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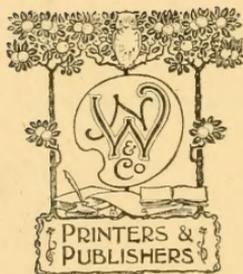
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PLATES.

I.—AQUATIC RHYNCHOTA (STRUCTURAL)	MAY.
II.—MECOSTETHUS GROSSUS (2 FIGS.)	JULY.
III.—THAMNOTRIZON CINEREUS (FIG. 1), XIPHIDIUM DORSALE (FIG. 2)	DECEMBER.

FIGURE IN TEXT.

TEPHROSIA BIUNDULARIA AB.	PAGE 241.
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ERRATA.

- Page 12, for "Two New Genera of Lecaniinae Coccidæ" read "Two New Genera of Coccidæ."
,, 13, at bottom, for "*Aspidiotis*" read "*Aspidiotus*."
,, 29, line 26, for "*colossicum*" read "*collossicum*."
,, 134, line 43, for "*bousdorjji*" read "*bonsdorjji*."
,, 198, line 15, for "*Melanippe unifasciata*" read "*M. subtristata*."
,, 220, line 26, for "*nigrideus*" read "*nigridens*"; line 36, for "*Philontochila*" read "*Philontocheila*."
,, 231, line 23 from bottom, for "ante, p. 179," read "ante, p. 169"; line 3 from bottom, for "ante, p. 219" read "ante, p. 213."
,, 251, line 17 from top, for "*T. betularia*" read "*T. betulæ*."

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NOTES ON THE GENUS *EUCHLOË*, HÜBNER, A GENUS OF THE PIERINÆ.

BY A. G. BUTLER, Ph.D., F.L.S., F.Z.S., &c.

FOR many years a number of Palearctic species stood in collections under Boisduval's generic name *Anthocharis*; but eventually it was discovered that this genus was, to all intents and purposes, a synonym of *Euchloë*, Hübner, which consequently superseded it.

Meanwhile, for a single species with strongly falcated primaries Herrich-Schäffer proposed the name of *Midea*, and to this group I subsequently added two species—*M. scolymus* from Japan and *M. limonca* from Mexico. (I did not, however, recognize *Midea* as a genus.)

When Schatz reviewed the genera of butterflies in Staudinger's 'Exotische Schmetterlinge,' he raised *Midea* to the rank of a genus, and divided *Euchloë* (which he called *Anthocharis*) into two genera, calling the orange-tips *Anthocharis* and the whites *Phyllocharis* (entirely overlooking the fact that the latter name had been used in 1824 for a genus of Coleoptera). Schatz figured, and somewhat distorted, the neuration of one species in each group, with the object of showing principally that in *Euchloë* (= *Anthocharis*, Schatz) the second subcostal branch, vein 10, is emitted before the end of the cell, and in *Phyllocharis* after the end: *Midea*, for which he figured *M. scolymus*, is represented as agreeing with *Euchloë* with vein 10 before the end of the cell,—a character varying considerably on opposite wings of the same individual, although I believe vein 10 in *Euchloë scolymus* is never emitted after the end of the cell.

In June of the present year, Dr. Beutenmüller published a 'Revision of the species of *Euchloë* inhabiting America, North of

Mexico,' in which he very correctly stated that "the venation is subject to variation"; nevertheless he took the trouble to give the following nerve-characters for the groups:—

Euchloë, Hübner (= *Anthocharis*, Schatz).—Fore wings with 12 veins; veins 6–9 on a short stalk, sometimes with vein 6 free.

Anthocharis, Boisduval. (= *Phyllocharis*, Schatz).—Fore wings with 12 veins; veins 6–9 on a long stalk, sometimes with vein 10 also on a stalk.

Midca (Herrich-Schäffer, not Schatz).—Fore wings with 11 veins; veins 6–8 on a stalk; vein 9 absent.

Now if these characters were constant, there would be no reason whatever why the three named groups should not stand as distinct genera; but unhappily they are by no means constant, as I shall now proceed to show.

In the wet season form of *E. sara* (the typical form) there are almost invariably 12 veins in the primaries, but we have one example in which vein 8 is absent. In our examples of the dry phase there are 12 veins, but we have three examples of an insect which might easily be recognized for the same thing from Vancouver, all of which have apparently lost vein 9. Our examples of what I believe to be *E. thoosa* and *stella* all have 12 veins, but five examples of *E. julia* from south-west Colorado and Arizona have apparently lost vein 9.

It would have seemed advisable to distinguish the Vancouver representative of *E. reakirti* by a separate name; only (unluckily for the species-maker) we possess a fourth example from the same collection in which 12 veins are present, but which, nevertheless, varies in another respect, vein 5 being emitted from 6, instead of from the cell.

Dr. Beutenmüller includes *E. cethura* and *E. pima* with *E. genutia* under *Midca* on the ground that they have only 11 veins to the primaries; but he seems to overlook a more important character which proves their close relationship to *Zegris*, viz. their extremely short antennæ. If *Zegris* is sufficiently distinct from this extremely variable genus to stand apart, in my opinion it has a greater claim upon *E. cethura* and *E. pima* than *Euchloë* has, in spite of the absence of that very uncertain little "vein 9."

Anthocharis of Beutenmüller = *Phyllocharis*, Schatz, is described by the later author as having 12 veins, veins 6–9 on a long stalk; but neither of these characters is constant, for whereas *E. hyantis* has an extremely short furcation of vein 7 (and consequently possesses 12 veins), the nearly related *E. venosa*, from Thibet, and *E. daphalis*, from north-west India, have only 11 veins, vein 9 being apparently absent.

Is vein 9 ever absent? In my opinion it is present throughout the genus; but veins 7 and 8, which are extremely variable in relation to the length of their furcation, are sometimes completely fused, or (as Sir George Hampson expresses it) coincident.

In one of our examples of *E. tagis* the length of the stalk bearing veins 6-9 is no longer than in typical *Euchloë*.

Schatz's definition of the supposed distinct genus *Phyllocharis* is no better than Beutenmüller's, for vein 10 varies in its position in individuals of the same species; sometimes, as in typical *Euchloë*, it is emitted before the end of the cell, sometimes at the end, and sometimes (as Beutenmüller points out) at some distance beyond the end.

Now, as regards *Midea*, Dr. Beutenmüller states that it has 11 veins, which is quite true of the type *M. genutia*, but Dr. Schatz figures it with 12 veins, which is equally correct as regards the Japanese species *M. scolymus*. If therefore *Midea* is retained, we must have a different name for *M. scolymus*; but surely in a genus like *Euchloë*, which is so utterly unstable and unreliable in its neuration, it is far better to recognize its transitional condition, and not distinguish genera whose evolution is incomplete.

A GUIDE TO THE STUDY OF BRITISH WATERBUGS (AQUATIC RHYNCHOTA).

BY G. W. KIRKALDY.

(Continued from vol. xxxi. p. 206.)

THE RHYNCHOTA, OR HEMIPTERA,* form, in some respects, the most isolated of the insect orders, and have no near allies, having evidently branched off from the primitive hexapod-line at a very early period. Taken as a whole, they are homogeneous, distinguished at once from all other Hexapoda by the structure of the mouth-organs, as well as by many other not superficially noticeable details. The Neuroptera are probably their nearest kin, although many authors have remarked upon the closeness of their relationship with the Coleoptera, an order with which in fact they are as remotely connected, perhaps, as with any other, though there is certainly a marked superficial resemblance, due, however, to their very similar habits in the imaginal stage. The average Rhynchoton is, in proportion to its size, rather heavily built, and adapted rather for crawling up a plant-stalk or along the leaf of a tree, remaining in one spot during a not inconsiderable period, than for prolonged aërial flights or hasty visits from flower to flower. These two orders—Rhynchota and Coleoptera—it may be remarked, are the only two in which a large number of species spend the greater portion of their imaginal existence under water.

* Greek *ῥυγχός* (*rhunkhos*), a beak; *ἡμι-* (*hēmi-*), half; *πτερά* (*ptera*), wings.

Omitting the parasitic group and, perhaps, the remarkable Coccidæ (scale insects), the Rhynchota comprehend two well-marked suborders—viz.: the HETEROPTERA and the HOMOPTERA. The former, containing the aquatic forms, are distinguished by the fact that the *genæ* (cheeks) are not contiguous with the anterior coxæ, as they are in the Homoptera; in the former, moreover, the elytra (upper pair of flight-organs) are usually coriaceous, except a small apical membranous portion, the “membrane,” while they are more or less uniform in texture in the Homoptera.*

The study of the Heteroptera, or “BUGS” *par excellence*, has, in comparison with that of certain other insect groups, been unjustly neglected; owing doubtless to the disagreeable associations connected with the popular name, and apparently also to an unformulated impression, current even amongst many entomologists, that they are, in their structure and habits, somewhat uninteresting. How absolutely alien to the truth is this supposition would be apparent to anyone who spent an hour in a preliminary study of some of their characteristics. It is obvious that the harmoniously-arranged tints of certain Lepidoptera or the gaudy patterns of others are not possessed by, and would indeed be deleterious to, the aquatic forms we are now considering, but in extraordinary structures specially adapted to their environment, such as the method of respiration in *Nepa* and *Notonecta*, and the remarkable modifications of the 8th pleura, in the former, into a long respiratory tube; the structure of the antennæ in the Cryptocerata; stridulation in *Corixa* and *Micronecta*; to mention but a few of the most salient—the Rhynchota certainly far surpass their more admired rivals.

The peculiar odour, which in some terrestrial species is of an agreeable nature, in others so disgusting, is by no means highly developed in the aquatic forms. So far as I am aware, no external opening of the glandular apparatus has yet been discovered in any of them, although the existence of repugnatorial glands has been proved in some at least. *Notonecta* possesses perhaps the most distinctive odour, which has been compared by Dufour, somewhat exaggeratedly, to that of the plant *Chenopodium vulvarium* (*olidum*), or “stinking Goose-foot,” but its tenacity is no way to be compared with that of the effluvia emitted, for example, by the Coleopteron *Gyrinus*.

Presuming that my readers wish to study the Aquatic Rhynchota of these islands, and that their whole aim is not merely to be able to identify their captures—after a fashion, I propose first of all to offer a few remarks upon three specially interesting portions of the external structure—viz.: the rostrum, the antennæ, and the legs.

* ἕτερος (*heteros*), other; ὅμος (*hōmos*), similar.

THE ROSTRUM.

Although greatly modified, all the principal parts of the mouth, present in the Mandibulate Hexapoda, can be traced in the Rhynchota.

The upper lip (*Labrum*) is usually very short and more or less triangular in form, covering the base of the labium. The lower lip (*Labium*, *Second Maxillæ*, &c.) forms an elongate, subcylindric tube (consisting normally of four segments) which acts as a kind of suction-pump for the conveyance of nourishment to the digestive apparatus; it also serves as a sheath and support for the four sharp, thread-like setæ which represent the first maxillæ (*interior setæ*) and the mandibles (*exterior setæ*). These parts are apparently always present, but their appendages are very obscure, and specialists are by no means agreed on the subject.*

The general impression as to the method of feeding employed by Rhynchota appears to be that the "rostrum" (i.e. the labium) is thrust into the food-substance—animal or vegetable—the surface of which is penetrated by the thrust of the rostrum. On examining the latter, however, we find that the apex is usually blunt or slightly concave, clothed with hairs or bristles, and quite incapable of piercing the epidermis of an insect or plant. In reality, the desired surface is punctured by the long, acute, often serrated, mandibular setæ (which, as remarked previously, are, at rest, concealed in the labium), and the apex of the labium is then applied *immediately* (rarely pushed well in), and the contents of the food-substance pumped up.† The blunter and shorter maxillary setæ apparently serve for the conduction of saliva.

THE ANTENNÆ.

Four segments appear to be the normal composition of the antennæ, though *Hebrus* possesses 5, with one or two intercalated nodes, and in *Micronecta* and the *Nepidæ* there are apparently only 3. In the *Hebridæ* and *Gerridæ* they are long, free, more or less thread-shaped (*filiform*), the apical segment often swollen and furnished with thick hairs. In *Aphelocheirus* they are subcylindric, long and slender (the apical segment rather long), and,

* For the latest papers, see Leon's "Beiträge zur Kenntn. der Mundteile des Hemipteren," Jena, 1887; the same author's "Labialtaster bei Hemipt." (1892, 'Zool. Anzeig.' pp. 145-7), and "Beiträge zur Kenntn. des Labiums der Hydrocoren" (1897, 'Zool. Anz.' pp. 73-7); in the latter the mouth-parts of *Gerris najas* and an extra-British species of *Velia* are figured. See also a preliminary paper by Heymons, "Die Mundteile der Rhynchota" (1896, 'Entom. Nachr.' xxii. pp. 173-5).

