywhere.

This is a good long list, and, I believe, compares favourably with any other county; in fact, I do not know where else such variety could be obtained in one shire. Monk's Wood is most famous for its valuable species, and adds considerably to the numbers. We must not forget that this county was the home of *P. Hippothoë*, and that *P. Machaon* was abundant in the fens, making a grand total of 48 different species. This is a large proportion out of the 62 British species, some of which are really unobtainable.

I am compiling a list of Huntingdonshire *Lepidoptera*, and shall be glad to receive names of authentic captures from residents in the county, or from friends who visit it.—HERBERT E. NORRIS, St. Ives, Hunts.: 5th November, 1883.

Capture of Laphygma exigua at Pembroke.—To my extreme surprise a rare *Noctua* has turned up at Pembroke. There had been two or three mild still nights, and stray specimens of *Epunda lichenea* and *Anchocelis lunosa* had come to the gas-lamps, but another storm was making its moan when I went out again on September 24th to look at the few lamps nearest home, and on one of them a *Laphygma exigua* was sitting. Whence it had come, and how far it had travelled in unavailing search for a mate (for it was a male, decidedly worn with travel, but not otherwise damaged)—or how far it would have carried on the fruitless quest, who shall guess? I feel rather glad that I turned out that night, and gave it a chance of some kind of appreciation.—CHAS. G. BARRETT, Pembroke: 23rd October, 1883.

Description of the larva of Semioscopis avellanella.—This larva appears to be unknown, or, at any rate, no notice of it occurs in entomological works. I have found it now for the last three years on lime bushes (*Tilia parvifolia*) in woods, in August and September, and this year in July as well. At first it rolls-over the edge of the leaf, forming a narrow cylindrical chamber open at both ends, from which it protrudes and eats the adjoining parts, consuming the whole thickness of the leaf—a somewhat remarkable circumstance considering how small and tender the larva at this time is. Afterwards its habit changes, and it lives for the rest of its life under a web, on the under-surface of a leaf, to which it communicates a partial curve. Like most larvæ with such a habit, it is always on the alert, and very quick in its motions, so that unless care is taken in plucking the leaf out it tumbles and saves itself in the herbage below.

It is smooth, long, and slender, cylindrical, but tapering a little behind; active, with a quick, jerky walk. Head full and round, narrower than the second segment, green. Thoracic plate green. Divisions marked by a yellow skin-fold. Colour whitish-green, passing into bluish-green on the belly; when full-fed, turns to a uniform green. Dorsal vessel dark green and distinct, but of variable intensity, being in some specimens almost absent on the middle segments. There is no indication of clubbing in the third pair of legs. It spins a tough cocoon underground. The pupa is stout, red with green wing-cases, but changes, before winter sets in, to brown, in consequence of the early development of the perfect insect, after the manner of the genus *Tæniocampa*. The empty case remains within the cocoon after the emergence of the moth.—JOHN H. WOOD, Tarrington, Ledbury: Nov. 2nd, 1883.

Occurrence of Coleophora vibicigerella, Z. (a species new to Britain) in Essex.—

Mr. William Machin has just sent me a specimen of this conspicuous, brightly-marked insect for determination. It was taken near Fobbing, in Essex, at no great distance from the salt-marshes, at the end of June last. It was obtained, as Mr. Machin writes, "from a hedge in the garden of a friend, about a yard from a large plant of *Artemisia vulgaris*. At the time of capture, I was, of course, unacquainted with the species and its food-plant. But on ascertaining from Mr. Warren that the insect was probably *C. vibicigerella*, of which the larva fed on *Artemisia campestris*, I returned to the spot with the intention of searching the plant of *Artemisia vulgaris*; arriving at my friend's house I had the mortification of learning that he had cut down the plant about a month previously. I have well searched the hedges and fields in the neighbourhood, when I found plenty of *A. vulgaris*, but no trace of the larvæ of *vibicigerella*. I met with no plants of *Artemisia campestris*." I may mention that *A. campestris* is a local plant, occurring, however, in great plenty in some parts of Suffolk and Norfolk. In H. C. Watson's New Botanists' Guide (1835), we read, under Suffolk, p. 118: "about Barton and Elden plentifully; and on Icklingham Heath, near Bury. Eng. Fl. At a place called Elden, two miles beyond Newmarket, towards Lynn, on the banks of corn-fields, and by the way sides abundantly, for a mile in length and breadth; also a mile from Barton Mills, on the way to Lynn, and among the furze-bushes under the hill. B. G." And under Norfolk, p. 132: "about a mile from Thetford, on the road to Norwich, in great abundance. B. G."

In the same author's *Cybele Britannica* (published in 1849), we have the further information, Vol. ii, p. 97: "It has occurred also on Hebburn ballast-hills, by the Tyne, doubtless introduced." I call attention to this, as it may possibly point to the chance of a casual introduction on the Essex coast.—H. T. STANTON, Mountsfield, Lewisham, S. E.: November 16th, 1883.

Habits of Sciaphila sinuana.—In the beginning of June, while looking among wild hyacinth for *Eupacilia maculosana*, I noticed a flower head spun together, and a large *Tortrix* larva in the web. My idea at the time was that it was some larva which had dropped from the oaks overhead, and was spinning up on the hyacinth; I boxed it, however, with the flowers, and on looking at it again, a few days after, found that it had eaten the flowers, and was pupating. In due time, to my great delight, a fine female *sinuana* emerged. It may, probably (unlike some of its relatives), be a restricted feeder; which, with the sluggish habits of the imago, may account for its rarity. I took both sexes afterwards, but very sparingly. They have a decided habit of dropping down instead of flying, when beaten out. They were only in a few places, but invariably where hyacinths abounded. I beat most of my specimens from elders; perhaps chosen because the large leaves were good shelter, and near the ground. I never before beat anything from that tree worth looking at twice. In fact, there is so little to be got from it, that I very seldom beat it. Probably, the true habit of the moth is to rest among the brackens and low herbage, and not to fly until late, as I never took it on the wing. I took only one on a tree-trunk, a female. I also took a single example of *Tortrix cratagana*, a female. I suppose I must have been late for the species, as I did not meet with it again. *Tortrix sordiana* is fairly common among the oaks, and I also met with four *T. cinnamomeana*. *Penthina picana* occurs sparingly on birch trees; and among larches and Scotch firs I have taken *Spilonota lariciana*, *Mixodia Ratzeburgiana*, *Coccyx nanana*, and *Pedisca occultana*. The larva of *P. sordidana* is fairly common on the alders in the woods.—J. SANG, 181, Horninglow Street, Burton-on-Trent: October 19th, 1883.

Occurrence of Gelechia Hübneri, at Burton.—I had the good fortune to come across this rare species in this neighbourhood. The specimens were taken at rest on the trunks of oaks, the first and second weeks in August.

They sit very closely concealed in the chinks of the bark, and are quite as difficult to see (if not more so) as a *Nepticula*; more especially as they do not run when they find themselves looked at, as *Nepticulae* do, but have the bad manners to drop, and generally outside the net. It seems surprising that so comparatively large a moth can make itself so nearly invisible. They sit very close during the day, except when stared at, to which they have a very decided objection, and must drop down among the herbage at dusk, as there are then none to be found. and I have taken none on the wing.—ID.

Captures of Lepidoptera at Howth.—I had my first trip across the Irish Channel this summer, to try to procure the larvae of *Nepticula acetosae*. I am happy to say that I was successful, thanks to "Shield's Practical Hints," the directions in which I found most exact and useful. The weather was not all one could desire for collecting, as they turned on the wet every afternoon I was there.

The mines are hard to find, and (especially when small) very difficult to distinguish from the ordinary spots and discolorations always present on the leaves everywhere. In fact, I searched closely the whole of the first day without finding one: they were certainly not numerous then, whatever they may be in the autumn. I fancy that when Shield speaks of their being in thousands, he must refer to the second brood, which is always much more abundant than the first. I was also so fortunate as to take five *Elachista flavicomella*; I believe that, with the exception of two taken near Glasgow by Mr. J. J. King, this species has not been taken since Mr. Shield met with it at Howth. It occurs later than I had expected it would, judging of it by *luticomella*, which had been out here for a month past at least. I got nothing else of importance; a few larvæ of *Depressaria rotundella* feeding on *Daucus carota*, and one *Eupacilia pallidana*, were the only other captures worth recording. I specially devoted myself in the day time to the search for *Nepticula acetosa*, by Dr. Mason's desire, and the heavy rain in the evenings prevented everything from flying.—ID.

[Mr. Sang had previously met with the larvæ of *Depressaria rotundella* on *Daucus carota* at Folkestone, in August, 1879 (see Ent. Mo. Mag., xvi, p. 112).—H. T. S.]

Scoparia conspicualis near *Burton*.—I had the pleasure of taking this latest addition to our *Scopariæ*, here, this summer, much to my surprise, as I did not dream of taking it so far south as this. The females are much more grey than the males, but all are, when in good condition, easily recognisable. I had the good fortune to get two or three small batches of eggs, which I sent to Mr. Buckler. No doubt they feed on the commonest mosses, as do all the *Scopariæ* with whose larvæ I have any acquaintance. I hope they may be successfully reared. I see the theory advanced that it is double brooded: one can hardly imagine such a thing in that genus. There may be a long succession of appearances, as one finds in *ambigualis*. Mine were taken in the beginning of August, and many of them were as fine as if freshly bred.—ID.

Additional Synonyms of Endotricha pyrosalis, Gn.—When examining lately the British Museum Collection, I saw the type of Mr. Butler's so-called *Rhodaria robina*; it is an ordinary male of this species, as I had supposed. Moreover, on carrying my investigations back into what were supposed to be *Deltoides*, I discovered three additional synonyms of the same species, considered by Walker as the types of three new genera; these are *Paconia albifimbrialis*, Walk., *Ivicomia auroralis*, Walk., and *Messatis sabirusalis*, Walk. I examined the *Geometrina* without finding further examples.—E. MEYRICK, Ramsbury, Wilts: Nov. 9th, 1883.

Tortrix Lafauriana.—In a box of insects recently submitted to Mr. Barrett I am pleased to find a specimen of this new *Tortrix*. I took it last August about two miles from the locality where Mr. Atmore states he first discovered it.—ALFRED BALDING, Wisbech: October 19th, 1883.

Philonthus astutus, Er.—A short time ago, M. Fauvel kindly sent me a specimen of this insect, which he had found in the collection of M. Javet, ticketed "Ireland." As M. Javet collected for some time in Ireland, especially in the neighbourhood of Belfast, and as the insect is by no means an unlikely one to occur in the locality, M. Fauvel thinks that the specimen is probably British. M. Javet may possibly have made a mistake, and more evidence will, perhaps, be required before it is inserted in the British list, but the fact is worth recording, as Irish collectors may possibly confirm the capture.

P. astutus belongs to the group with six punctures on the thorax: it is placed by Erichson close to *P. aterrimus* (*P. nigritulus* and *trossulus*); it has, however, a very different facies, being more than twice as large, with longer and less strongly punctured elytra; my specimen is about the size of *P. lepidus*, and has castaneous elytra; it is very distinct from any other British species.—W. W. FOWLER, Lincoln: November 7th, 1883.

Diglossa submarina, Fairm. (*sinuatocollis*, Rey).—Since writing the note on *Philonthus astutus*, I have again heard from M. Fauvel, who says that, on looking over M. Javet's species of *Diglossa*, he has found among them several specimens from Ireland, which were sent to M. Javet by Mr. Haliday; among these there is a specimen of *Diglossa submarina*, Fairm., an insect not hitherto recorded as British; the species is distinguished from *D. mersa*, by its broader elytra, and especially by having the abdomen dilated behind ("en massue"), with close and fine punctuation, the abdomen of *D. mersa* being parallel, with strong diffuse punctuation; the thorax of *D. submarina* is also always more constricted at the base than in *D. mersa*; the two species appear to inhabit almost the same localities, and M. Fauvel says that he has no doubt that it is distributed over all the coasts of Great Britain, and that it will be found in British collections mixed with *D. mersa*.—ID.: Nov. 17th, 1883.

Note on the development of Phryganea striata.—On several occasions at some deep ponds in this neighbourhood I have had the good fortune to witness the development of numbers of *Phryganea striata*. The pupæ appear to leave their cases and rise to the surface usually near the middle of the ponds. The insects are seen first as dark specks on the top of the water; gradually they rise higher and higher until almost wholly out of it, then somewhat abruptly they free themselves from the pupa-skin, and run with astounding rapidity to the side. Before leaving the water, however, a curious operation is performed: the insect rests a little while, and then slowly raises its wings until they meet in a vertical position over the back, not unlike that assumed by the wings of a butterfly in repose. This appears occasionally to be done twice; the insect then finally leaves the water and conceals itself in the herbage on the banks. To me it seems a curious fact that the wings of an insect should be raised immediately after emergence to a position they never again assume.—K. J. MORTON, Carlisle: November 12th, 1883.

[The position assumed is probably connected with the rush of air and blood into the tracheæ and vessels. Much the same position is assumed by recently-emerged moths when "drying themselves."—R. McL.]

ANAX LONGIPES.*

BY PROF. H. A. HAGEN.

Spending my summer vacation at Woodsholl, on the south-eastern coast of Massachusetts, opposite Martha's Vineyard Island, I saw on the top of a hill a number of *Papilio Asterias*, eagerly hunted by a large *Æschnide*, which I believed to be probably *Anax Junius*. Finally a *Papilio* was caught by the hunter, which directly settled on a shrub to devour its prey. Both were very soon in my net; and, to my surprise, I found a brick-red *Anax*, unknown to me; it had the *P. Asterias* still between its legs, but had cut off the head of it. Only the following day, August 27th, 1875, when I caught, with difficulty, another male, and finally a female, did I become aware that I had before me the long-sought-for *A. longipes*. The species was by no means rare, but very wild, in the woods, mostly swinging around the tops of the trees, and on the hill, disappearing with the slightest wind. I was, therefore, not able to get more specimens. Returning home, I found, to my surprise, another female, collected March 3rd, in Hannover, Florida, and a third female, caught in Florida, by Mr. R. Thaxter, together with a *P. Asterias*, beheaded just as in my observation. My friend Uhler wrote to me that he had also collected at the same time *A. longipes*, near Baltimore. Probably it is not well known that, just the south-eastern shore of Massachusetts and the islands Martha's Vineyard and Nantucket, all subjected to the influence of the gulf-stream, possess a number of insects not to be found in the intermediate country down to Florida or Georgia, as *Tramea abdominalis*, *Ascalaphus*, and others.

My notes about the colours of the living *A. longipes* are as follows:—Head pale green, eyes dark reddish-brown, ♂, bluish ♀; ♂, thorax green; legs as described in my Synopsis; abdominal segments 1 and 2 green; 1, with a basal brownish spot; 2, with transversal median stripe, a darker ante-apical spot, and two reddish-green spots (two blue ones on the female); abdomen brick-red, 3 to 5 with a brown, triangular, apical spot, less marked on 6; a triangular, basal, brown spot on 4 and 5: the following segments and appendages red: ♀, abdomen brown, segments 3 to 9 with two apical blue spots; 3 to 7 with two blue basal spots; 4 to 6 with two intermediate blue spots; appendages light brown.

I have several times written about *longipes*. In my description (Synopsis. N. A. Neur., p. 118), the word "surface" for the abdomen,

* cf. ante, p. 129.

and the "9 post cubitals" are *not* in my manuscript, but were probably additions by my friend Uhler. The described female type belonged to Mr. Escher Zollikofer, of Zürich, and is probably in the Museum of that city.

In Stett. ent. Z., 1863, p. 373, I stated that *A. longipes* is not figured in Abbott's MS. in the Brit. Mus., and in Proc. Bost. S. N. H., vol. xvi, p. 350, that it is equally wanting among the insects figured by Abbott, in Dr. Le Conte's possession. But Mr. Escher Zollikofer positively assured me that he received the specimen from Mr. Abbott himself, and, moreover, it was prepared as all others of Mr. Abbott's insects, with arsenical soap on the under-side of the body. A fuller description than in the Synopsis I have given in my notes (still before me) in Verh. Wien. z.-b. Ges., 1867, p. 5. The description of the male will be found in a forthcoming publication; its appendages are 6 mm. long. The two females from Florida are a trifle smaller than those from Massachusetts.

Concerning the specimen in the Dublin Museum, there must be an error in Mr. McLachlan's measurements: the hind-wing is said to be 51 mm. long, therefore, the expansion of the wings cannot be 125 mm. My Woodsholl specimens have expanse of wings, 110 mm., the Florida females 105 mm. The ante-cubitals vary from 20—19, 18—16 in the wings of the same specimen; the post-cubitals vary from 8—9 to 11.

Mr. McLachlan has some doubts about the identity of the Dublin specimen with *A. longipes*, because the membranule is entirely yellowish-cinereous, instead of black with white base. In my specimen the membranule is blackish-cinereous, and the extreme base is white, which colour does not reach the anal vein. Further, in my specimens, the colour of the neuration is black, the costa yellow, in the Dublin specimen the nervures are mostly pitchy-brown, and the network reddish. I have not seen the Dublin specimen, but I think, in a specimen more than 100 years old, which has, perhaps, been subjected to the influence of sunlight, such changes could well arrive, the more so if the specimen had been a freshly-transformed one. At least, after my experience with equally old specimens, I would not consider these differences as deciding ones. I have also compared a male of *A. Junius* with a male of *A. longipes*, and find the differences exactly as stated by McLachlan. If the genitalia of the 2nd segment should prove similar to those of *A. longipes* in the Dublin specimen, I should consider them identical.

[It is very satisfactory to hear of the re-discovery of this species. Dr. Hagen's remark concerning the expanse of wings of the "Dublin specimen" is critical, and to the point. As the specimen is no longer before me, I applied again to Mr. More for information, and the measurement he sends me (in inches and eighths) can be reduced to 105 mm., showing that "125 mm." was a typographical error. He says that the specimen shows no trace of having been treated with any preservative on the under-side of the body. The genitalia of the 2nd segment are quite concealed.

Dr. Hagen also sends me notes and sketches of the appendages of his *A. speratus*, from one of Drège's examples, in his collection. After having subjected the head to the action of boiling water, he thinks that the front and mouth parts may have been originally yellowish, excepting the labrum, middle part of labium, and the back of the head, which remain doubtful: the supposed tooth on the excised portion of the superior appendages of the ♂ could not be detached after having been subjected to boiling water, and hence cannot be considered an extraneous substance. In this case, there is sufficient distinctness from *A. Rutherfordi*, in which (as previously said) there is not the slightest trace of such a tooth.

The catalogue-name, "*A. validus*," represents my *A. Walsinghamsi*, as suspected. To me it appears that the publication of catalogue-names (without descriptions) should be avoided. They carry no weight, and the fact of their publication has frequently a deterrent effect upon workers, who would wish to respect such names *if possible*. The indication of a "new species," without specific name, seems to me better in those cases in which, from a faunistic, or other, point of view, it is desirable to indicate the existence of "new species" where they cannot be described. The "synonymy" of *Neuroptera* in nearly all families is loaded with catalogue-names. "Museum" and "Collection" names are open to the same objection, but in a milder form; they are comparatively harmless so long as they do not get into circulation; if the necessity exists for them, they are much better than the publication of names with "descriptions" that no one can understand.—R. McLACHLAN.]

Worker wasps in December.—On the 16th inst., several workers of *Vespa vulgaris* were observed by me busily engaged at the ivy-blossoms in the middle of the day at Osmington, near Weymouth. A fully-winged grasshopper (*Stenobothrus*) was seen a few days previously.—A. E. EATON, London: December 19th, 1883.

TROPICAL COLLECTING.

BY GEO. C. CHAMPION.

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I propose to give some account of the experiences of an entomologist who has spent upwards of four years collecting in Central America (two years in Guatemala, and two in Colombia). In this first paper I will speak chiefly of the apparatus, &c., I found most useful after a long residence in these countries. I took out with me a lot of heavy and fancy butterfly-nets, heavy sweeping and water nets, drying cages, &c., more than half of which I soon found were almost useless to me in countries where everything has to be carried either on the backs of Indians, or upon horses, or mules, where there are few, if any, cart roads, or navigable rivers, and where every additional ounce weight of baggage is a consideration; and the less you have to carry, and the lighter it is, the easier you will be able to get about from place to place. I usually travelled on horse- or mule-back, with a native servant, and carried my collecting apparatus in the saddle bags, or on front of the saddles, in addition to a change of clothing, waterproof coat, blanket, &c.; sometimes, if on foot, owing to the bad condition of the road, or if I intended making a stay of a month or so at a place, I would take (in Guatemala) one or two mozos, or Indian carriers, or another horse for my baggage with me; but, as a rule, I managed to carry sufficient for trips of a few weeks on my two saddle-horses or mules. My usual plan was to stay a few days here and there, at various places on the road, till I came to what appeared a likely place, then I would remain longer, and, if necessary, send to my nearest head-quarters for more boxes, &c.; in this way I travelled over a large part of Guatemala, and of the northern part of the Colombian State of Panamá. In my saddle bags I could generally manage to pack away my nets, bottles, boxes, tins, &c., and a store box or two, made up into a parcel my servant carried in front of his saddle, enough, altogether, to last me a month or six weeks. If the entomologist wants to obtain all Orders of insects, as well as many other things, as I did, he will find, when out collecting, one net quite as much as he can conveniently carry, more especially if he carries a gun also; sometimes I tried to carry, in addition to a butterfly-net, a large umbrella sweeping-net for beetles, &c., useful enough, no doubt, to a Coleopterist in this country, but in a tropical forest I would rather be without it; very soon I put away the latter as useless, finding that I could manage much better with a large, balloon-shaped, jointed-cane, fly-net: a net of this kind will answer very well for all Orders

of insects, it can be turned over to beat on to, and, at the same time, you have a net ready to catch anything on the wing (large numbers of *Coleoptera* and *Hemiptera* are found on the wing in tropical forests); the same net will also serve to sweep lightly with.

For more than three years I constantly used a net of this kind, and preferred it to any other; by taking out plenty of spare muslin or gauze, a few pieces of the jointed cane, and a Y or two in case of breakages, this kind of net can be used for almost any work. In my expeditions, I usually took a native servant with me, who, after a time, turned out a very good collector; I gave him a small cane or wire-ring butterfly-net (had a sweeping- and a water-bag also to fit this same ring, so that I could change if required) to carry.

A small light net on a long stick is sometimes very useful in the dense forest, various species of butterflies (*Pierella*, *Hetera*, *Antirrhæa*, *Callitæra*, *Taygetis*, &c.) frequent the dense matted undergrowth, where it is impossible to strike at them with a large net; this net is very useful for taking *Cicadæ*, butterflies, &c., from the trunks, also for some high-flying *Castniæ*, *Nymphalidæ*, &c., as a large net on a long stick is often unmanageable.

An ordinary umbrella (especially a white one) is very useful, not only for the rain or sun, but for beating purposes; in the early mornings of the rainy season, when the vegetation is still reeking with moisture, lots of *Carabidæ*, *Lampyridæ*, &c., occur by beating; later in the day, they are more active, and very often fly off instead of dropping into the umbrella.

For collecting purposes in the forest, I carried then, one or other of the above-mentioned nets, one or two largish corked zinc collecting boxes (damped before starting in the dry season, otherwise the insects will be stiff and dry long before you get home) for *Lepidoptera*, *Hymenoptera*, &c., a cyanide and plaster killing-bottle, a few bottles of various sizes, with a little piece of cyanide of potassium (tied up in paper or muslin), and plenty of crumpled paper inside (the paper to be changed daily, I preferred it to sawdust), for *Coleoptera* and *Hemiptera*, a few test tubes and small tin boxes, and, slung at my side, a tin box or vasculum, with a division or two inside for butterfly-papers (the papers, of course, folded and ready for use).

I, myself, seldom put many butterflies, excepting the very large species, in paper at the time of capture, unless my zinc collecting boxes were full; they carry much better till you get home, when you can put them away properly in papers—in the corked boxes, pinned through the side of the body, many species seldom die out-

right, either with a pinch of the fingers, or with the cyanide, they often come to life again, and if in papers damage themselves a good deal; large, thin-bodied species, however (*Heliconidæ*, *Morphidæ*, and most, but *not all* of the *Papilionidæ*), die readily enough, and may, like dragon-flies, be carried home in the papers; but *Hesperidæ*, *Castniæ*, and all thick-bodied species, are very much better carried in the field in the corked boxes, and put into paper on arrival at head quarters.

All *Hymenoptera*, *Diptera*, stout-bodied moths, many *Orthoptera*, the larger *Homoptera*, &c., I killed with the cyandide and plaster bottle, and pinned immediately after capture. I mounted on card, and pinned, if possible, before sending to England, types of all my *Coleoptera* and *Hemiptera*, packing the remainder away in pine sawdust, with a little spirit and carbolic acid; green *Orthoptera*, *Capsidæ*, many *Homoptera*, and many of the pubescent longicorns, do not improve in sawdust; they should be pinned, if possible, or, failing room, they can be sent dry, in papers, like the butterflies, thin-bodied moths, *Neuroptera*, &c.

In the long (seven or eight months) rainy season, it is only with the greatest difficulty possible to keep one's collections from going mouldy; a drying cage is of little use, unless you have a tin case to put it into immediately the afternoon rain commences, and can so suspend it as to keep out ants, small undeveloped *Blattæ*, &c. (I must say I could seldom manage to successfully keep out these pests myself); store boxes corked on one side only, and not fitting too closely are, perhaps, better than tight fitting ones (have nothing to do with varnished or painted boxes), and tin boxes for insect papers, and wide-mouthed bottles or tins for insects in sawdust; plenty of creosote, naphthaline, camphor, or similar substance, must be used for ants, &c., otherwise, you will speedily lose your captures. While mounting beetles, &c., indoors, the ants have often carried off my captures absolutely under my very nose; in the "tierra caliente," or hot country, you can scarcely put a box down on the table for these pests, even for a few minutes; often I have come in wet or tired from an entomological expedition, and put my collecting boxes down for a short time while changing my clothes, &c., only to find on opening them shortly afterwards that hundreds of ants had already commenced devouring my captures. I generally used store-boxes for drying all my pinned insects (the drying cage not answering satisfactorily), getting them out in the sun, of course not letting the direct rays fall on the insects, for a short time in the mornings during the rainy season. Carbolic

acid is of great use in preserving. I found it a good plan to just touch with it all large insects I wished to pin; decomposition seems to set in almost immediately after death in these hot damp climates: often I have pinned longicorns, &c., and, a day or two after, found the contents of the body turned to water, and the legs and antennæ dropping out entire from their sockets; by touching, however, in time with carbolic acid, this can be prevented. Large *Orthoptera*, *Fulgoridæ*, *Cicadæ*, the large *Libellulidæ*, and even some *Sphingidæ*, had better have the contents of the abdomen taken out and re-placed with rolled blotting paper. Blow-flies are often very troublesome, they are especially fond of *Orthoptera*; many times, on drying my boxes in the sun, I have found Dipterous larvæ or pupæ dropping out of the bodies of these and other insects. A large number of delicate fragile *Capsidæ* and other insects, mounted fresh on card, arrived in this country in first-rate condition. I had the greatest difficulty, I think, in keeping the *Trichoptera* and the smaller *Lepidoptera*; they would mould, and, if dried too often, their wings shrivel a good deal. Soft, thick-bodied moths, such as the *Zyganidæ* and allies, do not come well in papers, they are better pinned, as, indeed, are most moths. The *Castniæ* are most difficult to obtain in good condition (the *Hesperidæ* are bad enough), difficult to catch, and difficult to kill, and their loosely attached scales come off at the slightest touch.

Nearly everything can be killed with cyanide, some large moths, however, require pricking with a pen dipped in oxalic acid in solution, or some other poison; yellow *Hymenoptera* must not be left long in cyanide, or they will change colour: the yellow turning to red. Natives often brought me large *Passalidæ*, Longicorns, *Buprestidæ*, &c., tied round the junction of the thorax and abdomen with a thin piece of "bejuco," or vine from the forest, and moths, &c., impaled upon thorns, the latter plan I do not recommend, the former I often adopted out collecting, when my boxes were full. Travelling so much, I was able to do but little in the way of breeding *Lepidoptera*, it is not easy to carry many living larvæ about with you on horseback, but, doubtless, a great deal could be done by any one stationary; even with larvæ, the ants troubled me a good deal; as soon as one died, they would swarm in my breeding box. I obtained large numbers of insects at light, but sugar, on the few occasions I tried it, turned out a failure.

To conclude, I may say that, during my residence in Central America, I probably obtained not less than 15,000 species of insects (besides other things), the greater part of which I hope to see eventually catalogued or described in Messrs. Godman and Salvin's splendid work on the Zoology of that country.

(To be continued).

DESCRIPTION OF THE LARVA OF *APAMEA FIBROSA*.

BY WILLIAM BUCKLER.

After fruitless researches at various times during a quarter of a century by many skilful collectors, desirous to find the larva of this species,—reputed to be abundant in fens and similar places—my hope of obtaining it had almost died out, but revived towards the end of last year with encouragement from Mr. W. H. B. Fletcher, when he made known to me that very strenuous efforts had been devoted to it, and would be continued until the mystery of its habitat was cleared up.

The success that crowns perseverance has in this case been happily exemplified by Mr. Albert Houghton, of Wicken, who deserves great credit for his praiseworthy efforts in bringing this larva to light, after it had so completely baffled all who had before searched for it in this country.

Without calling in question the accuracy of Treitschke, who assigned to *fibrosa* the flower stems of *Iris pseudacorus*, I yet may venture to say there seems to me but little doubt that this conclusion may have been drawn probably from an aberrant example, as latterly in England there had come to be a consensus of opinion that it could not be found in those stems.

But, however that may have been, it is now certain that I had the great pleasure to receive this larva from Mr. Fletcher on the 1st of July, 1883, being one of several Mr. Houghton had a day or two before sent to him, and these were supplemented with further examples, and on the 21st, Mr. Fletcher most kindly presented me with one of the pupæ which had resulted from them.

Of course, I tended the larva most assiduously with fresh, but substitute food, from the most likely aquatic plants I could find, including at first *Sparganium*, *Iris*, and *Carex*, giving it the lower parts of each next the root; but it persistently refused the first two named, and ate only of *Carex paludosa*, and very sparingly of that as though not quite to its taste; yet seeing it eat, I was hopeful the first three or four days of rearing it, but was soon undeceived, as just within a week it died of atrophy, after vainly wandering about in quest of its proper food plant, the great fen sedge, *Cladium mariscus*.

Mr. Houghton was led to his discovery of the larva by observing that when the crop of this sedge had been cut and removed there were some of these plants that had not pushed out fresh shoots, and looked as though dead in the middle; these on being closely examined proved

to be tenanted by the larvæ, whose ravages had thus betrayed themselves to him, and from the experience subsequently gained, he arrived at the conclusion that each larva had ravaged about nine or ten shoots of *Cladium* before it was fed up.

When the *Cladium* is mown, the situation of the larva is found to average a distance of about an inch and three-quarters below the cut surface, where the leaves are grown so compactly together as to form almost a solid substance, and *there*, a little above the root-stock on the outside, is a roundish hole, pierced horizontally or tortuously to the very heart or centre of the plant, from whence this excavation is enlarged and extended either upwards or downwards or a little in both directions, just as the larva chooses to feed; and the hollow residence thus eaten out is thereby more or less irregular in form and direction, though generally an inch and a half in perpendicular length and from a quarter to three-eighths in width, as from a sample comprising a good number of these excavations, most kindly sent by Mr. Fletcher for my inspection, I found all varying a little from each other, though in one important particular they were alike, in the fact of their being just sufficiently low down to escape the scythe of the mower.

On the 14th of August I bred the moth, a female. The length of the larva I figured was from 13 to 14 lines, it was of moderate thickness and very cylindrical throughout, except that the head was a trifle smaller than the second segment and the third and fourth rather the stoutest, the thirteenth with a very remarkable sloping plate on the anal flap *flattened in the middle and having a prominent ridge round the margin* with large tubercular warts at the hinder edge; the segmental divisions plainly defined, and also the sub-dividing wrinkles across the back of each beyond the fourth, viz., one not far from the beginning, another well behind the first pair of tubercular warts, and a third a little behind the second pair of the trapezoid, and all the legs very well developed; in colour the head was of a dark warm brown, darkest at the mouth and very glossy, a black glossy plate on the second segment, the anal plate blackish-brown with black marginal ridge and posterior warts; the rest of the body above was of a very dark slaty-brown, rather inclining to a very deep olivaceous-drab, especially on the thoracic segments; and the belly and legs a lighter drab, the faintly paler dorsal and sub-dorsal lines of drab just distinct enough to be seen; the tubercular warts black-brown, each with a fine hair, and in relative sizes and situation arranged precisely the same as

in *H. micacea*; the spiracles oval and black, the ventral and anal legs barred with black, the feet fringed with dark-brown hooks that clung to any surface they touched; the skin, generally soft and smooth, glistened slightly at the wrinkles while the larva was crawling.

The cocoon was about an inch long and half an inch wide, of elliptical figure, composed of earthy particles mixed with moss and other vegetable comminuted matter, the inside smoothly lined with brownish silk. The pupa was 9 lines in length, of stout and robust character, the eye-pieces rather prominent, and beneath them the head produced to an obtuse point; the thorax thick, with a swollen rounded form, the wing-covers and all other parts clearly defined and smoothly wrapped close to the body; the lower abdominal rings tapered gently to the tip which ended with two fine points; in colour the head, thorax, and wing-covers were of a very deep olive-green, the abdomen of a less deep and brownish olive-green, the divisions of the movable rings darker, the surface shining; the two anal points had become entangled in silk threads that held the old larval skin, and this skin still retained the very remarkable anal plate, already described, in such perfect condition as to afford the most satisfactory identification.

Emsworth: December 3rd, 1883.

CONFIRMATION OF THE MIGRATION OF *APHIDES*.

BY JULES LICHTENSTEIN.

In the October (1883) No. of the Ent. Mo. Mag. my good friend G. B. Buckton, of Haslemere, replying to my criticism of his "British *Aphides*," says:—"The subject of migration of *Aphides* is of considerable interest from a scientific, as well as from an economic, point of view, and the production of well-ascertained facts will at once assert their value, and eventually hold its own against all comers."

I hope to be able to-day to convince the readers of the Ent. Mo. Mag., by affording undoubted evidence as to the fact of migration of the elm plant-lice.

Prof. Horváth, of Budapest, discovered in the last months of 1882 that a root-feeding Aphid, which he had determined as *Pemphigus zæ-mâidis*, Löw and L. Duf. (= *Boyeri*, Passerini, = *radicum*, Fonscol.), after becoming winged, flew from the maize roots to the trunks of elm-trees, and there deposited its sexed progeniture.

I tried, on receiving the notice of my learned friend of Budapest, to make the contrary proofs, and to bring the winged spring-forms of all elm-feeding plant-lice on to maize-roots. Contrary to my expectation, the only *Pemphigus* known on elm (*P. pallidus*, Haliday, sub *Eriosoma*) died without touching the roots; while, on the contrary, another elm-louse, viz., *Tetraneura ulmi*, immediately fixed itself, sucking at the roots, and improving in size.

Greatly puzzled by the fact, I wrote to my friend in Hungary:—"Please send me what you call *Pemphigus zæ-mäidis*." He did so at once, and I immediately recognised by the neuration of the under-wings, and the relative length of the antennal joints, that the insect was not a *Pemphigus*, but the very same *Tetraneura ulmi*, Auct.

I consulted the authorities on Aphidology, M. Passerini of Parma, Kessler of Cassel, Löw of Vienna, and Ferrari of Genoa, asking for specimens of their *Pemphigus zæ-mäidis* or *Boyeri*, and sending Horváth's examples for comparison: the result of my enquiries was that both insects are the very same thing, and that Hartig's character of the neuration of the under-wings in the genus *Tetraneura* cannot be absolutely relied on, as there is sometimes a second very feeble nervure in some examples, but that the character easy to seize, viz., the 5th antennal joint being equal to the 3rd, sufficiently distinguishes *Tetraneura ulmi* from all other elm-lice.

Meanwhile, as maize is not commonly cultivated in our district, whereas *Tetr. ulmi* is exceedingly abundant, I searched at the roots of various grasses, and found that those of *Cynodon dactylon* were also attacked by the same underground lice. In October, they changed to nymphs, and to winged forms. I had a certain number in glass tubes, where they soon deposited their sexed *proles* without rostrum, and I witnessed the pairing, after which the female dies, conserving her unique egg in the dried skin. I had already discovered the female in 1878 (*vide* Ent. Mo. Mag., vol. xiv, p. 224). But, in addition to this, I made experiments at large at my cottage at La Lironde, and, as the trunks of my young elms seemed to me too smooth to offer a good shelter to my pupiferous *pseudogynæ*, I tied round them a band of paper, and placed on it some winged-lice collected at the grass-roots. They did not fly away, but, on the contrary, finding probably the place to their taste, they passed between the paper and bark, and began to lay their sexed young ones.

But what is still more astonishing, they served as an attraction for other lice from the surrounding fields, where *Cynodon dactylon* grew, and already, on the following day, my paper band was crowded

with *pseudogynæ* and *pupiferæ*, bringing their male and female pupæ, which burst open in a very short time, giving issue to the "perfect" form, which is very imperfect indeed in these creatures, as they show only the organs of generation and nothing else.