† I think the first author to call attention to this was Marlatt: see "The Hemipterous Mouth" ('Trans. Ent. Soc. Wash.' iii. pp. 241-9); "How Hemiptera Feed" (1895, 'Insect Life,' vii. pp. 427, 428); and "The Periodical Cicada" (1898, 'Bull. U.S. Agric.,' new series 14, pp. 52, 53).

though much shorter than is usual in the *Gymnocerata** (to which *Hebrus* and the *Gerridæ* belong), they are not concealed in a groove (*fovea*) on the under side of the head, thus forming an exception to the general rule among the *Cryptocerata*. In *Ilyocoris* (= *Naucoris*, Saund.) they are somewhat similar to *Aphelocheirus*, but shorter and rather thicker, and the apical segment is very short. In the *Nepidæ* they are very small, so much so that GÉOFFROY, one of the earliest Linnean writers, made the mistake of supposing the raptorial anterior legs to be the antennæ. In *Nepa* the penultimate segment is laterally produced, on one side only, like a pickaxe, the apical segment being produced, on the same side, in a very similar manner. The foveæ, in this genus, are vaulted, probably forming an auditory chamber for the increase of sound-perception. With a slight difference in detail, the antennæ of *Ranatra* are very similar to those of *Nepa*. In *Corixa* the antennæ are subcylindric, the fourth segment being short and very thin; in *Micronecta* the last segment is spindle-shaped, concave beneath. In *Plea* the third segment is spindle-shaped and convex, the fourth being very small and thicker at the apex than at the base, arising *below* the apex of the third. In this genus the antennæ are clothed with sparse hairs near the apex of each joint. In *Notonecta* the first segment is very short; the second is subcylindric, thick; the third is smaller and slenderer, shaped somewhat like the blade of a knife; the fourth smaller and shorter still, but formed like the third. The third segment is furnished with half a dozen or more long clubbed hairs. It is probable that the antennæ, in the *Cryptocerata* at least, are very largely auditory and, to a much less degree, tactile organs. Those of the *Cryptocerata* are figured in Fieber's 'Genera Hydrocoridum' (1851, Abhandl. böhm. Gesellsch. Wissensch. (v.), 7, pp. 183-210, Plates 1, 3, & 4).

THE LEGS.

In all the aquatic forms, both *gymnoceratous* and *cryptoce-
ratous* (with the possible exception of the *Corixidæ*), the anterior legs are raptorial. In all the femora are dilated—in some moderately, in others enormously. In the *Hebridæ* and *Gerridæ* there is little modification, except that in *Gerris*, *Hydroessa* (= *Microvelia*), and *Velia* the claws are inserted, as also in the posterior pairs, in a cleft below the apex.†

* *γυμνός* (*gymnos*), naked, i.e. "not concealed," and *κεφαία* (*keraiá*), antenna; *κρυπτός* (*kruptos*), concealed.

† Most authors speak of the claws being "ante-apical" or "inserted above the apex." I regret that I cannot conceive of the claws being inserted *above* the apex! As will be noted further on, the genera with subapical claws form the genuine *Gerridæ*; the others—viz. *Alpophilus*, *Hydrometra*, *Mesovelia*—are probably more nearly allied to *Hebrus*.

In *Aphelocheirus*, *Plea*, and *Notonecta* the structure is fairly simple, and two claws are present in each tarsus, inserted at the apex. In *Ilyocoris* the femur is enormously dilated, forming an irregularly equilateral triangle; the tibia is slender, and fits at rest into a groove (*sulcus*) on the ventral surface of the femur; the tarsus is minute, composed of only one segment without claws. In *Nepa* the tibia is much longer, and fits into a similarly placed groove in the femur, the latter being slenderer and longer than in *Ilyocoris*. In the former there is also only one segment in the tarsus, which is minutely falcate at the apex, but there are no claws. In *Ranatra* the coxæ are very long, and were formerly often mistaken for the femora, which are rather longer and [in the British species *R. linearis* (Linn.)] are armed, about a third of the entire length from the apex, with a stout triangular spur; the tibia and tarsus are short, folding in close to the femur and locked by the femoral spur; there is only one segment in the tarsus, which is not provided with claws. The anterior legs in *Corixa* and *Micronecta* are exceedingly curiously formed, being more or less spoon-shaped. They will be discussed in detail later.

The posterior legs are those principally employed for locomotion. In *Hydrometra* and *Gerris* they are enormously long and very slender; in the other genera they are usually of medium length and thickness, more or less ambulatory. In *Corixa*, *Micronecta*, and especially *Notonecta* they have well-developed natatory powers. Claws are present in the *Gymnocerata*, *Nepidæ*, *Naucoridæ*, and *Plea*. The intermediate pair of limbs appear to be partly employed for progression, though in *Corixa* and *Notonecta* they certainly act as balancers. In the *Gymnocerata*, *Nepidæ*, *Naucoridæ*, and *Plea* they are not very dissimilar to the posterior pair; in the others they are long and slender. Claws are present in all.

I now purpose to deal systematically with the aquatic forms, discussing any special points of structural interest, and mentioning such of the habits, &c., as have been recorded, confirming or extending these as far as possible from my own observations.

HEBRUS. This genus, the systematic position of which is still doubtful, is readily distinguished from *Hydroessa* (= *Microvelia*), which is superficially similar, by the five-segmented antennæ,* and by the shape of the pronotum. The two British species may be found amongst *Lemna* and *Sphagnum* in marshy ground, but, as far as I am aware, no detailed observations of their habits have been published. *H. pusillus*, Fallén, which seems to be always macropterous, is figured by Douglas and Scott and by

* The presence of five distinct antennal segments is not a family character, as the extra-British genus *Merragata*, F. B. White, possesses only four. The extra two or three segments in *Hebrus*, enumerated by certain authors, are merely nodes.

Saunders (in the edition with coloured plates). It is a southern species, not having been recorded north of Birmingham. *H. ruficeps*, Thoms., is usually brachypterous, and is widely though locally distributed—viz.: Perthshire, Essex, Surrey, &c. It has not been figured.

Æpophilus bonnairei, Signoret, is another genus and species of doubtful position. It has lately been placed between *Acanthia* (= *Salda*) and *Ceratocombus*, but it may conveniently be considered here. It is always, so far as is known, brachypterous, having the general appearance of a narrow, rather plump, bed-bug nymph (*Cimex lectularius*, Linn.). It is figured by Saunders. As numerous interesting accounts* of its habits have been so comparatively lately recorded in papers accessible to British students, it will be unnecessary to do more here than briefly summarise them. It may be looked for under embedded stones and fragments of rock, or indeed under starfish (sec. Marquand), or any object affording good cover on the seashore near the lowest tide-limit. The mature insect has been encountered from February to August, and is probably to be found all the year round. The records of capture are from Polperro, Penzance, Plymouth, Lyme Regis, Isle of Wight; and near Waterford, Ireland. It has derived its generic name from the fact that it is often found in company with the remarkable Coleopteron *Æpus*.

(To be continued.)

MEDITERRANEAN LEPIDOPTERA.

By PHILIP DE LA GARDE, R.N., F.E.S.

With reference to the notes by Mr. Gervase F. Mathew on "Lepidoptera from the Mediterranean" (Entom. 1898, pp. 77-84, 108-116, and 141), I should like to add the names of some species found by me in three of the localities he mentions—viz. Malta, Corfu, and Trieste; in each case at a different time of the year from that at which he visited them.

MALTA.—The dates accompanying the following species show when they were first obtained:—*Lasiocampa* (*Bombyx*) *quercus* var. *sicula*, emerged in July; *Triphæna pronuba*, May 9th; *Aspilates citraria*, April 12th; *Acidalia asellaria*, March 28th; *Cornifrons ulceratalis* var. March; *Aglossa pinguinialis*, March 28th; *Pyralis farinalis*, May 9th; *Sphaleroptera ictericana*, April.

P. 82.—*Canonympha pamphilus* I saw first on March 18th, and *Deilephila euphorbiæ* emerged from chrysalis early in August.

* See Marquand in 'Ent. Mo. Mag.' 1887, xxiii. p. 169; and Keys in the same Magazine, 1895, xxxi. p. 135; and 1890, xxv. p. 247.

P. 83.—There is a notation, "*Deiopoia pulchella*, not common." On May 9th there were large numbers on the wing, as far as I can remember, up a wied at the back of St. George's Bay.

P. 84.—*Plusia gamma* I first saw on March 10th, and *Botys ferrugalis* on 18th of that month.

CORFU.—Of the species mentioned on pp. 111 and 112, *Pieris daphidice*, *Lycæna telicanus*, *Limenitis camilla*, *Melitæa didyma*, *Hipparchia (Satyrus) semele*, *Satyrus (Pararge) roxelana*, and *Epinephele hispulla*, were taken by me between May 22nd and 27th. *Vanessa egea* I did not get till returning on July 6th. The additions from May 22nd to 27th show as—*Melanargia larissa* var., *Cænonympha pamphilus* var. *lyllus*, *Vanessa atalanta*, *Lycæna icarus*, *Strymon w-album*, *Thymelicus actæon*, *Pamphila sylvanus*, *Arctia villica*, *Euchelia jacobææ*, *Zygena punctum*, *Z. filipendulæ*, *Plusia gamma*, *Acontia luctuosa*, *Acidalia aversata*, *A. imitaria*, *Duponchelia fovealis*, *Pyralis farinalis*, *Pyrausta purpuralis*, *Stenopteryx hybridalis*, *Sphaleroptera ictericana*; and on July 6th, *Vanessa c-album*.

The King's Park, to which one is admitted free, is an ideal place for a day's collecting; gardens, plantations, and grass land being in abundance, while on the sea face the cliffs afford good rough scrub, which I should imagine, especially for a coleopterist, would well repay careful search. Being quite a beginner, I did not appreciate all the possibilities of the place, I am sorry to say, or undoubtedly I should have made a big haul. There is one little piece of advice I would give to anyone going to the King's Park while the syringa bushes are in bloom, and that is, "Dont hang about them too long, as their effect is much like hay fever."

TRIESTE.—I think the hill-side Mr. Mathew speaks of, on p. 114, must have been the same one I explored on June 11th and 13th, three months earlier in the year than he was there; the results as shown by the list were much better.

NAVARINO, at the beginning of July, was, like most places on the coast of Greece, quite burnt up, but some large flats up the bay should be happy hunting grounds earlier in the year; as it was, I got twenty-six species, as shown in the list.

From the way Mr. Mathew speaks of his stay at Venice, I fancy he must have been lucky enough to be in a ship that was able to go up the canal and anchor off the city, instead of remaining outside, as we had to do in the 'Victoria' in June, 1891, whence communication with the city was only once a day by torpedo boat. Still, "it is an ill wind, &c.," so I was able to land on the vegetated sandbank that forms Malamocco, and get a few species.

POLA, being purely a naval port, our wanderings were very much limited, nobody being allowed to go near any of the forts

with which the sides of the harbour bristle, though the surroundings looked enticing.

FIUME, I was only able to land at for a very short time, but a climb over the hills at the back of the town is well repaid by the fine masses of scrub and wood beyond.

CATTARO, I should imagine, would be a grand ground, and I put down my poor catch on the day I landed to a heavy thunderstorm covering the hills which ring the harbour, the resultant temperature (94° in the shade at 4. p.m) having apparently as much effect on insect life as it had on me!

Appended is a list of the Lepidoptera I obtained, showing the different localities, but no attempt is made to arrange it in scientific order. My thanks are due to Mr. W. F. Kirby for nearly all the identifications.

- Papilio machaon*. Malta; Navarino.
P. podalirius. Navarino; Marmarice.
Pieris daplidice. Malamocco; Corfu; Navarino; Jaffa.
P. brassicæ. Malta; Spezia; Fiume; Corfu; Navarino.
P. rapæ. Malta; Spezia; Malamocco; Navarino; Jaffa.
Melanargia procida. Civita Vecchia; Trieste; Zara.
M. larissa. Corfu (var.).
Colias edusa. Spezia; Navarino.
C. hyale. Trieste; Zara.
Leucophasia sinapis. Civita Vecchia.
L. æstiva. Navarino; Nauplia.
L. erysime. Spezia; Trieste; Nauplia.
Aporia cratægi. Trieste; Pola.
Gonepteryx rhamnii. Zara; Navarino.
G. cleopatra. Navarino.
Epinephele hispulla. Malta; Spezia; Corfu; Navarino; Limassol.
E. nurag (?). Spezia.
E. ida. Zara; Spalato.
E. lupinus. Navarino; Nauplia.
Hipparchia fatua. Navarino; Nauplia; Marmarice.
H. allionia. Spezia; Marmarice.
H. briseis. Spezia; Zara (var.).
H. semele. Corfu.
H. fagi. Trieste; Fiume; Cattaro.
H. proserpina. Rosas Bay; Fiume.
H. actæa. Fiume (var.).
Satyrus roxelana. Corfu.
S. adrasta. Trieste; Pola; Fiume.
Cænonympha pamphilus. Malta (and var. *lyllus*): Spezia (and var. *lyllus*); Malamocco (and var. *lyllus*); Corfu (var. *lyllus*); Navarino; Nauplia.
C. arcania. Spezia; Trieste (var.),
Pararge megæra. Malta; Malamocco; Navarino.
P. egeria. Rosas Bay; Cattaro (var.); Navarino (var.).
Limenitis camilla. Corfu; Marmarice.
Melitæa didyma. Zara; Spalato; Corfu; Navarino.
M. athalia. Trieste; Fiume.
M. phæbe. Trieste.
M. ætheria. Trieste.
M. alpina. Zara.
Argynnis dia. Spezia.
A. cleodippe. Pola.
A. adippe. Fiume.
A. daphne. Trieste.
A. ino. Fiume.
Pyrameis cardui. Spezia; Spalato; Corfu; Navarino.
Vanessa atalanta. Corfu.
V. polychloros. Pola.
V. egea. Fiume; Spalato; Corfu.
V. c-album. Corfu.
Chrysophanus phlæas. Malta (var. *eleus*); Pola; Navarino (var. *eleus*); Marmarice (var. *eleus*).
C. thersamon. Jaffa.
Lycæna bætica. Marmarice.
L. argiolus. Navarino; Nauplia.
L. telicanus. Spezia; Corfu; Navarino; Nauplia.