Now the last step must be narrated, the last proof must be afforded. Out of the eggs concealed in the dried skin of the mother I must obtain the *pseudogyna fundatrix*, and see her form her gall on the young elm-leaf. This proceeding has already been so well observed and described by Prof. Kessler, that, besides the fact of seeing the *fundatrix* of the gall coming out of the egg proceeding from the grass-root lice, I will have only to follow and confirm his observations.

At the same time that I discovered *Tetr. ulmi* on *Cynodon* roots, I could also establish more surely the kind of grass on which the second species of *Tetraneura* of the elm feeds, which I named *Tetraneura rubra*, because the gall is red.

I had written to Mr. Buckton and others that it was *Triticum caninum*, but this spring I had the species of grass more certainly determined by Prof. Planchon: it was *Panicum sanguinale*. The young-lice of *Tetr. rubra* are reddish, while those of *Tetr. ulmi* are white, and in the winged *pupiferæ* the 5th antennal joint is shorter than the 3rd, while they are equal in *Tetr. ulmi*.

So I can affirm that *Tetr. ulmi* passes the summer as an underground plant-louse on grass-roots (maize or *Cynodon**), and *Tetr. rubra* on *Panicum sanguinale*.

The three other gall-lice of the elm, viz., *Pemphigus pallidus*, Haliday, *Schizoneura lanuginosa*, Hartig, and *Schizoneura ulmi*, Kalt., also assume their winged pupiferous form on the elm-trunks, but I cannot yet discover where they come from. I fancy that Buckton's *Schiz. fodiens*, feeding on black-currant roots, might be the underground form of *Schiz. ulmi*; at any rate, the antennæ are entirely similar, according to Buckton's figures, but, of course, this is only a supposition, and more evident proof requires to be given.

Montpellier: 3rd December, 1883.

* In quoting two species of grasses on which I found the under-ground form of *T. ulmi*, I do not wish to assert that it may not occur on other grasses. On the contrary, for Passerini has found it also on several species of *Sorghum*, *Panicum crus-galli*, *Oryza montana*, *Eragrostis megastachys*, *Lolium perenne*, *Coix lachryma*, &c., so it is very likely that, in England, the insect resorts to species of grasses more common there than are maize or *Cynodon*. Mr. Buckton says he has found the species plentifully at the roots of *Hieracium murorum*, *H. sabaudum*, and *Lactuca*, but I think there is some error, for the antennæ (Brit. Aph., ii, pl. cx, fig. 3), do not at all resemble those of Löw's *P. zeca-maldia*, in which the 5th joint is equal to the 3rd, and I think Mr. Buckton's insect will some day prove to be the under-ground form of some poplar gall-louse, perhaps *P. bursarius* or *pyriformis*, but, of course, proof is necessary to sustain my hypothesis. *Tetraneura rubra* has not yet been found in England, and this is, perhaps, owing to the scarcity there of *Panicum sanguinale*.—J. L.

ACANTHACLISIS OCCITANICA AND *A. BÆTICA*; A DIFFERENTIAL
ESSAY.

BY ROBERT McLACHLAN, F.R.S., &c.

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The comparative ease with which closely-allied species may be distinguished is not always in direct proportion to the size of the animals. This axiom is strikingly exemplified in the large Ant-Lions for which Rambur (in 1842) proposed the generic term *Acanthaclisis*.* Down to 1842 only one European species (*occitanica*, Villers, with synonyms) had been described. Rambur added a second European species (*bætica*). It was very recently that I found myself able, from the materials in my collection, to differentiate two European species, which could not be other than *occitanica* and *bætica*, but concerning which Rambur's descriptions left me uncertain, especially on one very important point (alluded to in the remarks that follow). The difficulty was increased because I possessed only the ♀ of one of the species. I therefore applied to my ever-obliging friend, Baron de Selys-Longchamps, who at once forwarded, for examination, the ♂ type of *A. bætica*, Rambur, in his possession. This cleared up the doubts occasioned by an unlucky expression used by Rambur, and has enabled me to put together the following notes, the result of former vain and now successful attempts, on my part, to come to any definitive conclusion as to the distinctive characters of the two species.

A. OCCITANICA.

General form more robust and average size greater.

Last joint of labial palpi shorter, *more suddenly clavate*, with the apex rather suddenly slenderer.

Median longitudinal band on the pronotum furcate anteriorly (complete posteriorly).

Anterior wings having a *short blackish basal line* between the two cubiti; the two rows of pentagonal cellules in the costal area *strikingly unequal in size, the upper being much shallower than the lower*.

A. BÆTICA.

General form more slender and average size smaller.

Last joint of labial palpi longer, *more gradually clavate, the club more slender*, and not suddenly narrowed at its apex.

Median longitudinal band on the pronotum separated into two lines for its whole length by a central (sometimes interrupted) line of the ground colour.

Anterior wings with *no blackish basal line*; the two rows of pentagonal cellules in the costal area *nearly equal in size*.

* Since Rambur's time, discordant species, probably forming several generic groups, have been located in *Acanthaclisis*, many of which contradict the character upon which the generic term was based

Posterior wings: the transverse basal nervules between the radius and the upper cubitus *suddenly thickened and geniculate* at their upper end.

Appendages of ♂ *long*, flexuous, reddish, *with a strong inner tubercle before the apex*, bearing strong black spinose hairs (or this tubercle may be considered the actual apex, from beneath which proceeds a straight cylindrical process).

Posterior wings: the transverse basal nervules between the radius and the upper cubitus sometimes slightly thickened, but *not geniculate* at their upper end.

Appendages of ♂ *short*, curved, yellow, obtuse, *with no inner tubercle* (or with no apical process, according to what appears to be the real nature of the appendages in *occitanica*).

Thus the most decisive characters whereby to separate the two species lie in the form of the apical joint of the labial palpi, *the presence or absence of a short blackish basal line in the anterior wings, the comparative sizes of the two rows of pentagonal cellules in the costal area in these wings, and in the form of the anal appendages in the ♂*.

Rambur's descriptions of the two are mostly excellent; but there is one expression so vague, and so apparently contradictory, that it quite misled me. In describing *A. occitanica*, he says simply, "espace costal ayant deux rangées d'aréoles;" in describing *batica* he says, "espace costal contenant deux rangées d'aréoles, dont une plus large que chez l'*occitanica*." The latter expression would leave it to be inferred that the two rows were *unequal* in *batica*, and *equal* in *occitanica*, whereas the contrary is the case, and the only way of reading it so as to bear even a semblance of truth, is that *one* row in *batica* is broader (or larger) than the *corresponding* row in *occitanica*; and I suppose that is what he really intended.

The presence or absence in the anterior wings of the short black or blackish basal line* between the two cubiti ("la 4^{me} et 5^{me} nervures" of Rambur) is an excellent *prima facie* character, not alluded to by previous authors.

Hagen, Stett. Zeit., 1866, p. 288, calls attention to a slight character in the neururation (it should have been stated only of the *posterior* wings), viz., that immediately under the radius ("mediana") there exists, in *batica*, a rudimentary longitudinal nervure in which the transverse nervules end (instead of directly in the radius); it certainly exists in most specimens of *batica* examined by me, but it equally exists in some undoubted specimens of *occitanica*; the *geniculation* of the end of these nervules appears to be constant in *occitanica* and absent in *batica*.

* Hagen, Stett. Zeit., 1868, p. 125, alludes to an example of *occitanica* with a black streak under the sector of the radius up to the pterostigma.

The form of the anal appendages of the ♂ is very different in the two species. If my ideas are morphologically correct, the inner tubercle ("portion interne saillante" of Rambur) in the appendages of *occitanica* really represents their true apex, the process below it being supplementary (and absent in *batica*). There is also a ventral process (or inferior appendage) which is longer in *batica* than in *occitanica*.

Locality is no guide. *A. occitanica* occurs certainly in all the Mediterranean districts of Europe (introduced in Prussia), South Russia, and in Central Asia. (A ♂ and ♀ from Bone in Algeria, in in De Selys' collection, have a slightly different *facies* in wing-markings, but are not structurally distinct). *A. batica* occurs in Spain, at Montpellier (coll. McLach.), in Turkey (Besika Bay, coll. McLach.), and in Syria (*teste* Hagen).

With a view to test the bibliography, I have consulted most of the older authors, and in my opinion they all had *A. occitanica* under consideration. I will here briefly refer to those authors who have given figures:

De Villers (Linn. Ent., iii, p. 63, pl. vii, fig. 10, 1789), originally described the species as *Myrmeleon occitanicum* (from Nimes in the south of France); his figure is *excellent*, and shows distinctly the inequality in the two rows of costal areoles.

Rossi (Faun. Etrusca, ii, p. 14, pl. ix, fig. 8, 1790), under the name *M. libelluloides pisanus*, gives a wretched figure, but no doubt intended to represent *occitanica*. In his description he shows that the form of the tibial spurs had not escaped his notice.

Olivier's figure (*M. occitanicum*, Encyc. Méthod., viii, p. 122, pl. xcvi, fig. 6) is only a bad copy of Rossi's.

Panzer's figure of *M. pisanum* (Faun. Germ., fasc. 59, pl. iv) was undoubtedly meant for *occitanica* (♂), but it is indifferent, and he contrived to represent the principal nervures as *double*.

Fischer von Waldheim (Ent. Russ., iv, p. 43, pl. i, fig. 1, circa 1846) describes and figures *A. occitanica* as *Myrmeleon georgianum*; his figure is tolerable. In his description he uses the vague term "costæ duæ præcipuæ duplicatæ" (*cf.* also Hagen, Stett. Zeit., 1858, p. 125), by which I think he intended to allude to the double row of costal areoles. At any rate, I cannot otherwise account for the expression, and he was not influenced by Panzer's figure.

A. Costa (Faun. Napoli, Neurotteri, Myrmeleontidea, p. 7, pl. viii, fig. 2) gives a good description as *Acanthaclisis occitanica*, and his

figure (♂) well shows the inequality in the two rows of costal areoles, but the markings of the thorax and wings are very differently indicated.

Finally as to figures: that by Savigny (Descript. de l'Égypte, Neuropt., pl. iii) indicates a ♀ *Acanthaclisis* that should be *occitanica* according to the costal areoles and the labial palpi, but the markings on the pronotum very badly represent those in that species. Therefore I consider there is just a little doubt as to the species intended, a doubt that would not exist had Savigny been a less faithful follower of Nature in his usually admirable figures.

Some minor points (chiefly alluded to by Rambur) have not been here considered in my endeavours to elucidate the chief distinctive characters of *A. occitanica* and *A. batica*; a difference in the form of the tibial spurs is the most important.

Hagen (Stett. Zeit., 1866, p. 289) alludes to an *Acanthaclisis* from Japan (*A. japonica*, Hag., McLach., Tr. Ent. Soc. Lond., 1875, p. 174) as perhaps only a variety of *A. batica*. Undoubtedly it is nearer *batica* than *occitanica* in the costal areoles, appendages of ♂, &c., but the markings of the pronotum, &c., are sufficiently distinct, and, if I mistake not, the labial palpi more nearly approach those of *occitanica* in form. My materials for this species are not sufficient, nor in absolutely good condition.

Lewisham, London :

December, 1883.

Concerning Tomateres pardalis, F., and T. clavicornis, Latr., two very closely allied species of exotic Myrmeleonidæ.—In 1781, Fabricius described (Spec. Insect., i, p. 398) a pretty ant-lion from "Coromandel," under the name of *Myrmeleon pardalis*, in Banks' collection (the original type exists, and is in the British Museum); this species was subsequently described by Walker in 1853, as *M. compositus*. In 1830, Latreille figured (Cuvier's Règne Animal, iii, p. 438, pl. xix, fig. 4), a species from Senegal as the "Fourmillon clavicorne." In 1866, Hagen formed for these (and some others) the genus *Tomateres*, on account of the form of the club of the antennæ.

The Indian *T. pardalis* was tolerably common in collections, but the Senegal *T. clavicornis* remained almost unknown, and even Rambur (1842) could only give a description after the original notes and figure; the relationship with *T. pardalis* was evidently very close. A few years ago numerous examples of a *Tomateres* (excessively like *pardalis*) arrived in this country from Abyssinia; on account of the rather wide difference in locality, I hesitated to consider them identical with *clavicornis*, and regarded them rather as a slight variety of *pardalis*. By a lucky chance, I found, two years ago, in one of M. E. Deyrolle's boxes at Paris, an un-

doubted *clavicornis* from Senegal, and, moreover, found the Abyssinian examples were identical therewith, and, further, that the Indian *pardalis* only differed in certain small points.

The chief character whereby to separate the two is in the colour of the legs. In *pardalis* the tibiæ and tarsi are wholly black (except the base of the tibiæ); in *clavicornis* the tibiæ and tarsi are wholly yellow, or reddish-yellow (the tarsi with black spines). There are some other minor points:—in *pardalis* the three black spots on the pronotum are usually (but not invariably) connected into a transverse line; in *clavicornis* they appear to be always widely separated; in *pardalis* the transverse black streaks on the anterior-wings are less numerous; and in *clavicornis* the colour of the body is paler yellow.

I believe the two may be considered distinct, but it is an interesting point in geographical distribution to find so marked a form existing with only slight modifications from Senegal to India, and also to find that the Abyssinian individuals do not differ from those from Senegal.

T. clavicornis may be regarded as a resuscitated species, so long had it remained known only by the original indications.—ID.: December 1st, 1883.

Formicaleo tetragrammicus, F., as a Swiss insect.—According to a remark in Meyer-Dür's "Neuroptern-Fauna der Schweiz" (1875), there exists some doubt as to this Ant-Lion having been observed in Switzerland. I am of opinion that it has hitherto been confused there with *Myrmeleon europæus (formicarius, auct.)* Dr. Jordan has just sent me an example of *F. tetragrammicus* that he caught a few years ago near Sierre in the Valais, and I have two specimens labelled "Zermatt."

I take this opportunity of stating that the "*Ascalaphus macaronius*, Scop.," of Meyer-Dür, is *A. longicornis*, L. The two Swiss species are *coccajus*, W. V., and *longicornis*, L. The true *A. macaronius* does not occur so far west in Europe as Switzerland.—ID.: October 30th, 1883.

Four species of Chrysopa, unrecorded for Switzerland.—I find in my collection the following species, all taken by myself, that do not appear in Meyer-Dür's "Neuroptern-Fauna:":—*Ch. dorsalis*, Burm., a single example beaten from *Pinus sylvestris* in the Val d'Anniviers (Valais), 9th July, 1882. *Ch. nigricostata*, Brauer, Forêt de Pfyn and Vispthal (both in the Valais), 10th and 11th July, 1882. *Ch. viridana*, Schneider, one example on the Alpbach above Meiringen, in July, 1878; ordinarily a meridional species. *Ch. flava*, Scop., Meiringen, July, 1878. In vol. xvii, p. 141, I recorded *Ch. pallida* from Thusis; in 1882 I saw this species in the late Ed. Pictet's collection at Geneva, with the label "Burgdorf," in Meyer-Dür's hand, so it must have been overlooked by that author when compiling his "Fauna."

Other unrecorded species of Swiss *Planipennia* (notably curious forms of *Coniopterygidae*) are in my collection, but not yet sufficiently worked out.—ID.: December 1st, 1883.

Destruction by White Ants at Calcutta.—On a "slip" inserted into Part ii of Vol. li of the "Journal of the Asiatic Society of Bengal" (published August 21st, 1882), is printed the following notice:—

"The greater portion of the impression of Plate xvi having been destroyed by white ants, members and correspondents are requested to abstain from binding Vol. i, Part ii, 1881, until they have received a copy of it."

This is both interesting and serious, as showing the danger to which scientific and literary work is exposed in India; and it is curious from a purely literary point of view.—ID. : *December 8th, 1883.*

Capture of Phaneroptera falcata, Scop., in England.—In September, 1881, while walking along the cliffs near the little fishing village of Porthgwarra, in the Land's End district, I captured a single specimen of *Phaneroptera falcata, Scop.*, at rest on the grass near the foot path.

This very conspicuous and beautiful Orthopteron belongs to the *Gryllida* of Stephens, = *Locustina* of Burmeister and Fischer, and has not hitherto been recorded as captured in England. According to Fischer, it occurs in S. Russia, S. Germany, Switzerland, S. France, and Egypt, and there are specimens in the British Museum from Madeira.

It is possible that it may be an imported specimen, if so, the nearest port through which it could be introduced is Penzance, which is distant about ten miles, as the crow flies. The Porthgwarra boats are small, and used for fishing near the coast in fine weather, in fact, their only access to the sea is through a tunnel excavated through the rock; on the other hand it is also possible, considering the Lusitanian character of the Flora of South-West Cornwall, that it may be an indigenous species, and it is to be hoped that any entomologist meeting with any species of this family either in Cornwall or the South-West of Ireland will preserve it for examination.—PHILIP B. MASON, Burton-on-Trent: *December, 1883.*

[If this fine and not specially destructive insect can be included in the very limited list of British *Orthoptera*, it will be a grand addition. Personally, I incline to the opinion that the specimen captured by Dr. Mason may have been imported by some vessel bound up-channel from the Mediterranean. Many years ago, I had given to me a living specimen of *Locusta viridissima* found on board a ship in mid-channel. As that ship was homeward-bound from the east (*via* the Cape), the natural inference was that the insect had flown on board in the channel, either from the French or English side. In Brunner von Wattenwyl's "Prodromus der europäischen Orthopteren" (1882), a very worthy expansion of Fischer's Monograph of 1853, and describing about double the number of European species given in Fischer, the northern distribution of *Ph. falcata* is stated as 48° in Europe proper.—R. McLACHLAN.]

Some further remarks on Nepticula.—Soon after the publication of my last notice concerning the pupation of *Nepticula*, in the Ent. Mo. Mag. for June, 1883 (pp. 17, 18), I was surprised to see freshly spun cocoons of *Nep. sericopeza*, both on the new, half-developed keys, and on the young, fresh leaves of a maple tree. These cocoons were all at, or near, the extremity of the lower boughs of a tree which grew on a hedge-bank, the lower branches of which spread far across a considerable ditch, and then over the pathway alongside of it. Now, whether these larvæ had wintered in

the ground, or on the trunk, they must, in either case, before spinning their final cocoons, have travelled a considerable distance, at a time when, considering their long winter sleep and fast, they might well be expected to be somewhat enfeebled.

Mons. Goureau records the finding of cocoons in the autumn on the keys, just outside the hole from which the larva had emerged. In this place I have never found them, but may it not well be the case, that the larvæ do so spin, close to the point where the key rests on the petiole, or even on the petiole itself? These do not generally fall with the keys, but remain on the tree till the appearance of new leaves in spring: in many cases also the keys themselves do not fall. Thus it would be only a short ramble for the resuscitated larvæ on to the young keys and leaves. One thing at all events is certain that the larvæ which had spun these fresh cocoons in the last week of May, had not fed up in this year's keys, which were even then in some cases not half their full size, while many still bore the parts of the flower. The imagos bred were all true *sericopeza*, in nowise differing either in size or colouring from the later brood.

In the month of July, while examining the leaves of *Salix alba*, I noticed at the extreme tip of a leaf, a brown *Nepticula* cocoon, and lower down, in the same leaf, the empty mine. On further search I discovered 20 or 30 such cocoons, all but one in the same place, at the tip of the leaf, not always the same leaf as that in which the larva had fed up, but occasionally in an adjacent one. The sole exception had spun up on a midrib, close to the leaf-stalk. Among the imagos which emerged and which appear to be true *salicis*, there was one very beautiful variety with the fore wing white from the base to the external margin of the pale fascia.

While on this subject of the *Nepticula*, I may call attention to two facts in connection with the autumn brood of the present year:—first, the excessive mortality among nearly all the species: secondly, the unusual scarcity of many larvæ generally plentiful, and the unusual abundance of others.

Thus *atricapitella* and *rusticapitella* of the oak-feeders, *viscerella* and *margini-colella* of the elm-feeders, and *gratiosella* and *ignobilella* of the hawthorn, the mines of which are all generally more or less common, have this autumn been quite scarce. On the other hand, *basiguttella* and *subbimaculella* have occurred in far greater numbers than I have ever met with them before, the latter, always abundant, being this year in thousands. The other commoner species, such as *oxyacanthella*, *atricollis*, *anomalella*, *trimaculella*, *catharticeella*, with those of the birch and alder, have appeared pretty much as usual. But nearly all alike have been extraordinarily subject to disease at every period of their larval life. This disease would seem to commence with a discolouration of the dorsal vessel alone, the larva ceases to feed, and dies *in situ*, after which the whole body becomes dark. After examining a large number I am satisfied that this mortality was not attributable to the attacks of ichneumon; possibly owing to the premature wet and cold weather of October the larvæ tried to feed up too fast and paid the penalty. The only species which seems to have been comparatively exempt from this disease was *subbimaculella*, which, being always a late feeder, would naturally not be so much affected by the bad weather.

A remark with regard to *Nep. quinquella* may not be uninteresting. Mr. Stainton in the Manual says of this species, "used to be common at West Wickham." It does not appear to have been observed again in any quantities until Mr. Meyrick

noticed its occurrence in great abundance in this neighbourhood in 1877 (Ent. Mo. Mag. xiv, p. 111.). The mines were equally abundant in the two following years, then they seemed almost to disappear, and it is only by knowing on what particular trees to look for them that here and there one or two mines can now be found, whereas, during those 3 years of their abundance, 20 or 30 in a leaf was the average number. Perhaps other *Nepticulæ* are subject to the same variation. Last autumn the larvæ of *Nep. ulmivora* were quite plentiful along one small elm-hedge, before which time I had never been fortunate enough to obtain more than an odd one here and there. This year a careful search on three separate days only resulted in half-a-dozen mines. I do not think it has been recorded that, apart from the distinctness of their mines, the larvæ of *ulmivora* may always be distinguished from those of *viscerella* by their blue-green colour.

I have mentioned above the great plentifulness of *subbimaculella*, but numerous as they have been, their numbers have been nothing compared with *rubivora*; and that not only in this immediate neighbourhood, and in Essex, but on the Lincolnshire Coast, where Mr. W. H. B. Fletcher found them in the greatest profusion. This is the third year I have taken them commonly; before 1881 they do not seem to have been noticed or recorded in England. It may be that, like *quinquella*, they too are periodic in their appearance, and will presently again become rare.—W. WARREN, Merton Cottage, Cambridge, November 20th, 1883.

Double-broodedness of Scoparia.—I am much surprised to read Mr. Sang's note in this month's Ent. Mo. Mag., p. 167, where, writing of double-broodedness in the *Scoparia* he says, "one can hardly imagine such a thing in that genus." I thought it was thoroughly well known to all who have taken any interest in the group, that *Scoparia muralis* is always double-brooded. I have myself reared the second brood in August from eggs obtained from a June moth, and the habits of the species are precisely the same outdoors. Full-grown larvæ can always be found in abundance under and among moss on our old walls from February to April, and the imagoes are plentiful at the end of May and early in June; but after about the middle of June not an imago can be seen for some weeks, but the larvæ are again feeding, which produce a still more numerous brood of moths at the beginning of August. And although there is certainly not the clear distinction between the appearance of the broods of *ambigualis* that there is in *muralis*, I have little doubt that it also is to a great extent double-brooded. It is always common in June, and although it occurs on the wing all through the summer, it becomes, especially about our moors, very plentiful again in August, and the specimens then are very fine and large. *Conspicualis* has never been looked for in June, but this year one was accidentally taken in that month; but the species not detected until it was too late to look for more. It is always in good condition at the beginning of August, hence I think it is not unreasonable to suppose there may be two broods of it also.—GEO. T. PORRITT, Huddersfield, December 1st, 1883.

Lepidoptera bred from larvæ on Myrica gale in Norfolk, with notes.—During this and last year I collected a number of larvæ from *Myrica gale* (Bog-Myrtle), which produced imagoes of *Tortrix Lafauriana*, and those of the following:

T. Podana in great variety, some of the forms being different from any I had previously noticed; *T. rosana* in plenty, amongst them some very dark specimens; *T. viburnana* also in numbers; the males of this species, whether caught or bred, are somewhat smaller and darker than my Scotch specimens. I note that the females with long, narrow, and pointed fore-wings are rarely seen on the wing, although they can be obtained in plenty from larvæ; some of my specimens have the fore-wings much reticulated. Of *T. ribeana* and *T. heparana* a few only emerged, whilst *Sericoris lacunana* and *S. urticana* were well represented. A few *Phoxopteryx siculana* were also bred.

Besides the larvæ which produced the *Tortrices* just enumerated, I found those of a *Noctua*. These, from their early habit of feeding between leaves, I at first put in my boxes as larvæ of a *Tortrix*, but as they became larger they left their leafy abode, and disclosed their true nature, emerging from pupæ next spring as *Tæniocampa gracilis*.

Cases of *Coleophora viminetella* were common, but from those collected few moths or ichneumons emerged; the cases of this species on *M. gale* are narrower, somewhat truncate at the apex, less serrated and brighter coloured than those on *sallow*.

Clepsis rusticana is sometimes rather common here among *M. gale*, and doubtless its larva feeds on that plant, but I have not yet bred the species.—EDWARD A. ATMORH, 3, Haylett Terrace, Exton's Road, King's Lynn: December 11th, 1883.

Note on Crambus furcatellus.—I read with interest the article on this species. I may perhaps go a little further back than many of the Entomologists of the present day. I found it in plenty in 1847 near Killin, on a range of hills stretching towards Ben Lawers. It used to be in profusion on Helvellyn, also on Scawfell more sparingly; it requires a good altitude; even *Stye Head* is hardly high enough; but a few hundred yards further upwards brings you to head quarters; it also occurs on *Skiddaw*. I have a number of larvæ now hibernated that will, no doubt, produce this species the first week in July next; some were very small early in October, one I saw was about five-eighths of an inch in length; I did not wish to disturb them, they were lying snugly ensconced at the roots of a club-moss that grows where *furcatellus* occurs. The larvæ are of a pale whitish-yellow, with very few hairs on the body, the head very small, shining, and in colour pale ash, no spots visible on the larva; in fact, to sum it up, a bit of horse-radish best describes it. Mrs. Fraser very kindly sent me the larva, of which some day I hope to give a better account.—J. B. HODGKINSON, 15, Spring Bank, Preston: December 3rd, 1883.

Captures of Coleoptera, &c., in the Hastings District in 1883.—Notwithstanding the extreme scarcity of insects, I have done pretty well this year, probably owing to my having had more time on my hands than formerly. As is generally the case in bad years a few species have been commoner than usual. In July the ♂ of *Lampyrus* was abundant at light. I have already recorded the abundance of *Athous difformis*. The Guestling sandpit has yielded me two specimens of *Leptinus testaceus*, *Pristonychus* somewhat commonly, two or three *Cænopsis*, several *Plinthus*, *Orobitis* in plenty, one or two *Ilyobates nigricollis*, and many commoner things. I have another speci-

men of *Leptinus* which I fancy was taken in the runs of *Formica fuliginosa*. At the entrance to the burrows of the larvæ of *Cossus*, I have found *Cryptarcha strigata*, *C. imperialis*, *Eparæa decempunctata*, *E. oboleta* (this latter was also common on a wet oak-stump), *Soronia grisea*, a ♂ *Homalota cinnamomea*, and some obscure *Homalote*. While fishing in the Rother at Robertsbridge, my brother found a fine *Panagæus cruz major* crawling on his trowsers. I have never seen the Camber sandhills so deficient in insect-life since I have collected there. The only things worth bringing home were *Bledius unicoloris* and *3-cornis* and *Peylliodes marcidia* common on a few plants of *Cakile maritima*.

Since sending the note on the Myrmecophilous *Coleoptera* (Ent. Mo. Mag., xx, p. 40), I have found, in a nest of *F. fuliginosa* at Battle, a specimen of *Myrmedonia lugens*, accompanied by *M. funesta* and *Oxyptoda vittata*. In moss at Guestling I have taken *Trachys troglodytes*, *Liosomus troglodytes*, *L. oblongulus* (rarely). *Tychus niger*, *Scydmanus denticornis*, *Cephennium thoracicum*, &c., &c.

The following I have also met with: *Elmis æneus*, Guestling and Fairlight; *Limnius tuberculatus*, Crowhurst; *Anobium fulvicorne*; *Mordella fuscata*, sparingly, Ashburnham and Battle; *Grypidius equiseti*, Battle; *Rhynchites pubescens*, Guestling; *Hyllobius abietis*, plentifully, Fairlight; *Callidium alni*, Crowhurst; *Bembidium prasinum*, one at Bulverhithe; *Bryaxis sanguinea*, *Leistus rufescens*, under rejectamenta, Guestling; *Oxyporus rufus*, sweeping, Fairlight; *Antherophagus pallens*, sweeping, Guestling; *Scaphidium 4-maculatum*, in a cart-rut at Guestling, completes the list of the better things.

Hemiptera have been nearly as scarce as the *Coleoptera*, but *Megalocæra longicornis* and *Acetropis Gimmerthalii* were abundant at Fairlight. Thanks to Mr. Herbert Henry, who conducted me to the exact spot at Ashburnham, I was enabled to take *Chilacis typha*, in comparative plenty, in the heads of *Typha latifolia*. It occurred in all stages, both in this year's heads and also, but more plentifully, in last year's. *Anthocoris sarothamni* occurred sparingly on its usual food plant at Guestling. Sweeping has produced *Calocoris striatus*, *C. fulvomaculatus*, and *Nabis flavomarginatus*, all three taken singly at Guestling. On two occasions I have met with *Macrolophus nubilus* by sweeping bracken in places where *Stachys sylvatica* was conspicuous by its absence. *Amblytylus affinis* occurred near Battle pretty commonly. With it were a few *Macrocoleus molliculus*; *Gerris najas* is common on all running water and on the powder-mill ponds; *G. paludum* is to be seen, but rarely caught, except in windy weather, when they generally lie under shelter of the bank.

It may not be out of place to mention that *Vanessa cardui* has been abundant here as elsewhere, and that I saw a specimen of *Colias Edusa* on the railway embankment at Bopeep the other day. *Vanessa Atalanta* has been far more abundant than of late years.—EDWD. P. COLLETT, 76, Islip Street, Kentish Town, N.W.: October 17th, 1883.

Myrmecozenus vaporariorum, Guér., &c., at Dulwich.—Among some *Coleoptera* recently named for me by the Rev. W. W. Fowler are two specimens of this insect, taken in either May or June of the present year from a hotbed in this neighbourhood. I was able only to pay one visit to the bed, which was soon after destroyed, so that

my chance of again meeting with the insect is but small. *Balaninus tessellatus* turned up here in some numbers, in company with the commoner species of the genus. I also obtained two specimens of *Phlæotrya Stephensi*, from a birch log, and one *Tillus elongatus* from a spider's web. Towards the end of September I visited my old locality for *Aphodius porcus* at West Wickham, but only succeeded in finding nineteen specimens; *A. obliteratus* was common in the same field. A single specimen of *Stenus geniculatus* appeared among a host of *S. impressus* swept from heather, and *Ceuthorhynchus alliarie* was also found in the sweep-net. *Prognatha* was rather common under the bark of a felled acacia. A *Cossus*-infested horse-chestnut at Streatham produced *Homalota hospita* in numbers, and from an ash near Belvedere, similarly attacked, I got several *Tachinus bipustulatus*, *Cryptarchoa strigata*, and the usual common things.—THEODORE WOOD, 5, Selwyn Terrace, Upper Norwood, November 23rd, 1883.

Triplax Lacordairei at Dulwich.—A few months since I recorded the capture of *Triplax anea*, among other *Coleoptera*, in the neighbourhood of Dulwich. Upon more careful examination I find that the insect is the much rarer *T. Lacordairei*, Crotch, a species principally taken, I believe, at Darenth Wood. I took two examples, one of which was unfortunately broken, from toadstools, the first towards the latter part of July, the other early in August. But for the scarcity of fungi in the district I should doubtless have met with further specimens.—ID.: December 6th, 1883.

Egialia rufa, F., at Wallasey.—During the past season I had the good fortune to take two specimens of this rare beetle, one in May and another in June, on the Wallasey Sandhills, Cheshire. I found them crawling on the bare sand along with *E. arenaria*.—R. WILDING, 40, Downing Street, Liverpool: December 12th, 1883.

Harpalus quadripunctatus, Dejean, from Somersetshire.—In overhauling my *Harpali* lately, I made an interesting discovery, viz., that amongst my exponents of *H. latus* was a specimen of *H. quadripunctatus*, Dej., which reference to my journal proved to have been captured on the Mendip Hills during my visit to Somersetshire in April, 1877. Judging from the wide European range of this species, I see no reason why it should not be found in suitable localities throughout England and Wales, as well as Scotland. My specimen proves that it occurs in England, and suggests the probability of its actual existence in collections mixed up (as in my own case) with *H. latus*. My specimen is also interesting in another way—the usual row of large punctures in the third interstice number four on the left elytron, and three on the right, showing that discrepancies on this point by different authorities are due to inconstancy on the part of the beetle, and not to confusion of species by the "Doctors."—W. G. BLATCH, 214, Green Lane, Smallheath, Birmingham: December 17th, 1883.

Obituary.

Dr. John L. Le Conte.—This distinguished entomologist was the son of Major Leconte of Philadelphia, himself a writer on entomology, and well known as the correspondent of Dejean and other prominent men in this department of science

in the early part of this century. Le Conte's attention was thus early directed to the field in which he became so renowned, and being a man of great courage, self-reliance and energy, he, as long ago as 1844, intimated his regret at seeing American insects going to Europe for determination and description, and set himself to remedy this by doing the work himself. This task he has carried on with unflinching energy for about forty years, the result being, that in this period, he has named and described about 5000 species of North American *Coleoptera*, and characterized about five hundred genera. It is, however, as a writer on the classification of *Coleoptera*, that he has gained his widest reputation. Having to study and arrange a comparatively unknown fauna, he investigated the classifications in vogue, and scarcely ever failed to suggest important modifications and improvements; in 1861—2, his work on the classification of North American *Coleoptera* was published by the Smithsonian Institute, but was left uncompleted till the spring of the present year (1883), when a second and complete edition was brought out with the assistance of Dr. Geo. H. Horn. His labours were recognised in Europe by his being elected honorary member of most of the more important Entomological societies, and in 1874, he was President of the American Association for the advancement of science. For many years he was almost the sole Coleopterist of ability in North America, but recently he had been much assisted by his fellow-citizen, Dr. Geo. H. Horn. Le Conte's health had for some year or two past given anxiety to his friends, as he had threatenings of apoplexy, and on the 15th of November last he died. He held an appointment in the American Mint at Philadelphia, and was, we believe, about 66 years of age, the date 1825 given in Hagen's *Bibliotheca** as the year of his birth, being erroneous. His important collection of North American *Coleoptera* will go, I understand, to the Museum at Cambridge Massachusetts.—D. SHARP.

ENTOMOLOGICAL SOCIETY OF LONDON: 5th September, 1883.—J. W. DUNNING, Esq., M.A., F.L.S., President, in the Chair.

Baron C. R. Osten-Sacken, of Heidelberg, was elected a Foreign Member.

Sir S. S. Saunders exhibited examples of the true "*Cynips carica*," of Hasselquist, obtained from Smyrna figs, and gave interesting details of the history of the species, and of the errors that had occurred in connection with it. Some unknown depredator entered the figs and destroyed the insects, for there were the remains of many individuals indicated only by the apex of the abdomen and long, hard ovipositor. The larva of a *Chrysope* had also been found in the figs.

Mr. Enock exhibited a very fine hermaphrodite example of *Macropis labiata*, in which the external characters of both sexes were distinctly represented, and the genitalia also appeared to refer to the two sexes. He remarked on the rarity of gynandromorphism in bees, and it was suggested that a full description (with figures) should be drawn up of this example.

Mr. Coverdale exhibited *Grapholitha cæcana*, Schläger, taken by him at Deal, and new to Britain; cf. Ent. Mo. Mag., ante p. 83.

The Rev. H. S. Gorham read a paper on the *Lycida* of Japan, with introductory notes, which gave rise to considerable discussion.

* Hagen simply says "1825." Henshaw, in Dimmock's "Special Bibliography" says "May 13th, 1825," the information having been obtained from the American "Popular Science Monthly" for 1874.—EDITORS.

NATURAL HISTORY OF *AGLOSSA PINGUINALIS*.

BY (THE LATE) WILLIAM BUCKLER.

I figured the larva of this species in April, 1860, from an example found in the Corn Exchange at Chichester, but did not then study its habits; nor indeed did I doubt the usually accepted account of them for twenty-two years after, until in 1882 Mr. W. H. B. Fletcher kindly sent me, from Thetford, a few eggs, laid by a female he had taken in a barn, and with them a supply of rubbish swept from the barn floor, amongst which he supposed the larvæ would find their proper food; this struck me at once, and I was still more interested when the eggs hatched, and the young larvæ seemed to be thriving, which induced me to study their habits as closely as possible, and also to investigate the origin of their being credited with feeding on fat and greasy substances.

That the latter part of my task has been accomplished is due to Mr. H. T. Stainton, who, with extreme kindness, expended much time and labour in research, and in furnishing me with a complete transcript from De Geer's "Mémoires" Tome II. 1^{re} partie, p. 371, in which both Réaumur and Rolander are cited; such effectual help claims my grateful thanks!

Réaumur I have no doubt knew the larva and its habits, for I consider that the figures (Pl. 20, Mémoire 8,) as well as the description of his "fausses teignes des cuirs," apply to *pinguinalis* and not to *cuprealis*; but it was Linnæus who bestowed the specific name—*pinguinalis*—relying, doubtless, on what Rolander had said of it, and thus gave the stamp of his great authority to a mistake, which has passed current for truth ever since.