- L. icarus*. Malta; Spezia; Malamocco; Cattaro; Corfu; Navarino; Nauplia.
L. astrarche. Malamocco; Spalato.
L. ægon. Trieste; Pola.
L. adonis. Trieste.
L. alcon. Trieste.
L. battus. Cattaro.
Strymon w-album. Corfu.
S. spini. Pola; Fiume; Zara.
Thecla ilicis. Trieste.
T. rubi. Trieste.
T. acaciæ. Pola.
Spilothyrus marrubii. Navarino; Marmarice; Limassol.
S. altheæ. Malamocco.
Pamphila nostrodamus. Navarino.
P. comma. Spezia.
P. sylvanus. Malamocco; Corfu.
Thanaos tages. Spezia.
Thymelicus actæon. Zara; Cattaro; Corfu.
T. lineola. Zara.
Hesperia cynaræ. Trieste.
Acherontia atropos. Stamphalia.
Chærocampa celerio. Nauplia.
Deilephila euphorbiæ. Malta.
Macroglossa stellatarum. Malta; Navarino.
Zygæna erythrus. Civita Vecchia.
Z. graslini. Civita Vecchia.
Z. punctum. Corfu.
Z. filipendulæ. Corfu.
Z. transalpina. Malamocco (var.).
Z. hedysari. Malamocco; Zara.
Z. coronillæ. Cattaro.
Z. oxsenheimeri. Zara.
Syntomis phegea. Trieste.
Callimorpha hera. Marmarice.
Callarctia pudica. Malta.
Arctia villica. Corfu.
Euchelia jacobææ. Corfu.
Deiopeia pulchella. Malta; Rosas Bay.
Clisiocampa castrensis. Civita Vecchia.
Lasiocampa sicula. Malta.
L. quercus. Malta.
Porthetria dispar. Port Mahon.
- Plusia gamma*. Malta; Corfu.
Synthymia monogramma. Malta.
Triphæna pronuba. Malta.
Acontia luctuosa. Corfu.
A. solaris. Malamocco.
Agrophila sulphurilis. Malamocco.
Euclidia glyphica. Malamocco.
Leucanitis stolidæ. Pola.
Calocampa exoleta. Malta.
Aspilates citraria. Malta.
Campptogramma bilineata. Marmarice (var. *testaccolata*).
Fidonia atomaria. Spezia; Trieste.
Rhodostrophia vibicaria. Trieste; Fiume.
R. calabraria. Trieste.
Acidalia ornata. Malamocco; Nauplia.
A. asellaria. Malta?.
A. aversata. Corfu.
A. imitaria. Corfu.
A. ochrata. Malamocco.
A. (Idæa) rufaria. Spalato.
Eubolia plumbaria. Trieste.
E. sp. Malta.
Venusia sp. Malta.
Pseudoterpna cytisaria. Trieste.
Aplasta ononaria. Trieste.
Boarmia rhomboidaria. Pola.
Cornifrons ulceratalis. Malta (var.).
Botys ferrugalis. Malta (var. *sphyrus*).
B. cinctalis. Malamocco.
B. nubialis. Malamocco; Trieste.
B. fulvalis. Pola.
Aglossa pinguinalis. Malta.
Pyrallis farinalis. Malta; Corfu.
Duponchelia fovealis. Corfu.
Pyrausta purpuralis. Corfu.
Stenopteryx hybridalis. Trieste; Corfu.
Pionea margaritalis. Malamocco.
Diasemia literalis. Malamocco.
Eletheia carnella. Trieste.
Ebulea verbascalis. Trieste.
Margaronia unionalis. Navarino.
Mecyna polygonalis. Navarino (var.).
Sphaleroptera ictericana. Malta; Corfu.
Aciptilia pentadactyla. Trieste.

TWO NEW GENERA OF LECANIINE COCCIDÆ.

By T. D. A. COCKERELL, N. M. Agr. Exp. Sta.

PLATINGLISIA, n. g.

♀. Scale differs from *Inglisia* in being quite flat, circular; with the glassy covering in two parts, divided longitudinally in the middle line; antennæ and legs absent. Type, *P. noacki*.

Platinglisia noacki, n. sp.

♀. Flat, circular, $6\frac{1}{2}$ mm. diam., reddish brown, with the marginal areas pallid; glassy covering transparent, with the two halves each having weak but easily visible concentric and radiating striæ, surrounding and arising from a centre a little to one side of the middle line of the insect. Under a microscope the glassy covering shows lines of air-cells as in *Inglisia*, and irregularly placed larger air-cells in the submarginal area. The insect has a deep longitudinal dorsal groove, thickly beset with small gland pores, and ending at the anal plates. This coincides with the suture between the glassy plates. The very small mouth-parts, with very short rostral filaments, are to one side of this groove, about the middle of the insect. The skin after boiling remains yellowish brown, except a sharply differentiated colourless marginal area; the brown area presents groups of irregularly formed gland-pits, the marginal area rather large round gland-pits. Extreme margin dark brown, with few short simple spines. There is a little white secretion in the spiracular regions, which remains as lines on the leaf when the scale is removed.

Hab. Campinas, Brazil, on the upper side of leaves of a myrtaceous tree or shrub (*Dr. F. Noack*, No. 83). This is a most remarkable Coccid, closely allied to *Inglisia*, but quite worthy of generic distinction.

CARPOCHLOROIDES, n. g.

♀. Globose, without legs or antennæ. Larva of the Eriococcine type, with numerous spines, and a comparatively short terminal segment to the antennæ. ♂ sac white, composed of cotton-like threads.

Carpochloroides viridis, n. sp.

♀. *Adult.* A globular sac, becoming transparent, but still more or less greenish, after boiling; no segmentation visible; mouth-parts well developed and large, the rostral sheath very dark brown, ribbon-like; skin without spines, except a very few minute simple ones at the sides; legs and antennæ wanting; anal ring not observed, it must be very small.

Larva, just hatched. Fusiform, not very elongate; each segment bearing numerous long spines arranged in a transverse row, which is interrupted dorsally, and again subdorsally, four spines being on each side between the dorsal and subdorsal gaps; antennæ 6-segmented; 3 and 6 about equal, and longest, 1 and 2 next longest, then 4 and 5

hardly shorter; 6 is a little shorter than 4 and 5 together, and bears some very long hairs. Caudal setæ rather long. Legs well developed, digitules filiform, distinctly knobbed.

♂ sac white, elongate, of loosely woven cottony filaments, as in the Dactylopiinæ; length slightly over 2 mm. The ♂ sacs occur on the upper side of the leaves.

♂. *Adult.* Thorax brownish yellow, abdomen clear light lemon-yellow: length of the body about $\frac{3}{4}$ mm.; wings very large and ample, length almost $1\frac{1}{2}$ mm.; two very long white caudal filaments, about $1\frac{1}{3}$ mm. long; genital spike pyramidal, not very much longer than broad (instead of being greatly elongated as in *Capulinia jaboaticabæ*); thorax much broader than abdomen; femur stout; tibiæ slender, enlarged at end, longer than femur, with a stout terminal spine; tarsus short, about one-third the length of tibia, with a long slender claw. The ♂ is described from specimens in the sacs, which were just ready to emerge.

Hab. On *Eugenia* sp., Campinas, Brazil, September, 1898 (Dr. F. Noack, No. 84). Dr. Noack writes that the adult females, as seen alive, are clear green, in form and colour very much like the young fruit of the *Eugenia*. The specimens arrived (in a letter) squashed flat, and in that condition I could not tell the females from the fruits. I boiled up several of the green objects, and found I had some of the coccids among them; the liquid was stained a deep gamboge-yellow, I suppose by the fruits.

This new genus is allied to *Capulinia* and *Cylindrococcus*. The larva resembles that of *Cylindrococcus* (*Crocidocysta*), but that has only two spines on each side of the dorsal line, where our insect has four; the antennæ also differ. It is to be noted that *Cylindrococcus* (type *C. casuarinæ*) and *Carpochloroides* have typically Eriococcine larvæ, i.e. with dorsal spines and a comparatively short terminal antennal segment. On the other hand, true *Sphaerococcus* (type *S. casuarinæ*) has a typically Dactylopiine larva, with no dorsal spines and a long terminal antennal segment. So also has *Chatococcus bambusæ* a Dactylopiine larva, without dorsal spines; and the last antennal segment in this species is considerably longer than 4 and 5 together, while the others are subequal, 3 however being decidedly shorter than 2. *Antonina* also appears to be a Dactylopiine.

Note.—In my article on Sandwich Island Coccidæ (vol. xxxi. pp. 239, 240) *Aspidiotis* is misprinted all through “*Aspidistus*.”

Mesilla Park, New Mexico, U.S.A.: Oct. 29th, 1898.

NOTES ON THE NOMENCLATURE OF SOME HYMENOPTERA.

By T. D. A. COCKERELL, N. M. Agr. Exp. Sta.

Pseudosphex and *Neosphex*.

The genus (or subgenus of *Sphex*) called *Pseudosphex* by Taschenberg (1869) cannot bear that name, on account of the lepidopterous *Pseudosphex*, Hbn. (1818), which Mr. W. F. Kirby treats as a good genus. According to Kohl, *Neosphex*, Reed, 1894, is the same as *Pseudosphex*, Tasch., so it is not necessary to propose a new name.

Gundlachia.

The name *Gundlachia* properly belongs to a genus of Mollusca, described by Pfeiffer in 1849.

Gundlachia, Herr.-Schäff., 1866, applied to a Trichurine moth from Cuba, will stand as *Burtia*, Grote; the only species will be *Burtia cruenta* (Herr.-Sch.).

Gundlachia, Cresson, Proc. Ent. Soc. Phila. 1865, p. 194, proposed for the peculiar Cuban bee, *Centris* (?) *cornuta*, Cresson, may be changed to *Heterocentris*, nov. nom.

Megachile inermis.

This name was proposed by Provancher (Add. Faune Hym. p. 323) to replace his *simplex*, preoccupied by Smith. Dalla Torre's name *simplicissima* for the same insect is therefore needless. *M. inermis*, Radoszkowski, Hor. Soc. Ent. Ross. 1893, p. 47, from Transcaepia, requires a new name, and may be termed *M. mitis*, nov. nom.

Hylæus minutus, Fabr., 1798.

Fabricius, in 1804, referred this to *Prosopis*, and it has so stood ever since. From the description I have little doubt it is a male *Halictus*, but the name is preoccupied in that genus by *Halictus minutus* (Schr. 1781). As the Fabrician insect cannot well be recognized from the description, it is not worth while to propose another name for it.

Macgillivraya.

Mr. Ashmead (Canad. Entom. 1898, p. 257) proposes this name for a genus of sawflies. The name was used by Forbes in 1851 for a genus of Mollusca.

Eunomia.

Eunomia, Cresson, 1875, is perhaps only a subgenus of *Nomia*, Latr., 1805. Cresson's name, however, is preoccupied by *Eunomia*, Hbn., which Kirby treats as a valid genus. It may be called *Dicunomia*, nov. nom. The species are *D. heteropoda* (Say), *D. apacha* (Cress.), and *D. marginipennis* (Cress.).

Mesilla Park, New Mexico, U.S.A. : Dec. 4th, 1898.

NOTES AND OBSERVATIONS.

GENERIC NAMES.—At the present time we are passing through a transition period as regards the classification of Lepidoptera, but probably it will be many years hence before the matter is adjusted, in any comprehensive way, to the satisfaction of everyone. As regards the arrangement of 'genera or species in our collections, it is not perhaps of much importance, except to the owner himself, what system is adopted, or in what order the families follow each other. The chief point is that we know where to find a species when wanted. A matter which is a greater source of trouble, and causes no little confusion and some misunderstanding, is that in nomenclature various authors are being followed. It would be a great convenience if those of our correspondents who prefer to use the more recently introduced or revived generic names would also give the genus in which species previously stood. If, for example, *Aglais* is adopted for *urtica*, it would not entail very much trouble to add *Vanessa* in brackets. A little uniformity in this respect would certainly be appreciated by the majority of the readers of the 'Entomologist.' The Editor is always pleased to make these additions, but unfortunately manuscript is sometimes so closely written that it is not possible to do so conveniently; the same remark applies also to those cases where generic names are omitted altogether.

OBSERVATIONS ON SPHINX (PHLEGETHONTIUS) CONVULVULI.—A female *S. convulvuli* was captured in a neighbour's garden on July 18th last, and brought to me. I induced it to deposit ova. On the 20th I had the satisfaction of finding twenty-five eggs on the food-plant supplied—*Convolvulus arvensis*, and eight more on the 21st. The moth died on the following day; its body was then opened, and some hundreds of eggs were found. In colour the eggs were bright emerald green, and much smaller than those of *S. ligustri*. The larvæ emerged on the 27th and 28th; these were whitish green; the anal horn was not curved, but erect, dull black, and rough. The first moult did not change appearance. After the second moult the ground colour was pale green with a dark green dorsal line, head and anal claspers greenish brown; so far no oblique stripes were visible. The next change produced two varieties; in one the ground colour was pale green with seven oblique whitish stripes bordered with a darker colour, anal horn black at its apex and base with a greenish band round the centre; the second variety had its head purplish brown, a broad dorsal line of the same colour inclining to green in the centre, spiracles and seven oblique stripes purple, claspers dark greenish brown, horn black. Fourth change, a broad dorsal line of dark grey minutely speckled with yellow; a yellow subdorsal line; below this a broad line of grey with stripes of yellow; spiracles bright red; claspers and under side dark grey; horn: tip black bordered with a yellow band and a second band of black, the base rufous. By the end of August about half the larvæ died, the remainder looking very unhealthy, caring little for the food offered. My brother having had much experience in rearing larvæ of British Sphingidæ, I gave them to his charge, unfortunately too late; however, he put the remaining larvæ on a living plant

of *C. arvensis*, and succeeded in getting one to full size. Description:—Head yellow, with five black stripes; ground colour almost black; an indistinct yellow chain-like dorsal line; subdorsal and spiracular lines of the same colour; stripes and anal flap yellow; spiracles bright red; horn slightly curved, tip and base black, with a central band of rufous. I cannot see that the ova or larvæ at any age bear resemblance to those of *S. ligustri* in form, colour, or behaviour. Contrary to the larvæ of *ligustri*, *convolvuli*, on being touched, or even the food shaken, would turn the head sharply round until it met the last segment, and then dropped from the plant. I believe the larvæ may not be so uncommon as generally supposed, but somehow lepidopterists have failed to discover them in any quantities. The perfect insect has been very plentiful here this season. My brother and I have for many years tried to obtain ova from captive *S. convolvuli*, however, without success until the present season; this success, I think, is owing to procuring the female so early. We seldom get *S. convolvuli* until well on in August. Generally we open the dead bodies of this species, but rarely find ova.—ALFRED BRAZENOR; Brighton, Nov. 26th, 1898.

THE BASAL SPOT ON AMPHIDASYS BETULARIA.—I have a series of four bred specimens of the black variety, *doubledayaria*—three females and one male. The females have a distinct white spot at the bases of the upper wings. This spot is absent in the male. My series of the type *betularia* is a small one, but the foregoing observations would seem to apply, though not so clearly, to the typical insect as well. Has anyone previously noticed this, possibly sexual, distinction?—J. ARKLE; Chester.

FORFICULA LESNEI.—M. de Bormans, of Savoy, sends me the following notes on *F. lesnei* (Entom. xxxi. pp. 49, 273):—"Voici ce que dit M. Finot de cet insecte:—'Cette espèce a été trouvée sur les herbes et les buissons, en Septembre, à St. Arnoult et Bénerville, près de Trouville (Calvaïos; marais de Villers-sur-mer).' En révisant la collection Brisout de Barneville, j'y ai trouvé quatre exemplaires de *F. lesnei*, étiquetés: *F. pubescens*, et provenant de St. Germain-en-Laye, près de Paris. Parmi les nombreux individus ♂ que je possède de *F. pubescens* et *F. decipiens*, les uns (plus nombreux) ont les pointes (apex) de la pince séparées, d'autres les ont contigues, mais aucun ne présente les pointes entrecroisées. Régulièrement *F. lesnei* a 12 articles antennaires, *F. pubescens* 12, et *F. decipiens* 13."—W. J. LUCAS; 4, Minerva Road, Kingston-on-Thames.

THE INSECT "PROTECTION COMMITTEE."—As adverted to by Mr. Hodges (Entom. xxxi. 277), there has been a distinct falling off in the number of records of local or otherwise interesting species, not only during the past year but also in 1897. I am, however, inclined to believe that this regrettable state of affairs was the result of other causes than the action of the "Protection Committee." The laudable endeavour of the said Committee, acting under the auspices of the Entomological Society of London, to impress upon collectors the wisdom of exercising moderation in their drafts on colonies of special insects and those restricted to limited areas in this country, should not

have deterred the practical entomologist from making known the results of his field-work. There does not appear to be any reason to suppose that the Committee had, or have, any intention of interfering with the legitimate pursuits of the collector. It is therefore to be hoped that entomologists who have the good fortune to obtain species that are at all above the common or garden kind will not refrain from publishing the fact for general information.—RICHARD SOUTH; 100, Ritherdon Road, Upper Tooting, S.W.

NOTE ON *COSSUS LIGNIPERDA*.—There is a fact in the life-history of *C. ligniperda* which is common in my experience, although it is only mentioned by one entomological work among those with which I am acquainted. The description, in brief, generally given in books is that the creature lives for four years in the larval stage, and that each winter the larva makes a cocoon of silk mixed with wood fragments, within the tree in which it resides, the final cocoon being placed in its tunnel near the exterior of the tree. The Rev. J. G. Wood, in 'Insects at Home,' mentions that in the 'Entomologist' for August, 1868 (iv. 121), Miss Newman records the finding of a cocoon of *C. ligniperda*, in April, in the middle of an arable field. The cocoon was made with earth instead of wood-chips. The moth emerged in the following June. It is my experience that it is quite common for the larvæ to bury themselves in the ground, both to pass the winter (when not full grown) and to pupate. For several years past no summer and autumn have gone by without some of these larvæ being brought to me by gardeners who have dug them up. They are also, here, very frequently found at the end of the summer, wandering across roads and gardens (presumably in search of suitable spots in which they may bury themselves). I may add that the majority of the larvæ thus found, and of those dug up, are full-fed. In no case have I found, or had brought to me, a very small larva.—ALBERT MAY; Hayling Island, Hants.

[There appears to be no doubt that larvæ of *C. ligniperda* do, perhaps not infrequently, leave their burrowings in trees and enter the earth to pupate. Newman (Entom. vi. 487), in reply to a question on the subject, states that he found a larva "under ground in a cocoon formed of silk and earth, without a particle of its home being made of sawdust." The matter again crops up in 1887 (Entom. xx. 231), when an example of *C. ligniperda* was seen to emerge from the surface of a lawn-tennis court, and, on a search being made, the pupa-case was found. Another correspondent, in the same volume (p. 274), remarks that although he had previously always found the cocoons in wood, he had that year "discovered the pupa-case at a considerable distance from the tree, just below the surface of the earth." Then, in 1892 (Entom. xxv. 46) there is a statement to the effect that a full-grown larva, which had been dug up in a garden, formed its cocoon of earth and bits of cork. Other instances might be quoted, but the foregoing sufficiently confirm Dr. May's observations. We may add that Wilson, in his 'Larva of British Lepidoptera,' published in 1880, states that caterpillars of *C. ligniperda* occasionally go under the surface of the earth to pupate; Barrett, in 'Lepidoptera of the

British Islands,' ii., refers to the wandering habit of the full-grown larva; and Tutt ('British Moths') leads us to suppose that pupation is always effected in the ground.—ED.]

CAPTURES AND FIELD REPORTS.

XYLINA FURCIFERA NEAR BRIGHTON.—A perfect example of this species was taken near here at sugar by Mr. Alfred Giebeler, of Wilbury Road, Hove, on September 13th last. It is not a locality one would expect to find this species. All being well, the district will be thoroughly worked next season; then it will be interesting to find if this rare *Noctua* is actually established in the locality.—ALFRED BRAZENOR; Brighton, Nov. 26th, 1898.

[Probably the first-known British examples of *Xylina furcifera* (= *conformis*) were the two specimens taken on ivy blossoms in October, 1859, near Cardiff, and exhibited at a meeting of the London Entomological Society in March, 1861. These were referred to in the 'Entomologist's Annual' for 1862, and a figure of the species given on the plate in that volume. Mr. T. H. Allis, in a note published in 1869 (*Ent. Mo. Mag.* v. 278), states that he had seen four or five British individuals of *X. conformis*; one of these, he says, "was taken near Halifax, in spring, many years since"; others were Welsh specimens, and had been received by entomological friends from the original captor. In 1869 (*Ent. Mo. Mag.* vi. 190) there is a record of two specimens taken in October at sugar in Monmouthshire. Two are mentioned as having been taken in November, 1870, but the locality is not given (*Ent. Mo. Mag.* vii. 188). In the spring of 1874 an example was found at rest on a birch trunk near Neath (*Entom.* vii. 260; *Ent. Mo. Mag.* x. 276).

The species was reared by Mr. W. Buckler in 1874 from eggs obtained from moths which had been captured in Wales in October, 1870, and kept in confinement during the winter. The larvæ began to hatch on April 17th, and were full grown about June 17th. The first imago emerged on August 7th, and the last ten days later (*Ent. Mo. Mag.* viii. 114). Mr. W. H. Tugwell, in 1880, bred eighteen moths from twenty eggs received from Glamorganshire (*Entom.* xiii. 242); and Mr. W. H. Grigg reared eight examples the same year from ten eggs that had been sent to him (*Ent. Mo. Mag.* xvii. 134). There were eight specimens in Machin's collection, which was sold at Stevens's in 1895, and these realised £3 7s.; while the sixteen examples in Wheeler's and Tugwell's sale made from 9s. to 12s. 6d. each.

It may be mentioned that *Xylina furcifera*, Hufn., is found in Central Europe, the Ural, and the Altai. *X. ingrlica*, H.-S., which is probably only a form of *X. furcifera*, is confined to boreal and alpine localities, and is always scarce. *X. (Agrotis) ustulata*, Bull., is the Japanese representative, and *X. grisea*, Graeser, the Amurland form of *X. ingrlica*.

Xylina lambda (= *zinkenii*) appears to be very rare in Britain. It was first brought forward by Dr. Knaggs in 1866, when he recorded a specimen from the neighbourhood of New Cross, where it was taken in the month of September of that year. Another example was announced from the Guildford district, and was obtained at sugar in October, 1866 (*Ent. Mo. Mag.* iii. 163, 208, 235). These specimens were also referred to by

Mr. Newman (Entom. iii. 203, 227) and by Dr. Knaggs in the 'Entomologist's Annual' for 1867 and 1868, a figure of the New Cross specimen being given in the volume for 1867. Mr. E. Hopley, in a communication to the 'Entomologist's Monthly Magazine,' 1869 (v. 252), states that an insect taken at rest on a poplar tree in the North of London in October, 1865, and which was considered to be a "strange example of *Acronycta psi*," turned out to be a specimen of *X. zinckenii*. In October, 1870, a specimen was captured at sugar in Darenth Wood (Ent. Mo. Mag. vii. 140).

At a meeting of the London Entomological Society, held in April, 1876, Mr. Bond exhibited a specimen which he stated had been taken near Erith in September, 1875; he also remarked that it was the fifth instance of the species having occurred in Britain (*vide* also Entom. ix. 191).

The most recent capture appears to be that of a specimen taken at sugar on September 30th, 1895, near Ipswich (Entom. xxix. 21).

There were two specimens in Fry's collection; these were stated to have been taken at "Rannorth," and were sold at Stevens's in March, 1896, at 12s. apiece.

This species is a native of Northern and Central Europe, but it is always scarce. The larva is said to feed on *Vaccinium uliginosum* and *Myrica gale*. *X. brachyptera*, Staud., from Amurland, is a very close ally.—Ed.]

XYLOPHASIA MONOGLYPHA (POLYODON) IN NOVEMBER.—As evidencing the extreme mildness of the weather, I may mention that a freshly emerged male specimen of *X. monoglypha* was taken yesterday, Nov. 16th, in this house, by my mother. Is not this late appearance very unusual?—C. GRANVILLE CLUTTERBUCK; 1, Spa Villas, Gloucester, Nov. 17th, 1898.