Next we have De Geer, who, in relating what he knew himself of the larvæ, says "It is in the rooms and entrances that I have often found them, crawling on the floor or climbing against the walls, and only in such places that I have met with them. They were almost always come to their last stage of growth, so that when one rested it was only to become a pupa."

Again, after stating what Réaumur had said of the larva making itself a tube, and gnawing leather coverings of books, and feeding on dry bodies of dead insects, he continues "I have had no opportunity to see their lodging nor how they feed themselves; it is always in spring or commencement of summer that I have found them, crawling in the rooms and against the walls of the entrances. They are not willing to eat at that time, but are all one after another preparing to become pupæ."

Having thus said what he knew himself, he goes on—"M. Rolander,

who has also followed the history of these larvæ in the place I have cited in the Mémoires de l'Académie des Sciences de Suède,* said that they fed on many sorts of eatables, as lard, butter, and dried meat, and for that reason they willingly dwell in the larder, and in the offices. He has seen them eat butter and lard with avidity. He has also rubbed all the body with lard and with butter, without their having appeared to suffer injury; one knows that the ordinary larvæ are suffocated, as soon as one stops their spiracles with oil or some other greasy matter. But M. Rolander has remarked, that the larvæ are able to hide their spiracles in folds of the skin, to avoid their being wetted and stopped by the greasy materials which surround them."

"He does not say that he has seen them reside in coverings in form of fixed tubes; he appears not to have known, that M. de Réaumur had before spoken of these larvæ under the name of 'fausses teignes des cuirs,' because they inhabit a fixed sheath: for he said they had not been described by any author."

Now, after my recent experience, the foregoing extracts afford me most convincing evidence, that Rolander was not really acquainted with the larva until it had ceased feeding, and I think I shall presently prove this; and I can only suppose that he must have somehow deceived himself in imagining that which he asserted of *its food*, and of *its spiracles*, ingeniously suiting the one to the other; but it seems something more strange, that for more than a hundred years, all authors who have written on the *Pyralides* have gone on copying the above, and commenting on it as one of the stock *facts* in this branch of Natural History.

To return to the record of my experience with the eggs sent me by Mr. Fletcher, when I received them on 11th of August, they were only just in time, as two of them hatched in the evening of that day, and five more the next day; I put the larvæ at first on a little of the barn sweepings in a glass-topped box, in order to observe, if they fed at all, what they would choose; for these sweepings consisted of a variety of things, such as husks of wheat and of oats, small fragments of straw and of *Cladium* thatch, also of the pods of beans, small seeds of various plants, short bits of grass and other dried stems, some woolly dust, and a few empty pupa skins in cases of some small species of *Lepidoptera*, all mixed up together with much chaffy and earthy matter.

Into this mixture the active little creatures at once went down out of sight, and did not show themselves at all while they remained

* Rolander, Mém. de l'Acad. de Suède, Ann., 1775, p. 51, Tab. 2.

in the box for twelve days, I then began to look for them, and found some small earthy particles of the rubbish adhering slightly to the bottom of the box, and under these I saw three larvæ, and a fourth lying under a morsel of old straw; after this, I removed all into a pot provided with more of the sweepings; later still, I began to realize the hazard of satisfying my curiosity while inspecting their progress from time to time, as I was obliged to turn them out of their tubular dwellings, which were of rather tender construction; and for some time this work of danger resulted in casualties, until after fatally injuring several larvæ, I was impelled to invoke help from Mr. Fletcher, between whom and myself many communications had passed at intervals concerning these larvæ, and on the 24th of September, he most kindly sent me six of part of the same brood he had been rearing for himself: and of these again, after they had wintered safely in a more or less torpid condition, I was unfortunate enough to injure several in the following spring, and in April found I had only two survivors: one of these fully grown, after abandoning its tube, crawled about and remained exposed on the side of the pot for a day or two, but finally retired to the bottom, on which it spun up in a firmly fixed cocoon on the last day of April, and I bred the moth from it on 14th of June: the second was kept in another pot, wherein it eventually during May spun its cocoon, and changed to a pupa, of which I secured a figure and description before the imago came forth on the 8th of July.

Meanwhile, I resolved to make acquaintance with the larvæ in their native haunts, and early in May sought for them in a farm stable, and there, by help from a small boy, on several occasions during that month, a number of them were discovered, enabling me thoroughly to learn their natural mode of life: the place in the stable where they were found was a dark corner between the oat-bin and north wall, in a very narrow interval of space between the two, into which some of the hulls and chaff would often be falling amongst the particles of straw accumulated there, whenever the bin was opened for feeding the horses; the larvæ were almost all on the floor in a cool and slightly damp temperature, inhabiting tubular residences of various lengths, quite flexible and adaptable to any surface, and as all these tubes were more or less covered with small fragments of straw and wheat husks, they, while being removed, appeared like strings of rubbish, accidentally held together without any visible means of cohesion, until the fragments were plucked away, when the dirty coloured silk would betray the residence of a larva, which never showed itself in any instance until turned

out. Some of these larvæ I sent to Mr. Hellins, who examined them for me under his microscope, and confirmed my view of their structure.

Towards the end of June, Mr. Hellins made further acquaintance with this species; he had gone with his nephew to fish in the Exeter canal, but, to use John Leech's explanation of one of his pictures of Mr. Briggs, "the wind that day was not in a favourable quarter," and so, to avoid a drenching from the S.E. rain beating in from the sea, they had to take shelter in a stable, where presently they observed a specimen of the moth sitting on the brick wall, and before long ever so many more, and, while trying to count them, they noticed several of the cocoons spun in the mortar-grooves between the bricks, at a height above the ground of from three to five feet, some perhaps more, clear away from the ledges of the rack and manger, where the larvæ must have fed on the matted and dusty hay seed husks; they noticed no straw in the stable, but only a coarse kind of hay, made from grasses and herbage grown on the canal banks, amongst which could be distinguished the seed-heads of *Holcus lanatus*; quantities of this chaffy rubbish filled the chinks, and lay about on all the ledges with a thick matting of dust, and from a farrago of this nature they stirred out two or three of the larvæ; they carried home five or six cocoons, and in a day or two bred two of the moths, and sent the remaining cocoons to me, and I also bred from them two *pinguinalis* on 14th and 19th of July; whilst from the larvæ I had myself found, the moths continued to appear from 25th July to 7th August.

From these observations I think it will be seen that the larvæ live in comparative darkness, in stables, barns, and outhouses, amid accumulations of the rubbish above mentioned, hidden within a protecting sheath or gallery nearly or quite close to the ground, composed of materials in which they find both their food and their covering; unless disturbed, they are never to be seen whilst growing, as they do not voluntarily leave their abodes until full-fed, but then only do they desert their quarters, and may occasionally be observed ascending walls to find a suitable place for pupation.

The egg of *pinguinalis* is of a good size for the moth, of a roundish-oval form, almost globular, though there is a bigger and a smaller end; the shell, dull and granulated all over, is whitish or creamy-white; a few hours before hatching a light brownish patch shows through one end of the shell, and a very faint pinkish-grey tint on other parts.

The newly-hatched larva is of a very pale whitish flesh-colour, with yellowish-brown head, and plate separated from it by a margin

of pale skin, a similar brown plate is on the anal flap. When twelve days old, the internal vessels appear full of food, and as the size increases the alimentary canal acquires more and more of a dark grey colour, showing very plainly through the clear almost colourless skin.

When six weeks old they become of a dingy grey-brown colour, almost approaching to blackness. On 25th September, I chanced to notice one larva, which appeared nearly ready to moult; it was then dark grey-brown at each end, and whitish-grey along the middle segments of the body, where the dark dorsal vessel showed through, but interrupted at the segmental folds of pale skin; this larva I kept apart, and in a few days it moulted, and became as dark as any of the others.

On 27th September, the smallest was from 9 to 10 mm., and the largest 13 mm. long; the head jet-black, the plate nearly as black, and also three or four following segments, this hue from thence melting gradually into slaty-grey, whereon the minute tubercular black dots appeared; the anal plate brownish-black, and dull. The individual kept apart from the others had increased to a length of 17 mm. by the 11th of October, when it was of a slaty blackness. By 13th of November, most of the others had grown to be 20 mm. long, inhabiting, as I said before, long soft tubes of dark grey-brown silk, smooth inside, but covered externally with quantities of the sweepings; the larvæ I turned out to inspect were now entirely black, excepting the pale upper lip, papillæ, and the legs, which were all semi-pellucid and light drab-coloured; a great number of pellets of black frass appeared in the pots, these I was careful to remove on all occasions of replenishing the supply of sweepings.

I did not disturb them again until 4th of March, 1883, after keeping them through the winter in a cool dark place, and then I found they had not grown at all in the interval, but during the next twenty days their tubes increased to a length of two and a half inches, and the agglomerations adhering made up roughly a transverse diameter of about three quarters of an inch.

As stated above, all this investigation of the growing larvæ was made at the cost of the lives of most of them; however, at the end of April, there still remained two alive, and from them, and also from other examples captured when mature, I made the following description.

The full grown larva is from 25 to 29 mm. in length, almost uniformly cylindrical throughout, though rather stoutest at the third and fourth segments, which have deeply sub-dividing wrinkles, and on each of the following segments to the twelfth is one deep transverse

wrinkle a little beyond the middle; sometimes faint indications of one or two more occur near the end, without detracting from the general plumpness of outline; the segmental divisions are well cut, the anal flap plumply rounded off behind; the tumid ridge below the spiracles is very prominent, the belly flattened and deeply wrinkled; the dorsal tubercular dots each with a fine hair are arranged rather in a square than a trapezoidal figure; the spiracles are very flat, situated just below each lateral wart where the skin is very plump, and in no way hidden or protected by any wrinkle or fold: the colour is generally black or blackish-brown, sometimes a little bronzy, the head having a pale bar of greyish-drab across the upper lip, the papillæ of the same pale colour, all the legs drab; the belly appears like rather worn bronze, the spiracles are black like the skin around them, and therefore are rather difficult to discern.

The pupa is about 13 mm. in length, and nothing unusual in form; the moveable segments of the abdomen are deeply cut, and furnished at the tip with four fine curly-topped spines; its colour is of a dark brick-red, and with a dull surface, though in the divisions of the moveable rings it glistens a little.

The cocoon, firmly attached to some solid surface, is of broad-oval form, composed of greyish silk, on which the spines of the pupal tail obtain a firm hold; it is covered externally with particles gnawed from the surface of its surroundings, whether of rubbish, or of mortar, like those from the Exeter canal stable, or indeed of paper, as I found many years since, when a cocoon was spun in a box of that material.

There now only remains for me to state that on two or three occasions, when I had a larva out before me to examine, I did not neglect to test the grease theory, by leaving butter and lard with it under a large glass, but in every case it seemed carefully to shun both, and though I contrived once that it should at least walk over some lard, it did so nimbly enough, but could not be induced to walk over it a second time, invariably swerving aside. As a final experiment, I turned a large but still feeding larva out from its dwelling into a pot containing three pieces of cloth, one piece lightly saturated with salad oil, the second bearing a lump of fresh butter, and the third a lump of lard, and tied over the pot a cover of calico; on being placed therein, the larva soon came in contact with a piece of cloth, and stopped as though afraid to advance any further; but on my looking next day I could only see the tail of the larva protruding from beneath the lard-bearing cloth, and on my touching it with a soft brush very gently it instantly sprang forward, concealing itself entirely under the cloth;

on the third day it was close by the same piece of cloth, but not under it, and on touching it I found it dead, hard to the touch, and rather swollen; neither butter, lard, nor cloth had on examination been nibbled at all, though there were traces of the larva having crawled all over most of the bottom of the pot; neither fat, therefore, nor greasy cloth, offered any attraction in the way of food, nor did the larva seem proof against the usual harm which contact with oil or grease causes to insect life; but, on the other hand, I confess I never saw a larva actually eating any of the rubbish, on which I believe it must have fed: I found whenever I turned a larva out of its abode, and supplied it with fresh materials to feed on, it immediately began to unite some of the particles together, to cover itself with a new residence, so that it would not feed until out of my sight and in darkness, and thus all my attempts to see it actually eat were frustrated by this habit. Perhaps, indeed, *dried meat*, which was one of the substances mentioned by Rolander, might be eaten, especially if it had become quite hard and tasteless; in this state it would not be very much unlike the leather of the book covers on which Réaumur found the larvæ feeding; and, as a concluding observation, it occurs to me to remark, that he must have kept his library in a state of dust, and never let the maids "put it to rights," or he would not have found his game so close at hand!

Emsworth: *January 2nd, 1884.*

TROPICAL COLLECTING.

BY GEO. C. CHAMPION.

(Continued from page 175.)

In my last paper I spoke chiefly of the outfit of an entomologist in Central America, now I will tell him what he is likely to find in his excursions, commencing with the "tierra caliente," or low country (below 1000 ft. elevation) of Chiriqui, or that part of the State of Panamá immediately adjacent to the frontier of Costa Rica. To reach the virgin forest, of which there is still plenty remaining, not only in the low country, but almost everywhere on the mountain slopes, he will probably have—if he is staying in any village or settlement—to ford one or two rapid rivers or streams, full of great, loose, slippery boulders, and nearly dry in the dry season, but, perhaps, up to his middle in the rainy; then most likely some "nastrojos," or second growth forest of quite a different character and different vegetation to

the virgin forest, and consisting principally of arborescent *Compositæ*, *Solanaceæ*, and *Leguminosæ*, till at last he will find himself in the forest—lofty trees compared to which our highest trees are but dwarfs, spindly palms going straight up 30 feet or so, and looking as if they would topple over every moment, as perhaps they would if they were not protected by their stilt-like roots growing several feet out of the ground, with undergrowth of smaller trees, smaller palms, and in damp places tree-ferns and *Bambusæ*, lower still great broad-leaved *Heliconia* (*Musaceæ*) and allies, ferns, *Arums*, &c. ; and on the ground in some places mosses, *Lycopodiums*, *Begonias*, &c. ; he will rarely see any flowers in the forest itself, excepting in the dry season, when now and then a lot of flowers will be seen on the ground, fallen from some lofty tree, perhaps leafless at this season, and the particular tree from whence they came almost indistinguishable, nor will he find anything he can satisfactorily sweep for insects. The branches of the trees are covered with *Epiphytes* (*Orchids*, *Arums*, *Bromelias*, &c.), and hanging down from them lots of rope-like lianas or vines (*bejuocos*), often reaching the ground and taking root in the soil ; climbing plants innumerable ; palms, ferns, *Arums*, *Passifloræ*, &c., he will find running up the trunks, and all over every tree ; palms with spines as sharp as needles, large trees with spines all over the bark, spiny creepers ; in fact, a thorny path everywhere.

In the height of the rainy season, it is almost impossible to get about in boots : the paths where they exist, and if used at all, will be nothing better than series of mud or water holes, with here and there stumps, tree-roots, or stones, to say nothing of innumerable small streams ; if the collector wants to do much at this season he will have to go native-fashion, barefoot ; in the short dry season, however, it is possible to get about almost anywhere, though he will not find nearly so much to repay him for his work.

Insects, as a rule, excepting ants (long processions of the leaf-cutting *Æcodomæ*, carrying in their mouths pieces of leaf much larger than themselves, and vast armies of *Ecitons* are to be met with everywhere) ; *Termites* (the hard, black, earthen nests of which look absurdly like niggers' heads on a large scale, and frequently to be seen propped up between forked branches or upon the tree trunks) do not abound, still there are very many species to be found by hunting ; the best time for collecting is during the mornings of the commencement of the rainy season in May or June, at this season the magnificent blue *Morphos* of perhaps three species—*M. Amathontæ*, *Peleides*, and *Cypris*—sailing leisurely (till one gets near them) through

the opener parts, rarely settling and rarely coming within reach of the net; the gigantic *Caligos* always settling on tree trunks in the shade, and if disturbed flying a short distance to rest again in the same manner, *Paphia*, *Opsiphanes*, *Gynæcia*, *Epicalia*, *Catagramma*, and *Protozonius*, often on excrement, &c., on the ground, and not seen till nearly trodden upon, when they fly off wildly to settle on some tree-trunk or leaf; the beautiful transparent-winged *Callitæra*, seen by its rosy-pink patch for a moment only as it crosses the path; a good many species of *Satyridæ* in the dense undergrowth, flying very near the ground; various *Euptychiæ*, *Mesosemia*, and other *Erycinidæ*, many *Heliconiadæ* (*Heliconius*, *Ithomia*, *Mechanitis*, &c.), the transparent-winged *Leptalis*, so like *Ithomia*, many *Hesperidæ*, *Apatura*, *Heterochroa*, and other *Nymphalidæ*, and others will be found in the opener parts of the forest; *Castnias*, flying wildly, *Glaucoptis* and allies (some of which, while on the wing, are absolutely indistinguishable from wasps) flying about the low undergrowth, various day-flying *Heterocera*, some of which so mimic *Heliconius*, *Ithomia*, and other butterflies, as to constantly deceive the collector; various *Lithosiæ*, *Notodontæ*, *Geometræ*, and *Pyræles*, will occasionally fly out or fall on to the beating net; of the *Micros*, very few species will be seen beyond an occasional *Tinea* or plume.

The Coleopterist will probably be very much disappointed at first, plenty of butterflies may often be seen when scarcely a beetle is to be found; general beating, as a rule, is not productive, unless on the margin of new clearings, or where the sun penetrates freely; the great thing is to find a new clearing in the forest, and these to any extent are only made by the natives in the dry season (December or January, so as to burn in March)—not by any means the best time for the collector; however, now and then, one does find a clearing or freshly fallen trees, then is the time, almost before the trees are down, beetles begin to appear—Longicorns (I have taken perhaps 100 species in one clearing, by constant hunting day after day for a fortnight), *Elateridæ* (*Semiotus*, *Chalcolepidius*), *Anthrribidæ*, *Brenthidæ*, *Trogositidæ* (*Temnochila*), *Histeridæ* (*Hololepta*, *Tryponæus*), *Scolytidæ* (especially *Platypus*), *Colydidæ* (*Colydium*, *Aubonium*), various *Cleridæ*, *Lycidæ*, *Buprestidæ*, &c. The best way to find many of these, especially the Longicorns, is to crawl over the fallen trees the best way you can and examine very carefully the shady or under-side of the trunks and branches, even to the smallest twigs, many of the smaller Longicorns, &c., are so active, taking to wing directly they are approached, that it is little use beating for them, diligent search-

ing will pay better ; some species run about very actively on the logs in the hot sun, as *Clytus*, *Calichroma*, *Trachyderes*, various *Anthribidæ*, *Brenthidæ*, and *Cleridæ* ; also *Euchroma* and a few other *Buprestidæ* (*Chrysobothris* and allies). These last named like the hottest sun, and are as active as flies. Large number of beetles, &c., occur in withered leaves of the fallen tree-tops or branches, in fact, this is one of the best methods of collecting in the forest ; many moths, *Hemiptera*, Longicorns (*Estola*, *Jamesia*, &c.), that are never seen on the trunks or branches, may be found in this way, some *Carabidæ* (*Lebia*, *Agra*, *Ina*, *Colpodes*, *Calleida*), *Cicindelidæ* (*Ctenostoma*), *Heteromera* (*Ap-sida*, *Hegemona*), *Cleridæ*, *Trogidæ*, *Telephoridæ*, *Staphylinidæ* (*Pæderus*, *Quedius*, *Pinophilus*, *Palaminus*), *Anthribidæ*, very many *Curculionidæ*, and others.

In the clearings, as they get older, or after they have been burned, and while you can still get about them before the crop of rice or maize prevents you (and if there is plenty of black fungoid growth about the fallen logs, as is usually the case), many different species begin to appear, as a good many *Heteromera* (*Spheniscus*, *Nyctobates*), *Erotylidæ*, *Endomychidæ*, and some few *Buprestidæ*, *Anthribidæ*, and Longicorns, not before seen ; a sappy log will probably contain many *Brenthidæ*, *Piestidæ*, *Dactylosternum*, *Temnochila*, *Hololepta*, *Hypophlæus*, *Morio*, and others, under the bark ; a good many *Carabidæ* (*Coptodera*) running on the sappy bark ; and, perhaps, the fine *Heteromeron*, *Phrenapetes*, in the decaying wood ; older logs will contain various species of *Passalidæ*, and fungi on these same logs will produce *Erotylidæ*, *Carabidæ*, allied to *Lebia* (these prey on small larvæ), *Gyrophæna*, and other *Staphylinidæ*, &c. In addition to some *Cleridæ*, many *Curculios* (suggestive of *Celiodes* and *Ceuthorhynchus* on a larger or smaller scale) run about in the hot sun on the bark of dead or fallen trees, most of these are exceedingly wary, flying off at once, and seldom to be caught with the fingers, though they can be brushed into the net ; general beating in the forest itself will not produce very much beyond species of the *Anchomenus*-like *Colpodes* (so numerous in species, about 140 are now known from Central America) *Calleida*, *Lebia*, various *Lycidæ*, *Lampyridæ*, *Ohrysolimidæ*, some *Heteromera* (*Strongylium*, *Statira*), *Telephoridæ*, *Curculios*, and others ; in the rolled unopened leaves of the banana-like *Heliconiæ*, many smooth flattened *Hispidæ*, some *Carabidæ* (*Calophæna*), and *Cassidæ* will be found. These insects may also be seen in fine weather sitting on the leaves, dropping down into the leaf again when approached ; sitting on leaves in the forest in sunny places, a good many *Hispidæ*, *Ohryso-*

melidæ, minute *Buprestidæ* (*Brachys*), some very bright metallic *Onthophagi*, and various *Lampyridæ* and *Lycidæ* will be found, by searching in this way very often far more will be found than by beating; great, black, greasy-looking *Calandræ*, and sometimes *Cetoniidæ*, will be found flying with a loud humming noise in the hot sun, about the sap of fallen *chonta* and other palms. As soon as it begins to get dark in the dry season the "cocujas," or *Pyrophori*, are to be seen flying rapidly in a straight line through the undergrowth; lots of *Lampyridæ* will be met with in the rainy season; these latter have an unsteady, undulating sort of flight, very different to *Pyrophorus*, the smaller species generally keeping low down about small bushes, some quite close to the ground. They do not retain their light nearly so long at a time as *Pyrophorus*, some flashing very frequently; though often found in large numbers, each one appears to take his own course. I never saw anything I could call a flight, nor any flashing in unison amongst the very large number of species collected by myself; many species appear to be very local, especially when one ascends the mountain slopes, where, with every 1000 feet ascended, different species are to be met with; nearly all the Central American species appear to be winged in both sexes.

A good many *Hemiptera*, especially *Reduviidæ*, occur in the forest, some species are common on fallen timber, one in particular (a *Reduvid*), with curious scarlet leaf-like appendages to the apex of the abdomen, and the abdomen itself covered with a sticky sort of substance, preys upon freshly-emerged Longicorns, &c., and I have often seen it with its rostrum buried in the bodies of other insects, anointing them well with the sticky substance before sucking them dry. This species, like most *Reduviidæ*, is very evil-smelling; they require to be handled as carefully as wasps, their bite is like the prick of a hot needle; some fine *Aradidæ* occur under bark, and a good many *Coreidæ* and *Pentatomidæ* on leaves or on the wing. Some fine dragonflies—species with exceedingly long bodies and long wings, and the apices of the latter tipped with yellow, white, or blue, occur in the damp forest; they are seldom, if ever, seen near water.

Some large *Hymenoptera* (*Pompilidæ*) are common in the fresh clearings, where they hunt for spiders and insects amongst the fallen timber.

On the margins of the forest, and in the second growth, a good many different species will be found, as the *Acrææ*, many *Pieridæ*, *Papilionidæ*, *Theclæ*, *Hesperidæ*, *Erycinidæ*, &c.; the fresh growth springing up about new clearings (the natives are frequently clearing

to plant sugar-cane, coffee, rice, maize, tobacco, &c.) is often alive with beetles—*Phytophaga*, *Carabidæ* (*Onypterygia*), *Heteromera* (*Stattira*), *Hemiptera*, &c. ; a “platanal” (plantation of bananas or plantains), if in a damp place, is sure to be productive, the withered or dead hanging leaves forming first-rate traps for all kinds of insects—moths, beetles, *Hemiptera*, &c. (as well as spiders and land shells). In the patches of wood on the hot “llanos,” or savannas, many insects may be found sitting on leaves, as various *Hispidæ*, *Chlamys* (these are exactly like the excrement of Lepidopterous larvæ), &c. ; by brushing about the low bushes with a gauze net—it is little use beating—a good many *Cryptocephalidæ*, *Clythra*, *Chrysomelidæ*, and *Hemiptera* will be obtained ; large *Coreidæ* and *Pentatomidæ* are more abundant in these places than in the forest, they like the hottest sun ; some few *Lepidoptera* more fond of the sun will be met with here—*Thecla*, *Siderone*, *Paphia*, *Ageroniæ* (always on tree trunks), *Prepona*, *Synchlœ*, *Colænis*, some *Glaucopis*, *Urania Leilus*, and the like ; and on the banks of the streams lots of *Terias*, *Callidryas*, *Papilio*, and *Callicore* ; some nice little *Erycinidæ*, darting about for a moment to settle again beneath leaves (their wings spread out horizontally at rest), are often met with in early morning. The flowers of the mango, guava (*Leguminosæ*), and other edible fruit trees, appear to be very attractive to insects—to *Hesperidæ* in the day-time, and to *Sphingidæ* in the short twilight. Excrement on the plains and elsewhere will contain *Phanæus* and other *Copridæ* ; fallen rotten fruit (oranges, pine-apples, bananas, cacao, &c.) swarm at times with *Nitidulidæ* and *Onthophagi* ; carrion is not easy to find, the turkey-buzzards devour it so quickly, and in consequence very few *Necrophaga* are to be met with, dead beetles (*Passalidæ*) have more than once produced me species of *Aleocharidæ* ! the flowers of *Arums*, and the decaying roots of the pine-apple-like plants called “pinuela,” often contain lots of Lamellicorns (*Cyclocephala* and allies) and *Nitidulidæ* ; lots of *Epilachna*, *Phytophaga*, and *Hemiptera* will be found sunning themselves on the leaves of *Cucurbitaceæ* (melons, squashes, &c.) ; and some pretty little *Coccinellidæ* on the orange trees.

Exceedingly few Lamellicorns of the larger species (*Dynastidæ*, &c.) will be found by the ordinary collector, though they are there ; I have had the remains of *Megasoma elephas* and *M. Hercules* brought me more than once, though I never met with them myself ; *Buprestidæ*, except small species, and the giant *Euchroma* are poorly represented ; no species of *Carabidæ* larger than *Agra*, nothing to compare in size with our *Carabi* ; *Staphylinidæ*, if worked for, very numerous in species.

The "manglares," or mangrove swamps, which are found everywhere along the coast in this part of the world, seem quite unproductive in insects, always excepting *Culicidæ*; on the sea beach, a *Cicindela* or two and *Phaleria* are almost the only things to be found.

Cicadæ abound in the dry season both in the forest and in the open country; the *Fulgoridæ* are not rare in the forest, they are very sluggish in their habits, and appear to sit in one spot for days together on the tree trunks, especially near the ground.

Minute ticks, or garrapatas (*Cuscusa*), are a great pest in Tropical American forests in the dry season, frequently swarming all over one, so that on returning home there is no alternative but to strip, and mosquitoes and other *Diptera* are sometimes very troublesome, though, fortunately, there are no land-leeches as in the east; snakes are only too common in these very hot damp forests, the majority, however, large as they are, are of innocuous species; in the forest amongst the dense vegetation, in hunting about the fallen timber, and while beating (I have beaten them on to my net several times), it is, of course, necessary to keep a sharp look out; in the rainy season they are sluggish, and you are apt to tread on them, but in the dry season they are so active that you can seldom get very near them; in pulling off bark with the fingers, as one very often does, you have to be a little careful not only of snakes, but of scorpions, both of which are very fond of hiding beneath loose bark.

The above will give some idea of what the entomologist will find by working in Central America, not so much as would be obtained more south (Brazil, Ecuador, &c.), still, the fauna is a very rich one. I do no more than give the result of my own experience.

(To be continued).

ON THE MALE OF *ZARÆA FASCIATA*.

BY J. A. OSBORNE, M.D.

Thanks to the kindness of Mr. E. A. Fitch, who has been good enough to send me some numbers of the *Entom. Nachrichten* for the year 1878, I am enabled to estimate more accurately the real scarcity of the ♂ of this species, and to forward a description of it, which may not be unacceptable under the circumstances.

After having, in a previous number, invited correspondence and specimens, Dr. Kriechbaumer of Munich published in the No. of the *Ent. Nachr.* for June 1st, 1878, an elaborate and, as it seems, exhaustive investigation, extending over 8 pages of that journal, into the

recorded descriptions of *Z. fasciata*, Mas., arriving at the somewhat negative result that most of them are incompatible with one another, and that he remained in doubt whether any of the insects described as ♂ *fasciata* belonged to that species at all, or whether, in fact, any ♂ *fasciata* had ever been met with. When I mention that among the authors whose descriptions are discussed are included the names of Linnæus, Jurine, Le Peletier, Fallén, Klug, Dahlbom, Zaddach, and Thomson, and that the result was what I have stated, it is obvious that the authentic discovery of a ♂ *Z. fasciata* must have a considerable interest for entomologists. Such a discovery followed speedily on the publication of Dr. K.'s paper, and was announced in the No. of the Ent. Nachr. for July 15th, 1878. Herr Gutsbesitzer Kuwert, of Wernsdorf, near Tharau, in Old Prussia, in whose neighbourhood the species is only too abundant, and who "believed to remember having once taken it *in copula*," after considerable difficulty at last succeeded in capturing a ♂ in June (or July) on a larch tree. From this specimen he furnishes the following description:

"Zaræa fasciata," L. Mas.

"The whole abdomen, inclusive of the first segment, is black. It is narrower than in the female. The last and penultimate segments have on the dorsum a median [longitudinal] groove, and are more strongly covered with black hairs at the sides. The metallic-brownish coloration of the abdomen in the fresh female has given place to a deep black. The eyes . . . meeting above, cover the whole vertex and hinderhead. Size in both sexes the same; likewise the band upon the wings."

With this description my specimen tallies accurately. I would add, however, that (in mine) there is likewise this difference from the ♀, that all the tibiæ and tarsi are light brown; and that the lateral tufts of black hair, especially prominent on the penultimate segment, give an almost trifid appearance to the apex of the abdomen which is very striking to a superficial view. The dead black of the body excludes from the comparison most of the supposed males of *Z. fasciata* described, after Jurine, as "bronzée," "nigro-æneus," or as having coppery or metallic reflexions. Zaddach's description of his ♂, as having the legs, from the knees down, yellow, recalls a similar feature in my insect, but differs in several other particulars, especially in the quadrate velvety spot on the abdomen.

Kuwert concludes his paper with the expression of his opinion that only Linnæus, of all those authors mentioned, had described the

♂ *fasciata* from an actual specimen of the species ; I cannot, however, help echoing the wish of Dr. Kriechbaumer (*loc. cit.* p. 142), that some London Entomologist would examine the Linnæan *type* if it is still preserved in the Linnæan collection there.

Whether any further discoveries of this ♂ resulted from Dr. K.'s paper, which seems to have awakened considerable interest at the time, I have no means of knowing,* but in any case the confirmation which my recently found specimen affords, seems to be not altogether superfluous.

Milford, Letterkenny :

December, 1883.

[I have examined the "Linnæan" collection, and find therein two examples of *Zaræa fasciata* ; both are females : one of them bears a label in Linné's hand, and is presumably his *type*.—R. MC. LACHLAN.]

BRITISH HOMOPTERA.—ADDITIONAL SPECIES.

BY JAMES EDWARDS.

THAMNOTETIX STUPIDULA.

Thamnotettix stupidula, Zett., *Ins. Lapp.*, 294, 9 ; J. Sahlb., *Finl.-och Skand. Cicad.*, 216, 8.

Above sordid greenish-yellow with fuscous or black markings : vertex in front with two triangular dark fuscous spots placed transversely, their bases parallel, separated by a line of the pale ground-colour, and their apices drawn out in a linear form as far as the ocelli, just behind these spots are two oblong dark spots, also placed end to end but more widely separated ; pronotum somewhat suffused with fuscous, with traces of one or more longitudinal lines of the ground-colour ; scutellum with two triangles at the base dark fuscous or black ; elytra with all the areas, except the costal and first sub-apical, more or less margined (sometimes entirely filled up) with dark fuscous or black ; membrane fuscous ; tibiæ spotted with black, posterior pair with a narrow black streak within ; body below chiefly black.

♂. Genital plates (taken together) elongate-triangular, rounded at the apex, about four times as long as the genital valve, with a row of bristles near the outer margins. Side-lobes of hypopygium much narrowed and produced. Lower apical angle of the anal tube produced in a tooth-like manner. Length, 3 lines.

The capture of this Arctic species at Pitlochry by Mr. A. Beaumont is an interesting addition to its geographical range, the latitude of that place (56° 41' N.) being ten degrees further south

* André, in 1880, expresses himself to the same effect as Dr. Kriechbaumer : " La femelle est commune mais le mâle est si rare qu' il n' est même pas très sûr que les individus qu' on lui rapporte en soient d' une façon bien authentique."—Species des Hymen : Tenthred. 1 32, January 7th, 1880.—J. A. O.

than any of its hitherto recorded localities. The most northern locality given for it by Dr. J. Sahlberg, *l.c.*, is Lyngen, Finmark (69° 34' N.).

T. stupidula may always be distinguished from *T. subfuscula*, the most nearly allied British species, by its greenish-yellow ground-colour, even when the dark markings on the elytra are obsolete or entirely wanting.

DELTOCEPHALUS PROPINQUUS.

Deltocephalus propinquus, Fieb., Verh. z.-b. Ges., XIX, 204, 5, tab. v, fig. 5.

Allied to *D. punctum*, Flor, in the pointed form of the head. Brownish-yellow; the nerves bounding the base and apex of the first sub-apical area thickened and milk-white. Very variable in the dark markings of the elytra, sometimes these are entirely absent, while in the darkest form all the areas are narrowly margined with fuscous, and many intermediate forms occur. In what appears to be the commonest form the upper margin of the first sub-apical and the hind margins of the apical areas are narrowly bordered with dark fuscous, and the hind margin of the fourth sub-apical area is also bordered with the same colour in such a manner as to nearly resemble the dark spot observable on the elytra of *D. punctum*, Flor.

♂. Genital valve triangular, shining black; plates (taken together) triangular, broadly truncate at the apex, about two and a half times as long as the valve, entirely covering the hypopygium, dark brown with pale yellowish margins. Lower margins of the hypopygium (viewed from below) with a falcate, acute, corneous, dark brown process placed near the middle and directed inwards and backwards. Inner processes (*griffel* of Fieber) deep shining black, about half as long as the plates, somewhat curved, obtuse, and having at their base a straight tooth which is about two-thirds as long as the process itself.

♀. Hind-margin of the last ventral abdominal segment with two small obtuse triangular teeth which are about equidistant from the side-margin of the segment and from each other. Entire segment brownish-yellow with an oblong black patch on the hind-margin, including the teeth, and below each tooth there is almost invariably a black dot, but this latter is evidently caused by the bases of some muscles connected with the ovipositor shewing through the pale portion of the segment, since it disappears when the segment is dissected out. Length, 2 lines.

The locality indicated in Dr. Puton's "Catalogue" (1875) for this apparently little-known species is Andalusia. It seems to be tolerably common in Norfolk, and is probably overlooked elsewhere. I have examined 42 examples (24 ♂ 18 ♀).

Swiss Cottage, Rupert Street, Norwich :
December 18th, 1883.

A MEMOIR OF ANT-LIFE BY THE LATE REV. H. S. R. MATTHEWS.

COMMUNICATED BY THE REV. A. MATTHEWS.

Among a host of notes and records of Natural History left by my brother, I lately found the subject of my present communication. And since so much interest has lately been excited by the researches of Sir John Lubbock into the life-history of Ants, I thought that its publication would prove interesting to those Naturalists who have paid so much attention to this subject, and also serve as a corroboration of facts already recorded by others. I have, therefore, transcribed the following memoir entitled in the words of its author:—

[THE WARS OF THE ANTS.

On the 25th of June, 1850, as I was passing through a fir-plantation near Skellingthorp in this county (Lincolnshire), I observed two very large colonies of the great red and black Ant, *Formica rufa*; their nests were about five or six yards apart, and had been built, like others in their vicinity, on the bank of a dry ditch by the side of the road. Their inhabitants were busily engaged in the usual occupations of Ant-life, some carrying home various articles of food, such as small insects or caterpillars, while the greater part seemed to be employed in collecting materials for the purpose of enlarging their already enormous nests. I was much amused by watching their proceedings; one individual was endeavouring with all his might to drag home a long piece of stick, unconscious that all his efforts were rendered abortive by two of his own companions, who, on the other side of an intervening root, were equally determined to drag the same stick in an entirely contrary direction; in another part, one, whose ambition exceeded his strength, seized a tolerably large caterpillar by the throat, and was forthwith hurled ignominiously on his back, nothing daunted by this rebuff he loosed his hold, and patiently watched the contortions of the caterpillar, until, seeing his head and tail in contact, he pounced suddenly upon him, and seizing both extremities in one grip of his powerful jaws he raised his now helpless victim on high, and bore him off in triumph. Feeling much interested in my new friends, and anxious to improve our acquaintance, I took an early opportunity of revisiting the spot. But, alas! in the short space of one week how great a change had come over the scene. The once flourishing colonies, a few days before teeming with life, seemed almost entirely depopulated, scarcely could an Ant be seen on either nest, and the few, whose appearance was the only sign that any of its former multitudes remained, crawled stealthily over the surface, more like robbers or spies than the rightful owners of the soil.