CAPTURES IN NOVEMBER.—At light, on Nov. 15th, I took four male *Asteroscopus sphinx* (*cassinea*), three male *Hybernia defoliaria*, and one male *Himera pennaria*; and on the 16th one male *A. sphinx* (which completely spoiled itself in the box in which it was being conveyed home), and two male *H. defoliaria*. On the 18th of the same month five male *A. sphinx* were found on the gas-lamps here, and two males and one female on the 19th; most of these specimens were inside the lamps, and very difficult to get at.—C. GRANVILLE CLUTTERBUCK; Gloucester.

CYMATOPHORA OCTOGESIMA (OCULARIS).—On Dec. 18th I was fortunate in finding a pupa of *C. octogesima* at poplar here.—C. GRANVILLE CLUTTERBUCK; Gloucester.

PHLOGOPHORA METICULOSA IN NOVEMBER.—With regard to your note respecting the occurrence of this species in November (Entom. xxxi. 293), I have not done much entomological work this autumn, but I examined some ivy in my garden here on Nov. 9th, 10th, 12th, 15th, and on each of those nights found specimens of *P. meticulosa* from two to eight in number.—WALDEGRAVE.

PHLOGOPHORA METICULOSA IN NOVEMBER: NOTES FROM THE CHESTER DISTRICT.—I took three specimens of *P. meticulosa* at the electric lamps here on Nov. 16th, and another on the 17th, all fine specimens, especially the last one. Other moths have been exceedingly few. One *Himera pennaria*, a female, was picked up, I think on the city walls in October; but this is the only representative I know, this season, of a species which seems to have been scarce since Nov. 8th, 1895, when I saw as many as six on one gas-lamp. I have seen very few *Hybernia defoliaria* and *Cheimatobia brumata* this autumn, and only one *Pecilocampa populi*, which came to an

electric lamp, Nov. 17th. A solitary *Scopelosoma satellitia*, Nov. 16th, completes my list up to date. (I see I omitted *Anehocelis lunosa* from my notes (Entom. xxxi. 298). Type and dark forms of this prettily marked moth were common at the lamps in September).—J. ARKLE; Chester.

LARVÆ OF *PIERIS BRASSICÆ* IN NOVEMBER.—On Nov. 17th I noticed that the cabbages in a garden near here were much eaten; upon closer observation, I found a number of larvæ of *Pieris brassicæ* upon them, just about full grown. Was it not very late in the year for these insects to be still in the larval stage?—F. D. BLAND; Llaurwst, N. Wales, Dec. 17th, 1898.

[For a still later date see Entom. xxix. 127.—ED.]

FORFICULA *LESNEI* AT COLCHESTER.—My son took three or four specimens of *F. lesnei* in the early part of the year, not very far from our house. Mr. Lucas's figure in the 'Entomologist' (xxx. pl. i. fig. 1) enabled me to determine the species at once.—W. H. HARWOOD; Colchester, Dec. 17th.

NOTES ON THE LEPIDOPTERA OF CHISWICK AND THE NEIGHBOURHOOD, 1898.—During the last two seasons *Lycæna argiolus* has, I am glad to say, again occurred frequently, after having for many years previously been very scarce. *Leucoma salicis* seems to be very uncertain in its appearance in this part of the country. Though I had long before made its acquaintance in the south, I never saw it in this district till May 31st, 1892, when I found many larvæ on Lombardy poplars at Barnes. From these I bred seven moths. The next year it was scarce, and I do not remember to have seen the species since. The larvæ of *Acronycta aceris* have been unusually common this year. My wife brought me one from Hyde Park. These larvæ, when resting, as their habit is, in a curled position on the under side of a sycamore leaf, much resemble those light-brown patches so common on the leaves of this tree in early autumn. The reddish tufts of hair on the back of the larva serve to heighten this effect. On May 9th I found a fine specimen of *Cucullia chamomilla* on a fence here, and another on May 23rd. The latter I set again at liberty, as it was rather worn. The only other specimen I have, I took here about 1870. Can anyone tell me how to find the handsome larva? as I should much like to rear this species.—ALFRED SICH; 65, Barrowgate Road, Chiswick.

NOTES FROM NORTH WALES.—In August, 1898, I spent a fortnight at Aber, North Wales, and did some collecting. Butterflies were not very plentiful owing to the prevalence of wind. Among those I noticed were the following:—*Pieris napi* (abundant, by far the commonest of the "whites"), *Vanessa urticae*, *V. io*, *V. atalanta*, *V. cardui* (a few in fine condition), *Pararge megæra*, *Satyrus semele*, *Cæonympha pamphilus*, *Polyommatus phlæas*, *Thecla quercus*, *Lycæna icarus*. Moths were fairly plentiful on favourable nights. Odd specimens of *Hydrecia micacea*, *Neuronia popularis* (males only), *Amphipyra tragopogonis*, and *Abrostola triplasia* came to light. I also noticed the following moths at various times during my visit:—*Lithosia complana*, *Hepialus sylvanus*, *Azylia putris*, *Mania maura*, *Plusia gamma*, *Selenia illunaria*, *Larentia didymata* (very common), *Hypsipetes elutata*, *Melanthia bicolorata*, *Melanippe subtristata*, *M. fluctuata*, *Cidaria immanata*, *C. prunata*, and *Eubolia limitata*.—P. J. BARRAUD; Bushey Heath, Herts.

COLLECTING AT DEAL.—I spent five days towards the end of July this year at Deal, collecting Lepidoptera. The weather being fine and hot,

insects were abundant, and amongst others I met with the following species:—*Nola centonalis*, one only on the night of July 24th; hard work on three subsequent nights failed to produce another specimen. *Porthesia chrysoorrhæa*, two specimens at light, and several others found by searching bushes in the daytime on the sandhills; a small batch of ova was obtained, and the larvæ are now hibernating. This is not, I believe, usually considered a rare insect; but in the course of twenty-five years' collecting I have never before met with it. *Lithosia lutarella* (*pygmæola*), fairly abundant, and occurring over a large area on the sandhills. I saw it stated in the entomological journals, some years back, that this insect was likely to become extinct at Deal, and was very pleased therefore to find it still in existence and by no means rare. Amongst the Noctuæ, *Agrotis tritici* and *A. vestigialis* were abundant and in fine condition; so also was *Caradrina alsines*. *Hydrécia nictitans* was just appearing; but *Xylophasia sublustris* and *Agrotis corticea* were scarce and probably getting over, as the specimens seen were all more or less worn. *Mesotype virgata* (*lineolata*) was plentiful in one or two places on the sandhills. *Crambus contaminellus*, not easily disturbed in the daytime; but at night by no means uncommon, a fine series being secured. On the marshes a few *Acidalia emutaria* were obtained during the day by beating the vegetation growing on the sides of the ditches. I was fortunate in obtaining ova, and have the larvæ now hibernating. My stay being so short gave me no time for night work on the marshes. There is no doubt but that our friends the golfers have done an immense amount of injury to the Deal sandhills from an entomological point of view, but fortunately their operations do not by any means cover the whole of the ground; and, judging merely from my limited experience, I do not see any reason why all, or nearly all, the Lepidoptera recorded from this locality should not still occur there, with the possible exception of *Acidalia ochrata*. I did not see a sign of this species, and very much fear that it is quite extinct there.—G. HAROLD CONQUEST; 58, Hatherley Road, Walthamstow, Dec. 12th, 1898.

COLLECTING AT BUSHEY HEATH, HERTS, AND NEIGHBOURHOOD, IN 1898.—The past season has been a very fair one for collecting Lepidoptera. Light was attractive during the greater part of the year, while hardly anything came to sugar until quite the latter part of the season. Sallow-hunting in the spring produced a fair number of species. In January and February I captured *Hybernia rupicapraria*, *H. leucophæaria*, *H. marginaria*, *H. defoliaria*, *Anisopteryx ascularia*, *Cheimatobia brumata*, *Larentia multistrigaria*, and *Phigalia pedaria* (*pilosaria*). Later, at sallows, I took *Teniocampa gothica* (common), *T. instabilis*, *T. populeti* (one male), *T. stabilis* (abundant), *T. munda*, *T. cruda* (abundant), *Cerastis vaccini* (few), *Scopelosoma satellitia* (few), and one *Brephos parthenias* flying in sunshine. In April I found the following species on palings, &c.:—*Xylocampa lithoriza* (common), *Amphidasys prodromaria* (*strataria*) (one female), *Larentia multistrigaria*, and a few *Anticlea badiata*. In May I netted *Hepialus lupulinus*, *Gonoptera libatrix*, *Drepana falcataria*, *Panagra petraria* (abundant), *Cabera exanthemata*, *Rumia cratagata*, and *Melanippe fluctuata*. The only captures at light in May were one *Cucullia verbasci* and one *Anticlea nigrofasciaria* (*derivata*). In this month I also found the following on palings, &c.:—*Tephrosia crepuscularia*, *Cilix spinula*, *Hemerophila abruptaria*, *Coremia designata*, *Selenia illunaria*, and *S. illustraria*. On Whit-Monday at Bricket Wood I captured *Argynnis euphrosyne*, *Co-*

nepteryx rhamni, *Cænonympha pamphilus*, *Venilia macularia*, *Acidalia remutaria*, and *Ematurga atomaria*; and in June I took twenty-one species, including *Sesia tipuliformis*, *Hecatera serena*, *Aptecta tincta* (one on palings), *Euclidia mi*, and *Cidaria russata*. In July light was very attractive. Among those I took were the following:—*Chærocampa porcellus*, *Thyatira batis* (one, in fine condition, the first I have taken at light), *Bryophila perla* (common), *Orthosia upsilon*, *Abrostola urtica*, *Plusia chrysitis*, *Eupithecia rectangulata*, *Hypsipetes elutata*, *Melanthia ocellata*, *Cidaria fulvata*, *C. dotata*, *C. associata*, and *Pelurga comitata*. Dusking resulted in the capture of *Chærocampa elpenor*, *Miana strigilis*, *Noctua augur*, *Plusia iota*. *Uropteryx sambucaria*, *Pericallia syringaria*, and others. Sugaring in July was most disappointing, the only capture being a single *Euplexia lucipara* on the 2nd. In September eighteen species were taken at sugar, the best being *Agrotis saucia*, *Xanthia citrago*, *X. gibuyo*, *Polia flavicincta*, *Catocala nupta*, and *Thera variata*. One *Macroglossa stellatarum* was netted in the garden at dusk; and I also found *Ennomos angularia* and *E. tiliaria* at rest. In October *Anchocelis pistacina*, *Cerastis vaccinii*, *C. spadicea*, *Scopelosoma satellitia*, *Meselia oxyacanthæ*, *Phlogophora meticulosa* (any number) occurred at ivy, and *Oporabia dilutata* was common on fences. November proved an unproductive month. I took one *Hybernia defoliaria* at light; and *H. auran-taria* (one only), *Oporabia dilutata*, and *Cheimatobia brunata* on palings. —P. J. BARRAUD; Bushey Heath, Herts.

OBSERVATIONS OF INSECTS DURING THE PAST SEASON.—On March 14th I noticed *Gonepteryx rhamni* in Somersetshire; but the month being somewhat cold I did not see it again until April, when it was fairly abundant locally. *Lycæna argiolus* appeared in same district on April 17th. Visiting South Wales in May, I found *Euchloë cardamines* on the 4th; it did not afterwards appear so abundant as in other years, the season being wet and cold at times; and yet on bright days *Lycæna argiolus* locally, however, appeared commonly. *Argynnis euphrosyne* was not so abundant as in some seasons. Vegetation at this time was much later than usual, the hawthorn not being in bloom until the end of the second week of May. In June the "whites," especially *Pieris brassica*, were more frequently seen than in the previous season. I did not try sugaring often, as moths appeared so sparingly. On June 22nd I noticed a female *E. cardamines* in Breconshire; and again a male was seen so late as July 5th in the same county. None of the Geometræ during June and July were at any time abundant. On August 15th I noticed several examples of that wanderer *Pieris napi* flying over the top of the Sugar Loaf Mountain. *Polyommatus phlæas* might then be seen frequently in that part of Wales; and *Vanessa io*, *V. atalanta*, and *G. rhamni* were then appearing. Wasps and their nests were also excessively common. On August 30th I noticed a single *Colias edusa* flying by the side of the railway near Taunton, Somerset, the only one seen during the season. During September in West Somerset the "whites" in some localities were very commonly seen; and I noticed several times single specimens of *Macroglossa stellatarum*—now at late blossoms of the heather, and then in gardens. I heard of *Sphinx convoluti* being frequently seen in other parts of Somersetshire, and it also turned up in Gloucestershire. In October, with the exception of *Anchocelis pistacina* and *Phlogophora meticulosa*, moths were scarce the few times I was able to visit the ivy bloom, as wet

weather set in. I find, in conclusion, that, with the exception of the insects before mentioned, it has not been a good season for Lepidoptera. I noticed very few examples of that often abundant and lively insect *Plusia gamma*.—T. B. JEFFERYS; Bath.

RECENT LITERATURE.

Handbook of Insects Injurious to Orchard and Bush Fruits, with Means of Prevention and Remedy. By ELEANOR A. ORMEROD. 8vo, pp. x, 286. London: Simpkin, Marshall, Hamilton, Kent & Co., Limited. 1898.

In this volume, the most recent of Miss Ormerod's valuable contributions to the literature of economic entomology, all the most important information on the subject has been brought together and presented in a form that should be of great help to the fruit-grower.

The matter is arranged in accordance with the alphabetical sequence of the various fruits considered; thus, under the heading "Apple" there are accounts of American Blight (Woolly Aphis), *Schizoneura lanigera*, Apple Aphis (*Aphis mali*), Codlin Moth (*Carpocapsa pomonella*), Figure-of-8 Moth (*Diloba carulcocephala*), Goat Moth (*Cossus ligniperda*), Lackey Moth (*Clisiocampa neustria*), Lappet Moth (*Gastropacha quercifolia*), Small Ermine Moth (*Hyponomeuta padellus*), Garden Chafer (*Phyllopertha horticola*), Apple Sawfly (*Hopllocampa testudinca*), Mussel Scale (*Mytilaspis pomorum*), Apple Chermes (*Psylla mali*), Apple-blossom Weevil (*Anthonomus pomorum*). In all cases the questions of prevention and remedy are fully treated, and figures of each "pest" in its mature and one or more of its earlier stages are given.

Referring to *Carpocapsa pomonella*, our author states that other orchard fruits besides apples are liable to this infestation. "Pears are sometimes much injured; quince, plum, peach, and apricot are sometimes attacked; walnuts have been found infested; and this species has been recorded as having been bred frequently from sweet chestnuts. The method of infestation is for the moths to come out about the time of the opening of the apple blossoms, and when the petals have fallen and the embryo fruit is beginning to form, the females lay their eggs; formerly it was supposed especially at the eye or blossom end of the fruit, but according to recent observations it appears that the eggs may be attached anywhere,—to the surface of the fruit, or to its stem."

In the case of *Gastropacha quercifolia* Miss Ormerod says:—"The attack of the lappet caterpillars to orchard leafage has very rarely been reported as occurring to any injurious extent with us, and here, as well as on the Continent of Europe (where the attack is much more destructive), it is rather from the great size of the caterpillars than from their numbers that they are seriously mischievous."

The illustrations in the text, over sixty in number, are excellent, and there is a portrait of the author, reproduced from a photograph by Messrs. Elliott & Fry. We have very great pleasure in commending this handy manual not only to those for whom it has been especially prepared, but also to the student of general entomology.

Proceedings of the South London Entomological and Natural History Society for 1898. Part I. Pp. 32. Published at the Society's Rooms, Hibernia Chambers, S.E. November, 1898.

CONTAINS the following papers read before the Society during the first half of the session:—1. "The Lasiocampids," by J. W. Tutt, F.E.S.; 2. "British Species of Lepidoptera occurring in Japan," by R. South; 3. "Notes on Collecting British Hemiptera," by Edward Saunders, F.L.S., F.E.S.; 4. "Notes on some South European Lepidoptera, with Remarks on *Thais* and *Euchloë*," by A. H. Jones, F.E.S.

In his contribution, Mr. Tutt has collected together a good deal of information concerning the natural history of the group of moths he refers to as Lasiocampids. He divides these into six tribes and nine genera. *Neustria* and *castrensis* are referred to *Malacosoma*, which, together with *Macrothylacia* (*Bombyx*) *rubi*, are placed in the fifth tribe. *Cosmotriche* is adopted for *potatoria*, *Gastropacha* for *quercifolia*, and *Phyllodesma* for *ilicifolia*, all three being comprised in tribe six, but the two last generic names are afterwards changed to *Eutricha* and *Epicnaptera* respectively.

The device usually employed to indicate the probable relationship of families and genera of Lepidoptera has here assumed the form of a veritable genealogical tree.

We note that the author says that he has "long come to the conclusion that synonymy is of the devil." Probably, however, it is easier to settle questions connected with the priority and significance of written names than it is to fix the order in which groups of living organisms were evolved.

Mr. Saunders's paper is a useful introduction to the collection and study of Hemiptera; and that by Mr. Jones is interesting, and embraces some instructive remarks on *Thais* and *Euchloë*.

Manchester Microscopical Society. Transactions and Annual Report, 1897. Pp. 114, with 8 photo plates. Manchester: published by the Society. July, 1898.

AMONG the contents are two entomological papers, one of which, by A. T. Gillanders, deals with "The Hemiptera-Homoptera," and the other, entitled "Natural Selection in the Lepidoptera," is by Mark L. Sykes. The latter discusses the question of "Mimicry," and is illustrated by eight excellent plates.

Marvels of Ant Life. By W. F. KIRBY, F.L.S., F.E.S., &c. Pp. 174, illustrated. London: S. W. Partridge & Co. 1898.

A CHARMING little book, teeming with interesting facts connected with the habits and natural economy of ants of all countries. Our author professes to have furnished us with a popular rather than a scientific work, but we find, nevertheless, that the information supplied is scientifically accurate and of a distinctly educational character.

THE ENTOMOLOGIST

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[No. 429.

LEPIDOPTERA PHALÆNÆ OF THE WHOLE WORLD.*

WE have here the first volume of a gigantic undertaking, which will mark a new era in the study of the Heterocera or, as we must now term them, the Lepidoptera Phalænæ. Though it professes to be a catalogue of specimens in the British Museum, we learn in the introduction that descriptions of all species hitherto described are included of which specimens are available for study, or about which sufficiently reliable information is published to enable them to be classified with approximate correctness, and lists of species of which the descriptions are insufficient will be given. No new species are described unless they are represented by specimens in the British Museum. In simple terms, the work is to include all known moths, and will enable any specimen to be at once named or shown to be a new species, a matter at present impossible without access to the best libraries and collections, and then only after a laborious search.

When we find that the present volume of 580 pages treats of only one family—viz., the Syntomidæ—and contains descriptions of 1184 species, some idea of the probable extent of the work may be formed.

The descriptions appear to be all drawn up by the author, usually with the type specimen before him. Here and there only are there any references to early stages, these appearing to be quite unknown in most species. The known larvæ of *Dysauxes punctata* and *ancilla* are not however referred to. A large number of new genera and species are defined. There is also an atlas

* 'Catalogue of the Lepidoptera Phalænæ in the British Museum': Vol. I.—'Catalogue of the Syntomidæ in the Collection of the British Museum.' By Sir George F. Hampson, Bart. London: Printed by order of the Trustees. 1898. Pp. xxi, 559. Seventeen coloured plates.

of 17 coloured plates, with 466 figures, chiefly of species of which no reference to a good figure can be given, and there are 285 woodcuts in the text.

As a descriptive catalogue the work seems to be eminently satisfactory, and the British Museum and the entomological public are to be congratulated that such an important undertaking should have fallen to so capable an author. In the larger genera many of the species seem closely allied, and our impression is confirmed that in some of these a recognition of geographical variation may diminish the number of separate species. This is a subject of which the study will be much facilitated by the present volume, when the long enough series and a knowledge of early stages are obtained.

The table of phylogeny of Syntomidæ is interesting, but we doubt whether anyone but the author possesses the knowledge necessary to intelligently consider it. We confess our inability to criticise it.

There is a short introduction giving some general information about early stages, structure, phylogeny, and geographical distribution. Possibly that dealing with phylogeny presents items of most general interest. To a descriptive catalogue like this, the phylogeny adopted is really of very little importance, as each volume will be complete in itself; but as a subject of general interest it is really what we are all working at, either as regards the relationship of orders and families, or, in closer detail, of species and varieties to each other. The views held by Sir George Hampson, who has a knowledge of the forms and structure of lepidopterous imagines that is perhaps unequalled, are, therefore, worth some study. A comparison of the table on p. 16, with that in the 'Moths of India,' vol. i. p. 8, 1892, shows what a great advance has been made in the last six years. So great in some respects are the differences, that an equal advance in the next six years will give us a tree that will be very near the truth.

Besides including the butterflies, the present table strikes us at once as rescuing the Syntomidæ from their traditional, but absurd, place beside the *Zygænas* (*Anthrocera*), and placing them with the Arctiadæ and Noctuidæ, brought from two different positions in the 1892 table. The Limacodidæ are brought into a less impossible place. The Pterophoridæ are in a conceivable position; and several other collocations are more in accordance with the positions suggested by other than the imaginal stage. There still remain several arrangements that are extremely doubtful. Of these the most pronounced is the place assigned to *Zygæna*. This is more satisfactorily placed in the 1892 table, as it is a terminal form. The highly specialised larva forbids its being an ancestor of many forms placed above it, though its

imaginal and pupal states do not stand greatly in the way. For a Cossid or Psychid larva to be derived from a Zygænid one seems impossible. As positions that are not impossible, but very unlikely, the collocation of Sphingids and Cymatophorids seems open to question. We should remove the Cymatophorids to the Geometridæ, and both nearer the Pyralidæ. The rest of the flat-egged families on the Notodontid stirps should be brought to the Limacodid stem.

However, it is easier to criticise than to construct; and no phylogeny of Lepidoptera yet suggested has quite pleased anyone but the author, whom we may guess to be often as dissatisfied as anyone else. The materials are not yet nearly abundant enough. The 'Key' is a much better one than in the 'Moths of India,' being founded for the most part on significant characters, or rather these are taken more in order of their importance, giving a more natural result. The families placed in the 'Key,' under A. b. b¹. have no greater claim to be other than subfamilies of Tineidæ than many that are not differentiated, except perhaps the Pyralidæ. They differ by superficial characters, chiefly the good old one of size. The table and key still show traces of a fault to which all systematists are prone, and, from having had the field so much to themselves, neurationalists perhaps more than others. That is, the assumption that a similar neurational (or whatever character the systematist affects) means alliance, a different one divergence, not merely usually and generally, as is indeed truly the case, but practically always and without exception. Where other structures dispute this position, they are prepared to say that these other structures may differ widely in allied forms, or may have reached a practically identical specialisation in very distinct forms; no doubt a correct proposition, but they appear to be unable to apply it to the character they have adopted. This is no doubt largely inevitable, as a specialist does not know what value to attach to structures that he has not studied in detail. We recognise in the table that its author is still largely a neurationalist, but not absolutely so, or altogether unable to use his wide knowledge to modify neurational conclusions.

T. A. C.

ON SOME AQUATIC RHYNCHOTA FROM JAMAICA.

BY G. W. KIRKALDY.

THE works of Uhler, Guérin, Poey, and others have made a good foundation for a knowledge of the aquatic Rhynchota of Cuba, Grenada, and St. Vincent, among the Antilles; but it is remarkable that, with the exception of two species, nothing has been recorded from the large island of Jamaica.

My kind friend Mr. C. B. Taylor has lately been collecting for me in the vicinity of Kingston, and the results of his first consignment are now recorded.

1. *KALLISTOMETRA*, n. gen.

Belonging to the family Gerridæ and tribe Halobatitæ.

First segment of the antennæ nearly twice as long as the second. Pronotum short, mesonotum and metanotum well developed; suture between meso- and metasternum straight. Metasternum apparently concealed by mesosternum. Posterior femora longer than intermediate, which are longer than anterior. Second segment of anterior tarsi three times as long as the first. Claws inserted below the apices of the tarsi.

Differs from *Trepobates*, Uhler, in the incrassation of the anterior femora, in the straightness of the posterior margin of the mesonotum, &c.; from *Trepobatopsis*, Champion, in the elongate oval form, in the visibility of the propleura from above, in the straightness of the posterior margin of the mesonotum, &c. The length of the abdomen, moreover, will distinguish it from any of the smaller Halobatitæ (Gerrinæ with convex intero-lateral ocular margins).

Type. *K. taylori*, n. sp.

♀. Apterous. First antennal segment two-thirds longer than the head, nearly twice as long as the second segment. Eyes large, oblique. Head longer than the short transverse pronotum, the breadth of which is twice as great as its length. Mesonotum two and a half times as long (along its median line) as the pronotum; two-thirds longer than the metanotum (along its median line). Metanotum triangularly produced at the base on either side of the middle point at an angle of about 135°. Pronotum and mesonotum not clearly sutured from their pleura. Mesopleura produced triangularly over the metapleura. Labrum very small, acutely triangular; rostrum reaching well beyond the apical margin of the mesosternum. Posterior femur one-sixth longer than the intermediate, which is three-quarters longer than the anterior; anterior femur one-half longer than the tibia, which is three-fifths longer than the tarsi, second tarsal segment three times as long as the first; claws inserted about two-thirds of the length of the second segment from its base. Posterior femur about seven and one half times

longer than the tibia. Seventh abdominal (ventral) segment roundly emarginate. Length 3·75 mill., width 1·9 mill.

Jamaica, St. Andrew; C. B. Taylor, Sept. 1898.