Astonished by what I saw I investigated the matter more closely, and before long discovered the true state of affairs. An internecine war had broken out, which arising probably in some private quarrel, had eventually involved the whole of the rival communities, and had been carried on with the most rancorous hatred, and the most persevering hostility. The scene of the main conflict lay in the ditch between the two nests; the whole of this space was literally covered with the dead bodies of the combatants, which in some places lay more than an inch deep. The historical hatred of the Kilkenny Cats, which, as we are told, terminated in their total annihilation, was here exhibited in all its intensity. With a few solitary exceptions all, preferring death to defeat, had paid the last debt of nature. Here and there, in various parts of the battle-field, the strife was still carried on by single combat; each antagonist blindly bent upon destruction, endeavouring to seize the other by its antennæ, and when this had been accomplished, locked in each other's embraces, they rolled upon the ground, until the struggle had ended in the death of one or both combatants. A survivor from one of these duels still able to crawl about, and still burning with fury, was searching in every direction for another antagonist; having touched with his antennæ a supposed enemy he halted for an instant, and gathering together all his remaining strength, rushed blindly forward, and frantically seized a small stone.

Pondering much on what I had seen, but too true a picture of the suicidal folly of mankind, I at length pursued my way to a neighbouring village, where I intended to remain for a few days fishing and insect-hunting. Three days after I had witnessed the sad though interesting sight I have described, I passed the same locality on my return homewards, and was pleased to find affairs much improved. All traces of the conflict had been obliterated, and the bodies of the fallen removed. As if by magic a fresh race had sprung up, apparently as numerous as its predecessors. The arts of peace were again flourishing with renewed energy; the nests had been repaired, and set in order; fresh outworks had been constructed, and every thing that industry could accomplish had been done to render the defences complete, and guard against future disasters.

In this state I left them, nor was I able to repeat my visits, but much hope, that profiting by past experience, they would in future prefer the quiet blessings of peace to the miseries of savage warfare.]

Gumley, Market Harborough:

December 24th, 1883.

THE ACULEATE HYMENOPTERA OF THE NEIGHBOURHOOD OF COLCHESTER.

BY W. H. HARWOOD.

Having, during the past two seasons, devoted some attention to the Aculeate *Hymenoptera* of the Colchester district, I send a list of the species I have met with, hoping it may prove as interesting to others, as similar local lists have been to me. I have worked principally at the bees, but have taken representatives of the other families when they came in my way. I ought to mention that I have been largely indebted to Mr. Edward Saunders for his kind assistance in naming my specimens, without which my list would be neither so long, nor so reliable, as it is.

Formica rufa, L., and *fusca*, L.

Lasius fuliginosus, Ltr., and *niger*, L.

Myrmica rubra, L., races, *ruginodis*, Nyl., and *scabrinodis*, Nyl.

Leptothorax tuberum, F., race, *Nylanderi*, Foerst.—this seems to be a scarce ant generally, but I do not think it is uncommon hereabouts. I found a nest under bark of black poplar at Bures, in Suffolk, on the 12th of last April, and had previously taken it nearer home. As yet I have met with no specimens in the winged state.

Mutilla europæa, L., scarce.—three or four males on the wing, and at bramble and *Angelica* flowers, and one female curled in a curious manner round a young oak-twig, St. Osyth.

Sapyga 5-punctata, F.

Pompilus cinctellus, Spin., and *plumbeus*, F.: *ohalybeatus*, Schiödte.—this species was not rare one sunny morning last autumn, on a small sandy hillock among clay cliffs at Walton-on-the-Naze, but was exceedingly active and difficult to capture; *Wesmaeli*, Thoms., and *spissus*, Schiödte.

Priocnemis fuscus, L., *exaltatus*, F., and *hyalinatus*, F.

Ceropales maculatus, F.—*Angelica* flowers, St. Osyth.

Ammophila sabulosa, L., *lutaria*, F.—coast-sands.

Tachytes pectinipes, L.

Passalacus cornigera, Shuck., and *insignis*, V. d. L.

Pemphredon lugubris, F., *unicolor*, Latr., and *lethifer*, Shuck.

Gorytes mystaceus, L., and *campestris*, L.

Hoplisis bicinctus, Rossi.—of this rare and beautiful species I captured a male in 1882, and a female on August 1st, 1883.

Mellinus arvensis, L.—very abundant at Walton-on-the-Naze, flying about coltsfoot, and resting on the leaves; I have not as yet met with it elsewhere!

Cerceris arenaria, L.—at raspberry flowers, &c.: *5-fasciata*, Rossi—rare: *labiata*, F.—generally distributed, on yarrow-flowers, &c.: *sabulosa*, Panz.—very rare: *ornata*, F.—at thistle and other flowers, varies greatly in size.

Trypoxylon figulus, L., and *clavicerum*, Lep.

Crabro leucostoma, L., *podagricus*, V. d. L., *Wesmaeli*, V. d. L., *signatus*, Panz.

—of this insect, of which only three or four other examples have occurred, I took a fine male in 1882, and a second in 1883, the latter from its burrow in a post: *cephalotes*, Panz., *vagabundus*, Panz., *cribrarius*, L., *vagus*, L., *Kollari*, Dhlb.—of this novelty (see Ent. Mo. Mag., vol. xix, p. 246, April, 1883) I have taken a nice series of both sexes on *Angelica* flowers: *albilabris*, F.—on flowers of *Anthemis cotula*, &c.

Entomognathus brevis, V. d. L.

Oxybelus uniglumis, L.—not uncommon at Dovercourt on yarrow-flowers.

Vespa crabro (not seen during the past two seasons), *vulgaris*, L., *germanica*, F., *rufa*, L., and *syloestris*, Scop.

Odynerus spinipes, L., *melanocephalus*, Gmel., *callosus*, Thoms. (this was found as early as March 26th, 1883), *parietum*, L., *pictus*, Curt., *trifasciatus*, Oliv., *antilope*, Panz.—not uncommon at raspberry flowers; *parietinus*, L., and *sinuatus*, F.

Colletes succincta, L.—at flowers of *Eryngium maritimum*, common, but local: *Daviesana*, Sm.—common at *Anthemis cotula* and *Tanacetum vulgare* flowers.

Prosopis communis, Nyl., *signata*, Panz., *hyalinata*, Sm., *confusa*, Nyl., *brevicornis*, Nyl., and *pictipes*, Nyl.—this last very local species occurs in my garden, where its habit is to burrow into old posts.

Sphæcodes gibbus, L., *pilifrons*, Thoms., and *ephippium*, L.

Halictus rubicundus, Chr., *leucozonius*, Schr., *quadrinotatus*, Kirb., *cylindricus*, F., *albipes*, Kirb., *villosulus*, Kirb., *nitidiusculus*, Kirb., *punctatissimus*, Schk., *tum-lorum*, L., *minutissimus*, Kirb., *Smeathmanellus*, Kirb., and *Morio*, F.

Andrena Hattorfiana, F.—two specimens only as yet, on *Scabiosa arvensis* flowers: *cingulata*, F.—apparently rare and local, Nayland; *albicans*, Kirb., and *atriceps*, Kirb., *rosæ*, Panz.—rare, Stanway: *Trimmerana*, Kirb., and *var. spinigera*, *fulva*, Schr., *Clarkella*, Kirb.—Nayland, St. Osyth, and Bentley (Suffolk); a fine variety of the female occurred, with the pubescence on the abdomen entirely fulvous instead of black: *nigro-ænea*, Kirb.—common inland, swarming on the coast: *Gwynana*, Kirb., and its autumn brood *bicolor*: *præcox*, Scop.—at sallow blossoms, Nayland, &c., also near Sudbury (Suffolk): *varians*, Rossi, *helvola*, L., *fucata*, Sm., rare, St. Osyth, on bramble flowers: *nigriceps*, Kirb.—one specimen near Bentley (Suffolk) on ragwort in 1882, a fine series at Stanway on bramble flowers, July, 1883: *denticulata*, Kirb.—at thistle flowers, rare: *fulvicrus*, Kirb.—rare at present, Nayland: *albicus*, Kirb.—this is one of the bees that burrow in trodden pathways; the males may be seen flying close to the ground, upon which the tiny mounds of earth thrown up by the females may be easily discovered; where these are quite fresh, the proprietor of the establishment may generally be found at home: *chryso-celes*, Kirb., *coitana*, Kirb., *labialis*, Kirb., *minutula*, Kirb., *nana*, Kirb., *dorsata*, Kirb., and *Afzeliella*, Kirb.

Dasygoda hirtipes, Latr.—at hawkweed flowers; rare in 1883, not found previously.

Nomada solidaginis, Panz., *succincta*, Panz., *alternata*, Kirb., *ruficornis*, L.: *borealis*, Zett.—rare, about burrows of *Andrena Clarkella*; Smith gives April 10th as an early date for this species; I took it last year on April 3rd: *Fabriciana*, L., and *furva*, Panz.

Epeolus rufipes, Thoms.—rare, Stanway and Nayland: *productus*, Thoms.

Melecta luctuosa, Scop., and *armata*, Panz.

Colioxys rufescens, Lep., *elongata*, Lep., and *acuminata*, Nyl.

Megachile maritima, Kirb.—Walton-on-the-Naze: *Willughbiella*, Kirb., *circumcincta*, Lep.—Nayland: *ligniseca*, Kirb.—at flowers of *Geranium pratense* in my garden; this plant does not occur here in the wild state; also at flowers of everlasting pea, &c.: *centuncularis*, L.—very common in my garden.

Anthidium manicatum, L.—at flowers of *Ballota nigra*, *Geranium pratense*, and raspberry; I have found *G. pratense* a very attractive plant to bees generally, and especially to those belonging to the genera *Colioxys* and *Megachile*.

Stelis aterrima, Panz.

Chelostoma florissomne, L., and *campanularum*, Kirb.

Osmia rufa, L.—common at *Brassica* flowers, also flying on sunny afternoons about the fronds of cottages, to which grape vines, &c., have been nailed: *pilicornis*, Sm.—of this rare species I met with two specimens in 1883: *cærulescens*, L., and *fulviventris*.

Eucera longicornis, L.—very abundant, especially at flowers of *Ajuga reptans*.

Anthophora retusa, L.—Nayland, &c., rare: *pilipes*, Fab.—very abundant about sunny banks in the early spring; the male was out last year on March 4th: *furcata*, Panz.—rare.

Ceratina cyanea, F.—Nayland, rare.

Psithyrus rupestris, F., *vestalis*, Fourc., *Barbutellus*, Kirb., *campestris*, Panz., and *quadricolor*, Lep.—the males of this genus seem much more abundant than the females; a friend of mine last year brought me a "humble bees' nest," from which I bred a number of male *rupestris*, but the occupants of the very few female cells all died without emerging.

Bombus cognatus, Steph.—when collecting *Coleoptera* on the St. Osyth coast last year, I unwittingly disturbed a nest of this species, the proprietors of which came buzzing about my head in a very menacing manner, but having a good-sized net with me, I quickly made them all prisoners; they were mostly males, and probably some of them had never flown before; I tried to breed some females, but failed, probably I kept the cells too dry; this is a common species here, especially towards the coast: *muscorum*, L.—excessively variable: *Latreillellus*, Kirb.—not common; in 1882 I only obtained females, but last year I found all the sexes: *hortorum*, L., and *var. Harrisellus*, Kirb., *pratorum*, L., *sylvarum*, L., *lapidarius*, L., *terrestris*, L., and *var. lucorum*, Sm.

Apis mellifica, L.

Colchester: January 9th, 1884.

Captures in North Uist and St. Kilda.—Last June I spent a few days in the island of North Uist, one of the Hebrides, and met with the following species:

LEPIDOPTERA: *Sericoris littoralis*, *Bactra lanceolana*, *Grapholita campoliana*, *Argyrolepia Baumanniana*, *Dicrorampha simpliciana*, *Eupæcilia angustana*, *Simaethis Fabriciana*, *Plutella cruciferarum*, *Gelechia tenebrosella*, *Tinea rusticella*, *Miana fasciuncula*.

NEUROPTERA and ORTHOPTERA: *Asynarchus canosus*, *Limnophilus extricatus* and *affinis*, *Lestes sponsa*, *Forficula auricularia*.

Lepidoptera in the Isle of Man in July.—At the end of July last I made a ten days' visit to the Isle of Man, in the hope that in some of the unexplored parts, something fresh might possibly be turned up. I worked hard on the east, south, and west sides of the island, but very little of interest could be found, and although no doubt the season was a bad one there as elsewhere, I was reluctantly forced to the conclusion, that at best the ground would probably be unprofitable to the Lepidopterist. The four local species, *Sesia philanthiformis*, *Dianthæcia capsophila*, *D. cæsia*, and *Polia nigrocincta* can of course always be relied on there at the right time, and I believe would each be found in plenty all along the rocky parts of the coast, and this includes a great proportion of it; but there seems to be little else to tempt one across, now that the red form of *Cirrhædia xerampelina* cannot at all be relied on. *Dianthæcia cæsia* must be on the wing for a long time, as it was still in good condition, and not uncommon at the time of my visit. Other species taken or noticed included *Argynnis Aglaia*, common on the cliffs and on uncultivated ground inland; *Satyrus Semele* and *S. Janira*; *Chortobius pamphilus*, abundant; *Bombyz rubi*, larvæ common; *Metrocampa margaritata*; *Boarmia repandata*, abundant; *Gnophos obscurata*, very dark; *Pseudopterpna cytisaria*, common; *Acidalia scutulata* and *A. bisetata*; *Laurentia didymata*, some of the males very dark, and of the females a curious variety; *Emmelesia alchemillata*, common; *E. albulata*, *Eupithecia venosata*, larvæ in *Silene maritima*; *E. subfulvata*; *E. nanata*; *E. absynthiata*, very large; *E. pumilata*; *Melanthia ocellata*, common; *Cidaria fulvata*, common; *Eubolia mensuraria*, and *E. palumbaria*, both plentiful; *Anaitis plagiata*, common; *Dianthæcia capsophila*, full-fed larvæ abundant on *Silene maritima*, the imago also on the wing; *Plusia chryritis*, very common; *Pyrausta ostrinalis*; *Scopula lutealis*, common; *Scoparia ambigualis*, common; *Crambus pascuellus*; *C. perlellus*, not uncommon; *C. geniculeus*; *Homæosoma nimbella*; *Tortrix pyrastrana*; *T. rosana*, abundant; *Dictyopteryx Holmiana* and *D. Bergmanniana*; *Aspis Udmanniana*, common; *Sciaphila alternana*, *S. perterana* and *S. virgaureana*; *Grapholitha trimaculana*; *Trycheris mediana*; *Xanthosetia hamana*; *Pepilla Curtisella*; *Depressaria liturella*; *D. heracliana*, larvæ very abundant; *Argyresthia nitidella* and *A. albistria*, both common; *Gracilaria Swederella*, abundant among oaks at Ramsey; *Coleophora lizella*, about thyme on the cliffs; *C. Tengstromella*; *Elachista albifrontella*; *Ptercophorus pterodactylus*; and *P. microdactylus*, beaten out of *Eupatorium cannabinum*.

Among a number of species given to me unset by Mr. E. Birchall, and taken at different times by the lighthouse keeper on Douglas Head, were *Charæa graminis*; *Agrotis lucerneæ*; *Anchocelis lunosa*; *Dianthæcia cæsia*, evidently a free visitor to the lights; and *Epunda lichenea*, also evidently not uncommon.—GEO. T. PORRITT, Huddersfield: January 4th, 1884.

Obituary.

William Buckler died at his residence, Lumley, Emsworth, Hants, on the 9th of January, of bronchitis (after a very short illness), aged 69.

We make this announcement with unfeigned regret, which we know will be widely felt amongst our readers.

A fuller notice of Mr. Buckler is in preparation for our next Number.

ON SOME GENERA OF THE SUB-FAMILY *ANCHOMENINI* (*PLATYNINI*, HORN) FROM THE HAWAIIAN ISLANDS.

BY D. SHARP, M.B.

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The Hawaiian members of this group show a great variety of appearance, and must form several genera, which may be defined as below:—

METROMENUS (*n. g.*).

This genus comprises the larger number of the Hawaiian species hitherto placed in *Anchomenus*, *Colpodes*, and *Dyscolus*, from which it is distinguished by the total absence of systematic setæ on the pronotum. The elytra are margined at the base, and the scutellum penetrates backwards between the margins, the fourth joint of the tarsi may be either conspicuously bilobed or only slightly emarginate; the mesothoracic epimera are short externally. The rather numerous species agree satisfactorily in these characters, with the exception of *Anchomenus mysticus*, Blackb., which has the scutellum smaller, and scarcely penetrating between the basal margins of the elytra: this species may, perhaps, be entitled to generic isolation, but the material at my disposal does not enable me satisfactorily to examine into this.

COLPODISCUS (*n. g.*).

Elytra margined at base, scutellum scarcely penetrating between the basal margins; pronotum furnished with a single systematic seta, placed close to the hind angle, mesothoracic epimera considerably prolonged externally; anterior and middle tarsi bilobed, posterior either bilobed (*A. lucipetens*, Blackb.) or slightly emarginate (*Dyscolus tantalus*, Blackb.). The existence of the thoracic seta in conjunction with the scutellar structure, justifies the formation of this genus, though the two species forming it are very discordant in appearance.

BABYPRISTUS (*n. g.*).

Stature large and robust, the after-body large and heavy; elytra margined at the base, scutellum dividing the margins; pronotum with a single systematic seta placed some little distance in front of the hind margin; mesothoracic epimera much prolonged externally; all the tarsi with the fourth joint emarginate, but not bilobed. The three species of this genus form a sufficiently natural group; one of them, *Anchomenus Sharpi*, Blackb., forms, perhaps, the nearest approach of the Hawaiian *Carabidæ* to the great genera *Anchomenus* and *Colpodes*, from which it differs by the absence of the anterior systematic seta on

the pronotum, by the mesothoracic epimera prolonged externally, and by the condition of the tarsi, which may be considered as intermediate between those of *Anchomenus* and *Colpodes*.

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BLACKBURNIA, Sharp.

The curious insect for which I proposed this generic name, is a very distinct genus: there is no pronotal seta; the basal margin of the elytra is very peculiar, being towards the middle sloped backwards, the scutellum is quite small, nearly concealed, and the mesothoracic epimera are a good deal prolonged externally. These characters are supplementary to those I mentioned when describing the genus originally.

DISENOCHUS, Blackb.

This genus was correctly referred by Mr. Blackburn to the *Anchomenini*, and Karsch was in error in treating the species known to him as a *Promecoderus*, which is a genus of *Broschini*. The mistake of the German savant was, however, a pardonable one, as *Disenochus* has much the appearance and characters of the *Broschini*, the mesothorax being pedunculate or sub-pedunculate, and the elytra unmarginated at the base, and the scutellum placed entirely on the mesothoracic peduncle. There are two systematic setæ on the pronotum, one in front of the middle and one a little in front of the hind margin; the two orbital setæ occupy the usual positions.

ATRACHYCNEMIS, Blackb.

This represents another most interesting insect, which I have been able to study only by a single example, which was deprived of tarsi, antennæ and palpi on its journey to me. Though located by both Blackburn and Karsch in the *Harpalidæ*, yet its true relationship is, I believe, with the Hawaiian aberrant *Anchomenini*. There are two orbital setæ, the posterior being placed far from the eye, owing to the reduction of the magnitude of this organ. The pronotal setæ I cannot speak of, owing to the condition of my specimen, but probably there is a single one (which, like those of the head, may be *very feeble*) near the hind angle; the elytra, though possessing rather prominent shoulders, are not margined at the base, and the scutellum is placed entirely on the thoracic peduncle; the elytra are remarkably free from sinuation behind, and closely adapted to the hind-body. These characters are (since the importance of the orbital setæ in the classification of the *Carabidæ* has been demonstrated) consistent only with the location of their possessor in the *Anchomenini*, though it must be admitted that the general facies is an approximation (but only an approximation) to that of the *Dapti* group of the sub-family *Harpalini*.

CYCLOTHORAX, Motsch.

This genus is well distinguished from *Olisthopus* by the untruncate apices of the elytra, a character of interest, inasmuch as *Olisthopus* appears to form a transition to the "truncatipenne" series of *Carabidæ*. It is much less easy to point out good characters to distinguish the genus technically from *Anchomenus*, but the insects of these two genera are so distinct in facies and stature, that no doubt good characters will ultimately be found to distinguish them. So far as the Hawaiian fauna is concerned, *Cyclothorax* is distinguished by the presence of two setæ on the thorax, one in front of the middle, the other on the hind angle itself (apparently very slightly attached, and, in dried specimens, most frequently removed); it thus approaches *Disenochus*, from which it is distinguished by the less pedunculate mesothorax, and by the scutellum not being confined to the peduncle, and by the margined base of the elytra.

Those interested in the genera of Hawaiian *Carabidæ* should consult, in addition to the above remarks, some observations by Mr. Blackburn, in Ent. Mo. Mag., xvi, pp. 105—107.

Thornhill, Dumfrieshire :
February 2nd, 1884.

ON THE EUROPEAN SPECIES OF *LEPIDOPTERA* WITH APTEROUS OR SUB-APTEROUS FEMALES.

BY R. C. E. JORDAN, M.D.

Apterous species occur in all Orders of insects, but in *Lepidoptera* wingless examples seem confined to the female sex; none of these are met with in the *Rhopalocera*, the first group are the *Heterogynidæ*, placed in Staudinger's list next to the *Zygænidæ*; there is only one genus in the family, and it contains two species, *Heterogynis penella* and *Heterogynis paradoxa*. These are insects of warmth and summer time, the males dusky, with semi-transparent wings, the females entirely apterous. Nextly in order, follows the remarkable genus *Ocnogyna*, the species of which may be almost defined to be *Spilosomata* with sub-apterous females, they are ten in number, and inhabit Southern Europe, North Africa, and Asia Minor; *Ocnogyna corsica* has almost the colour and appearance of a small tiger-moth.

Hepialus pyrenaicus forms an exceptional instance in the genus to which it belongs, the wings of the female being only rudimentary.

The whole family of the *Psychidæ*, with at least seventy species, all have perfectly apterous females; following these come the

Liparidæ, and amongst them, firstly, the dusky *Penthophora morio*, with its half-winged mate, and then the more brightly coloured *Orgyia*,* two species of which are British; in this genus, as is well known, the females have only the bare rudiments of wings.

Mr. Stainton kindly reminds me of one *Noctua* amongst our European list, with an apterous female, *Ulochlena hirta*, of which Guenée says, "La femelle a des ailes reduites à de petits moignons très courts, comme celles des *Hyberniæ*." The female is figured by Millière, in his *Icones* (livr. 6, pl. 4).

In the *Geometridæ* apterous females become comparatively common: thus following the order of Staudinger's list, there is, firstly, the genus *Hibernia* (7 species†), then *Anisopteryx* (2 species), *Phigalia pedaria* (*pilosaria*), *Chondrosoma fiduciaria*, and the first section (including 9 species) of the genus *Biston*, nextly, the last sub-section of the genus *Gnophos*, namely, *Gnophos Zelleraria*, *G. Andereggaria*, *G. calibaria*, and *G. operaria*, have all sub-apterous females, and so also have two genera allied to *Psodos*, *Pygmæna fusca*, and *Egea pravata*; the two *Cheimatobia*, and, to the best of my belief, the rare *Malacodes regelaria*, close the list of *Geometræ*. In this group the reason for the absence of wings is more evident than in former insects, many are winter moths, and this absence may make them less conspicuous, yet it may be fairly doubted if the sharp eye of a titmouse would easily pass over a female *Cheimatobia*, or even a female *Exapate gelatella*; others, as the *Gnophoi* and *Psodoi* are inhabitants of mountain summits, which seems in part to account for it, yet it has happened to me on the same day to find *Pygmæna fusca* on the Riffel, and going higher to meet with the winged *Gnophos dilucidaria* near the top of the Görner-Grât.

Amongst the *Pyralidæ*, *Acentropus niveus* has the female‡ (in part) with rudimentary wings, and it is easy to see that these might much embarrass a moth which lays its eggs under water.

In the *Tortrices*, as usually classified by English authors, there would be no species with apterous or sub-apterous females; but Wocke places *Oxypteron impar* and *Exapate gelatella* next to the genus *Cheimatophila* in this group, separating them, therefore, widely from *Dasystema* and *Chimabacche*, which are retained in the *Tineidæ*, next to the *Gelechidæ*; these, like many of the wingless *Geometræ*, are

* See a highly interesting paper by Mr. Stainton on the graduated helplessness of these "lazy house-wives," published in the *Journal of the Linnean Society, Zoology*, vol. vi, pp. 156-164: "On the abnormal habits of some females of the genus *Orgyia*."

† I believe the ♀ of *Hibernia Ankeraria* is unknown.

‡ See a very interesting account of the habits of this species in Vol. xii, *Ent. Mo. Mag.*, p. 257.

winter insects. The *Talæporidæ* close our short summary; in these are found the *Solenobiæ*, which, speaking physiologically, are certainly the most interesting of all our *Lepidoptera*.*

A glance at these varied conditions of apterous life in the *Lepidoptera* teaches us how little is yet known of cause and effect in nature, amongst them are some summer moths flying in broad daylight others are night-flying insects of the frost and the winter, there are some living on the mountain tops, others in the warmth and shelter of the woods, in some, as in *Orgyia*, the nearly allied genera have the sexes differing materially from each other in their structure, in others, as in *Biston*, the difference is but small; one feature only seems common to the whole group, and even here, too positive an assertion must not be made, since *Chimabacche*, at least, has a small sucker; this common character is that the digestive organs are reduced to a minimum, and the females are, therefore, little else than living ovisacs.

From the wide diffusion of these "ocnai gunaikēs" over distant regions of the world, it may be predicted that they are very ancient types, and though the testimony of the rocks is against me, it may be allowed to indulge in the hypothesis that the archaic form of Lepidopterous life was almost a land *Trichopteron*, and that the cases of these early *Psychidæ* may yet be found in the fossil state.

The following list of apterous *Lepidoptera* belonging to the European fauna may conclude this summary:

| | | |
|----------------------------|-------------------------|--------------------------|
| HETEROGYNIDÆ. | PHIGALIA | <i>G. calibaria</i> |
| HETEROGYNIS | CHONDROSOMA | <i>G. operaria</i> |
| ARCTIADÆ. | BISTON (pars, i. e.) | PYGMENA |
| OCNOGYNA | <i>B. hispidarius</i> | EGEA |
| HEPIALIDÆ. | <i>B. lanarius</i> | MALACODES |
| <i>Hepialus pyrenaicus</i> | <i>B. pomonarius</i> | CHEIMATOBIA |
| PSYCHIDÆ. | <i>B. lapponarius</i> | PYRALIDÆ. |
| LIPARIDÆ. | <i>B. liquidarius</i> † | <i>Acentropus niceus</i> |
| PENTHOPHORA | <i>B. incisarius</i> | TORTRICIDÆ. |
| ORGYIA | <i>B. zonarius</i> | OXYPTERON |
| NOCTUÆ. | <i>B. alpinus</i> | EXAPATE |
| <i>Ulochlena hirta</i> | <i>B. græcarius</i> | TINEIDÆ. |
| GEOMETRÆ. | GNOPHOS (pars, i. e.) | DASYSTOMA |
| HIBERNIA | <i>G. Zelleraria</i> | CHIMABACCHE |
| ANISOPTERYX | <i>G. Andereggaria</i> | TALÆPORIDÆ. |

105, Harborne Street, Edgbaston:
January 18th, 1884.

* It is strange that no real advance has been made in the life-history of this genus since the publication of Von Siebold's work on true Parthenogenesis, translated by Mr. Dallas in 1857.

† *liquidarius* ♀ unknown.

Entomological Collecting on a voyage in the Pacific (continued from page 96).— We arrived in Papetoai Bay (Eimeo) on the morning of May 9th, and on the following day we steamed over to Tahiti and anchored in Papiéte Harbour. Eight days were spent here, in coaling ship and giving leave to the crew, and I was able to make two excursions to the mountains, besides sundry shorter walks about Papiéte. On one occasion, I reached the hill-fort of Fautaua (famous in the history of Tahiti, as the spot where the natives made their last stand against the French in 1845), which is most picturesquely situated at a height of 2500 feet above the sea. Close by is the principal waterfall in the island, a considerable stream falling over a grand precipice of columnar lava 700 feet high, the surrounding scenery being of the most magnificent description. No new butterflies turned up, but both at Eimeo and Tahiti, I got several moths which I had not previously taken. Specimens of *Chærocampa Erotus* and *Sphinx convolvuli*, usually much rubbed, were occasionally brought to me, and the larva of the latter hawk-moth again occurred, on several species of *Convolvulus*. A very delicate-looking green *Chærocampa* larva, found not rarely on the Taro, the "Nono" (*Morinda citrifolia*, a common wild fruit) and especially on the "Apé" (*Arum costatum*, a gigantic species with an esculent root) produced, to my surprise, our rare British *C. Celerio*, and I reared a beautiful series: the oblique stripe on the fore-wings being much more silvery than in any examples I have seen in English collections. The larva of *Macroglossa* sp. also occurred on the "Nono:" it is very similar in appearance to that of our own humming-bird moth. Several *Geometra*, apparently related to *Boarmia*, &c., occurred sparingly in the forest, and two very interesting moths were obtained in plenty, by beating the foliage of the *Hibiscus tiliaceus*. One (of which I had previously found a single specimen in Nuka Hiva) is a satiny-white insect, in size, make, and general aspect almost a fac-simile of *Liparis salicis*: and not until I had reared it from a long green "half-looper" caterpillar, did I find out that it is really a *Quadrifid Noctua*. The other is a very pretty delicate green moth, reminding one strongly of *Geometra smaragdaria*: this I bred from a curious long thin reddish-green larva, very closely imitating the midrib of the guava leaf on which it feeds. A *Heliothis* (I think *H. assulta*, Gn.) which occurred rarely in weedy places, was somewhat like a pale *H. marginata*: I found the remains of *Ophideres* sp. near the fort of Fautaua, where a brilliant little Pyralid, black, with large fiery-red spots, was common, flying among ferns in the sunshine.

On May 19th we finally left Tahiti, and reached Pitcairn Island early on the morning of June 1st. The aspect of this famous little island (which is only two and a quarter miles long, by less than one mile wide) is extremely picturesque and striking. Steep, rugged hills, covered with forest in most parts, and attaining an elevation of 1000 feet, terminate in an iron-bound coast of black trachytic rock, on which a tremendous surf is always breaking, and, to all appearance, landing in a boat is nowhere possible. The ship was, however, soon boarded by some of the islanders in a fine whale-boat, in which several of the officers, including myself, shortly afterwards went on shore. The boat, managed with wonderful dexterity, was pulled through the furious breakers without shipping a pint of water, and was hauled up on a very small strip of sandy beach, almost the only landing-place in the island. The people welcomed us heartily, and were evidently greatly pleased to see us, the visit of a British man-of-war being one of the principal events in their

secluded life. There are now 103 persons on the island, all, with very few exceptions, descendants of the mutineers of the "Bounty:" they live in a neat little village of about twenty houses, with a small church and school-house, very prettily situated on a wooded bluff about 300 feet above the sea. Nearly all tropical, and many European fruits thrive here to perfection, and a good deal of arrowroot and sweet potatoes is grown: the native vegetation is very luxuriant, much resembling, in general character, that of Tahiti. No butterfly is apparently found on the island, and I saw only a few common Tahitian moths: but I found, for the first time, the large yellow-striped green larva of *Chærocampa Erotus* on the "Nono" plant, and a good many living pupæ of *Sphinx convolvuli* (equal in size to English specimens) were brought to me, having been found in the patches of sweet potatoes, of which a supply was then being dug up for the ship. Four species of *Coleoptera* (a *Tomicus*? two Cossonid weevils, and a Rhizophagoid?) occurred rarely, and I got a number of a pretty land-shell (*Helix sp.*) on the foliage of the screw-pine (*Pandanus*), and *Dracæna terminalis*.

We remained off the island under steam until the afternoon of the 2nd, and having supplied the inhabitants with some clothing materials, soap, &c., and received in return a good quantity of coco-nuts, oranges, and sweet potatoes, with a few goats and pigs, we took our departure for the coast of Chile. On the following day, at noon, we were close to the uninhabited Elizabeth or Henderson Island, round which we steamed, firing guns at intervals to attract the attention of any people unfortunate enough to be shipwrecked thereon, but we met with no response. This island is a most singular formation, being an ancient coral reef upheaved to a height of about 80 feet: the shores in most parts consist of perpendicular or even overhanging cliffs, honeycombed by the surf into innumerable holes and caverns. There are one or two sandy beaches, on which landing appears to be practicable, but no attempt was made to do so: the top of the island is level, and covered with dense low bushes and small trees, among which we could only recognise the *Pandanus*.

After leaving Pitcairn Island, the weather was fine and warm for about a week, after which we encountered such a series of fierce north-easterly gales, alternating with brief intervals of calm weather, with a most uncomfortable amount of swell, that we were all very glad to make the coast of Chile on the morning of June 30th, and to find ourselves safely at anchor in Coquimbo Bay on the same evening.

The "Kingfisher" remained at Coquimbo, almost without intermission, from June 30th until October 18th. During July and August (winter months) the weather was nearly always dull, cloudy, and hazy, often very cool, and with only an occasional fine day; and insects were exceedingly scarce. The country was, however, more verdant and attractive in appearance than I had ever seen it before, and wild flowers were exceedingly abundant and beautiful—wide stretches of what at other times of the year are nothing but bare loose sand, being completely carpeted for a few weeks only, with handsome *Liliaceæ*, &c. Almost the only butterfly to be seen was *Papilio Archidamas*, which was as usual common, and the specimens exceedingly fine and fresh, the dull weather preventing it from flying much. There appears to be a succession of broods of this beautiful insect throughout the year, and larvæ, pupæ, and imago may be found together at almost any time. Stray worn specimens of *Pyrameis Carye*, *Terias chilensis*, and *Pieris*

Blanchardi and *Autodice*, occasionally were met with. At the end of August, the fields suddenly became alive with the beautiful little *Colias minuscula*, Butler, both sexes being equally plentiful, and I secured a lovely series. *Argynnis Cytheris*, Drury (previously taken by me at Sandy Point in the Straits of Magellan, and sparingly at Valparaiso) became common a few days later, in rocky places at the foot of the hills, and with it two or three species of "Skippers," of which *Pamphila fasciolata*, Blanch., was at once the prettiest and the most abundant; also two fine *Satyridæ* in October.

Several Bombyces also turned up in the larva state, the most remarkable of these being *Ormiscodes crinita*, Blanchard. The larva of this moth—a large, heavy-bodied insect, bearing a superficial resemblance to the ♀ of *Endromis versicolor*—was exceedingly plentiful on the so-called "pepper-tree" (*Schinus molle*), and, even more so on that abundant weed the "Quilo" (*Muhlenbeckia injucunda*). It looks somewhat like an exaggerated *Vanessa* larva, being, when full-grown, nearly four inches in length, of a general dark brown colour, with the incisions between the segments dull orange, and each segment bearing six long branched spines. The slender tips of these, as well as the short whitish hairs with which the body is clothed, sting, when touched, more severely than a nettle, and I have suffered a good deal through incautiously handling these well-protected caterpillars. The larvæ of many other Chilean Bombyces appear to possess this property of urtication, in a greater or less degree. From a green larva, found commonly feeding on *Aristolochia chilensis* and other plants, and very closely resembling that of our *P. gamma*, I reared a very fine series of a handsome *Plusia* not unlike that species in general aspect and markings, but varying in ground-colour from silvery-grey like *interrogationis*, to golden-brown almost as rich as *bractea*. *Heliothis armiger* was very common flying by day in rocky places, and several species of *Agrotis*, *A. saucia* among them, were to be found with their larvæ—not to mention plenty of scorpions—by turning over stones. The pretty yellow-flowered Leguminous shrub, known in Chile as the "Flor del Mayo" (*Cassia Candolleana*) was, in many places completely stripped of its leaves by the handsome "half-looper" larva of *Alamis polioides*, Guenée (a rather large, obscure-looking grey-brown quadrid *Noctua*), the pupa of which, enclosed in a slight cocoon and covered with a white mealy powder, was often to be found attached to the under-side of stones in the neighbourhood of the plant. A good many *Geometræ* (among them one or two handsome *Ennomidæ*, a very fine *Lobophora*?, &c.) were obtained, the majority of them at rest on Cactus stems, securely hidden among the formidable spines, whence they could only be dislodged by punching the plants with the point of a thick stick. This method of collecting yielded, in addition, a considerable variety of *Tortrices* and *Tineæ*, several species of *Pterophori*, &c.

Coleoptera were not at first very plentiful, but directly the warm weather set in at the end of September, enormous numbers of two species of large, white-striped, black Heteromorous beetles (*Nyctelia Luczoti*, I think, being the more plentiful of the two) made their appearance. In some hot, sandy places, these creatures might have been collected literally by bushels. Several other less conspicuous species of this group were almost equally plentiful, and a good sized black *Calosoma* was not rare on the wing, and crawling on the sand in a railway cutting. A handsome bronzy *Buprestis* occurred occasionally on a fine-leaved Leguminous shrub, and the flowers of the Cacti harboured several small hairy beetles allied to *Dasytes*, &c., in great numbers.