Black and stramineous. Head stramineous, with a broad black median line between the eyes. Pronotum stramineous, with two almost contiguous median black lines, mesonotum with a narrow black median line and two submarginal elongate O's, their centres stramineous, base of mesonotum (except at the middle) stramineous. Metanotum with four broad diagonal stramineous bands, the two basal uniting anteriorly to form an obtuse angle. First abdominal segment with a large stramineous spot in the middle, sixth and seventh segments stramineous. Antennæ blackish (except the basal fourth of first segment); labrum and apical two segments of rostrum black. Mesopleura with a broad black marginal band extending almost from the apex to the base; mesosternum with a narrow black submarginal line and two short almost parallel black lines near the middle. Sternal sutures of thorax and ventral suture of connexivum black; the rest of ventral surface yellowish cinereous. Anterior tarsi, posterior femora, and posterior tibiæ blackish; anterior femora yellowish, with two black annules near the apex, anterior tibiæ yellowish, black near the apex and base; intermediate femora yellowish, with two or three long black lines.

*2. *Pelocoris femoratus* (Palisot de Beauvois).

"From under floating weed" in "the Hunts Bay River, St. Catharine."

*3. *Belostoma colossicum* (Stål).

No special locality.

*4. *Belostoma annulipes*, Herrich-Schäffer.

No special locality.

*5. *Ranatra annulipes*, Stål.

The vicinity of Kingston is not favourable to the collection of waterbugs, as there are no ponds or pools of still water. From an ornamental tank (Constant Spring, St. Andrew), "about two-thirds full of tepid foul water, the surface entirely covered with confervæ," an hour's work produced this species and fragments of a *Notonecta*.

6. *Notonecta undulata*, Say.

Mr. Taylor informs me that this species "comes to 'light' in great numbers, and is often a great nuisance at the dinner-table."

St. Andrew, four or five miles from Rae Town; Balaclava, St. Elizabeth (middle of the island).

* The species preceded by an asterisk have been kindly examined by Dr. Montandon also.

This is the "*N. variabilis*, Fieber," of Guérin, in Sagra's 'Cuba,' and differs slightly from the northern *undulata* in the form of the head, but scarcely sufficiently to warrant a varietal name. The colouring of the elytra varies from almost unicolorous pale luteous (with a yellow mesonotum) to almost black, with a luteous claval band (and a black mesonotum).

7. *Anisops antigone*, n. sp.

Belongs to "*macrophthalmus*" group.

♀. Pronotum, mesonotum, and elytra finely but rather sparsely punctured. Head short, rather truncate in front, vertex five-eighths wider than synthlipsis. Mesonotum one-third longer than pronotum, posterior margin of the latter sinuate. Anterior tibia one-fourth longer than the tarsus, armed with a strong tooth at the base, first segment of tarsus nearly twice as long as second; claws falcate. Intermediate tibia one-fourth longer than tarsus, first segment of the latter two-thirds longer than the second; claws falcate. Posterior femora armed with a double row of fairly stout spines, each row containing about twenty-five spines, set somewhat widely apart. Length 8.5 mill.

Jamaica, St. Andrew; C. B. Taylor, Sept. 1898.

This species bears a certain resemblance to large females of *A. pallipes* (Fabricius), in which, however, the claws are digitiform, and the posterior femora are armed with two rows of slight spines, each row consisting of nearly one hundred closely-set spines. It is remarkable that in nearly all the species of *Anisops* known to me the male is comparatively, in some species extremely, rare.

Cinereous, hyaline; labrum and *entire rostrum* black, and a longitudinal blackish line along the posterior legs; venter of abdomen and last four or five segments (dorsal) of abdomen blackish.

8. *Anisops elegans*, Fieber.

A single specimen from St. Andrew.

The only other records from Jamaica, of which I am aware, are—

9. *Trochopus plumbeus* (Uhler) = *marinus*, Carpenter. [See Carpenter in Ent. Mo. Mag. 1898, p. 78.]

10. *Rhagovelia collaris* (Burm.). [See Johnson and Fox in 'Entom. News,' iii. 1892, p. 60.]

There are also some examples of a species of *Corixa* from Jamaica in Dr. Montandon's collection, now before me. They are probably *C. kollarii*, Fieber, but as they are all females, I cannot be sure.

LEPIDOPTERA FROM CHINA.

By W. F. KIRBY, F.L.S., F.E.S.

I HAVE lately received a small collection of insects of various Orders from Mr. T. B. Fletcher, of H.M.S. 'Centurion,' for the Natural History Museum; and as they are all carefully labelled with dates and localities, I think it may be useful to publish a list of the Lepidoptera, though they are but few. All except those which I have marked "C" (Chifu) and "H. K." (Hong Kong) were taken on Len-Kung-Tan Island, Wei-Hai-Wei. All were taken during 1898.

Lethe rohria, Fab. (H. K.); March 23rd.

Mycalesis mineus, L., var. *confucius*, Leach (H.K.); March 15th and 17th.

Crebeta deidamia, Eversm.; March 28th.

Cænonympha amaryllis, Cram.; June 14th.

Clerome euneus, Drury (H. K.); March 17th.

Argynnis nerippe, Felder; June 14th.

Neptis hainana, Moore (H. K.); March 12th.

Zemeros confucius, Moore (H. K.); March 12th.

Chrysophanus turcicus, Gerh. (C.); May 5th and 13th.

Pieris daplidice, L.; June 12th.

Macroglossa stellatarum, L.; June 14th.

Zygæna phegea, L.; June 14th.

Spilarctia bifrons, Walk. (H. K.); March 12th.

Heliothis scutosa, W. V.; June 12th.

Spiramia simplicior, Butl. (C.); May 21st.

Zygæna phegea is perhaps, geographically, the most interesting species in the above list.

Natural History Museum, Nov. 24th.

THE NOMENCLATURE AND ARRANGEMENT OF BRITISH BUTTERFLIES ACCORDING TO VARIOUS RECENT AUTHORS.

IN the following list of British Butterflies the species are arranged as enumerated in the 'Entomologist Synonymic List.' References are given to 'Lepidoptera of the British Islands,' vol. i., by C. G. Barrett (1893); 'A Handbook of British Lepidoptera,' by E. Meyrick (1895); and 'British Butterflies,' by J. W. Tutt (1896). Newman's 'British Butterflies' is also cited, and the generic changes indicated by Prof. A. Radcliffe Grote (Proc. South London Entomological and Natural History Society,

1897, pp. 54–59) are also included. The figures in brackets show the sequence of the species according to the arrangement of each author referred to.

RICHARD SOUTH.

LIST OF BRITISH BUTTERFLIES.

1. PAPILIO MACHAON, Linn.
P. machaon, Barr. p. 13 (1); Meyr. p. 355 (60); Tutt, p. 217 (28); Newm. p. 150 (52).
2. APORIA CRATÆGI, Linn.
A. cratægi, Barr. p. 18 (2); Meyr. p. 354 (59); Tutt, p. 225 (29); Newm. p. 167 (59).
3. PIERIS BRASSICÆ, Linn.
P. brassicæ, Barr. 21 (3); Meyr. p. 354 (58); Tutt, p. 229 (30); Newm. p. 165 (58).
Mancipium brassicæ, Grote (2).
4. PIERIS RAPÆ, Linn.
P. rapæ, Barr. p. 23 (4); Meyr. p. 253 (57); Tutt, p. 232 (31); Newm. p. 161 (57).
5. PIERIS NAPI, Linn.
P. napi, Barr. p. 24 (5); Meyr. p. 253 (56); Tutt, p. 235 (32); Newm. p. 160 (56).
6. PIERIS DAPLIDICE, Linn.
P. daplidice, Barr. p. 26 (6); Meyr. p. 353 (55); Tutt, p. 240 (33); Newm. p. 158 (55).
Pontia daplidice, Grote (5).
7. EUCHLOË CARDAMINES, Linn.
Anthocharis cardamines, Barr. p. 28 (7); Newm. p. 156 (54).
Euchloë cardamines, Meyr. p. 352 (53); Tutt, p. 243 (34).
8. LEUCOPHASIA SINAPIS, Linn.
L. sinapis, Barr. p. 30 (8); Meyr. p. 352 (54); Tutt, p. 248 (35); Newm. p. 154 (53).
Leptidia sinapis, Grote (11).
9. COLIAS HYALE, Linn.
C. hyale, Barr. p. 32 (9); Meyr. p. 350 (50); Tutt, p. 251 (36); Newm. p. 141 (49).
Eurymus hyale, Grote (8).
10. COLIAS EDUSA, Fabr.
C. edusa, Barr. p. 35 (10); Meyr. p. 351 (51); Tutt, p. 257 (37); Newm. p. 143 (50).
Eurymus edusa, Grote (9).
11. GONOPTERYX RHAMNI, Linn.
Gonepteryx rhamni, Barr. p. 39 (11); Meyr. p. 351 (52); Tutt, p. 263 (38).
Rhodocera rhamni, Newm. p. 147 (51).
Colias rhamni, Grote (7).

12. ARGYNNIS SELENE, Schiff.
A. selene, Barr. p. 178 (46); Meyr. p. 330 (7); Newm.
 p. 37 (7).
Brenthis selene, Tutt, p. 295 (43).
13. ARGYNNIS EUPHROSYNE, Linn.
A. euphrosyne, Barr. p. 174 (45); Meyr. p. 330 (6); Newm.
 p. 35 (6).
Brenthis euphrosyne, Tutt, p. 300 (44).
14. ARGYNNIS LATONA, Linn.
A. lathonia, Barr. p. 170 (44); Meyr. p. 330 (5); Tutt,
 p. 281 (40); Newm. p. 33 (5).
Issoria lathonia, Grote (25).
15. ARGYNNIS AGLAIA, Linn.
A. aglaia, Barr. p. 167 (43); Meyr. p. 329 (4); Tutt, p. 290
 (42); Newm. p. 25 (2).
16. ARGYNNIS ADIPPE, Linn.
A. adippe, Barr. p. 161 (42); Meyr. p. 329 (3); Tutt,
 p. 285 (41); Newm. p. 31 (4).
17. ARGYNNIS PAPHIA, Linn.
A. paphia, Barr. p. 156 (41); Meyr. p. 329 (2); Newm.
 p. 22 (1).
Dryas paphia, Tutt, p. 274 (39).
18. MELITÆA AURINIA, Rott.
M. artemis, Barr. p. 196 (49); Newm. p. 39 (8).
M. aurinia, Meyr. p. 331 (8); Tutt, p. 315 (47).
19. MELITÆA CINXIA, Linn.
M. cinxia, Barr. p. 190 (48); Meyr. p. 331 (9); Tutt, p. 310
 (46); Newm. p. 43 (9).
20. MELITÆA ATHALIA, Rott.
M. athalia, Barr. p. 185 (47); Meyr. p. 331 (10); Tutt,
 p. 304 (45); Newm. p. 46 (10).
21. VANESSA C-ALBUM, Linn.
V. c-album, Barr. p. 121 (34); Meyr. p. 332 (11).
Polygonia c-album, Tutt, p. 344 (52).
Grapta c-album, Newm. p. 49 (11).
22. VANESSA POLYCHLOROS.
V. polychloros, Barr. p. 127 (35); Meyr. p. 333 (13); Newm.
 p. 55 (13).
Eugonia polychloros, Tutt, p. 340 (51).
23. VANESSA URTICÆ, Linn.
V. urticæ, Barr. 131 (36); Meyr. p. 333 (12); Newm.
 p. 52 (12).
Aglais urticæ, Tutt, p. 334 (50).
24. VANESSA IO, Linn.
V. io, Barr. p. 136 (37); Meyr. p. 333 (14); Newm. p. 60
 (15); Tutt, p. 325 (48).
Hamadryas io, Grote (19).