The ship left Coquimbo on September 28th, arriving at Valparaiso on the evening of the following day, and remained there until October 8th. The weather throughout our stay was fine (though there had been torrents of rain just before our arrival), and I enjoyed several very pleasant rambles over the steep, bush-covered hills on the lower slopes of which the town is partly built. These hills attain an elevation of 1200 to 1500 feet, and on them I found insects in greater plenty, or at any rate in greater variety, than at Coquimbo. Here I took the recently described and very pretty *Satyridæ*, *Neosatyrus violaceus* and *ochreivittatus*, Butler, not uncommonly among the tall "Coligné" or arborescent grass, over which the little, blackish-brown *N. ambiorix*, Wallgr., was often to be seen fitting quietly, making me think of our *Erebia Epiphron*. *Geometræ* were fairly well represented, especially in the deep "quebradas" or ravines, where the vegetation is much more luxuriant than on the open hill-sides, and I obtained a good many species new to me. I had a day at El Salto, some eight miles by rail from Valparaiso, and was much pleased to add to my collection, among other things, the large and delicate cream-coloured Pierid, *Heliochroma leucothea*, Gay, which was apparently just coming out of pupa, and not rare, though very difficult to catch.

On October 18th we again left Coquimbo, this time for our old location at Callao, where we arrived on the 25th. During the remainder of this month, and throughout November, insects were very scarce, and, indeed, are not much more plentiful now; in marked contrast to the swarms of such common butterflies as *Agraulis vanilla*, *Pieris sp.*, *Danais Archippus*, *Junonia Lavinia*, *Anartia jatropha*, &c., which enliven the damp meadows and lucerne fields from February to June. Almost the only insect worthy of mention I have obtained is *Papilio Pæon*, of which a few larvæ have again turned up. Here I may correct a mistake I have made as to the food-plant of this fine species (*Ent. Mo. Mag.*, Vol. xix, p. 53), which is not, as there stated, the common parsnip, but an allied plant, *Arracacha esculenta*, a native of the higher regions of the Andes, and grown in small quantities about Lima and Callao. It closely resembles parsnip in the general aspect and properties of its foliage, but the root is altogether larger and more tuberous in growth. Larvæ of two or three species of *Halesidota* (a genus allied to *Arctia*, &c.) are not uncommon on various plants, one being remarkable for its dense clothing of pure white hair, which assumes a delicate canary-yellow tint just before the larva spins up. The resulting moth is a very pretty little pale ochreous species, with darker pencillings. The Indian corn is here very subject to the attacks of the larva of a dull-looking species of *Agrotis*?, which eats out the soft central shoot of nearly every young plant, and causes great damage to the crop. A few *Geometræ*, and many species of small *Pyræles*, are to be obtained by beating: but with the exception of the large horned *Golofa*, which flies at dusk over the tops of the low willow trees on the plain, scarcely a beetle is to be obtained at Callao, at this time of the year.—J. J. WALKER, H.M.S. "Kingfisher."

Agathidium rhinoceros near *Colinton*.—In November I had the good fortune to take, near Colinton, a few specimens of *Agathidium rhinoceros*, Sharp. It is a very local species. I only took it on a patch about twenty yards square. I searched the whole wood carefully, and only found it on the one spot.—ALFRED BAUMONT, Low Valleyfield House, Culross: January 25th, 1884.

Coccinella labilis in the Hastings district.—I am pleased to record this species from this locality. On May 15th last year I saw a good many of what I took to be at the time large-spotted *7-punctata*, so only saved a single specimen, which has turned out to be the above species. The locality was the Wood at Guestling, where I worked the nests of *Formica rufa*.—E. P. COLLETT, 76, Islip Street, Kentish Town: February 18th, 1884.

Observations on Lepidoptera at Cambridge.—LEPIDOPTERA—NOCTURNI: insects of this group (and it may be said of all others too), were much less abundant last year than usual. I usually find the *Sphingidæ* tolerably plentiful, but in 1883 *Smerinthus ocellatus*, *S. populi*, *S. tiliæ*, *Acherontia Atropos*, *Sphinx convolvuli*, *S. ligustri*, *Chærocampa elpenor* and *C. porcellus* occurred but sparingly. *Macroglossa stellatarum*, *M. bombyliiformis*, and *Sesia tipuliformis*, were, as far as my observation went, very scanty in numbers; whilst *Sesia formicæformis*, *S. bembeciformis* and *S. apiformis* I did not meet with at all.

Cossus ligniperda larvæ were plentiful in 1881 and 1882, and I reared several by putting them under an aquarium-vase together with pieces of willow bark and chips of wood, and tying the glass firmly down to a piece of slate. They spun cocoons at the end of the autumn, and remained in them during the winter. One or two obligingly spun up close to the glass, so I was enabled to observe them, and noticed that they were still in the larval state. They came out of their cocoons as spring approached, and crawled about the vase for a few weeks and, I presume, resumed feeding. They then one by one, either went back into their old cocoons, which they strengthened with tiny chips of wood interwoven into the substance of the exterior, or they constructed fresh and stronger ones; I am not quite sure which, as I disarranged them a good deal by putting in fresh willow bark, but I am of opinion they constructed new cocoons, and in these they underwent their pupal changes—the imagos coming out in June.

Zuzera æsculi: I also met with several larvæ of the wood-leopard the year before last, but failed, unfortunately, to rear any of them.

Of the rest of the *Nocturni* I have little to say, I can merely enumerate such species as are generally distributed and common everywhere, with the remark that each and all were less abundant than usual last year.

GEOMETRINA: the *Geometrina* were, as regards some species, fairly plentiful, *Abraxas grossulariata*, for instance, was in great numbers even for that, often too, common moth. The principal species I have seen here are, in addition to commoner ones, *Selenia illunaria*, *Crocallis elingvaria*, *Phigalia pilosaria*, *Amphydasis betularia*, *Hemerophila abruptaria* and *Hypsipetes elutata*.

NOCTUINA—*Acronycta aceris*, I always find in some abundance in the neighbourhood of Downing College, although, strange to say, I never see it in any other part of the town, but it was much less common last year, as far as my observation went, and the same may be said of *A. ligustri* and *A. rumicis*. 1881 was a grand year for the latter species, I have never seen it so plentiful. The only other *Noctua* I particularly noticed last year were *Miana furuncula*, *Caradrina blanda*, *Agrotis puta*, *Noctua C-nigrum* (pretty plentiful in September) and *Plusia chrystis*.

Of the remaining groups I have nothing noteworthy to record, and, all things together, 1883 was a very unsatisfactory year to me. I hope I may do better this.—ALBERT H. WATERS, Mill Road, Cambridge: February, 1884.

Rare Lepidoptera in Pembrokeshire.—One evening in July, 1881, I thrice saw *Triphæna subsequa* at sugar. The first appearance was a sight and nothing more; the second gave me time to attempt a capture—and fail; the third resulted fatally for the insect, but gave me a splendid example for my cabinet. In the same locality were taken at sugar *Agrotis agathina*, *Aplecta advena*, *Cryptoblates bistriga*, *Rhodophaea tumidella*; and, as previously recorded, a single specimen of *Polia nigrocincta*. *Agrotis lucerneæ* appeared not infrequently flying in its usual reckless manner over and under some very rough shingle below high water-mark. *Minoa euphorbiata* was taken rarely in the woods, and one specimen of *Emmelesia unifasciata* appeared at light. A worn ♀ *Anticlea rubidata* gave me a few eggs which resulted in fine varieties of the perfect insect, the ground-colour being darker than the ordinary type, and of a rich olive hue, such as we get in Pembrokeshire specimens of *Triphæna fimbria*.—GEORGE J. HEARDEE, Job's Well, Carmarthen: February 8th, 1884.

Sphinx convolvuli at Carmarthen.—One evening at dusk last September, one of my boys noticed a large noisy moth hovering over a bed of Petunias. He procured a net from the house and captured it, but it escaped immediately, only, however, to return boldly to the flower-bed to be once more captured, and this time properly secured; it proved to be a worn specimen of *Sphinx convolvuli*.—ID.

Emergence of both parasite and moth from the same larva.—A larva of *Dicranura furcula* when being full fed, showed symptoms of serious internal disease, which was not relieved by the appearance of the pupa case of an ichneumon projecting through the skin of the larva. The projecting portion of the pupa-case was crushed between forcep blades, and thus allowed to remain *in situ*. The larva afterwards made a well formed cocoon, from which, in due time, emerged an imago, with the left hind-wing somewhat crippled, but otherwise a perfect insect.—ID.

Is Hesperia Actæon double brooded?—A visit to Lulworth Cove during the first week in July, produced this butterfly in fair numbers. They had then evidently been out for some time, so the larger number of specimens taken were in a very dilapidated condition, and no fresh specimen was seen.—ID.

Botys urticata in February: a problem for solution.—This evening my attention was called to a "large" moth (in contradistinction to a "clothes moth") said to be flying about the kitchen. Not unnaturally I expected to see one of the *Hybernæ*; or a precocious *Tæniocampa*; or possibly one of the hibernating species roused into activity by the heat of the kitchen fire, and the spring-like weather recently experienced. My astonishment was very great when I saw a *Botys urticata* evidently recently emerged ("scarcely dry") and in good condition. The larva of this insect is suppose to hibernate. Why, therefore, this abnormal appearance of the imago, and under such conditions? But, putting aside the origin of the larva that produced this moth—why did the latter appear this evening? Was it a specimen that *should* have developed last summer; or was it the result of a "second brood" larva? There are some of the ordinary dried (now *very much dried*) culinary herbs in the kitchen, but they could hardly be suspected of harbouring *Botys urticata* in any shape.—R. MCLACHLAN, Lewisham: February 15th, 1884.

Bigamy in Platypteryx hamula.—On the 28th of August, 1883, I bred a male and a female imago, who paired the same evening. On the 29th of the same month a fresh female had emerged. Finding that the pair of the 28th had separated, on the evening of the 30th I placed the male of the 28th with the virgin female of the 29th. These paired within two hours; and, on the 31st of August and 1st of September, both females deposited their ova on the sides of their muslin cages. After a lapse of fifteen days both broods hatched off satisfactorily, the second brood about three or four hours earlier than the first brood. I carefully marked both bags containing the ova for the purpose of observation and identification.—HAROLD ARCHER, The Close, Ely: *January, 1884.*

Description of the larva of Pterophorus zophodactylus, Dup., = Ioewii, Zell.—

In the middle of August last Mr. Thomas Parmiter, of Cattistock, Dorchester, kindly sent me a nice supply of full-grown larvæ and pupæ of this species. The larva is slightly less than half an inch in length, and of proportionate bulk; head much smaller than the second segment, the lobes rounded and polished; body cylindrical and uniform, tapering a little posteriorly; segmental divisions fairly defined, and a tuft of several short hairs springs from each of the indistinct tubercles. In colour there are two extreme varieties, and the larva varies between these forms. Var. 1 has the ground colour a delicate pale green, strongly tinged indeed with yellow; head pale yellowish-green, the mandibles and ocelli brown; medio-dorsal stripe dark green or purple in different specimens; sub-dorsal stripes yellow, and there are two other fine but very faint yellow lines, one above and the other below the spiracles; segmental divisions also yellow; spiracles black, very narrowly encircled with white. Ventral surface, legs and prolegs uniformly pale yellowish-green.

Var. 2 has the ground-colour brownish-yellow; head also brownish-yellow, freckled with brown; medio-dorsal stripe broad bright purple; sub-dorsal stripes also broad, but of a much less distinct dull pale purple, and having a fine white line running through them; a narrow purple line, edged above with white, extends along the spiracular region. Ventral surface, legs and prolegs uniformly pale yellowish-brown. Feeds on the flowers of *Erythraea centaurea*.

The pupa is slender, and nearly (if not quite) as long as the full-grown larva; it is of almost uniform width, the last two segments only tapering to the anal point. It is glossy and cylindrical, but there is a depression on the thorax and front abdominal segments; the snout and top of the thorax are prominently and sharply defined; the leg-cases extend a long distance down the front of the abdomen, but before the end, become detached from it. The ground-colour is yellow, but is almost hid with a deep pink, which is suffused all over the surface, and almost forms a stripe from the head through the abdominal segments; wing- and leg-cases dingy olive, tinged with pink. All the imagos (a fine series) emerged from August 23rd to September 1st.—GEO. T. PORRITT, Huddersfield: *February 5th, 1884.*

Zaræa fasciata (♂), and its parasite, *Mesoleius sepulchralis*—I have a ♂ of this saw-fly, bred by Mr. F. Norgate, from a larva taken in the New Forest in 1879. The ichneumon bred by Dr. Osborne from *Zaræa* are *Mesoleius sepulchralis*, Holm., new to Britain; I believe the ♂ is undescribed; it differs from the ♀ in having the face, front and middle coxæ, and trochanters, tibiæ and tarsi, and basal ring of hind tibiæ, white, in other respects the sexes are very much alike.—JOHN B. BRIDGMAN, Norwich: *February 16th, 1884.*

Halictus breviceps, E. Saund., and *H. brevicornis*, Schenck.—In my Synopsis of British Hymenoptera (Trans. Ent. Soc. Lond., 1882, pp. 218 and 221) I described two species of *Halictus* under the names *brevicornis*, Schenck, and *breviceps*, E. Saund. I regret that I must now withdraw the *brevicornis* of my Synopsis from our list, as its exponents are, I believe, referable to the ♂ of *breviceps*, E. S., and not to the true *brevicornis*, Schenck.

When I described *brevicornis* I had only seen two ♂ specimens from the country, and on comparing them with a ♂ *brevicornis* received from C. Ritsema, I was satisfied of their identity. I therefore described the species as British, characterizing the ♀ from a Dutch specimen.

Whilst at Hayling Island in August last year, I took the ♂ of what I had called *brevicornis* pretty freely on thistle-heads, and the ♀ of my *breviceps* on *Crepis* flowers near the same spot, and I searched in vain day after day for ♀ *brevicornis* and ♂ *breviceps*, till it began to dawn upon me that the males and females that I had been taking must be sexes of the same species; accordingly, on my return home, I very carefully examined my males a second time with Ritsema's *brevicornis*, and, although the two species are even more alike than usual in this genus, I can see that they are really distinct. The face of *breviceps* ♂ is slightly longer than that of our species, and the clypeus rather narrower; the joints of the antennæ towards the apex are slightly longer than broad, instead of being slightly broader than long; the mesothorax is less remotely punctured, and the genital armature has the sagittæ less raised, and the basal portion or "cardo" smaller. Still the two males are very closely allied, and in general aspect are almost indistinguishable; the females of the two species are at once separable by the shape of the face and the very different puncturation of the mesothorax. I have sent specimens to C. Ritsema, and although the species was unknown to him, he thought the ♂ and ♀ sent were probably referable to one species. The synonymy will now stand as given in my Catalogue—*breviceps*, E. Saund., = *brevicornis*, E. S., ♂, nec Schenck.—EDWARD SAUNDERS, St. Ann's, Mason's Hill, Bromley, Kent: Feb. 12th, 1884.

Obituary.

William Buckler, who, as already announced, died on the 9th January of bronchitis, was born 13th September, 1814, at Newport, in the Isle of Wight, and received his early education in his native town; when quite young, he showed great aptitude and taste for drawing; this was recognised by Captain (afterwards Admiral) Ffarrington, of Woodvale, near Cowes, through whose influence he was introduced to the studio of Mr. Sass, Soho, whence, after having completed his course in a highly creditable manner, he became a student of the Royal Academy, and distinguished himself in the Antique School, and in drawing from life. Though a painter in oils, he turned his attention mainly to water-colours, in which he was a successful portrait painter, and from 1836-56, he was fully engaged by numerous and influential patrons; during these years he exhibited *sixty-two* subjects at the Royal Academy—his pictures were always highly finished and pleasing. In 1857 he wrote: "this being the first year I have omitted sending anything."

He lived for some years at 32, Orchard Street, Portman Square, London, but about 1848 he settled at Emsworth in the South of Hampshire, and after a time began to "turn his attention to Entomology, as an amusement for his leisure

hours." His first appearance in print as an Entomological writer is a short notice of "Captures of *Lepidoptera*" in the *Entomologist's Weekly Intelligencer*, for June 14th, 1856 (Vol. I, p. 83), this was followed on the 26th July (p. 132) by a notice of the capture of *Colias Hyale* by a friend. Then came a notice in the *Substitute*, for January 3rd, 1857 (p. 132) on the duration of the pupa state of *Acherontia Atropos*, and in the *Intelligencer* (Vol. II, p. 4) of a male *Phigalia pilosaria* being attracted to the outside of a breeding-cage by the presence within of a female, which had lately emerged from the pupa state.

But in the summer of 1857 an event occurred, which was destined to bring Mr. Buckler more prominently forward, and which enlisted his artistic talent in the cause of Entomology. This event was the abrupt discontinuance of that line of work by the artist, who had for more than two years been employed to figure the larvæ of the *Tineina*. It was absolutely necessary to find a fresh artist with as little delay as possible, and a forcible appeal appeared in the *Intelligencer* (Vol. II, p. 113) entitled, "Portrait-painting."

The result was that Mr. Buckler offered his services as delineator of these Micro-larvæ and their mines and food-plants, and the exquisite finish of his drawings is well known to all who have seen the originals, though it is to be feared that the published figures of his larvæ, such for instance as those of *Exeretia Allisella* and *Psecadia funerella* in the thirteenth volume of the *Natural History of the Tineina*, scarcely give an idea of the beautifully soft appearance of the actual drawings.

For nearly three years Mr. Buckler was engaged in this work, and had made about 120 figures, but, owing to the fact, that a full-grown larva just arrived from the Continent, cannot wait, but must be figured *at once* when it reaches the artist, the nature of the employment was found to tie him so very closely, and to interfere so seriously with his time in preventing him from keeping engagements with his friends, that in June, 1860, he begged, though with some regret, that some other artist might be found for the task, most courteously, however, offering to continue his services till the needful artistic aid had been obtained.

The (short-lived) *Weekly Entomologist*, which began to appear in August, 1862, nearly 12 months after the decease of the *Entomologist's Weekly Intelligencer*, contains (Vol. I, p. 45) the description of the larva of *Pamphila sylvanus*; in the same work (Vol. III, p. 213) appears a description of the larva of *Euperia fulvago*. These have a special interest as being the first two descriptions of Macro-larvæ from the pen of William Buckler—to be followed by the long series which have enriched the pages of this Magazine.

Descriptions of the following larvæ by William Buckler have appeared in the *Entomologist's Monthly Magazine* :—

- In Vol. I.—*Leucania littoralis* (p. 48), *Lithosia pygmaeola*, *caniola*, *complanula*, *complanata*, *stramineola* and *rubricollis* (pp. 48, 49), *Xylophasia scolopacina* (p. 50), *Leucania comma* (p. 140).
- „ II.—*Hadena rectilinea* (p. 20), *Cænonympha Davus* (p. 65), *Toxocampa cracca* (p. 67), *Leucania putrescens* (p. 94), *Agrotis ravidata* (p. 115), *Agrotis aquilina* (p. 133), *Agrotis nigricans* (p. 162), *Hipparchia Semele* (p. 188), *Acidalia manciunata* (p. 189).
- „ III.—*Leucania pallens* (p. 68), *Hadena suasa* and *Hepialus sylvinus* (p. 136), *Leucania conigera* (p. 137), *Agrotis lunigera* (p. 188), *Cucullia umbra-tica* (p. 208), *Acronycta auricoma* (p. 261), *Catocala sponsa* (p. 276).

- In Vol. IV.—*Sesia chrysidiformis* and *Aplecta advena* (p. 14), *Limenitis Sibylla* (p. 33) (see also V., p. 226), *Hadena genistæ* (p. 61), *H. adusta* (p. 62), *H. thalassina* (p. 63), *Tanagra chærophyllata* and *Apatura Iris* (p. 85), (for the latter see also XIII, p. 3), *Epunda nigra* (p. 87), *Cucullia scrophulariæ* and *verbasci* (p. 116), *Colias Edusa* (p. 117), (see also Egg-laying of *C. Edusa*, XIV, pp. 40 and 89), *Cirrædia zerampelina* (p. 136), *Miana furuncula* (p. 137), *Argynnis Aglaia* (p. 155), *Xanthia gilvago* (p. 156), *Xanthia ferruginea* (p. 180), *Agrotis puta* (p. 199), *Dasytopia templi* (p. 251), *Zygæna loniceræ* (p. 253).
- „ V.—*Acontia luctuosa* (p. 75), *Argynnis Euphrosyne* (p. 125), *Lycæna Artaxerxes* (p. 176), (see also *L. Medon* (*Agestis*) XV, p. 241), *Hepialus hectus* (p. 177), *Heliophobus popularis*, *Charæas graminis* and *Luperina cespitis* (p. 225), *Limenitis Sibylla* (the young larva p. 226), *Lycæna Ægon* (p. 241), *Vanessa cardui* (curious variety of the larva, p. 278).
- „ VI.—*Aporophila australis* (p. 13), *Thecla rubi* (p. 38), *Plusia interrogationis* (p. 65), *Lycæna Arion* (the eggs of, p. 91), *Sesia ichneumoniformis* (p. 90), *Pyralis glaucinalis* (p. 111), *Nephoptyx angustella* (p. 143), *Hydræcia micæa* (p. 164), *Chilo phragmitellus* (p. 188), *Thanaos Tages* (p. 233), *Epunda lutulenta* (p. 235), *Noctua Dahlii* (p. 261), *Xanthia cerago* and *silago* (p. 262).
- „ VII.—*Scoparia muralis* (p. 13), *Pempelia formosa* (p. 14), *Hypsipetes impluviata* (p. 42), *Erebia Medea* (*Blandina*) (p. 64), *Acronycta myricæ* (p. 83), *Hepialus vellea* (p. 84), *Argynnis Selene* (p. 114), *Deilephila galii* (pp. 123 and 232), *Homæosoma senecionis* (quoted in an article by Mr. Howard Vaughan, p. 131), *Crambus fascelinellus* (*Pedriolellus*) (p. 160), *Ptilophora plumigera* (p. 210), *Miana arcuosa* and *Chesias spartiata* and *obliquaria* (p. 260).
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- „ X.—*Aventia fezula* (p. 42), *Limacodes asellus* (p. 70), *Hesperia Actæon* (p. 86), *Phycis* (?) *Davisellus* (*Nephoptyx genistella*, Dup.) (p. 89), *Herminia barbalis*, *tarsipennalis*, *derivalis* and *cribralis* (pp. 100—104), *Crambus pinetellus* (p. 162), *Mimæseoptilus aridus* (p. 182), *Ephestia elutella* (p. 213), *Rhodophæa marmorea* (p. 214), *Lithosia quadra* (p. 217), *Nonagria geminipuncta* (p. 230), *Caradrina Morpheus* (p. 254), *Apamea gemina* and *Nonagria neurica* (p. 275).

- In Vol. XI.—*Dianthoscia albimacula* (p. 16), *Deilephila euphorbiae* (p. 73), *Anerastia lotella* (p. 186), [How to rear *Bombyx rubi* from the larva (p. 188)], *Xylophasia lithozylea* and *polyodon* (p. 208), *Heliothis dipsacea* (p. 256).
- „ XII.—*Enodophaea ruvelia* (p. 13), *Aplecta occulta* (p. 66), *Clecras glabrararia* (p. 84), *Cataclysta lemnalis* (p. 102), *Xylina rhizolitha* (p. 140), *Paraponyx stratiotalis* (p. 160), *Hydrocampa nymphæalis* (p. 210 and XVII, p. 249), *Pterophorus dichroductylus* (p. 233), *P. microductylus* (p. 234), *Botys lancealis* (p. 277).
- „ XIII.—*Apatura Iris* (p. 3), *Crambus tristellus* (p. 14), *Lycæna argiolus* (pp. 29, 62 and 138), *Miana fasciuncula* (p. 62), *Cymatophora ocularis* (p. 90), *Herminia grisealis* (p. 110), *Cryptoblabes bistriga* (p. 111), *Ebulea stachydalis* and *sambucalis* (p. 133), *Lobophora viretata* (p. 185), *Catocala promissa* (p. 233).
- „ XIV.—*Drepana sicula* (p. 1 and XVII, p. 122), *Earias chlorana* (p. 42), [Egg-laying of *Colias Edusa* (pp. 40 and 89)], *Boarmia cinctaria* (p. 83), *Hydrocampa stagnalis* (p. 97), *Mamestra furva* (p. 182), *Scopula ferrugalis* (p. 200), *Boarmia abietaria* (p. 219), *Argynnis Paphia* (p. 252).
- „ XV.—*Xylomyges conspicuillaris* (p. 17), *Crambus contaminellus* (p. 38), *Cidaria reticulata* (p. 61), *Ebulea verbascalis* (p. 102), *Myelois pinguis* (p. 162), *Crambus geniculatus* (p. 206), *Lycæna Medon* (*Agestis*) (p. 241).
- „ XVI.—*Mamestra abjecta* (pp. 19 and 93), *Crambus selasellus* (p. 41), *Dianthoscia Barretti* (*Luperina luteago*) (p. 52), *Nonagria sparganii* (p. 99), *Emmelesia affinitata* (p. 102), *Botys fuscalis* (p. 161), *Pempelia carnella* (p. 167), *Scopula prunalis* (p. 209), *S. olivalis* (p. 227).
- „ XVII.—*Stauropus fagi* (observations on the last moult of, p. 18), *Botys pandalis* (pp. 28 and 156), *Crambus culmellus* (p. 91), *Nonagria fulva* (p. 114), *Pempelia hostilis* (p. 178).
- „ XVIII.—*Ennychia octomaculalis* (p. 57), *Miana exposita* (p. 76), *Crambus Warringtonellus* (p. 129), *Scopula lutealis* (p. 147), *Emmelesia blandiata* (p. 180), *Hydræcia nictitans* (p. 195), *Papilio Machaon* (p. 244).
- „ XIX.—*Heliodes arbuti* (p. 36), *Rivula sericealis* (p. 49), *Ennychia anguinialis* (p. 77), *Ephestia passulella* (p. 104), *Pionea stramentalis* (p. 126), *Endotricha flammealis* (p. 149), *Dicycla Oo* (p. 203), *Pamphila lineæ* (p. 244), *Petasia nubeculosa* (p. 271).
- „ XX.—*Meliana flammea* (p. 63), *Endromis versicolor* (p. 73), *Bankia Bankiana* (p. 77), *Procris globulariæ* (p. 97), *Zygæna exulans* (p. 150), *Apamea fibrosa* (p. 176), *Aglossa pinguinalis* (p. 193).

Mr. Buckler also assisted the Rev. J. Hellins in the following description of larvae, which have appeared under the name of the latter, in the pages of this Magazine:—

- In Vol. I.—*Lozogramma petraria* (p. 71), *Acidalia immutata* (p. 72), *Cidaria russata* and *immanata* (p. 165), *Ennomos fuscantaria* (p. 187, see also III, p. 159), *Nemoria viridata* and *Corycia temerata* (p. 263), *Tæniocampa gracilis* (variety of larva, p. 283).
- „ II.—*Ligdia adustata* and *Hybernia leucophearica* (p. 16), *Acidalia rubricata* (p. 66), *Phorodesma bajularia* (p. 114), *Sterrhæa sacraria* (p. 134 and IV, pp. 179 and 200), *Botys asinalis* (p. 135), *Phytometra œnea* (p. 163, see also X, p. 139), *Scoria dealbata* (p. 190), *Luperina cœpitiis* (p. 211), *Emmelesia albulata* (p. 261), *Grammesia trilinea* (p. 278).

- In Vol. III.—*Acidalia ornata* (p. 44), *Acidalia contiguaria* (p. 69), *Ennomos tiliaria* and *alniaria* (pp. 161, 162), *Leucophasia sinapis* (p. 210), *Acidalia rusticata* (p. 259), *Spilodes sticticalis* and *Anchocelis lunosa* (p. 260), *Thera simulata*, *obeliscata* and *firmata* (p. 277).
- „ IV.—*Acidalia emutaria* (p. 88), *Lithostege niveata* and *Agrophila sulphuralis* (p. 115), *Hyria auroraria* (p. 158), *Tethea retusa* (p. 180).
- „ V.—*Zygæna nubigena* (p. 73), *Acidalia holosericata*, *interjectaria*, *soutulata* and *bisetata* (pp. 95—99), *Fidonia pinetaria* (*brunneata*) (p. 108), *Lithosia molybdeola* (*sericea*), *griseola* (see also X, p. 69), *meomella*, *plumbeola* (*complanula*), *Calligenia miniata*, *Lithosia helveola* and *aureola* (pp. 109—114), *Dasycampa rubiginea* (p. 206).
- „ VI.—*Emmelexia unifasciata* (p. 186), *Hyphenodes costastrigalis* (p. 216), *Hydrelia unca* (p. 232).
- „ VII.—*Deilephila livornica* (p. 99), *Lycæna Alsus* (p. 186 and X, p. 43), *Camptogramma fluviata* (p. 279).
- „ VIII.—*Phibalapteryx lignata* (p. 18), *Dasydia obfuscata* (p. 20), *Hybernia aurantiaria* (p. 90), *Aspilates gilvaria* (p. 116), *Phibalapteryx lapidata* (p. 165).
- „ X.—*Eubolia lineolata* (p. 255 and XI, p. 16).
- „ XI.—*Boarmia roboraria* (p. 40), *Erastria fuscula* and *Pyrausta punicealis* (p. 66), *Larentia olivata* (p. 86), *Asthena Blomeraria* (p. 87), *Lycæna Adonis* (p. 113), *Syrichthys alveolus* (p. 236 and XII, p. 232).
- „ XII.—*Larentia ruficinctata* and *casjata* (pp. 5—7 and 113), *Agrotera nemoralis* (p. 232).
- „ XIII.—*Anarta melanopa* (p. 11), *A. cordigera* (p. 12), *Asthena sylvata* (p. 213), *Lobophora hexapterata* (p. 249).
- „ XIV.—*Anisopteryx æscularia* (p. 113).
- „ XVIII.—*Himera pennaria* (p. 33).

In addition to all the foregoing, two descriptions of larvæ from the joint pens of Mr. William Buckler and the Rev. John Hellins, appeared in the *Entomologist's Annual* for 1864, p. 137, viz., those of *Oporabia filigrammaria* and *Cidaria sagittata*.

One description, that of the larva of *Nonagria typha* by Mr. Buckler, appeared in "Young England" for March, 1865, whence it was quoted in the *Zoologist* for 1865, p. 9513.—H. T. S.

My friend Mr. W. Buckler has died without being able to achieve in person the object, for which he had laboured long and steadily, namely, the publication of an original work on the larvæ of the *Macro-Lepidoptera* of Great Britain; but we may trust that his labour will not have been altogether in vain: in him we have lost the living guide, who could speak with the instinctive knowledge, which long work alone gives, but his drawings and notes remain, and it is hoped some arrangement may be possible for their publication.

Meanwhile, as I was perhaps his oldest intimate entomological friend and associate amongst the considerable number who, at different periods, gave him their help, I may be allowed to say a few words about him and his work.

We became acquainted with one another in the summer of 1858, when both were beginning to take up the study of the *Macro-Lepidoptera* to some purpose; he wrote to me for eggs of *Smerinthus tilia*, which I had offered in the *Intelligencer* to give away: this was my first and last time of making an offer of this sort, for it opened upon me such an experience of the lengths to which the *amor habendi* urges many collectors, that I never again ventured on inviting their applications; but it also procured for me one of the most solid and satisfactory pleasures of my life—the friendship of William Buckler. There must have been something in his letter, which at once drew me to him, for very soon we had become constant correspondents: Stainton's Manual with its descriptions of larvæ all taken from foreign authors, had stung us into desiring to wipe off what seemed a blot on the fair fame of British Entomologists; I had, like many others, who for a time have taken in hand such a scheme for themselves, begun to figure such larvæ as I could get hold of, but when I found that Mr. Buckler, possessing the trained skill of a first-rate artist, and—since photography had taken away his occupation—having time at his disposal, had formed a similar plan, it at once became apparent that the best thing for me was to supply him with subjects, and thus set him free to devote more pains to their delineation; but he would not accept help without making some return; so a sort of treaty was drawn up and signed, pledging me to send him all the larvæ I possibly could, and he in return was to give me his first figures, after he had copied them into his interleaved Manual. What a spur this was to my collecting energy, then in its first freshness and zeal, to know that everything was to be figured in life-like style, and to expect to become the possessor of a whole gallery of larval portraits! Through the summer months of 1859, and many succeeding years, we wrote to one another almost every day, and often after a letter or a box had been despatched by the afternoon's post, a second epistle was begun at night to announce some fresh acquisition, which he was to make ready to pourtray as soon as he had finished the subjects already in hand. At first I doubt if there was any definite purpose of publishing more than descriptions, the figures being intended chiefly as memoranda, but as time went on, and the Manual pages became more and more filled, the intention of publishing an illustrated book became fully settled, and Mr. Buckler worked on towards that end with ever-growing interest and zeal, and before his death had figured more than 850 species, in most cases to the extent of five or six varieties, or stages of growth, and in several to the extent of a dozen or fifteen; in 1873 he reckoned he had done at least 5000 figures, and since that time must have added many more, for he has left more than 4500 among the materials amassed for his projected work, while I possess some 1800 of his doing, and there must be several in the possession of others; he left also four volumes of MS. notes, from which were extracted the substance of his numerous communications to this Magazine, which he looked upon as acknowledgments for help given, and as keeping alive an interest in his doings; but there remains over and above these a considerable quantity of observations never yet published.

When he first began, fishing and boating, and other recreations, still held their sway over him, and would sometimes interfere with the figuring of a larva; the yearly visit to London for a sight of the Royal Academy Exhibition was a fixed holiday, and larvæ that came to maturity whilst he was thus engaged had to spin up unfigured; but for many years all this had been changed; all his other movements

came to be regulated so as to suit the convenience of the larva of any species that had not been figured before, and even bodily ailments, which might have frightened most into desisting from close application to such work, were resolutely conquered by the exercise of a strong determination: his right hand was at times subject to a kind of palsy, called, I believe from an allusion to a frequent cause of it, "Scrivener's thumb," and during these attacks he could scarcely write legibly, much less hold a pencil to draw with; when this was so, his remedy was to set himself a task of carpentering; he had a full chest of tools, and was a beautifully neat workman, in fact, he made his own cabinet of 24 drawers in capital style; but for exercise he would work for a week, or a month, or whatever time he felt necessary, at house-carpentering, mending all the doors, window frames, boxes, &c., that were found out of repair, and thus he would bring his rebellious nerves and muscles to their finer work; and though he became slower as age advanced, yet to the last he could use his pencil for the faithful representation of the most delicate pattern and colouring; I believe I have the last figure he drew, namely, the copy of one he had taken of a larva of *Deilephila euphorbiae*, which had been sent to us by Dr. Chapman from the Continent, and this done in November last is perfect in all its intricacy of detail as well as in general outline and effect. And so he toiled on year after year, meaning when he had reached a certain point, to lay aside the pencil, and give all his time and energy to the work of publication. Whether he would ever have satisfied himself that he had done enough, I almost doubt; as his work went on, it seemed to grow before him; details, which at first were slightly noticed, assumed their real importance, and he found himself obliged to repeat observations over and over again; fifteen years ago he had begun to wonder whether he should live long enough to begin to publish; after three years' attention to some common species of *Agrotis*, he wrote that he had burnt many of his figures, as he had come to find them incorrect; and quite recently he was figuring again such species as *Pieris brassicae* and *Cheimatobia brumata*.

As the readers of this Magazine are aware, he had recently resolved to avail himself of Continental help in procuring species not easily attainable here, and this, as well as the adoption of the mm. as a scale of measurement, is remarkable as coming at an age, when changes are to most men no longer acceptable; but a stronger mark of his keeping his mind to the last fresh and open is given by the fact, that after his sixty-eighth birthday he procured a German grammar and exercise book, and worked hard at them all through the winter of 1882-83, in the confident hope of being by and by able to read the letters of his German correspondents, and to tell them what he wanted in his own handwriting, and I know that in this view Prof. Zeller's death was a great blow to him. Mr. Buckler possessed nothing that could be called a library; the *res angusta domi* forbade the acquisition of expensive books, but this made the loan of a standard work from a friend all the more appreciated as a great delight; he would sit up into the small hours of the night mastering its contents, or neatly copying out page after page, that struck him as containing valuable help for his own purpose; and so, too, with illustrated books, he must have taken copies of hundreds of the figures in the plates of Hübner and Sepp and others. When we first became correspondents, and he was still sore from the injury which photography had done him, he had a whimsical way of taking revenge by getting himself photographed in all sorts of stiff attitudes and sullen expressions, such as

can remember to have seen in the cartes of themselves or their friends; I have now several of these which he sent me, at the same time pointing out their absurdities; but he must have overcome this contempt for photography, for he also sent me two likenesses taken at different times, for which he had posed himself, and with which he was content, the last one showing in the prominence of the right eye the effect of constant use of the magnifying lens. And this leads me to say that it is, of course, as an indoor worker that Mr. Buckler has made his mark; his sight was never good enough to enable him to become a very successful collector, but in the way that was open to him he was a most patient and loving student of Nature; that he might have his broods of growing larvæ always under observation (and in this he owed much to the kind help and attention of the friends with whom he lived), he used to keep them either on plants in flower pots on the window seats of his bed-room and sitting-room, or else in German test tubes of very thin glass, through which he could watch every movement, and lens in hand he would sit for hours, alternately observing and recording the habits of any fresh species. Of course it follows from this that his name is associated with detailed accounts of life history, and not with captures of new species, but it is remarkable that the last figure he took from life, in October, 1888, was that of a pug larva, singled out from a large batch I had sent him, and which, as he could not identify it with any of our known British species, he was hoping might turn out to be new.

It is difficult to know where to stop in speaking of one, who has been so very much to me, and who, though I saw him on three occasions only, was by our constant interchange of letters always, as it were, present; but I will add one thing more; the fascination, which Natural history exercises over observant minds, my friend felt and enjoyed to the full; and it touched in him a yet deeper spring of pleasure; on the fly-leaf of the 2nd volume of his copy of Stainton's Manual, I found written—apparently some time after he first began to use the book, and as the result of later reflection,—this quotation, "For Thou, Lord, hast made me glad through Thy works, and I will rejoice in giving praise for the operations of Thy hands."—J. H., Exeter, 12th February, 1884.

NOTES ON BRITISH TORTRICES.

BY CHAS. G. BARRETT.

(Continued from page 135).

Referring back to Vol. xi, p. 29, of this Magazine (July, 1874), it will be seen that in the course of these notes I arrived at the genus *Onephasia* of Curtis (*Sciaphila*, Tr.), and after a few remarks on the two very distinct species, *cinctana* and *hybridana*—which, indeed, hardly belong to the genus—I found it desirable to defer any detailed notice of the remainder until further information upon our native species could be obtained. Nearly ten years have passed, and the genus is still involved in difficulty, but it seems time that such knowledge as we have of it should be brought together, if only as a basis for further investigation.

From long and careful observation, and the examination of vast numbers of specimens, it seems certain that the attempt to define the species of *Sciaphila* by means of their *markings* is practically hopeless. In most of the species the ground-colour is grey or white, or even grey in the male and white in the female; and the markings—of some shade of grey—consist of a curved, elbowed, or abbreviated fascia near the base of the fore-wing, representing the exterior margin of the usual basal blotch, an oblique central fascia angulated and indented, and apical blotches indicating a third fascia across the tip, and all these are so irregular, so uncertain, so broken up by interruptions, and obscured at times by dark scales or round dots, that any hope of defining the species by their means must, I think, be abandoned. Yet they may be used as secondary characters in confirming distinctions arrived at in another way.

Wilkinson, in his work, appears to have overlooked the reliable characters afforded by the *forms* of the fore-wings, which really seem to be tolerably constant in the different species. He certainly notices the peculiarity in *Sphaleroptera ictericana* of the nearly straight costa, and uses it in separating this species as a distinct genus; but he seems not to have noticed that the costa of *ictericana*, ♂, is no straighter than that of several species of *Sciaphila*, and the only really distinctive character in *Sphaleroptera* is the unsatisfactory one that the ♀ also has the costa straight.

The genus appears to bear sub-division into groups, thus:—

1. Fore-wings short and broad: *nubilana*, *abrasana*.
2. Fore-wings elongated, broad, costa gently arched: *virgaureana*, *alternella*, *octomaculana*.
3. Fore-wings broad, costa strongly arched before the middle: *sinuana*.
4. Fore-wings elongated, rather ovate: *pascuana*.
5. Fore-wings elongated and narrow, costa slightly arched: *conspersana*, *subjectana*, *communana*, *Wahlbomiana*?, *ictericana*.
6. Fore-wings very long and narrow, hind margin very oblique: *Penziana*, *Colquhounana*?

With the assistance of these characters, it may be possible to get some idea of the different species, or, perhaps, in some cases, permanent varieties.

nubilana, Hüb.—Fore-wings each 3 lines long, by $1\frac{1}{2}$ broad, of fairly equal breadth, with short costa, blunt apex, and rounded hind margin. In the female rather broader and still rounder. A dark grey insect, accurately described by Wilkinson.

A very plentiful species among hawthorn in some districts. Mr. Machin has reared it from hawthorn and blackthorn. He says that the larva is pale green, feeds between leaves drawn together, and assumes the pupa state among them.

abrasana, Dup.—Each fore-wing $4\frac{1}{2}$ lines by $1\frac{1}{2}$, rather broader towards the hind margin, costa nearly straight, apex blunt, hind margin rather rounded, not very oblique. A larger species than *nubilana*, of a rather smooth-looking dull dark grey, with a brownish tinge, almost devoid of markings, except a mere shadow of the oblique central fascia, and sometimes a few scattered black dots. These black dots are rather strongly developed in a very curious moth, taken many years ago on the moors of Cumberland by Mr. W. Thompson, of Stony Stratford, which moth must be, I think, a large *abrasana*.

This species seems to be rare or extremely local in this country. A specimen was taken in a dry lane in Wiltshire by Mr. E. Meyrick in August, 1876, and I have seen three specimens from the collection of Mr. G. Harding, of Bristol, who took them more than twenty years ago, and believes that the species was common when he took these.

virgaureana, Tr.—Each fore-wing measuring 4 lines by $1\frac{1}{2}$ to $1\frac{1}{4}$, fairly broad, with well rounded costa and blunt apex. This most abundant species is fairly well described by Wilkinson, it is usually much irrorated with round dark grey dots, obscuring the ground colour, and sometimes the markings are also much obscured.

The larva seems to be quite as variable as the moth. Mr. Machin has reared the species from “a dirty green larva feeding on *Genista anglica*.” Mr. Buckler communicated the following description, taken from a larva found on *Teucrium scorodonia*:—“Light greenish-grey above, paler flesh-coloured—greyish below, with a darker dorsal line, and rather less dark sub-dorsal line. Tubercular spots black, anterior-legs black, a blackish plate on second segment, head light reddish-brown.”

Mr. A. Balding, of Wisbech, “collected a lot of larvæ from water betony, and sorted them into two lots, one with spots lighter than the ground colour, the other with them darker. All produced *virgaureana*.”

My own descriptions also vary:—“Sluggish, cylindrical, plump, smoky-black, spots faintly shining, head light brown, plates jet-black, hairs rather long. On *Plantago lanceolata*, drawing together each leaf, lengthwise, in the middle”; and another: “plump, pale bluish or greyish-green, dots black, small, but distinctly visible, especially

across the anterior segments, head pale brown, dorsal plate pale brown, with blackish dots or a black bar, anal plate green with black spots. In tops of *Lathyrus*, twisting and drawing together the terminal leaves, also in *Genista tinctoria*, end of May." "Pupa black-brown."

alternella, Wilk. (Schiff. ?).—Fore-wings 5 lines by $2\frac{1}{2}$; a broad-winged species, with moderately arched costa, blunt apex, and a decidedly squared appearance. Occasionally a female is found of remarkably large size. The costa in this sex is more arched.

Wilkinson's description is fairly good, but his dimensions are too small. This fine species is generally found on rough ground among the herbage, and flies readily before dusk. It seems only to shelter on tree trunks casually from stress of weather. I have not yet obtained the larva. Mr. W. H. Grigg, of Bristol, has reared one specimen from a larva found on *Conyza squarrosa*. Mr. Harold Ruston finds the moth rather commonly near Chatteris, where *Carduus arvensis* is abundant, and suggests this as its food-plant; and, some years ago, Mr. E. Meyrick (who has been lately doing splendid work at the antipodes) wrote me that it was common near Cambridge, and "very evidently attached to thistles, *Carduus arvensis*", in fact, I took several where it *must* have fed on that plant."

It used to occur in old chalk-pits and on other rough ground at Norwich, where I thought it attached to *Centaurea*.

Hofmann says, "according to Mann, with black head and neck-shield, and white warts; in spring, on *Chrysanthemum*."

Wocke calls this species *chrysantheana*, Dup., ignoring *alternella*, Schiff. (which, probably, is not *very* certain), and quoting *alternella*, Wilk., as a synonym. He does not include it in the large group which he lumps together as *Wahlbomiana*.

otomaculana, Haw., Curt.—Fore-wing 5 lines by $2\frac{1}{2}$, a very square looking species, easily distinguishable as well as by its shape as by its beautifully clear white ground-colour, with distinct blackish-grey markings, and dark grey hind-wings. It is one of the least variable species in the genus.

Some years ago, Mr. J. Dunsmore, then residing at Paisley (now, I hope, doing good work in the United States), took much pains to supply me plentifully with larvæ as well as imagos of this lovely species. He wrote:—"It is one of our commonest hill-insects, and may usually be picked off old stone walls without trouble, and in any numbers. Its larva feeds like that of *ictericana*, in rolled leaves of plantain and knapweed, leaving a way of speedy escape at top or

bottom, most commonly at top. It is very active, and of a dark sooty or almost black colour, not so stumpy as *ictericana*, in fact, rather long and thin, and wriggles out at the top of the tube when disturbed, so that you require to be active to take it. The young leaves of the knapweed seem to be the most acceptable food." The larvæ sent were thickest in the middle, and when young, in the beginning of June, of a pale silvery-grey, slightly darker on the back, pale yellowish beneath, spots distinct, black, head and plates black. A fortnight later smoky-black, more bluish-grey on the back, paler between the segments, spots large, raised, shining black, head pale brown, blackish at the hinder margin, plates black; curls up when disturbed. On *Centaurea nigra* and *Plantago lanceolata*. Pupa blackish.

I have not met with any record of the occurrence of this very distinct species on the continent. Its nearest ally seems to be *styriacana*, H.-S., a very pretty species, with *white* hind-wings, found in Austria and Switzerland, but confounded by Wocke with the more narrow-winged *conspersana*, Dgl., = *perterana*, Gn. My German example of *Penziana*, Hüb., also appears to represent a species of this group—a very beautiful species, resembling our so-called *Penziana* in colour and markings, but with broader wings.

sinuana, Steph.—Fore-wing 5 lines by 2. Costa strongly arched before the middle, then nearly straight to the apex, thus having a remarkable resemblance in shape to a *Peronea*. It is also more silky in its appearance, and more regularly and delicately reticulated with grey scales than any other species. It varies very little in markings, and the peculiar form of the abbreviated, pointed, curved, basal fascia is extremely reliable.

It is still a rare species, though widely distributed. The Rev. E. N. Bloomfield has taken one near Hastings, and Mr. Grigg several near Bristol, but it seems to occur more frequently in the Perthshire highlands; I have a record of one at Lochgoilhead, and it has been taken by Mr. F. D. Wheeler and Mr. T. W. Salvage in the Blackwood and on the mountains at Rannoch. The only record that I have of its larva is from Mr. Sang, who took several of the moths near Burton-on-Trent, and reared one from a larva found feeding in a web on flowers of wild hyacinth.

For some reason which does not seem clear, this species is sunk by Wocke as a synonym of *pasivana*, Hüb., which figure it does not resemble at all. There is certainly no more reliable and clearly defined species in the genus.

pascuana, Hüb., Wilk. (erroneously spelt *pasivana*, Hüb., 99, but corrected in a subsequent work—Verzeichniss bekannter Schmetterlinge).—Fore-wing $4\frac{1}{2}$ lines by $1\frac{1}{2}$, rather long and oval, the margins being curved and much rounded off. Rather a smooth and greasy looking insect, with its markings much obscured by grey scales. Easily distinguished from all the other species in the genus by the very considerable over-lapping of its wings when in repose, and its consequent appearance of narrowness. It is very plentiful indeed at Brandon, and found in many parts of the country, but usually confounded with *virgaureana*, from which the over-lapping wings readily distinguish it.

Mr. W. R. Jeffrey, of Ashford, describes the larva as yellowish-grey with black spots, feeding on flowers of *Hypochaeris radicata* and *Anthemis arvensis*.

Dr. Wood, of Tarrington, and Mr. W. Thompson, of Stony Stratford, have reared it from *Chrysanthemum leucanthemum*. My own efforts to rear it have, so far, been unsuccessful.

Among the examples of *Tortrices* sent me by Professor Zeller some years ago, are several specimens of a peculiar grey-brown—almost yellowish-brown—*Sciaphila*, labelled "*pascuana*, F. v. R." These seem to be very close to, if not identical with, a pale greyish-brown, or yellowish-brown, *Sciaphila*, which is found in plenty in salt marshes in the south of England, and particularly on both sides of the mouth of the Thames. This form seems pretty constant in size and colour, and, in absence of markings, but it also corresponds so very accurately in size and shape with *pascuana*, Hüb., that there seems little probability that they are really distinct. The markings, when visible, also agree closely with those of the latter.

I am indebted to Messrs. Sydney Webb and Howard Vaughan for specimens. Mr. Webb has reared one specimen (accidentally) from *Aster tripolium*. This variety appears to be plentiful in the drier parts of the salt marshes, and scarcely to be known elsewhere. It was, I believe, first noticed there by Mr. S. Stevens many years ago. Mr. Webb says that it emerges in June and July, and continues out a long time. In colour, it shows a remarkable divergence from typical *pascuana* and the remainder of the genus, leaning strongly towards that of *S. ictericana*.

conspersana, Dougl., Wilk. (*perterana*, Gn., MS.).—Fore-wing 5 lines by $1\frac{1}{2}$, long and narrow, with the costa straight beyond the middle, apex somewhat pointed, and hind-wings oblique.

Wilkinson's description is good, except that he does not remark the length of fore-wings, in which this species closely approximates to *ictericana*.

It is common in some parts of the western coast, particularly on the mountain limestone of Pembrokeshire, attaining a larger size and much greater depth and distinctness of marking, than specimens from the chalk districts of the south coast. But this species has already been remarked upon (Ent. Mo. Mag., vol. xii, p. 230), and repetition is unnecessary. Its larva is over half-an-inch long, sluggish, stout, tapering at each extremity, very pale greenish-grey, yellowish beneath, and semi-transparent; spots small, black, head and plates yellowish-brown. Drawing together the ray-florets of *Chrysanthemum leucanthemum*, in June, and feeding on the disc-florets and seeds. Also in blossoms of *Apargia hispida* abundantly, and more rarely in those of *Hypochæris radicata*, *Aster tripolium*, and *Ranunculus bulbosus*. In the absence of suitable flowers on the sea-cliffs, it is quite at home on the tops of *Teucrium scorodonia* and *Senecio erucifolius*, drawing together the terminal leaves and eating out the heart. When feeding in the flowers of oxeye and *Apargia* it folds down the ray-florets regularly and neatly, so as to form a comfortable, and also a conspicuous, habitation. The pupa is blackish-brown, often spun up in the flower, and the moth emerges in July.

Mr. Doubleday seems to have suppressed *conspersana*, Dougl., in his list, because there is a *conspersana* in the genus *Teras* (a synonym of *ferrugana*), and substituted *perterana*, Gn., an unpublished name. I think that there is no reason for this.

subjectana, Gn.—Fore-wing 4 lines by $1\frac{1}{2}$, costa very little arched, nearly straight beyond the middle, hind-margin rather oblique. The most abundant species of the genus. Generally, its ground-colour is pale and very little suffused with grey scales, so that the markings are usually distinct. It is constantly mixed with *virgaureana*, but has narrower and more pointed wings, and a straighter costa.

Its larva varies a good deal, partly, no doubt, at different ages. Mr. Machin has reared it from a brownish-black larva on the common plantain, and others on sorrel and chickweed. Mr. Sang used to find it at Darlington feeding on *Lotus* and other vetches. I have had larvæ; cylindrical, except that they were slightly tapering at the ends, smoky-brown, with brown head and black plates. In blossoms of *Ranunculus acris* and *bulbosus*, drawing together the petals and feeding on them and the anthers in June; also smoky-black spots slightly paler, head

brown, plates black, in flowers of *Chrysanthemum leucanthemum*. It always rolls into a ring when disturbed. The pupa is blackish. *Incertana*, Tr., seems to agree closely with this species.

communana, H.-S.—Fore-wing 5 lines by 2 barely, long, and fairly equal in breadth, hind-margin rounded, apex not very pointed. A handsome species, readily recognisable by its shape, having even, oblique, dark grey fasciæ, and the whole wing generally irrorated with grey scales, or even dots. The distinctness of this species from typical *Wahlbomiana*, and its remarkably long wings were pointed out to me long ago by M. Ragonot, who also sent examples.

In this country, it has been noticed principally in Cambridgeshire and Huntingdonshire. Mr. Harold Ruston took a number of specimens some years ago near Chatteris, and this year several have reached me, taken by Mr. A. F. Griffith, at St. Albans, where it does not seem to be rare.

Wahlbomiana, L. ?—This is not a satisfactory name to apply. Wocke unites under it, *virgaureana*, *subjectana*, and *communana*, with a lot more names, but Ragonot assures me that it is a small species, narrow-winged, but not so long as *communana*.

Some years ago, Mr. J. Gardner, of Hartlepool, reared several small *Sciaphilæ* from tops of *Artemisia maritima*, which seemed to me to agree with this description. They resembled *virgaureana*, but had a much straighter costa, quite straight in fact beyond the middle. Larvæ were sent to me, but they did not like the change of air, or of food, and I only reared a very poor specimen, but cannot refer it to any species, the straight costa, blunt apex, and narrow wings being so peculiar. Further investigation will be necessary to prove, first, whether it is distinct from all the previous species, and, secondly, whether it agrees with Linné's type of *Wahlbomiana*.

Penziana, Wilk. (? Thunb.), *bellana*, Curt.—Length of fore-wing 6 lines by $2\frac{1}{2}$ in breadth, long and narrow, and nearly triangular, being very narrow at base, with nearly straight margins and long apex. A very handsome species, with white ground colour, and sharply defined, indented narrow blackish fasciæ. Found on rocks and hills about Keswick, Cockermouth, Rannoch, and other northern hill-regions.

The only information that I have respecting its larva is from Mr. Hodgkinson, who says:—"The larva is a grass feeder, nibbles the tops of fescue-grass at night, and lives in a silken gallery at the roots of the grass. It is a hard species to breed." Mr. Hodgkinson sent me

a larva feeding among roots of a small wiry grass, which, however, I fully believe was that of some species of *Crambus*; I was unable to rear it.

I have an example of a very beautiful *Sciaphila*, similar to this, with much broader fore-wings (sent by M. Ragonot, and taken, I believe, on the Alps), under the name of *Penziana*, certainly a distinct species, which seems to agree fairly with Hübner's figure. Mr. Doubleday also heard, many years ago, from Dr. Wocke, that this species was not the *Penziana* of Hübner. It seems desirable, therefore, to adopt a name about which there cannot be much doubt = *bellana*, Curtis.

Colquhounana, H. D. Catalogue.—Closely allied to the last species is a handsome form which has stood in lists and collections for many years under this name. Its size and measurements are almost exactly the same as those of *bellana*, but the dorsal margin of the fore-wings is not so straight, making the wing a little broader near the base, and not so sharply wedge-shaped. It is a handsome species; ground-colour of fore-wings slate-grey, varying much in intensity, and occasionally whitish in the central area. Markings of the usual fasciæ much like those in *bellana*, but slightly more oblique, and not nearly so sharply defined. Hind-wings whitish, tinged with grey at the margins. Head and thorax of the same shade of grey as the fore-wings.

The late Mr. T. H. Allis, writing in 1868, told me that he believed it to be distinct (from *bellana*, Curt.), that it "occurred in lower ground than that species." It is, in fact, like *conspersana*, an inhabitant of sea-side rocky localities, taking the place of that species on the more northern west coast. It is tolerably common in such places near Dublin and the Isle of Man. Mr. Hodgkinson asserts that it was reared by Mr. Gregson from the roots of sea-pink.

ictericana, Hw.—I see no reason why this species should be excluded from *Sciaphila*. It is very nearly allied to *conspersana*, and a grey variety reared by Mr. Jeffrey, of Ashford, is quite undistinguishable from a *Sciaphila*. Larvæ sent by Mr. Jeffrey were moderately long and slender, slightly attenuated at the extremities, pale yellowish, with rather broad dorsal and subdorsal longitudinal greenish-grey lines, spots black, head pale brown, with a black spot at each side, plates pale brown. In blossoms of *Hypochæris radicata*, *Anthemis arvensis*, and *Chrysanthemum leucanthemum*, drawing together the ray-florets. Feeding in May and June, moth emerging in July. Pupa light brown.

THE LARVA OF *HEDYA SERVILLANA* AND ITS HABITS.

BY JOHN H. WOOD, M.B.

In the spring of last year I was much interested by finding, in the shoots of willow, a larva that in the end proved to be this species. I am aware that in this I can lay claim to no discovery; Mr. Bond has already stated that it feeds in willow, and Herr Anton Schmid says, in a swelling in willow shoots, but as neither observer, so far as I know, has given any particulars, nor entered into a description, I have put together the following notes, which will, I hope, render fairly clear the economy of this scarce species, and at the same time enable Entomologists to meet with it more readily than hitherto.

The larva forms a symmetrical swelling, I mean by that an enlargement running equally round all sides of the stem, on the shoots of the broad-leaved willow (*Salix caprea*) in those localities where the shrub occurs among young undergrowth in woods. The swelling is oval in outline, with a circumference, at the widest part, barely half as much again as that of the sound stem; it measures 8 or 9 lines in length, and occupies the site of a bud, extending, usually, as far below it as above it, and, in most cases, without interfering with its vitality. The circumstance of its position, combined with its gentle outline and moderate girth, render it a somewhat inconspicuous object, and liable to be mistaken for the natural thickening that occurs at the origin of the buds; this is especially likely to be the case whilst the leaves are on, but in the winter months its recognition is not difficult, for the eye runs over the naked twigs, and quickly distinguishes the symmetrical swelling caused by the larva from the one-sided one of the bud. In its attack on the tree the insect invariably selects shoots of the year, and when these are vigorous, and such are the ones usually chosen, no injury is done beyond the production of the enlargement, but when weaker shoots are attacked or the mine is placed too near the end, then the part beyond ceases to grow, acquires a stunted appearance, and, at length, dies, becoming in the course of the winter black and shrunken. The point where the larva enters is just where the apex of the bud touches the stem, and this is so generally the case as to lead to the conclusion, that the moth is guided by the bud in laying her egg, and deposits it at this particular spot. At first, communication is maintained with the outside, and the frass is thrown out and caught on the parts below, but before the larva has ceased to feed, the opening gets closed up, and its site marked by a small brown scar, through which the perfect insect eventually breaks. The mine is cylindrical, short

and narrow—the upper part contains the frass and is rather the most capacious, in consequence of the removal, to some extent, of the woody tissue, while the lower part occupies little more than the pith-canal. The whole length of the mine has never exceeded, and rarely reached, an inch in any of the numerous specimens I have examined. It is impossible not to be struck with the smallness of these dimensions, and their apparent incapacity for supplying material enough to build up an insect of this size, so that I am inclined to think that the larva derives a considerable part of its nourishment directly from the sap, which it probably licks up from the walls of its tunnel. And confirmation is given to this view by the character of the frass, which is small, irregular, and excrementitious-looking, instead of being large and well-formed, as would be the case, did a large part of the food consist of indigestible material. I have no information when the larva hatches, but as the galls are found fully developed in the middle of August (Aug. 19th), this event probably takes place some time in July. It continues to feed up to the end of September, and in October lines the upper part of its dwelling with a close coating of silk, cutting it off from the part below by an open fragile diaphragm of the same material. Within the chamber so formed it remains unchanged through the winter, and goes into pupa in the spring, the case being completely extruded, and dropping to the ground on the emergence of the moth. So far as my experience goes, it is but little subject to parasites of any kind, but a large number, in the course of the winter when food is scarce, fall victims to the tom-tits, who appear to have discovered what a savoury morsel the swelling hides, and by means of their strong little beaks succeed in getting possession of it.

The larva is cylindrical, moderately stout, tapering slightly from the 10th segment, and with large prominent dark spots, from each of which springs a small white hair. Head rather small, narrower than the following segment, jet black and shining. Thoracic plate black and shining, but less so than the head, and divided down the middle by a pale line. Legs and anal plate dark grey. Colour very pale grey, but changes, during hibernation, to white with a tinge of yellow. The dorsal vessel, in some specimens, partially visible as a red line. The spots are grey and conspicuous—the anterior trapezoidals roundish-oval in shape, the posterior ones, oval. The row of large somewhat conical spots in the spiracular region are notched on the lower side for reception of the spiracles. These are round and black, and surrounded by a pale ring.

Tarrington, Ledbury :
14th February, 1884.

A NEW SPECIES OF *SCYDMENUS*.

BY THE REV. W. W. FOWLER, M.A., F.L.S.

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SCYDMENUS POWERI, n. sp.

Sat convexum, nigrocastaneum, pilis longis flavis indutum; pronoto longiore, ante medium latissimo, lateribus antrorsum rotundatis, ad basim sensim contractis, foveis quatuor parvis ad basim impresso; elytris ovatis, convexis, dilatatis, ante medium latissimis, quatuor magnis foveis ad basim, et puncturis modicis haud profundis diffusius impressis; antennis sat longis, flavis, primo et secundo articulo pari longitudine, tertio his in feminis vix, in maribus aliquantulum brevioribus, tribus ultimis sat subito latioribus, ultimo apice modice acuminato.

Differt a S. pusillo colore et forma et puncturâ elytrorum minus profundâ; a S. Sparshallii sculpturâ thoracis, et tertio antennarum articulo valde abhorret.

Length, $\frac{1}{2}$ lin.

Head rather large: eyes large and somewhat prominent. Antennæ pale testaceous, rather large; first and second joints about equal in length; third joint shorter than the preceding, but not very perceptibly so in the female.

Thorax longer than broad, anteriorly rounded, very gradually narrowed towards the base, impunctate, thinly covered with long yellowish hairs; with four small round foveæ, not connected by any line, at the base; the two centre ones are close together, and their sculpture is rather indistinct in some specimens.

Elytra oval, rather wide, convex, rather thickly covered with long yellowish hairs, with four large depressions at the base—the inside pair being considerably the larger—and with rather large shallow and somewhat diffuse punctures.

Legs yellow; femora somewhat inflated at apex.

This species comes rather near *S. pusillus*, Müll., but may be distinguished by its colour, which resembles that of *S. elongatulus*, as well as by its general form, smaller size, and the shape and punctuation of the elytra, the latter in *S. pusillus* being evidently coarser and more diffuse than in *S. Poweri*.

Dr. Power has for some time had this species turned on one side in his cabinet as distinct, and, as it has been returned to me by M. Fauvel as unknown, I venture, at Dr. Power's request, to describe it.

Eight specimens taken by Dr. Power, one at Seaton, in Devonshire, on January 3rd, 1866, two at Wimbledon, on February 23rd, 1867, three at Wimbledon, March 25th, 1871, one at Birdbrook, Essex, August 18th, 1865, and another in the same locality, April, 1868. It is a marsh species.

The School House, Lincoln:

March 18th, 1884.

TROPICAL COLLECTING.

BY GEO. C. CHAMPION.

(Concluded from p. 205).

Ascending from the "tierra caliente" of Chiriqui, to 3000—4000 ft., the elevation at which the coffee plantations are usually made, the forest is of rather a different character, though very luxuriant; the growth is denser, it is, as might be expected, less tropical in appearance, the trees are not so lofty, there are fewer palms and of different species, fewer Musacæ, fewer Arums, but more ferns, especially of the arborescent kinds, and Lycopodiums; as we go higher (5000—6000 ft.) the tree-trunks and branches are covered with moss—all reeking with moisture during the long rainy season; except for a short time in the morning, very little is to be seen of the sun, the higher mountain forest-clad slopes are constantly enveloped in mist; the clouds descending soon after mid-day to remain till nearly dark, and shrouding everything as in a fog; the tree-tops are, perhaps, just visible, above all is impenetrable mist; at this time the forest is very gloomy and dark, and not a sound of life will be heard except the dismal howling of the monkeys at intervals, even the large blood-thirsty *Tabanidæ* leave you in peace, the butterflies vanish, and the collector will no longer find anything to repay him for his work.

The mountain-sides are everywhere scored or cut up by enormous deep "barrancas" or ravines, sometimes 1000 ft. or more in depth, the sides of which are often so steep as to make the ascent or descent a matter of very considerable difficulty, at times an impossibility. At 8000 ft. (I did not succeed in ascending higher), some interesting butterflies occur, similar to those found in Costa Rica at a similar elevation—species of *Clothilda*, *Euterpe*, *Euptychia*, *Oxæoschistus*, &c., and a few beetles—minute species of *Hispidæ* and *Cebrionidæ*, some *Lampyridæ* not before met with, *Malthinus*, various *Phytophaga*, &c., chiefly obtained by brushing bamboo; the undergrowth at this elevation consists almost entirely of bamboo and small palms, tracks of the tapir were numerous here, and help the collector a good deal in getting about, otherwise he must cut his way everywhere. At 4000—5000 ft. a good many butterflies, &c., not to be seen in the low country, will be met with—species of *Euterpe*, *Mesosemia*, *Heterochroa*, *Papilio*, *Timetes*, *Pieris*, *Anæa*, *Leptalis*, *Apatura*, &c.; a gigantic *Noctua* (*Erebus*, sp.), the largest specimens of which are fully ten inches in expanse, will be seen occasionally settled high up on the trunks of the largest trees in the forest, looking like nothing so much as a

gigantic *Boarmia*, it rests in the same manner, with its wings spread out horizontally. Some very fine *Lamellicornes*—species of *Plusiotis* (metallic, golden or silvery in colour), *Antichira*, and others, may be found at an elevation of 5000 ft. flying in the hot sun round the tops of forest trees; *Lampyridæ*, *Longicornes*, *Phytophaga*, &c., of different species to those of the hot country. *Coleoptera* and *Hemiptera* are abundant at an elevation of about 3000 ft., and many of the species of the low country will be found as high as this; higher, fewer and different species are to be met with.

The highlands of the State of Panamá, unlike those of Costa Rica, are almost uninhabited; there are no villages except in the low country, travelling is in consequence very difficult, no roads, and the country exceedingly broken, the coffee plantations only made within the last few years, are, probably, the highest inhabited places in Chiriqui, and it is chiefly owing to being able to stay at these places I was enabled to collect at the higher elevations.

A great deal of forest is to be found in Chiriqui, besides the patches of wood on the plains, but as we go nearer to Panamá, into the department of Veraguas, we begin to leave the forests and come to a different sort of country and vegetation, very broken hills and valleys covered with grass and wooded only by the streams or in the hollows and forest of any extent only to be found high up on the mountain slopes. Certain *Malacoderms* (*Astylus*) swarm in flowers on these grassy hills.

I will say but little about Guatemala, as my remarks on Chiriqui will apply almost equally well to that country, fine forests are to be found there also, both in the highlands and in the low country; of course, lots of species met with there will not be found in Chiriqui and in the highlands. The fauna partakes much more of a North American character. Travelling is much easier in Guatemala; there are roads (or what are termed such) and a few bridges; villages or towns are scattered all over the country, except in Peten and part of Vera Paz, villages up to nearly 10,000 ft. above the sea, a cart road (over which the diligences pass in the dry season) running along the highest parts of the Cordillera between the capital and Quezaltenango, and ascending to little short of 11,000 ft., whence the ascent of at least one of the volcanoes (the Volc. de Agua, elevation nearly 13,000 ft.) can easily be made, and altogether there are far more facilities for work. Hot, dry valleys, at 3000 ft. or so, with plenty of *Cactaceæ* (not, however, productive to the entomologist), pine forests, &c., characteristic of certain parts of Guatemala, will not be found in Chiriqui.

Indians will not easily be found in Chiriqui to carry your luggage, everything has to be carried on pack horses or mules, unless you are making the three or four days' journey across to the Chiriqui lagoon on the Atlantic coast from David or Caldera, to make this trip you may, perhaps, find carriers; the path or road is seldom traversed except by natives, and is quite impracticable for horses or cattle.

I will now conclude my remarks on collecting in Central America, and hope they may be of use to future travellers.

274, Walworth Road, London, S.E.:

February 18th, 1884.

TWO NEW BUTTERFLIES ALLIED TO *APHNÆUS NATALENSIS*.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

The two following species bear so strong a resemblance upon the upper surface to *Aphnæus natalensis** that, when we received them, I unhesitatingly placed them in the cabinet with our series of that species; indeed, the chief difference on the upper surface is in the greater width and more ochreous tint of the V-shaped band on the primaries: the differences on the under-surface are, however, more marked, and are as follows:—

APHNÆUS NYASSÆ, *sp. n.*

Under-surface creamy sulphur-yellow, purer in tint than in *A. natalensis*, the silver markings on the bands more continuous, almost touching, and in parts quite touching the margins of the bands, which are considerably thicker, and, for the most part black, though varied here and there with dull dark red; primaries with the third (oblique) band considerably more oblique than in *A. natalensis*, the costal spot further beyond it, the abbreviated discal band slightly irregular, the sub-apical costal spot absent, the sub-marginal lines slightly undulated and nearer together; secondaries with most of the spots towards the base filled in with dark red, the oblique post-median band slightly curved and well separated from the abbreviated discal band, which is narrower; instead of the two sub-marginal stripes, there is a single tapering, bright saffron-yellow stripe from the elbow of the post-median band (where it unites with the band from the abdominal margin) to near the apex, a slender, abbreviated, sub-apical black stria between it and the margin.

Expanse of wings, 35 mm.

Lake Nyassa.

* I may note here that the species figured by Hewitson in his "Illustrations," is not the true *A. natalensis*, or, indeed, at all nearly allied to it.

APHNÆUS VICTORLE, sp. n.

Wings below of a decided sulphur-yellow colour, excepting towards the internal margins; the silver markings in the bands slender and rather dull, borders of the bands on the primaries and towards costa of secondaries thick, and, for the most part, black, oblique post-median band of primaries slightly curved, not single at its inferior extremity, costal spot beyond it further away, abbreviated discal band distinctly sigmoidal instead of straight; no sub-apical spot; two sub-marginal lines thick and near together; sub-basal markings very strongly defined with partly black and partly red borders; oblique elbowed post-median band excepting at costa with very slender margins; abbreviated band elbowed and almost divided, a spot at costa being separated from the main body by a black oblique line; inner sub-marginal line black, straight, outer line abbreviated, and only remaining at apex.

Expanse of wings, 37 mm.

Victoria Nyanza.

It will be seen that in some respects these two species are more like one another than like *A. natalensis*: the differences are such as have been proved to be constant in this genus, and as such have been used even by men holding the expansive views touching the variability of species of the late W. C. Hewitson: I think I need say no more than that to establish their claim to separate attention: of *A. natalensis* we have six examples from Natal, besides those in Hewitson's collection.

British Museum: *March*, 1884.

THE BRITISH DRAGON-FLIES ANNOTATED.

BY ROBERT McLACHLAN, F.R.S., &c.

In the "Catalogue of British *Neuroptera*," published by the Entomological Society of London in 1870, were enumerated 46 species of British Dragon-flies (*Odonata*). That list was practically based upon Dr. Hagen's "Synopsis," published in the "Entomologist's Annual" for 1857, with the addition of one species (*Leucorrhinia pectoralis*), and the subtraction of another (*Somatochlora metallica*). The number remains at 46*—*Somatochlora metallica* has been discovered in Scotland, whereas *Sympetrum vulgatum* and *striolatum* are united as representing only one species. But the claims of some species to be considered "British" rest on very slender grounds; in one or two cases on single specimens captured 70 or 80 years ago. It therefore occurred to me that it might be useful (and perhaps serve as an *impetus* to observers) if a brief annotated list of our species were drawn up; an idea that has resulted in the following notes.

* A writer in the "Midland Naturalist" for 1882 estimates the number of known *British* species at about 200!!

Some slight discrepancies in generic (or "sub-generic") nomenclature, and in sequence, between these notes and the Catalogue of 1870, result from changes made since that time.

The nomenclature of the older British authors (Curtis, Stephens, Evans, &c.) was very defective, and no sound basis was obtained until De Selys-Longchamps published his Revision of our species (from personal inspection of types) in the "Annals and Magazine of Natural History," ser. i, xviii, pp. 217—227, 1846 (reprinted in abstract in the "Zoologist" for 1846, pp. 1522, 23). Dr. Hagen's Synopsis of 1857 was to some extent founded on those notes, and also on personal observation. Forty-six species were enumerated in 1846, and now, after nearly 40 years, we are not able to increase the number, and, in fact, some species should perhaps be omitted from the List.

Really very little has been done of late, and the only important local list published since 1870 is that by the late Henry Doubleday on the species of the Epping district (*cf.* Ent. Mo. Mag., viii, pp. 86, 87, 1871).*

Sub-Fam. LIBELLULINA.

Leucorrhinia pectoralis, Charp.—At the Meeting of the Entomological Society of London, held on January 2nd, 1860 (*cf.* Proc. Ent. Soc., n.s., v, p. 89) Mr. Groves exhibited a specimen of this insect taken in June near Sheerness. On the authority of this example (seen by Dr. Hagen, but now destroyed) the name has found its way into the British list. I believe the specimen was taken on board a fishing boat (at the mouth of the Thames). The species can only be regarded as "casual."

Leucorrhinia dubia, V. d. L.—Certainly common on some of the extensive moors of the north of England. I have never seen a southern example; but, according to Curtis, Mr. J. C. Dale found it in abundance near Dorchester, and he also recorded it from Lincolnshire. Mr. Doubleday recorded it from Epping.

Sympetrum vulgatum, L. (*striolatum*, Chp.).—I am quite of the opinion now held by De Selys-Longchamps, that *vulgatum* and *striolatum* are specifically identical, the usual exponents of the former being represented by very adult examples, the supposed difference in the "vulvar scale" of the ♀ being illusory. The name "*striolatum*" should be suppressed as other than a synonym. This species, in point of numbers and distribution, is perhaps the most common British Dragon-fly.

Sympetrum meridionale, Selys.—I have not examined an example of this species supposed to have been taken in Britain. Two such examples appear to have been recorded, both females, one in Evans' collection (which is in Dale's) from "near London," and the other in Wailes' collection, from the "South of England." If "British," it can, at the most, only be considered a "casual." It is a very abundant species in the Alps of Central Europe, ascending to great elevations, but probably

* Mr. Bond possesses a fair representative old collection, for the most part formed by the late Mr. Farr. Through his courtesy I recently had the opportunity of examining it, but found therein none of what may be termed the "critical" British species.

does not breed there. Its liability to have the well known red *Acari* attached to the wings (sometimes in enormous numbers) is so marked as to be almost a specific character of the insect itself, few specimens being entirely free from them.

Sympetrum Fonscolombii, Selys.—Another "casual." A ♀ was detected by De Selys in Stephens' collection, and therefore appears to have acquired the usual "near London" as a locality. A ♂ (erroneously recorded by me as *S. vulgatum*, cf. Ent. Mo. Mag., v, p. 220) is in my collection, obtained at the sale of T. Desvignes' collection, and of the precise origin of which I know nothing. Of very wide southern distribution, extending to South Africa.

Sympetrum flaveolum, L.—Local and "sporadic." In the year 1871 it was excessively abundant in the London District (I even saw several examples in the Strand!).

Sympetrum sanguineum, Müller.—No doubt a common species (perhaps also "sporadic") in certain districts. I have never seen it *alive* in Britain!

Sympetrum scoticum, Donovan.—A frequenter of moors, and no doubt more common in the north.

Platetrum depressum, L.—Needs no comment.

Libellula quadrimaculata, L.—Abundant in certain localities, general in certain years. I am not aware that anything approaching the enormous migratory swarms that often astonish our continental neighbours has ever been observed in Britain; the tendency is, however, manifested here in the unequal and uncertain distribution.

Libellula fulva, Müller.—Possibly general in the southern portion of England, never common, and always difficult to capture on account of its habits. I have never noticed a British ♂ in the thoroughly "blue" condition seen in very adult continental examples, and which gives them a so entirely distinct appearance.

Orthetrum cærulescens, F.—Needs no comment.

Orthetrum cancellatum, L.—Possibly confined to the southern half of England. Often common about brick-holes in the London district.

Sub-Fam. CORDULIINA.

Somatochlora metallica, V. d. L.—In 1869, Dr. Buchanan White took this species in some numbers in Inverness-shire (cf. Ent. Mo. Mag., vii, p. 38); it has since been taken in the same county by Mr. King. The name was previously in our lists, but no doubt erroneously. Van der Linden misquoted a figure in Harris as representing *metallica*, whereas, in all probability, it was intended for *Cord. anea*, as stated by Harris. Stephens says, "it has been found within the metropolitan district in June;" I know not what has become of the specimen said to have been in his cabinet, and from which Evans' very uncertain figure was taken; probably there was an error in identification.

Somatochlora arctica, Zett.—The Highlands of Scotland (has also been recorded from Killarney in Ireland). It was not uncommon during my visit to Rannoch in June, 1865 (cf. Ent. Mo. Mag., ii, p. 118), but since that time other visitors to the locality do not appear to have succeeded in finding it.

Cordulia anea, L.—Local in the southern counties of England.

Oxygastra Curtisi, Dale.—A species which, from its continental distributor

should scarcely occur in Britain. The older entomologists used to find it in Dorset, Hants, and Devon. Then it was lost sight of until Mr. Herbert Goss took it in some numbers near Christchurch in 1878 (*cf.* Ent. Mo. Mag., xv, p. 92).

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Sub-Fam. GOMPHINA.

Onychogomphus forcipatus, L.—A "casual" at the most. Rests as British on the authority of a ♀ in Stephens' collection, and that entomologist assured De Selys that he remembered to have taken it in England. Stephens originally confused *forcipatus* and *vulgatissimus*.

Gomphus vulgatissimus, L.—Local in the south. A common Thames insect.

Gomphus flavipes, Charp.—A "casual." Rests as British on a ♂ captured by Stephens near Hastings on the 5th August, 1818.

Cordulegaster annulatus, Latr.—Needs no comment.

Sub-Fam. ÆSCHNINA.

Anax formosus, V. d. Lind.—Common in the south; how far it extends northward I know not.

Æschna mixta, Latr.—Probably widely distributed, but certainly rare. A few years ago Mr. S. Stevens found an example in a torpid condition in his garden near London, in the month of November.

Æschna borealis, Zett.—Highlands of Scotland. Few specimens exist in collections. I observed it, but not commonly, at Rannoch in June, 1865 (*cf.* Ent. Mo. Mag., ii, p. 117).

Æschna juncea, L.—Certainly rare (even if it occur at all) in the south; common in the north, and probably also common in Ireland.

Æschna cyanea, Müller, and *Æsch. grandis*, L.—Need no comment.

Æschna rufescens, V. d. Lind.—Used to be common near Yarmouth, but there seems to be an idea that it has disappeared. Some of the resident entomologists in that vicinity can no doubt solve this question. I have seen no recent British examples.

Brachytron pratense, Müller.—Probably generally distributed, but precise local information is desirable.

Sub-Fam. CALOPTERYGINA.

Calopteryx Virgo, L., and *C. splendens*, Harris.—Need no comment.

Sub-Fam. AGEIONINA.

Lestes viridis, V. d. Lind.—A very doubtful native. According to De Selys, a specimen existed in Evans' collection. That collection passed into the hands of the late J. C. Dale, and his son (Mr. C. W. Dale) cannot now trace it.

Lestes nymphæ, Selys.—I have never seen a *living* British example, but it certainly used to occur (and probably still occurs) in the Fen District, and Doubleday recorded it from Epping.

Lestes sponsa, Hans.—Probably generally distributed.

Lestes virens, Charp.—I regard this somewhat doubtful as British. One ex-

ample (said to have been taken in the New Forest) was in Stephens' collection (now in the British Museum) ; a second was recorded from Leach's collection. Doubleday recorded it from Epping.

Lestes barbara, F.—Still more doubtful. According to De Selys (1846) a ♂ in the Dublin Museum was believed to have been taken in Ireland.

Platynemis pennipes, Pallas.—Needs no comment.

Ischnura pumilio, V. d. Lind.—I have seen no recent British examples. Used to be taken not uncommonly in Dorset by J. C. Dale. Recorded also from Cambridge and Belfast. Parfitt recorded it (Transactions of the Devonshire Association, 1879) as common near Exeter, but upon enquiry I found he had made a wrong identification. It is a species of somewhat meridional distribution, but is also alpine. I found several examples close to the St. Gothard Hospice, therefore at an elevation of about 6500 feet.

Ischnura elegans, V. d. Lind.—Needs no comment.

Enallagma cyathigerum, Charp.—Needs no comment.

Agrion pulchellum, V. d. Lind.—Local, but probably generally distributed.

Agrion puella, L.—Needs no comment.

Agrion mercuriale, Charp.—Probably not uncommon in the New Forest. I once found it there in some abundance, but did not succeed in refinding it on the occasion of two flying visits.

Pyrrhosoma minium, Harris.—Needs no comment.

Pyrrhosoma tenellum, Villers.—This essentially South European insect is very abundant on some of the extensive heaths of the south of England.

Erythromma najas, Hans.—Local in the south of England. Also recorded from Belfast.

Of the foregoing 46 species, I regard eight as only *casual visitors or otherwise doubtful*. There is no evidence whatever that *Leucorhina pectoralis*, *Sympetrum meridionale* and *Fonscolombii*, *Onychogomphus forcipatus*, and *Gomphus flavipes*, breed in Britain. There is the strongest evidence that two or three of these were casual immigrants, and the origin of the specimens on which others are included in our list cannot be traced. With regard to *Lestes viridis*, *virens*, and *barbara*, the case is slightly different. These insects could scarcely fly over, and everything depends upon the authenticity, as British, of the examples upon which the species have been included. In placing *L. virens* in this category, I am aware that a doubt is cast upon the late Henry Doubleday's discrimination, owing solely to the great difficulty that often attends the determination of the species of *Lestes*. I never saw Mr. Doubleday's Dragon-flies, and it is possible that had I seen them in 1871, I might then have arrived at no satisfactory conclusion with regard to *L. virens*.

In Mr. Doubleday's Epping list he alluded to having seen a

"*Cordulia*" with yellow dorsal markings on the abdomen, which he believed was *O. Curtisi*. A doubt as to whether this might not have been *Somatochlora flavomaculata*, V. d. Lind., has always existed with me. The latter is a species that certainly *should* occur in Britain.

Allusion should not be omitted concerning the somewhat notorious "*Libellula Sparshalli*, Dale, MS.," that found its way into the earlier British lists. Curtis says, "Taken at Horning in 1823 by the late Mr. J. Sparshall; it is very similar to a Chinese species." This has long been known to be identical with the nearly cosmopolitan *Pantala flavescens*, F. (with a multitude of synonyms). If any reliance whatever could be placed upon the supposed origin of the example, another species could be added to the *European* list (only about 102 species), for Europe is the only quarter of the globe in which *P. flavescens* has *not* been noticed. Its occurrence in Britain would be extraordinary, but that it may occasionally extend (as a "casual") to the south of Europe seems not at all impossible, when we consider its distribution in Africa and Asia.

England possesses two Dragon-flies (*Oxygastra Curtisi* and *Pyrrhosoma tenellum*) that are of South European distribution, and which should *not* occur. On the other hand, if we compare our list with that of the species found in Belgium, Holland, and Scandinavia, there are several that *should* occur, not as "casuals," but as residents. No one seems able to find these, and at present the British Dragon-flies appear likely to go the way of the British Butterflies—on a *descending* scale.

Lewisham, London :
26th January, 1884.

Additions to the entomology of the Isle of Harris.—In the Ent. Mo. Mag., vol. xix, p. 237, I gave you a list of the insects taken by me in the Isle of Harris. To these I may add the following, taken by myself on July 29th, on my way from St. Kilda:—*Satyryus Janira*, of this species I took a remarkable female, with the fulvous band continued across the hind-wings: the males have darker under-sides than usual; *Lycæna Alewis*, of usual type; *Noctua xanthographa*, dark; *Boarmia repandata*, var.; *Melanippe fluctuata*, dark; *Hypsipetes slutata*, small and dark, as are most of the following: *Lurentia cæsiata* and *pectinitaria*; *Emmelesia albulata* and *blandiata*; *Campptogramma bilineata*; *Melanthia ocellata*; *Anaitis plagiata*; *Scopula fuscalis*; *Eudorea atomalis*; *Plutella annulatella*; *Hæmatopota pluvialis*; *Tetanocera umbrarum*; *Halictus villosulus*; *Creophilus maxillosus*, var. *ciliaris*; *Sisyra fuscata*; *Psychomyia phæopa*; *Cyrnus trimaculatus*; *Hydroptila sparsa*; *Bercsa pullata*; *Wormaldia occipitalis*; *Leptocerus bifasciatus*; *Limnophilus estriatus* and *luridus*. I must not forget to mention, it was a fine, bright, and beautiful day, very different to the usual Scotch weather.—C. W. DALE, Glanvilles Wootton: February 1st, 1884.

Captures in the Isle of Skye.—After leaving Harris, I spent three days at Dunvegan, Sligachan Inn, and Portree, and took: *Pieris rapæ*, *Argynnis Aglaia*, *Chortobius pamphilus*, *Cidaria russata*, *Metrocampa margaritata*, *Eupithecia lariceata*, *Boarmia repandata*, large and fine, *Larentia castata*, *Abraxas grossulariata*, *Tortrix viburnana*, *Mizodia Schulziana*, *Aphelia pratana*, *Sericoris lacunana*, *Pardia tripunctana*, *Eupacilia angustana*, *Crambus ericellus* and *culmellus*, *Lepidocera hison-tella*, *Pleurota bicostella*, *Pterophorus tephradactylus*, *Phryganea obsoleta*, *Hemerobius humuli*, and *Vespa arborea*. I was quite pleased at seeing grasshoppers and other insects, which apparently do not exist in the outer Hebrides.—ID.

Botys urticata in January.—The account in this month's Magazine of the abnormal advent of *Botys urticata* reminds me of a similar adventure with an individual of the same species that befel me in or near the year 1856. It was in the kitchen of a country house near Worcester, on the 27th of January, after dark: a snow storm prevailed at the time, and the wind was bringing smoke and snow down the chimney, in the direction of which I was looking, when, with one of the gusts came down into the room a recently-emerged and scarcely expanded specimen of *Botys urticata*. The creature was preserved, and, with its somewhat crumpled wings, remained in my collection several years.—J. E. FLETCHER, Happy Land, Worcester: *March 5th*, 1884.

Botys urticata in February.—I had read but a line or two of the notice at page 227, in this month's Ent. Mo. Mag., when I ventured to guess there would be in the kitchen some sage or other herb belonging to the Labiate family; and that the full-fed larva of *Botys urticata* in its cocoon, having been brought in with these leaves, had, by a rare chance, been forced by the warmth to transform, and produce the moth thus early, instead of drying up, as would almost sure to be the case, if one tried such an experiment. The larva is well known to feed on a variety of plants besides common nettle, spinning its cocoon in the autumn, and remaining unchanged through the winter, like so many others of the group. I have bred the moth at the usual time, by keeping the cocoons in cages out of doors, having often found the larvæ on some plants of horehound (*Marrubium vulgare*) which are growing freely in my little town-garden. These plants are sometimes cut in the autumn, and hung up to dry in the house for use as a domestic medicine during the winter: so, possibly, a similar experience to the one recorded may come under our observation some mild winter's day.—W. R. JEFFREY, Ashford, Kent: *March 11th*, 1884.

Botys urticata frequenting mint.—My earliest acquaintance with *Botys urticata* dates from nearly 50 years ago, and I well remember my boyish delight on starting this pretty insect from a bed of mint in my father's garden. I probably saw half-a-dozen specimens, but struck at them so wildly in those days, that I doubt whether I boxed more than one or two.

I used, however, to revisit this mint-bed again and again, and, during the season, rarely failed to meet with one or more of this brightly contrasted species. Hence, it is always associated in my mind with culinary herbs.—H. T. STAINTON, Mountsfield, Lewisham, S.E.: *March 13th*, 1884.

Notes on Lepidoptera in Roxburghshire in 1883.—The season of 1883 was not in this district a prolific one in *Lepidoptera*, either in the larval or perfect state. There were, however, as seems always the case, a few particular species in as great force as usual, and in one or two instances, notably, *Eupithecia indigata* and *pygmaea* were even more numerous than I have seen them. *Noctua*, during the summer and autumn months, were in small numbers. I again took *Tryphana subsequa* in fine condition, also *Noctua festiva*, *Dianthæcia capsicola*, and *Cucullia umbratica*, not having seen the latter for some years; and, in the beginning of August, when trying the effect of light at my bedroom window, using the mirror as a reflector, I was agreeably surprised by a fine specimen of *Plusia bractea* coming in and settling on the window-blind, its two burnished spots shining with gem-like brilliancy in the reflected light. I need not say I at once closed down the window and so made an easy capture. I took *Coremia munitata* in the beginning of August, in fresh condition, in one of the wildest parts of the Cheviot range; apparently a second brood. Among the *Micros*, I took the following, viz.: *Scoparia pyralella* and *murana*, *Eupœcilia atricapitana*, *Argyresthia retinella*, *Gædartaella*, and *arceuthina*, *Cedestis farinatella*, *Coleophora albicosta* and *artemisiella*, *Elachista opicipunctella* and *atricomella*.—A. ELLIOT, Samieston, Jedburgh, N.B.: Feb. 21st, 1884.

Instinct of locality in Lepidoptera.—In the month of July last, when passing alongside a wire fence, and when near its termination, I noticed on one of the posts, just at the point where the top wire is stapled in, a specimen of *Xylophasia polyodon* settled, and as it seemed a fine and peculiarly shaded one, I boxed it, but after bringing it home, allowed it to escape. Having occasion to pass the same fence a few days afterwards, I again noticed in my belief the same specimen settled, not only on the same post, but on the exact spot as formerly, close to the staple of the upper wire. I think it would be interesting to hear of any similar experience; at any rate, it may serve as a suggestion to make trial of this instinct, as I have not hitherto heard of a similar instance.—ID.

Importation of Ephestia passulella and E. ficulella at King's Lynn.—On February 6th, I was informed that numbers of small moths were flying about the Schooner "Ellen Holt," of Grimsby, which had just put into our dock with a cargo of decorticated cotton-cake from Galveston, United States (Texas). A few of the moths were also brought me on the same day, and I at once thought them to be *E. passulella*, but, subsequently, noticing that they varied considerably, a few of them were sent to Mr. C. G. Barrett, from whom I learn that there are two species, viz., *E. ficulella* and *E. passulella*. On the 7th, the day after the arrival of the vessel here, I paid it a visit with the view of finding out how far the statements made to me about these moths were true: the moths were there, and not in hundreds only, but in thousands. From a fair amount of questions put to the crew, I obtained the following information:—"That when the vessel left Galveston, having been 63 days on her voyage here, no moths were noticed amongst the cargo or any part of the ship; that whilst traversing the Atlantic a severe gale was encountered, and water found its way to the hold, thereby wetting the cargo and causing it to heat; that upon arrival here the hatchways were opened, when a cloud of these moths immediately flew out, settling on everything and everybody near."

As the process of unlading was being proceeded with whilst I was on board, the opportunity thus afforded me for watching the insects was turned to account. The cotton-cake was packed in bags, and as these were removed, numbers of the moths continually flew through the hatchways into the open air. They did not fly far, but settled down on various objects, or on the deck, apparently not appreciating the difference of temperature—for it was cold outside as opposed to the unnatural and abnormal heat of the hold; at any rate, they appeared in a very short time to become benumbed, and lying on their backs, showed, even when touched, scarcely any signs of life. There is not much doubt that the heat to which I have alluded—which would for the most part be generated by the wet cargo—had caused the moths to emerge from their pupæ much earlier than they would have done under ordinary circumstances. Upon examining the bags, I found them to be covered with cocoons, most of which were empty; I have also since been informed that “white maggots” (by which I presume larvæ are meant) had been observed on the outside of the bags as they were being stowed away in the warehouses, and a closer examination has shown that larvæ were at work amongst the cake inside the bags, and I think there can be little doubt that these larvæ were those of the two species which form the subject of these lines. The cargo has been deposited in two warehouses, about half a mile distant from each other, and as I understand that the cotton-cake is not likely to be disposed of for some few months, both *E. passulella* and *E. ficulella* will probably have good opportunities for obtaining a sound footing here. Two years ago, the former species (*E. passulella*) was plentiful in and about the dock Company’s warehouses, where it had doubtless been introduced; but last year, although a sharp look out was kept for it, I could find no trace of the species. I suppose the cake, or whatever the larvæ might be feeding upon at the time, was removed from the district, and that consequently *E. passulella* disappeared, or at the least, became scarce.—EDWD. A. ATMORE, 3, Haylett Terrace, Exton’s Road, Lynn: February 21st, 1884.

Blatta americana.—Amongst the cargo of cotton-cake recently imported from America to which I have just alluded, were observed numbers of *Blatta americana* (American cockroach) in various stages of development; some of them were very small, others had reached the full size, but were yet of a whitish colour, whilst not a few had assumed the characteristic reddish colour of the fully developed insect, and were exceedingly active. I believe I am right in stating that this insect is far more destructive in America than the common and familiar *B. orientalis* is in this country; but although introduced here in such plenty, I consider it probable that our climate will prove unsuitable, as it has done hitherto, for the increase or naturalization of this pest.—ID.

Tortrices, &c., in South Wales and Sutherlandshire.—In the autumn of 1880, I spent a few weeks in the neighbourhood of Brecon, and collected a few moths there, including *Camptogramma fluviata*, *Crambus falsellus*, *Peronea perplexana*, and *Ephippiphora tetragonana*. *Peronea sponsana* (*favillaceana*, of Stainton) was abundant in the hornbeam hedges, even where no beech could be found, and it seems not impossible that its larva may feed on hornbeam occasionally. I have never found it, however, among hornbeam in this neighbourhood, although our hedges are

largely composed of that tree. Mr. Barrett informs me that, according to Zeller, the larva is sometimes found on dewberry, as well as on mountain ash, while Heine-mann gives oak as a food-plant.

In June, 1881, while fishing in Sutherlandshire, I took a few *Tortrices*, including *Penthina pralongana*, *Grevillana*, and *marginana*, *Clepis rusticana* (abundantly), *Coccyx tadana*, *Phoxopteryx uncana*, *biarcuana*, and *inornatana* (*subarcuana*, of Stainton), *Argyrolepis Baumanniana* and *subbaumanniana*. The *Hypermezia angustana* seemed very distinct from our southern forms of *H. cruciana*, with very evident, well-defined, dark markings. *Phoxopteryx inornatana* scarcely answers to its name in that locality, being of a rich fawn-colour, with the median streak well-defined and very distinct; in fact, the insect looks at first sight almost like *biarcuana*. *Pedisca semifuscana*, bred from willow, varied but little. On the other hand, *P. Solandriana*, bred from birch, varied considerably, most of them being of a brilliant orange-red ground-colour, none, however, shewing either a dark or a white blotch along the inner margin. I obtained a single specimen only of *Tortrix ministrana*, which, however, is a very dark richly marked example. *Eupacilia ciliella* varied from the fine, richly-marked, Scotch form (*subroseana*, of Stainton) to small obscure specimens like our cowslip-bred form. The variety of *G. ulicetana*, with the white or whitish ground-colour, was not uncommon, feeding apparently on various trefoils as well as gorse. Among the *Tineæ*, *Nemophora pilella*, very bright *Tinea rusticella*, *Ecophora subaquilea*, *Ornix scoticella* and *Loganella*, appeared to be fairly common. Of *P. Grevillana* I took but one example, and am unable to give any exact particulars with regard to it, as, on catching it, I did not distinguish it from *P. pralongana*. I do not think it can be at all common, as I took every *Penthina* that I saw.—A. F. GRIFFITH, Sandridge, St. Albans: *March*, 1884.

The late Mr. Buckler's drawings of the larvæ of British Macro-Lepidoptera.—

We are glad to be able to announce that the Ray Society has acquired these drawings, and the voluminous MSS. in connection therewith, for publication, and the Rev. J. Hellins has kindly lent those of Mr. Buckler's drawings in his possession to the Society. They will probably form the subject for three or four volumes of the Society's publications, but at present the scheme has not been sufficiently developed. In the meantime, those entomologists (not already members of the Ray Society) who wish to obtain these volumes, would do well by sending in their names and addresses to the Secretary—the Rev. T. Wiltshire, 25, Granville Park, Lewisham, London, S.E. By so doing, they would materially aid the Council of the Society.—Eds.

The late Mr. Harper's collection of British Lepidoptera.—The sale of this collection at Stevens' rooms on the 20th and 21st March, attracted about the largest assemblage of British Lepidopterists we ever remember to have seen in these rooms. The collection was a remarkable one, perhaps the most remarkable ever dispersed, and the prices realized were in proportion. The late Mr. Harper did not appear to have considered it necessary to label his insects in any way whatever, even by names: it seemed to him to suffice if he possessed the specimens. The collection was extraordinarily rich in bizarre varieties, in the rarer British species, and in those strange forms from the Hebrides, Shetlands, and other outlying Scotch

islands, that have attracted so much attention of late; and it is a great pity these latter had to be dispersed before being worked out in comparison with the forms existing in the extreme north of continental Europe and northern Asia. The entire collection of *Macro-Lepidoptera* realized about £900. A brief analysis as to some of the more remarkable points here follows:—The butterflies alone realized £264; a lot of seven *Papilio Machaon*, including an extraordinary variety, brought £4 5s.; the series of *Colias Edusa* and vars. over £17; 4 vars. of *Vanessa Io*, £4 10s.; 20 *Lycena dispar*, £28 10s.; 1 example of *Trochilium vespiforme*, £3 5s.; 1 of *T. allantiforme*, £3; the series of *Arctia caja*, nearly £90 (!); 11 of *Spilosoma lubricipeda*, var. *radiata*, £8; varieties of *Odonestis potatoria*, £5 9s.; the unique example of *Nyssia lapponaria* (cf. Ent. Mo. Mag., vii, p. 282), £13 13s. (Meek); the series of extraordinary vars. of *Abrazas grossulariata*, £105 (!); *Synta musculosa*, about 12/- each; *Nonagria concolor*, £2; fine vars. of *Crymodes exulis*, about 24/- each; *Hydrilla palustris*, £1 each; *Noctua subrosea*, about £1 each, on an average; *Hadena satura*, £2 9s. for two; *H. peregrina*, one guinea each; *Heliothis scutosa*, £3; *Catocala electra*, 5 guineas (!); *Ophiodes lunaris*, £2 10s.; and so on in proportion. We understand that the *Micro-Lepidoptera* will not be disposed of until the beginning of May.

Review.

HEMIPTERA GYMNO CERATA EUROPE.—HÉMIPTÈRES GYMNO CÉRATES D'EUROPE, DU BASSIN DE LA MÉDITERRANÉE ET DE L'ASIE RUSSE: décrites par O. M. REUTER. Troisième Tome. Avec 5 Planches. pp. 317—568, 4to. Helsingfors, 1883. (Extrait des "Acta Societatis Scientiarum Fennicæ, Tomus xiv").

This volume, dedicated in a few graceful words to Dr. Victor Signoret, contains a continuation of descriptions of the *Capsidæ*, to which Family of *Hemiptera* the two previous volumes were devoted (cf. Ent. Mo. Mag., xv, 19, and xvi, 214), embracing the genera and species comprised in the Divisions *Nasocoraria*, Reut., *Cyllocoraria*, Reut.; *Dicypharia*, Reut. (pp. 317—438); Addenda et Corrigena to Vols. 1, 2 and 3 (pp. 439—477); Explanation of the figures in Plates 1 and 5 of this volume (pp. 478—480); Systematic Index of the species described (pp. 481—484); Alphabetical Index to Vols. 1—3 (pp. 485—496); Supplement to Vols. 1—3, Synopsis of genera and species (pp. 497—563); Appendix, Arrangement of the Divisions of the *Capsidæ* (pp. 564—568).

Some new genera and species are described; on the other hand, many hitherto assumed species have been deposed and relegated to the position of synonyms. As might have been expected, when genera are instituted on such fine-drawn lines as are now or have been previously laid down, many already known species have been removed from genera in which they had been located—sometimes but recently, and either referred to other existing genera, or, when they could not go through their Caudine Forks, have been passed under the yoke of new genera. It is appalling even to think of the mass of generic characterizations, under names that give no clue to their relative connection, that will have to be mastered if the *Hemiptera* of the whole world be treated in this centrifugal fashion; for, after all, genera are but idealisms. But on the plan adopted the discrimination and description of the species are admirably done. The mere technical toil of reference and compilation must

have been immense, and nothing but an intense love of his subject and untiring perseverance could have enabled the author to do so much and so well. But few if any other persons exist who possess at once the materials, time, perception of affinities, general ability, and inclination to do such work, and the recipients of the result cannot be too grateful for the boon conferred upon them. The plates are excellently engraved by Debray of Paris, from the drawings of Fieber and the author.

The author hopes to be able to publish the fourth volume before the end of this year, and in order to make it as complete as possible, he requests the loan of specimens of any of the species with which he has yet to deal, and to be furnished with any information respecting them. He particularly indicates as unknown to him: *Stiphrosoma bicolor*, Germ., *nigritarse*, Costa, *Halticus puncticollis*, Fieb., *consimilis*, Jakovl., *Orthocephalus stygialis*, Muls. & Rey, *funestus*, Jakovl., *tristis*, Fieb., *nebulosus*, Fieb., *alutaceus*, Fieb., *Pachytoma punctigera*, Horv., *rugicollis*, Jakov., *nigrita*, Jakov., *longicornis*, Jakov., *Euryopocoris Reuteri*, Jakov., *Camptotylus aphidioidis*, Jakov.; and any examples of these which may be entrusted to him he engages shall be returned as soon as possible.

ENTOMOLOGICAL SOCIETY OF LONDON: 3rd October, 1883.—R. McLACHLAN, Esq., F.R.S., &c., Vice-President, in the Chair.

J. H. Durrant, Esq., of Hitchin, and G. W. Oldfield, Esq., were elected Members.

Mr. Pascoe exhibited sundry uncommon British *Hemiptera*, including *Ledra aurita* L., *Nabis brevipennis*, Hahn, and *Aræopus pulchellus*, Curtis.

Mr. Theod. Wood exhibited a specimen of a *Malthodes* from Dulwich, probably new.

Mr. Wailly exhibited several species of exotic *Saturnidæ* and other silk-producing Bombyces, bred by him in this country. One of the most notable was a *Samia* allied to *S. Cecropia*, and possibly a hybrid between it and some other (unknown) species.

Mr. Kirby exhibited examples of a *Zygana* captured by Mr. Prest near York, and which the latter thought might be *Z. meliloti*. The general opinion of the Meeting appeared to be in favour of their not being distinct from *Z. lonicera*.

Mr. Billups exhibited specimens of *Acidia heraclei*, L. (the celery-fly), which had proved very destructive this season.

Dr. Sharp communicated notes on the nomenclature of certain species of *Batrachus*, embodying changes necessary in consequence of names previously applied by him to new species being already in use.

Mr. Kirby read notes on the *Diptera* of New Zealand, supplementary to Prof. Hutton's Catalogue published in 1881. A discussion on the New Zealand Insect Fauna ensued, in which Messrs. Meyrick, Pascoe, and others took part.

7th November, 1883.—J. W. DUNNING, Esq., M.A., F.L.S., President, in the Chair.

R. J. Attye, Esq., of Stratford-on-Avon, was elected a Member.

Mr. Enoch exhibited living examples of *Atypus piceus*, Sulz., which was not uncommon in the neighbourhood of Woking.

Mr. Billups exhibited a large number of interesting British Aculeate *Hymeno-*

ptera and *Ichneumonidæ*, the former from Margate, the latter from Sevenoaks, &c. Also about 35 species of parasitic *Hymenoptera* bred from the galls of *Cynips Kollari*; several of these were undetermined and probably new.

Mr. C. O. Waterhouse exhibited the specimen of *Phaneroptera falcata*, Scop., captured by Dr. Mason in Cornwall (*cf. ante* p. 186); and a living Dipterous parasite that had emerged from a cocoon of *Megalopys citri*, Sepp, from Brazil.

Mr. H. W. Bates sent a communication, in which he mentioned that his *Brososoma elegans* had been previously described by Von Harold as *Miscodera Donitzi*.

Sir S. S. Saunders exhibited, and remarked on, a species of *Chalcididæ* parasitic on *Blastophaga* in Italian figs, especially in connection with the *Cynips caricae* of Hasselquist, and the necessity, or otherwise, for "caprification."

Mr. Distant read the first portion of his projected Memoir on the *Rhynchota* of Japan, chiefly drawn up from materials collected by Mr. Lewis.

Mr. Elwes read further notes on the genus *Colias*.

Mr. Poulton read notes on the protective attitudes assumed by the larvæ of *Sphingidæ* and Saw-flies.

Dr. Leuthner read a description of *Ægognathus Waterhousei*, a new genus and species of *Dorcidæ* from Peru.

Mr. C. O. Waterhouse read a description of *Eurytrachelus picipes*, a new species of *Dorcidæ* from the Solomon Islands.

5th December, 1883.—R. McLACHLAN, Esq., F.R.S., &c., Vice-President, in the Chair.

The Chairman announced the death of Dr. Le Conte, one of the Honorary Members of the Society.

G. B. Buckton, Esq., F.R.S., was elected a Member.

Mr. Pascoe exhibited curious egg-cases of an insect from Delagoa Bay, collected by Mrs. Monteiro, attached by a loop to twigs of a shrub, which Sir J. D. Hooker said was probably one of the *Rhamnaceæ*; they were sub-diaphanous, shining, and yellowish in colour, and about an inch in length, but varying in size, and contained a number of eggs placed in an erect position. Mr. McLachlan and Mr. Wood-Mason remarked on these cases, the former expressing a decided opinion that they pertained to some species of *Mantidæ*, which the latter somewhat doubted.*

Mr. Billups exhibited *Pachylarthrus smaragdinus*, bred from the pupæ of the celery-fly; also certain rare British *Tenthredinidæ*, viz., *Pœcilosoma Fletcheri*, *Tenthredopsis inornata*, and *Tenthredo Lachlaniana*, recently described by Mr. Cameron.

Mr. E. Saunders exhibited *Athous difformis*, Lac., captured at Hastings by Mr. Collett.

Mr. E. A. Fitch said that *Priocnemis Pascoei*, Kirby, from New Zealand, was an Ichneumon, and a variety of *I. lotatorius*, F., the type of which is in the Banksian Collection (now in the British Museum).

A communication was read from the Colonial Office, through the Royal Gardens at Kew, respecting the supposed occurrence of *Phylloxera* in the Colony of Victoria.

Mr. Miskin communicated descriptions of new Australian *Rhopalocera*, chiefly from Queensland.

Mr. Meyrick read a paper on the Classification of Australian *Pyralidina*.

* Mr. Wood-Mason has since acquiesced in this opinion.—R. McL.

16th January, 1884 (ANNUAL MEETING).—J. W. DUNNING, Esq., President, in the Chair. The following were elected Members of Council for 1884, viz.: Messrs. T. R. Billups, J. W. Dunning, E. A. Fitch, F. Grut, W. F. Kirby, G. Lewis, R. McLachlan, J. W. May, R. Meldola, F. P. Pascoe, E. Saunders, J. W. Slater, and Sir S. S. Saunders.

The outgoing President, Treasurer, Secretaries, and Librarian, were re-elected.

The President read an Address, which was ordered to be printed, and the Meeting terminated with the customary votes of thanks, which were acknowledged. It was mentioned in the Report of the Council that the President had presented a complete set of the "Annals and Magazine of Natural History" to the Society.

6th February, 1884.—The President in the Chair.

E. A. Poulton, Esq., M.A., of Jesus and Keble Colleges, Oxford, and S. Prout Newcombe, Esq., of Covent Garden, were elected Members.

The President appointed Messrs. Meldola and Pascoe, and Sir S. S. Saunders, Vice-Presidents for the year.

Mr. Crowley exhibited specimens of *Castnia Eudesia*, with their "cocoons," or larval galleries, formed of ligneous débris, of great length, and frequently furcate; also the eggs, which were of large size: these had been sent from Valparaiso.

Mr. Kirby exhibited a coloured photograph of the abnormal *Samia* bred by Mr. Wailly, and exhibited at the Meeting on the 3rd October, 1883.

Mr. Stainton called attention to the history of *Aglossa pinguinalis*, as detailed by Mr. Buckler in the Ent. Mo. Mag. for February, remarking on its extraordinary habits; he also stated that Mr. Buckler had left notes on the habits of its congener, *A. cuprealis*.

Dr. Sharp sent a photograph of the extraordinary *Hypocephalus armatus*, which species he had recently acquired.

Mr. Pascoe exhibited a fine collection of *Curculionidæ* from New Guinea.

The President stated that he had received information from Mr. Nottidge, of Ashford, that a number of *Bombi* had recently been sent to New Zealand, and he hoped that better success would attend this consignment than those previously sent. They were to be kept at a temperature of about 40° Fahr. Mr. McLachlan and others thought this was too high a temperature. The President also alluded to the apparent scarcity, or disappearance of butterflies in Yorkshire (according to Mr. Porritt's list) as compared with the conditions formerly existing. Mr. Beaumont confirmed the accuracy of the statement, and Mr. Hudd said that a precisely parallel condition existed with respect to Bristol. Messrs. Stainton and Weir added their testimony to the correctness of the statement with regard to other localities.

The report of the Committee (Messrs. McLachlan and Fitch) appointed by the Council to examine into the question of the supposed presence of *Phylloxera* in the Colony of Victoria was read. The insect was present on the roots sent (in alcohol), in considerable numbers, and the matter was the more serious because these roots were those left in the ground after the vines had been destroyed. Precautionary measures were recommended.

Mr. Douglas communicated a paper (accompanied by a plate) on a new species of *Orthezia* from Monte Criso, sent to him by M. Lichtenstein.

Sir S. S. Saunders communicated further notes on "caprification" and fig-insects.

It was announced that the next Meeting would be made special, to consider a requisition (signed in accordance with the Bye-Laws) as to the advisability, or otherwise, of obtaining a Charter for the Society.

NOTES ON *TENTHREDINIDÆ*.

BY P. CAMERON.

(Continued from Vol. xix, p. 135.)

Since the publication, in 1882, of my Mon. Phyto. Hymen., i, I have only been able to record one additional species to those described in it, namely:—

1a. *DOLERUS PRATORUM*.

Tenthredo pratorum, Fall. Acta, 1808, 64, 27.

Tenthredo (Dolerus) equiseti, Klug, Berl. Mag., viii, 298, 225; Htg., Blattw., 233, 9.

Dolerus pratorum, Thoms., Hym. Sc., i, 281, 5.

Black; segments 2—6 of abdomen, and femora, and tibiæ red. *Eyes oblong, inner orbits margined.* 3rd joint of antennæ longer than 4th; tegulæ black, fuscous, or white; labrum white.

Length, 8—9 mm.

Sometimes the clypeus is white, and one specimen (a ♂) has the flagellum reddish.

The oblong eyes readily separate it from the other species with red-belted abdomens, it being the only species of this coloration with oblong eyes.

Taken by Mr. Ed. Saunders at Chobham. It is not, I believe, a common species, and has been only recorded from Sweden, Germany, and France.

Nematus xanthopus, André, Brischke and Zaddach = *Dinura stilata*, Klug. In regard to this, I should mention that the vast majority of the specimens of *D. stilata*, have only one radial cellule, and even with those specimens in which the transverse radial nervure is present it is faint. I have reared a specimen with two radial cellules from larvæ similar to those described by Brischke and Zaddach, under the name of *xanthopus*, have carefully examined it with some types received from Herr Brischke, and have also compared the saws of the two and find them quite identical in all respects.

NEMATUS ORBITALIS, *n. sp.*

Pallid-green; the head from the base of the antennæ, including the whole of the frontal area, the vertex between the sutures, and the occiput in the middle behind, meso- and metanotum, and a broad continuous band on dorsum of abdomen, black. Antennæ as long as the thorax and abdomen together; black above, brownish beneath; 3rd joint nearly as long as the 4th. Wings hyaline, nervures blackish, costa pale at the base, stigma greenish-white. Vertex finely punctured, sutures deep, an indistinct transverse suture behind the ocelli. Hind tarsi lined with black above,

the apex of posterior tibiæ and the apices of the joints of anterior tarsi black. Spurs acutely pointed, about one-third of the length of metatarsus.

The ♂ has the antennæ longer and thicker; the 3rd joint is shorter than the 4th; the under-side of the body testaceous; the tarsi are darker coloured, and there is a short black line on the posterior femora above; the last abdominal segment keeled in the middle on upper-side.

Length, 2½ lines.

This species comes very close to *N. lacteus*, Thoms., from which it differs in coloration only in the part immediately behind the sutures on vertex being black in both sexes, while with *lacteus*, the head is completely black behind, except perhaps at the extreme edge. Otherwise, *orbitalis* differs from *lacteus* in having the front and vertex punctured, the antennæ, if anything, longer and lighter coloured, the clypeus not so deeply incised, the recurrent nervure in hind-wings is not interstitial; and, lastly, the saw is very much narrower, and differently toothed.

The ♂ differs from the same sex in *lacteus*, in having the antennæ longer, these being longer than the body, they are more densely pilose, more slender, the last segment of abdomen is more distinctly keeled above and beneath; it is much broader at the apex, not being brought to a point in the centre. In coloration it differs in having only a longitudinal black mark under the wings, while the entire mesothorax in *lacteus* is black. So far as I know, this is the only species of the green section which has not the head entirely black behind.

Rare. Cadder Wilderness; Ballantrae, Ayrshire; Germany. The larva feeds on sallow.

NEMATUS SYLVESTRIS, *n. sp.*

Green; the vertex between the ocelli, a line in centre of middle lobe of mesonotum at the base touching the pronotum, a longer line on inner side reaching from near the pronotum to the scutellum; a small round mark on either side of these at apex, a larger mark outside of scutellum; a curved line in front of each of the cenchri; and two or three narrow transverse marks at base of abdomen; black. Antennæ as long as the body, a thin black line on upper surface; 3rd joint shorter than 4th, longer than the long diameter of the eye. Wings clear hyaline. Apices of tarsal joints fuscous. Cerci short, thick.

The ♂ has the antennæ as long as the body, densely covered with a close pile, the 3rd joint a little curved; blackish above, testaceous beneath. Vertex broadly black, behind black, except at edges. Body greenish-testaceous beneath, meso- and metanotum and abdomen above, except at extreme apex, and at the sides of the apical segments, black. Apical segment of abdomen transverse at apex above; rounded beneath, with the edges incised. There is a short blunt keel above, which does not reach to the apex, and with a depression on either side of it. Stigma griseous-testaceous. The sides of scutellum are obscure testaceous.

Length, 2½ lines.

The species is exceedingly like *M. miliaris*, and I am not sure if the ♀ can be distinguished from the ♀ of that species; the ♂, however, may be known from *miliaris*, ♂, by the keel on the last abdominal segment being much shorter, not being much longer than broad, and not reaching to the apex; in *miliaris*, on the other hand, it projects beyond the apex, which is thus not transverse; the black on the vertex, too, is broader, but behind it is not quite so broad, the edges being testaceous.

The larva feeds on *Salix caprea*, in August and September, feeding either along the edge, or in the centre of the leaf. Its head is green, with a faint yellowish tinge; there is a brownish stripe on either side going down from the vertex to the eyes; another line goes down to the centre of face to the middle, the top is mottled with light brown dots. Body deep green; legs glassy-green; the skin is much wrinkled, and at the side the wrinkles form oblong raised objects, which are edged with black. Over the eye is a black line, the entire body is covered with blackish irregular lines, which give the skin a mottled appearance, the back is also more or less covered with these lines; the centre, however, being much lighter in tint.

The single cocoon is spun in the earth, the flies emerging in the following summer.

The larva of *N. miliaris* differs in not having the body mottled with black, and in having a distinct black lateral line, *sylvestris* not having one.

Glasgow: April, 1884.

NOTES ON BRITISH *TORTRICES*.

BY CHAS. G. BARRETT.

(Continued from page 244)

Pædisca corticana, W. V.—Larva half an inch long, cylindrical, rather sluggish, dull pale yellowish-brown or bone-colour, rather darker towards the head, and having a conspicuous, square, reddish-brown, internal blotch on the ninth segment. Spots small, black, hairs rather long, head light shining brown, plates bone-colour, feet black.

Living in a rolled oak-leaf, often connected with other leaves, and sometimes with one of the soft leaf-galls of the oak or oak-apples, in which it makes tunnels. When full-grown, making a smaller chamber by drawing together a corner of oak-leaf within the rolled portion, and finally becoming a pupa in the same place. Feeding in June and

emerging in July. Zeller's description agrees closely, but it is quoted twice in Hofmann's "Kleinschmetterlingsraupen," on p. 58, correctly, for this species, and on p. 41, for *Penthina corticana* = *picana*.

Pædisca profundana, W. V.—Larva active, cylindrical, but rather tapering at each end, and with well-divided segments. Shining dark green or bottle-green, with faintly marked black dots and strong hairs, head pale horn-colour, plates of the colour of the body.

In rolled-up oak-leaves, feeding through June and emerging late in July and in August. Zeller says feeding also on *Prunus padus*. He describes the larva—probably younger—as having the spots large and the head and dorsal plate shining black.

Pædisca occultana, Dougl.—Larva resembling that of a *Sciaphila*, sluggish, nearly cylindrical, but with the anal segments rather attenuated. Slate-grey, with the segmental divisions paler, spots large, black, and very prominent. Head flat and rather broad, jet black, as also are the plates and feet.

Found feeding on larch on the Yorkshire moors in June by Mr. Eedle, and sent by Lord Walsingham. Pupa light brown. Moth emerging in July and August.

Baron von Nolcken records rearing this species (under the name of *pinicolana*) from silver fir, *Pinus picea*.

Pædisca ophthalmicana, Hüb.—Larva short, thick, and wrinkled with swollen segments. Dirty greenish-white, spots olive-grey, prominent, head shining black, dorsal plate olive-brown with a white collar, last two segments retracted, anal plate light brown. This larva was sent by Mr. J. B. Hodgkinson, of Preston. It fed in June on aspen, rolling up the leaf and eating the substance of the upper skin. It died after forming a tough cocoon of whitish silk, but others were said to have been reared.

This larva is described by Treitschke as "greenish-white, with small grey raised dots. Head and dorsal plate shining black, anal plate grey, belly whitish. In May, in rolled leaves of *Populus tremula*. Pupating in an earth-cocoon, pupa light brown." This description is evidently from a younger larva than I have seen.

Pædisca Solandriana, L.—Larva sluggish, flattened and swollen in the middle. Dull white, tinged on the back with faint bluish-grey, which is interrupted at each segmental division. Head pale brown, with dark brown jaws, plates both whitish. Feeding between drawn-together leaves of willow early in June. Emerged in August.

Larvæ sent from Scotland by Mr. Watson, of Paisley, differed from these. When half-grown, they were dark or light greenish-grey, with more or less distinct, raised, shining black dots, and numerous rather long hairs. Head black, dorsal plate having the anterior half grey and the posterior black, anal plate greenish or yellowish, feet black. When full-grown, more of an olive-green, head banded with paler, dorsal plate browner.

These were found in May, feeding on birch, they produced the more mottled form of the moth in July.

Fischer describes this larva, "when young, dirty white, with black head and dorsal plate; when full-grown, yellowish-white, with visible intestinal canal, and with small black warts or shining grey dots. Head chestnut-brown, dorsal plate indistinct yellow-brown, with a white edge towards the head." Feeding on hazel, birch, aspen, and willow. Pupa yellow-brown in an earthy cocoon.

Pædisca semifuscana.—Larva, when young, active, plump, cylindrical, pale blue-green, with minute but distinct black dots. Head and plates black. When older, rather flattened, dorsal region slate-colour, whitish-green at the sides and below, and also on the last three segments. Spots whitish, with bristles. Head dark umber-brown, eyes paler, plates whitish-green.

Feeding in drawn-together willow shoots in April and May. Pupa light chestnut-brown, spun up among the dead leaves. Moths emerged at the end of June and in July.

Dr. Wocke says of this species that it feeds on *Salix cinerea* and *autumnalis*, in May.

Halonota trigeminana, Steph.—Larva cylindrical, moderately active, plump and smooth, with rather deeply divided segments. Pinkish-yellow, the dorsal region sometimes a beautiful bright pink, paler below. Head chestnut-brown with darker jaws, dorsal plate very pale brown, with a crescent-shaped blotch behind each lobe of the head, anal plate hardly perceptible, spots faintly shining with very minute hairs. When full-grown still plump, but wrinkled and tapering towards the extremities. Bright light vermilion throughout the dorsal region, faint flesh-colour below. Head very light brown, dorsal and anal plates pale bone-colour, with a vermilion tinge, feet bone-colour. When in motion, the incisions of the segments very pale.

In root-stocks of *Senecio jacobæa*, when young feeding on the outer skin, and making covered ways, meandering about the root-stock, constructed of silk and frass, and having a little chamber at the end

of the burrow in which it lies when not feeding, afterwards penetrating to the middle of the root-stock, feeding on the pith, and making a chamber of considerable size. When full-fed—in December or January—making its way out of the root-stock to spin up among rubbish on the ground.

These larvæ were found in great abundance on Mablethorpe sandhills, Lincolnshire, by Mr. W. H. B. Fletcher, in October, 1880, but believing that they would hibernate in the stems, I put them out of doors for the winter and lost them all. Mr. Fletcher very kindly sent another consignment in the autumn of 1882, which were kept indoors, but although they wandered all about the room, and spun up in all manner of substances, only one specimen emerged. Doubtless, they required exposure out of doors, but it is hardly possible to enclose out of doors, so that they cannot escape, larvæ which feed in large awkward stems like those of the ragwort.

Pembroke: *December*, 1883.

LITTLE-KNOWN BRITISH ACULEATE HYMENOPTERA.

BY EDWARD SAUNDERS, F.L.S.

At the commencement of another collecting season I wish to call the attention of Hymenopterists to the following *Aculeata*, whose titles to places in our list either rest on only one or two recorded captures, or whose claims to specific distinction are more or less doubtful. Some of these I feel sure would turn up again if collectors would search for them in the localities where they have occurred already, and the only hope of solving the questions respecting the doubtful species is in obtaining further specimens so as more fully to test their specific value. I therefore commend the following list to the consideration of collectors, hoping that some at least of the questions may be cleared up during the season.

1. *TAPINOMA NITENS*, Mayr, = *POLITA*, Smith.

One specimen taken many years ago by Mr. J. C. Dale at Bournemouth.

This should be carefully looked for in the Bournemouth and New Forest districts. A shining testaceous ant belonging to the section with only one node at the base of the abdomen; it could not be mistaken for any other species.

2. POMPILUS PECTINIPES, ♂.

Of this red-bodied species, whose ♀ is certainly not rare in sandy localities and is easily distinguishable by the posterior emargination of the prothorax being curved instead of sharply angular, the ♂ is at present unknown in this country. On the Continent, Wesmael and Thomson have assigned to it a ♂ with a rounded emargination, but no such ♂ has occurred here. F. Smith's supposed ♂ is that of *chalybeatus*. So far as my experience goes I have only found *pectinipes* in localities where *Evagethes bicolor* also occurs, and I suspect that the ♀ of the latter is found sometimes with 3 sub-marginal cells and sometimes with 2, whereas the ♂ always or nearly always has 2 only, but the only hope of solving this is for collectors to take all the ♂ *Pompili* they can find where the ♀ *pectinipes* occurs, on chance of finding its missing partner.

3. CRABRO CLYPEATUS, Linn.

This very distinct species appears only to have been taken by F. Smith in 1848 and 1853 at Weybridge, the triangular head of the ♂ (the apex of the triangle forms the base of the head) and the large deep puncturation of the abdomen in both sexes, distinguish it immediately; the abdomen is banded with yellow.

4. VESPA ARBOREA, Smith.

This to me is a most mysterious insect. Only females so far have been recognised, and they certainly differ from those of the allied species in having the basal segment of the abdomen unusually long. But why in a social insect like a wasp should the female occur singly, and no workers or males be found? One would have thought that where one sex occurred the others would occur also. It belongs to the group with the scape of the antennæ yellow in front, but has the eyes touching the mandibles or nearly so, whereby it may be at once known from *sylvestris* or *norvegica*.

5. SPHECODES.

The species of this genus are very difficult to distinguish, and probably several new species would reward careful collectors. The one point to be observed is that the genital armature of the ♂ be pulled out so as to be visible, and also the 6th segment in the ♀, as the specific characters are chiefly derived from these parts—the ♀ appears in June and July, the ♂ in July and August.

6. *HALICTUS LEVIS*, Kirby.

A well-marked species, easily known by its impunctate abdomen and the remote puncturation of its thorax, in which latter character it resembles *villosulus*. No specimens have been recorded since Kirby's original captures at Nacton, Suffolk.

7. *ANDRENA ANGUSTIOR*, Kirby.

Occurs on dandelion flowers, and is closely allied to *Gwynana*, Kirby, but may be known by its clear testaceous tibiæ. I much wish to obtain undoubted males of this. I think it very probably = *ruficrus* of Continental Entomologists.

8. *A. POLITA*, Sm.

Taken at the chalkpits, Northfleet; easily recognised, according to Smith, by its shining finely punctured abdomen and golden apical fringe.

9. *NOMADA GUTTULATA*, Schenck.

A medium-sized species, very like *ochrostoma*, but rather smaller and distinguishable at once by the 3 short blunt black spines at the apex of the posterior tibiæ. I have only seen one ♀ of this, without note of locality.

10. *MEGACHILE ERICETORUM*, Lep., = *PYRINA*, Sm., *nec* Lep.

Has occurred at Weybridge, Southampton and Bristol (*vide* Smith), but no recent captures recorded. May be easily known by the testaceous tarsi in both sexes, and the small tubercular spine on the 7th abdominal segment of the ♂, also by the well-defined apical bands to the abdominal segments in the ♀.

11. *HEBIADES TRUNCORUM*, Linn.

This little insect has not occurred for a great many years; it is one of our smallest bees, scarcely larger than a *Prosopis*, but in shape more like an *Osmia*; the carina at the base of the 1st abdominal segment is a distinct characteristic of the genus. It is recorded from Dulwich and Brentford.

12. *BOMBUS NIVALIS*.

Recorded from Shetland, but the specimens in the British Museum are much smaller than continental *nivalis*. More specimens, especially males, for the examination of the genital armature are much wanted.

St. Ann's, Mason's Hill, Bromley, Kent :

April 4th, 1884.

DESCRIPTION OF A VARIETY OF *PHILOPOTAMUS MONTANUS*,
DONOVAN, FROM SCOTLAND.

BY KENNETH J. MORTON.

In July last, at a small stream at the south of Lanarkshire, I took the curious form of *Philopotamus* which, at Mr. McLachlan's suggestion, is here described. It is a beautiful and distinct-looking insect; but, notwithstanding a peculiar coloration and an apparently constant neural character, I am inclined to look upon it as being only a remarkable local variety or race of *P. montanus*, Donovan.

P. MONTANUS, DONOVAN, *var. CHEYISOPTERUS*.

Anterior-wings with the 4th apical fork *not reaching the anastomosis*; the membrane of these wings is nearly hyaline (neuration darker and rather distinct) clothed with bright golden-yellow pubescence, which is transversely and somewhat faintly reticulated with pale greyish-fuscous; there are also a few larger fuscous spots, one at the arculus being especially conspicuous: fringes golden, excepting at the termination of the nervures, where there are fine fuscous points. Posterior-wings with membrane rather more obscure, clothed more or less with golden pubescence in their apical third; at the apex are reticulated markings more distinct than in the typical form (in the latter, too, the golden pubescence does not encroach on the disc); fringes as in anterior-wings. Other characters and anal structure apparently agreeing with the typical form.

Three ♂ at a little stream running down the side of Tinto, a hill in South Lanarkshire.

In form of the wings, this insect is most like *P. montanus*, but in general appearance it more resembles *P. insularis*, McL., from Guernsey. However, in the latter species, for a type of which I am indebted to Mr. McLachlan, the anterior-wings appear to be of a longer oval shape, the fork No. 4 is sessile, and the pubescence *dull pale yellow*; the posterior-wings want the golden pubescence on the apical portion, on which there are only a series of marginal festoons of this colour.

Carlisle, N. B.: 27th March, 1884.

Dragon-flies near Worcester.—The species of these insects taken by me in this locality are so few, and so common-place, that I have hitherto refrained from publishing a list of them; but Mr. McLachlan's welcome annotated list of the British species has caused me to think of one or two matters anent the subject that I wish to treat of, and I incorporate my local list (of 13 species) therewith.

Sympetrum vulgatum.—I am pleased to see that the name *striolatum* is now sunk, as the highly coloured specimens have long seemed to me only very mature exponents of *vulgatum*.

Platetrum depressum.—This of late years has become uncommon, and I rarely see more than one or two in a summer.

Libellula quadrimaculata.—Only two have occurred to me.

Gomphus vulgatissimus.—This also is less common than formerly.

Cordulegaster annulatus.—Only one specimen has occurred to me.

Æschna cyanea and *Æsch. grandis*.

Calopteryx Virgo.—*C. Vesta*, Charp., is accounted a form or race of this species. *C. Virgo* I have never found away from a stream, where, as is well known, it frequents the bushes and trees that fringe the water. *C. Vesta*, on the other hand, has never occurred to me on any stream, but only in woods, where it disports on and about the tops of sapling trees in the full sunlight. *C. Vesta* occurs in Trench wood, situated on a limestone ridge, near which is no stream. The Birmingham and Worcester Canal runs through the low ground below, but it is nowhere bordered by bushes or trees, and I have walked its towing-path for miles scores of times in the proper season without seeing a *Calopteryx*. *C. Virgo* frequents the river Teme, in parts where it is most shaded by trees, while within sight, and almost within throwing distance, *C. Vesta* frequents a wood on a rising ground, in which there is no stream and no body of water larger than a small pond which dries up in summer.

Calopteryx splendens.

Platycnemis pennipes.

Ischnura elegans.—Local.

Agrion puella.

Pyrrhosoma minium.

A specimen of *Leucorrhinia dubia* was captured with *Sympetrum scoticum* at Whitherslack, some three or four years since, by Mr. J. H. Threlfall, of Preston, and kindly sent to me.—J. E. FLETCHER, Worcester: April, 1884.

[There can, I think, be no doubt that *Calopteryx Vesta* is founded on individuals of *C. Virgo* that have not acquired their full colour, and that the difference in habits of the two forms is due to the fact that *C. Virgo* (like most *Agrionidæ*) shuns the water in which it was bred until it is mature.—R. McL.]

Geographical distribution of Chrysopa venosa, Rambur.—Hitherto, so far as I am aware, this insect has only been recorded from Spain. As a curious point in distribution it is worthy to note, that I have just received three examples (2 ♂, 1 ♀) from my valued correspondent, Herr Max von zur Mühlen, of Dorpat, labelled "Persien" (by which North Persia is intended), and I previously had an example from another source labelled "Sharud, Persia." These agree with a Spanish example received from the late Ed. Pictet.

The pretty markings on the dorsum of the abdomen, tolerably well indicated by Rambur in his figure in the "Faune de l'Andalousie," ii, pl. ix, fig. 7, are an attribute of the ♀ only. In the ♂ the dorsum is somewhat fuscous, with a pale band at the posterior extremity of most of the segments. Also from North Persia I have

an example of *Ch. Zelleri*, Schneider, but this has a wide range in Southern Europe, and is probably scarcely more than a variety of *prasina*, Burm.—R. MCLACHLAN, Lewisham, London: *April 12th, 1884.*

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Alleged breeding of Trypeta alternata, Fall., from Impatiens (ante p. 163).—I have just received a letter from Mr. Hodgkinson on the above subject, from which it appears that he threw the mined leaves of *Impatiens noli-me-tangere* "and hips of rose together" in his greenhouse, and when the imagos of *Trypeta* appeared, inferred that they were from the larvæ he saw in the balsam-leaves. It seems clear, therefore, that the *Trypeta* were derived from their known food-plant, the hips. Mr. H. purposes looking up the *Impatiens*-mining larvæ this year, so we may hope to learn what it will yield.—J. E. FLETCHER, Worcester: *April, 1884.*

The influence of extreme cold on the Phylloxera of the vine.—In the Transactions of the Hungarian Académie des Sciences, 1883, Dr. Géza de Horváth has an article giving the result of his experiments on this subject, from which we make the following extract:—"It is known that insects in general are endowed with great vitality, and that they can often endure cold by which many other animals and plants are killed. In the spring, caterpillars are often found quite alive, which have hibernated under shrubs destroyed by the winter." After adverting to the experience of M. J. Fallou with eggs of *Bombyx neustria*, which sustained the temperature of -26° C.; of M. J. Lichtenstein with divers *Aphides*, at -11° and -12° C.; and of M. Girard with the *Phylloxera* of the vine, at -6° to -10° for several days—all without detriment to the insects—he continues with the narration of his own experiments: "On the 4th of February, I grubbed up in the experimental ground of the Hungarian *Phylloxera*-station at Farkasd (dept. of Pest) some old vine-stocks, which were severely attacked. These stocks, of which the roots were covered with *Phylloxera*, remained on the surface of the cleared ground; on the 22nd February, that is 18 days afterwards, I examined the roots, with the expectation that the *Phylloxera* would all be dead. But what was my surprise when I discovered on one stock, on a little branched root, about 2 mm. in diameter, a *Phylloxera* living in a small group of five dead ones. This example was living in its winter sleep, but it was distinguishable at once from its dead companions; when taken into a heated room it soon recovered, and four hours after it began to move and walk. This hibernating insect then had been for 18 days in the open air, exposed on a place open on all sides to cold, wind, snow, fog, and sunshine, and yet it remained alive."

"The temperature fell every night below zero, once it was -8° , twice -9° , once -10° , and once -12° C. If in the winter the soil is frozen, it is certain that many *Phylloxera* will be killed, but there remain a large number, and that not only in deep situations where the frost does not penetrate. I have often observed living *Phylloxera* even in upper strata of frozen soil, and more than once I have found in hard, frozen ground, at a depth of 10 centimètres, some of the insects in hibernal lethargy, yet alive. To the insects which have taken refuge in the deeper strata of the soil not even the most rigorous winter can do any harm."

"It results then, that in the contest with *Phylloxera* the insecticidal action of cold and the frosts of winter cannot be absolutely counted upon to aid."

Ammæcius brevis, Er., at Bewdley.—Towards the end of last month (March) I captured three specimens of *Ammæcius brevis* in a sandy bank of the Severn near Bewdley. Besides my previous note of its occurrence at Matlock (Ent. Mo. Mag., xix, p. 117) I have seen no record of this beetle being found in an inland district.—W. G. BLATCH, 214, Green Lane, Smallheath, Birmingham: April 15th, 1884.

Homalota (Leptusa) testacea, Ch. Bris., at Weymouth.—I found this exceedingly rare beetle in some numbers on the coast near Weymouth in the early part of last June. It occurred under stones embedded in the sands, below high water mark, in company with *Diglossa mersa* and the two species of *Phytosus*, which latter it somewhat resembles in appearance as well as in habit. *Homalota testacea* must be fairly plentiful in the neighbourhood of Weymouth, as I captured about thirty specimens, and could, doubtless, have taken more had not the wet weather interfered with my collecting.—Id.

Notes from Cambridge.—The extremely mild winter and spring has had its natural influence on insect life. The spring-feeding larvæ, especially, show an increased abundance, and this, I think, promises well for the prospects of the season of 1884, especially as regards the late summer and autumn *Lepidoptera*. The larvæ of *Hepialus humuli*, for instance, have been excessively abundant at roots of low plants; I never remember them more so. I have found several larvæ of *Noctuidæ* in the early morning, such as *Leucania lithargyria*, *L. pudorina*, *Grammesia trilinea*, *Cerigo cytherea*, as well as such species as *Noctua c-nigrum* and *N. xanthographa*, of common occurrence everywhere, together with some others more worthy of mention, of which I will send notes later on.—ALBERT H. WATERS, Cambridge: April, 1884.

Thirsty Butterflies.—In "Nature," for May 17th, 1883 (p. 55), appeared a letter from Mr. E. Dukinfield Jones, in which the author stated that he had observed a kind of moth in Brazil engaged in sucking up water in large quantity through its proboscis. I may say that this strange habit is not confined to the moth in question, as I have observed the same thing in two species of butterfly (*Papilio Orizaba*, B., and *Appias saba*, F.), and imagine that the phenomenon is by no means rare. These two butterflies are very common by the sides of streams and damp places on the Anky plain in Madagascar.

One morning, while sitting by the side of one of these streams, I noticed the *Papilio*, which is an insect measuring about four inches from tip to tip of its wings, resting on a wet bank; and wishing to procure it as a specimen, I approached it as gently as possible, the creature being apparently so absorbed in what it was about as to be totally unconscious of my proximity to it. Noticing strange and unaccountable movements—sundry jerks and probings with its proboscis—I quietly sat down near it in order to watch it more closely. I observed that every second or two a drop of pure liquid was squirted (not exuded merely) from the tip of its abdomen. I picked up a leaf that was lying near, and inserted the edge of it between the insect's body and the ground, so as to catch the liquid. Unfortunately, I had no watch with me at the time, nor means of measuring liquids; but I reckoned that about thirty drops

were emitted per minute. I held the leaf for about five minutes—as nearly so as I could reckon—and at the end of that time there was caught in it about a salt-spoonful of what seemed to be pure water, without either taste or colour. After watching the butterfly for a time, I seized it by the wings between my thumb and fingers with the greatest ease, so utterly lost did it appear to me to what was going on near it.

In another spot, I saw as many as sixteen of these large butterflies within the space of a square foot, all engaged in the same strange action. Some of them emitted the liquid more frequently than others; and one of them squirted the liquid so as to drop fully a quarter or a third of an inch beyond the point on the ground, perpendicular with the end of its body. It was at this spot that I saw the second species of butterflies alluded to also engaged in the same curious proceeding.—R. BABON, Antananarivo, Madagascar: *January 3rd, 1884 (extracted from "Nature," March 27th, 1884).*

[That most butterflies drink must have been observed by all entomologists even in England, and more especially in the Alps of Europe, where it is not at all unusual to see groups of fifty or sixty individuals engaged at a damp spot on a hot day. The interesting points in the above extract are, firstly, the great quantity of water taken in by an individual in a short space of time; and, secondly, the fact that it was apparently discharged as fast as taken in—a kind of bath taken *internally*.—EDS.]

Food-plant of Sciaphila pascuana, &c.—As supplementary to Mr. Barrett's notes on the genus *Sciaphila* in this month's Ent. Mo. Mag., pp. 241—4, I may add, that two seasons ago I bred *S. pascuana* freely from larvæ collected spun up in the flowers of *Ranunculus bulbosus*, in a rough uncultivated field near here. *S. ictericana* also emerged from the flowers in about equal numbers with *S. pascuana*, and with them one specimen of *S. octomaculana*.—GEO. T. POBBITT, Huddersfield: *April 3rd, 1844.*

Review.

ROYARTANI LAPOK: Budapest, 1884.

This is a new Entomological Magazine in the Hungarian language published monthly by the Editor Dr. G. Horváth, who is assisted by Messrs. J. Frivaldsky, Al. Mocsáry, J. Paszlavsky and Dr. Edm. Tömösvary. All communications should be sent to the Editor at Budapest (au palais du ministère de l'agriculture).

With No. 3 is given, in French, a Supplement (to be continued) containing a summary of all the articles published, in order to put entomologists in general in possession of a concise idea of the contents of the publication. From the Introduction we learn that during the last 15 years the natural sciences have made considerable progress in Hungary, and that a general progressive activity is discernible in entomological studies; and this journal is established to encourage and assist in developing and making popular knowledge of insects, especially of such as are beneficial or injurious to agriculture, in other words, to make entomology scientific, popular and practical in that country. The contents are varied; the chief articles

in the three numbers published are; An elementary lesson on the morphology of Insects, illustrated; On the evolution of *Ecanthus pellucens*, with a plate; On the organization of Agricultural Entomology in Hungary; Metamorphoses of *Lethrus apterus*, with a plate; On the respiratory organs of the nymph-state of *Simulia*, illustrated; Hermaphrodite Insects in the Hungarian National Museum, illustrated; Description of a new species of *Tenthredinida*,—*Dolerus 4-notatus*: there are also short notes, with figures. Altogether, such a well-conducted journal as this should be of essential service to the objects in view, and we wish it every success.

This publication has no kind of connection with the "Rovarászati Lapok," noticed *ante* p. 20, which, indeed, is defunct for want of efficient nourishment and support.

Obituary.

Sir Sidney Smith Saunders, C.M.G., died suddenly at his residence, Gatestone, Upper Norwood, on the 15th April; he had suffered from one of his frequent attacks of bronchitis for a few days previously. He died truly "in harness," for he had just been engaged in correcting the proof of a paper he read at the meeting of the Entomological Society on April 2nd.

Sir S. S. Saunders was the son of Mr. William Saunders, of Wandsworth, and was born in June, 1809; he was a cousin of the late Mr. W. Wilson Saunders. In 1826 he obtained an appointment in the Consular Department of the Foreign Office. In 1835 he was made British Consul in Albania; was transferred to Alexandria in 1859; in 1861 and 1862—1863 was Acting Agent and Consul-General; and Consul-General in the Ionian Islands, from 1864—1870; all of them onerous positions viewed in the light of the political history of the period. In 1860 he was made a Commander of the Order of St. Michael and St. George, and was knighted in 1873.

As an entomologist, the list of memoirs by him at the foot of this notice speaks for itself. His studies were eminently biological, and in every published result of them he showed the *thoroughness* of his working; not a point of habits, anatomy, or bibliography, being left without personal investigation. His studies on *Strepsiptera* and fig-insects naturally led him to microscopic examination, and those who have seen his beautifully mounted microscopic dissections of insects microscopic in their entirety, can do naught but marvel at the patience and skill displayed by an old man, for many of his best preparations were made when he was already past three score years and ten. Those who listened to his papers read before the Entomological Society could not but feel admiration at the enthusiasm, and utter obliviousness of surroundings, displayed by him. In his particular branch of investigation it will be difficult to find a successor. He was one of the original members of the Entomological Society of London (now reduced to five), was President in 1874-75, and was one of the Vice-Presidents at the time of his death.

Sir Sidney Saunders leaves a widow, and four sons and four daughters, to mourn his loss. Invariably courteous in bearing as became a diplomatic official of high standing, it can truly be said he had only friends. He was a good classical scholar, and was a master of several European languages, including some (such as modern Greek) known to only few Englishmen.

His published papers, numerous though they be, probably afford a poor comparison with the notes he has left behind him, and from his method of work, it is not probable that these latter can be utilized.

The following is a probably complete list of his published memoirs, all of which appeared in the Transactions of the Entomological Society of London.

Descriptions of some new Coleopterous Insects lately received from Monte Video: Tr. Ent. Soc., ser. i, vol. i, pp. 149—157 (1836). On a new genus of *Diptera* allied to *Stratiomys*: ser. i, vol. iv, p. 62 (1845). Descriptions of two new Strepsipterous insects from Albania, parasitical on Bees of the genus *Hylæus*: ser. 2, vol. i, pp. 43—59 (1851). Descriptions of some new Aculeate *Hymenoptera* from Epirus: ser. 2, vol. i, pp. 69—75 (1851). Notes on some new species of Strepsipterous Insects from Albania, with further observations on the Habits, Transformations, and Sexual Economy of these Parasites: ser. 2, vol. ii, pp. 125—144 (1853). Observations on the habits of the Dipterous genus *Conops*: ser. 2, vol. iv, pp. 285—291 (1858). Stylopidarum, ordinem Strepsipterorum Kirbii constituentium, mihi tamen potius Coleopterorum Familiæ Rhipiphoridis Melödisque propinquæ, Monographia: 1872, pp. 1—48. On the habits and economy of certain Hymenopterous Insects which nidificate in briars; and their Parasites: 1873, pp. 407—414. On the adult larvæ of the *Stylopida* and their puparia: 1877, pp. 195—197. On the habits and affinities of *Apocrypta* and *Syoophaga*, with description of a new species of *Apocrypta* from the figs of *Ficus sycomori* of Egypt: 1878, pp. 313—320. On the habits and affinities of the Hymenopterous genus *Scleroderma*, with descriptions of new species: 1881: pp. 109—116. Notes on *Euchalcis vetusta*, Dufour (Fam. *Chalcididæ*) and on the terminal segments of the females in *Halticella* and its allies: 1882, pp. 291—305. Descriptions of three new genera and species of fig-insects allied to *Blastophaga*, from Calcutta, Australia, and Madagascar; &c.: 1883, pp. 1—27. On the *Cynips carica* of Hasselquist, and other fig-insects allied thereto: 1883, pp. 383—392. On "*Pediculus melittæ*:" 1884.

In addition to these, his notes and materials formed the subject-matter of several papers by the late Frederick Smith, and his surviving colleague Prof. Westwood, upon whom the death of his old friend has fallen as a severe blow.

No where will he be more missed than at the Meetings of the Entomological Society; at which, since his retirement from official duties, he was a constant attendant.

ENTOMOLOGICAL SOCIETY OF LONDON: 5th March, 1884.—Special General Meeting. J. W. DUNNING, Esq., M.A., F.L.S., President, in the Chair.

It was proposed by Prof. Westwood, and seconded by Mr. Stainton, that it is desirable to obtain a charter for the Society. After some slight discussion this was carried *nem. con.*

Ordinary Meeting.—Prof. WESTWOOD, Honorary Life President, in the Chair.

H. H. C. J. Druce, Esq., of St. John's Wood, and the Rev. A. Fuller, of Chichester, were elected Members.

Mr. E. A. Fitch exhibited a large Coleopterous larva, apparently Geodephagous, which he was assured had been coughed up by a young man at Maldon who was suffering from bronchitis. Some Members present appeared to be slightly incredulous, and suggested the possibility of an error in observation.

Mr. E. Saunders read the concluding portion of his Synopsis of British *Aculeate Hymenoptera*, and also a paper on the anal segments of insects of the same group.

A discussion on nomenclature ensued, arising from some remarks by the President respecting a recently-described butterfly which the describer avowedly named after himself, and respecting the generic terms *Darwinhydrus*, *Tyndalhydrus*, *Spencerhydrus*, &c., employed by Dr. Sharp a few years ago.

2nd April, 1884.—The PRESIDENT in the Chair.

The following were elected Members, viz.:—Stanley Edwards, Esq., of Blackheath, E. P. Collett, Esq., of Kentish Town, J. A. Finzi, Esq. (formerly a Subscriber), of Gower Street, F. Lovell Keays, Esq., of Cobham, and Edward Shuttleworth, Esq., of Preston.

The President read a letter received from the describer of the butterfly noticed in the report of the previous meeting.

Mr. Billups exhibited *Diospilus oleraceus*, Hal., and *Sigalphus obscurellus*, Nees., two species of *Braconida* parasitic on *Ceuthorhynchus sulcicollis*; he remarked that whereas one of these underwent its transformation within the swellings caused by the beetle-larva, the other came out and formed cocoons in the earth. He also exhibited *Dimeris mira* and *Ceroptres arator*, new to Britain, the latter also indicating a new British genus. Also *Philonthus thermarum* from cucumber frames at West Ham. Mr. Pim said he had taken the latter at Dulwich.

The Rev. A. Fuller exhibited a small number of figures of the larvæ of British *Lepidoptera*, made by the late Mr. Buckler.

Sir S. S. Saunders read a long and interesting historical and biological sketch, respecting the vexed question:—What is *Pediculus melitta*, Kirby? He considered that, in all probability, it is founded on young larvæ of *Meloë proscarabæus* that have been arrested in their development, the black colour being only the result of age.

Mr. Elwes read a paper, illustrated by specimens and diagrams, on the "pouch" of the females of the genus *Parnassius*. After alluding to the supposition that these pouches are not developed until after the insect has paired, he proceeded to demonstrate that they were of great value as a means of grouping together and separating the numerous species, some of which he considered were, on this character, little more than local forms. A discussion ensued in which Messrs. Fitch, Weir, Pascoe, Kirby, and others, took part.

Mr. Meyrick read a further paper on the classification of the Australian *Pyralidina* treating on the families *Masotimida*, *Botydida*, and *Scopariida*.

Lord Walsingham communicated a paper on North American *Tortricida*.

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