25. VANESSA ANTIOPA, Linn.
V. antiopa, Barr. p. 140 (38); Meyr. 333 (15); Newm.
 p. 58 (14).
Euvanessa antiopa, Tutt, p. 329 (49).
26. VANESSA ATALANTA, Linn.
V. atalanta, Barr. p. 145 (39); Meyr. p. 334 (16).
Pyrameis atalanta, Tutt, p. 355 (54); Newm. p. 62
 (16).
27. VANESSA CARDUI, Linn.
V. cardui, Barr. p. 149 (40); Meyr. p. 334 (17).
Pyrameis cardui, Tutt, p. 350 (53); Newm. p. 64 (17).
28. LIMENITIS SIBYLLA, Linn.
L. sibylla, Barr. p. 117 (33); Meyr. p. 335 (18); Tutt,
 p. 361 (55); Newm. p. 67 (18).
29. APATURA IRIS, Linn.
A. iris, Barr. p. 105 (31); Meyr. p. 335 (19); Tutt, p. 380
 (57); Newm. p. 71 (19).
Potamis iris, Grote (13).
30. MELANARGIA GALATEA, Linn.
M. galathea, Barr. p. 204 (50); Meyr. p. 337 (20); Newm.
 p. 77 (20).
M. galatea, Tutt, p. 435 (68).
Agapetes galathea, Grote (32).
31. EREBIA EPIPHRON, Knoch.
E. epiphron, Barr. p. 210 (51); Meyr. p. 340 (28); Newm.
 p. 80 (21).
Melampias epiphron, Tutt, p. 425 (66).
32. EREBIA ÆTHIOPS, Esp.
E. blandina, Barr. p. 216 (52).
E. æthiops, Meyr. p. 340 (27); Tutt, p. 430 (67).
E. medea, Newm., p. 82 (22).
33. PARARGE EGERIA, Linn.
P. ægeria, Barr. p. 227 (54); Meyr. p. 337 (21).
P. egeria, Tutt, p. 387 (58).
Pyrarga egeria, Newm. p. 86 (23).
34. PARARGE MEGÆRA, Linn.
P. megæra, Barr. p. 234 (55); Meyr. p. 337 (22); Tutt,
 p. 392 (59).
Pyrarga megæra, Newm. p. 87 (24).
Lasiommata megæra, Grote (31).
35. SATYRUS SEMELE, Linn.
S. semele, Barr. p. 222 (53); Meyr. p. 338 (23); Newm.
 p. 89 (25).
Hipparchia semele, Tutt, p. 397 (60).
Eumenis semele, Grote (40).

36. EPINEPHELE IANIRA, Linn.
E. janira, Barr. p. 240 (56); Meyr. p. 339 (24); Tutt,
 p. 402 (61); Newm. p. 91 (26).
Maniola ianira, Grote (39).
37. EPINEPHELE TITHONUS, Linn.
E. tithonus, Barr. p. 245 (57); Meyr. p. 339 (25); Tutt,
 p. 407 (62); Newm. p. 93 (27).
Pyronia tithonus, Grote (38).
38. EPINEPHELE HYPERANTHES, Linn.
E. hyperanthus, Barr. p. 251 (58); Meyr. p. 339 (26);
 Newm. p. 95 (28).
Enodia hyperanthus, Tutt, p. 411 (63).
Hipparchia hyperanthus, Grote (33).
39. CÆNONYMPHA TYPHON, Rott.
C. davus, Barr. p. 255 (59); Newm. p. 97 (29).
C. tiphon, Meyr. p. 341 (29); Tutt, p. 416 (64).
40. CÆNONYMPHA PAMPHILUS, Linn.
C. pamphilus, Barr. p. 263 (60); Meyr. p. 341 (30); Tutt,
 p. 421 (65); Newm. 101 (30).
41. THECLA BETULÆ, Linn.
T. betulæ, Barr. p. 43 (12); Meyr. p. 343 (35); Newm.
 p. 112 (36).
Zephyrus betulæ, Tutt, p. 202 (24).
42. THECLA W-ALBUM, Knoch.
T. w-album, Barr. p. 45 (13); Meyr. p. 343 (34); Tutt,
 p. 206 (25); Newm. p. 108 (34).
43. THECLA PRUNI, Linn.
T. pruni, Barr. p. 48 (14); Meyr. p. 343 (33); Tutt, p. 208
 (26); Newm. p. 110 (35).
44. THECLA QUERCUS, Linn.
T. quercus, Barr. p. 51 (15); Meyr. p. 344 (36); Newm.
 p. 106 (33).
Zephyrus quercus, Tutt, p. 199 (23).
Aurotis quercus, Grote (45).
45. THECLA RUBI, Linn.
T. rubi, Barr. p. 53 (16); Meyr. p. 343 (32); Newm.
 p. 105 (32).
Callophrys rubi, Tutt, p. 196 (22).
46. POLYOMMATUS DISPAR, Haw.
Chrysophanus dispar, Barr. p. 56 (17); Meyr. p. 346 (42);
 Tutt, p. 149 (9).
Polyommatus hippothoë, Newm. p. 114 (37).
47. POLYOMMATUS PHLÆAS.
Chrysophanus phlæas, Barr. p. 62 (18); Meyr. p. 346 (41);
 Tutt, p. 152 (10).
Polyommatus phlæas, Newm. p. 115 (33).
Heodes phlæas, Grote (58).

48. *LYCÆNA BÆTICA*, Linn.
L. bætica, Barr. p. 65 (19); Meyr. p. 347 (43).
Lampides bætica, Newm. p. 117 (39); Tutt, p. 192 (21).
49. *LYCÆNA ÆGON*, Schiff.
L. ægon, Meyr. p. 348 (47); Newm. p. 119 (40).
Polyommatus ægon, Barr. p. 70 (21).
Plebeius ægon, Tutt, p. 182 (18).
Lycæides ægon, Grote (49).
50. *LYCÆNA ASTRARCHE*, Bgstr.
Polyommatus agestis, Barr. p. 73 (22).
Chrysophanus astrarche, Meyr. p. 346 (40).
Polyommatus astrarche, Tutt, p. 179 (17).
Lycæna medon, Newm. p. 123 (41).
51. *LYCÆNA ICARUS*, Rott.
Polyommatus alexis, Barr. p. 77 (23).
Lycæna icarus, Meyr. p. 349 (48); Newm. p. 128 (42).
Polyommatus icarus, Tutt, p. 174 (16).
52. *LYCÆNA BELLARGUS*, Rott.
Polyommatus adonis, Barr. p. 80 (24).
Lycæna bellargus, Meyr. p. 348 (46).
Polyommatus bellargus, Tutt, p. 170 (15).
Lycæna adonis, Newm. p. 129 (43).
53. *LYCÆNA CORYDON*, Fabr.
Polyommatus corydon, Barr. p. 85 (25); Tutt, p. 166 (14).
Lycæna corydon, Meyr. p. 348 (45); Newm. p. 131 (44).
54. *LYCÆNA ARGIOLUS*, Linn.
Polyommatus argiolus, Barr. p. 88 (26).
Lycæna argiolus, Meyr. p. 347 (44); Newm. p. 135 (47).
Cyaniris argiolus, Tutt, p. 187 (20).
55. *LYCÆNA SEMIARGUS*, Rott.
Polyommatus acis, Barr. p. 94 (28).
Chrysophanus semiargus, Meyr. p. 345 (39).
Nomiades semiargus, Tutt, p. 164 (13).
Lycæna acis, Newm. p. 133 (45).
56. *LYCÆNA MINIMA*, Fues.
Polyommatus alsus, Barr. p. 92 (27).
Chrysophanus minimus, Meyr. p. 345 (38).
Cupido minima, Tutt, p. 160 (12).
Lycæna alsus, Newm. p. 134 (46).
57. *LYCÆNA ARION*, Linn.
Polyommatus arion, Barr. p. 96 (29).
Lycæna arion, Meyr. p. 349 (49); Tutt, p. 157 (11); Newm.
p. 136 (48).
58. *NEMEOBIUS LUCINA*, Linn.
N. lucina, Barr. p. 102 (30); Meyr. p. 342 (31); Tutt,
p. 210 (27); Newm. p. 103 (31).

59. SYRICHTHUS MALVÆ, Linn.
S. alveolus, Barr. p. 268 (61); Tutt, p. 122 (2).
Hesperia malvæ, Meyr. p. 356 (61); Newm. p. 170 (60).
60. NISONIADES TAGES, Linn.
N. tages, Barr. p. 304 (68); Tutt, 119 (1).
Hesperia tages, Meyr. p. 357 (62); Newm. p. 170 (61).
Thanaos tages, Grote (67).
61. HESPERIA THAUMAS, Hufn.
H. linea, Barr. p. 275 (62); Newm. p. 174 (66).
Pamphila thaumas, Meyr. p. 358 (64).
Thymelicus thaumas, Tutt, p. 138 (7).
Adopæa thaumas, Grote (64).
62. HESPERIA ACTÆON, Rott.
H. actæon, Barr. p. 283 (64); Newm. p. 173 (65).
Pamphila actæon, Meyr. p. 359 (66).
Thymelicus actæon, Tutt, p. 132 (5).
Adopæa actæon, Grote (63).
63. HESPERIA SYLVANUS, Esp.
H. sylvanus, Barr. p. 289 (65); Newm. p. 172 (63).
Pamphila sylvanus, Meyr. p. 359 (67); Tutt, p. 126 (3).
Augiades sylvanus, Grote (62).
64. HESPERIA COMMA, Linn.
H. comma, Barr. p. 294 (66); Newm. p. 172 (64).
Pamphila comma, Meyr. p. 359 (68); Tutt, p. 128 (4).
Erynnis comma, Grote (61).
65. CARTEROCEPHALUS PALÆMON, Pall.
C. palæmon, Tutt, p. 140 (8).
Cyclopides paniscus, Barr. p. 298 (67).
Cyclopædes palæmon, Meyr. p. 357 (63).
Hesperia paniscus, Newm. p. 171 (62).
Pamphila palæmon, Grote (60).

SPECIES ADDED TO BRITISH LIST SINCE 1884.

LYCÆNA ARGIADES, Pall.

- L. argiades*, Barr. p. 68 (20).
Chrysophanus argiades, Meyr. p. 245 (37).
Everes argiades, Tutt, p. 185 (19).

HESPERIA LINEOLA, Ochs.

- H. lineola*, Barr. p. 279 (63).
Pamphila lineola, Meyr. p. 258 (65).
Thymelicus lineola, Tutt, p. 235 (6).
Adopæa lineola, Grote (65).

NOTES AND OBSERVATIONS.

XYLINA FURCIFERA.—I was much interested in the history (given by the Editor) of the British specimens of *X. furcifera* (*ante*, p. 18). As I was one of the earliest breeders of this beautiful insect, I should like to add my experience of it. On Christmas Day, 1871, I received the generous gift of eighteen eggs from Mr. Evan John, of Llantrissant, Glamorganshire. The larvæ hatched the following March. With some difficulty I managed to feed them with bruised buds and bark of alder, the tree not being in leaf at that early period of the year. I had the singular good fortune of breeding the whole eighteen magnificent specimens, nine of which are in my collection now.—(Rev.) J. GREENE; Rostrevor, Clifton, Bristol.

CONTINENTAL LOCALITY FOR LYCENA (POLYOMMATUS) ARION WANTED.—I should be very grateful if any of your correspondents could tell me of a locality on the Continent where *Polyommatus arion* is common, and the approximate date of its appearance on the wing. I am anxious to secure a number of females with a view to breeding this insect.—C. DALLAS; Lymington, Hants.

THE BASAL SPOT ON AMPHIDASYS BETULARIA.—In the 'Entomologist' for January, p. 16, Mr. J. Arkle asks whether the white basal spot is confined to the females of *Amphidasys betularia*, as his limited experience would seem to suggest. It will, therefore, interest him to know that it is certainly not a sexual distinction. Of var. *doubledayaria* I have thirty bred specimens (about equally divided between the two sexes) before me as I write. In everyone of these the white basal spot is present, thought it is, as a rule, larger and therefore more conspicuous in the females than in the males, in which it is occasionally reduced to a minimum. It is also present in both sexes of the typical form of the insect, though, owing to the colours of the wing, it is not nearly so noticeable as in the variety.—EUSTACE R. BANKES; The Rectory, Corfe Castle, Dec. 31st, 1898.

In reference to the note on this subject by Mr. Arkle (*ante*, p. 16), we have a bred specimen of the black variety *doubledayaria*, a male, which has the distinct white spot at the base of the upper wings; and we have also two females of the typical form with the basal spots present.—J. and W. HILL; Leek, Jan. 9th, 1899.

ANTENNAL STRUCTURE versus GENITALIA.—In "Notes on the genus *Manestra*, Ochs., with descriptions of New Species" ('Entom. News,' ix. 240), Prof. Smith remarks: "The character of the antennal structure is not so important as I believed at first, and would, if strictly adhered to now, separate species closely allied. As it appears now, the change from shortly pectinated to simply ciliated is so gradual that no dividing line is possible, and the rearranged groups will, in some cases, contain forms with simple and with pectinated antennæ. On the other hand, all the genitalic groupings have approved themselves; and I am inclined to attribute increased importance to this character in arranging the species of a large genus."

NEW WORK ON BRITISH LEPIDOPTERA.—Mr. J. W. Tutt is about to publish, at the subscription price of 15/- per volume, an important

work on the 'Lepidopterous Insects of the British Islands.' We gather from the prospectus that the subject is to be treated in a thorough and exhaustive manner. Lepidopterists will no doubt make a point of adding these volumes, as they appear, to their library, as when the work is complete they will then be in possession of a valuable digest of all that concerns the technical aspect of the subject, together with a reliable guide to a knowledge of the species themselves, and a magazine of information connected with their life-history, times of appearance, distribution, &c. As the price of each volume is to be increased to 20/- on publication, it will be well for those who wish to secure copies to at once send in their names to Mr. H. E. Page, Bertrose, Gellatly Road, Hatcham, S.E.

PUPATION OF *COSSUS LIGNIPERDA*.—In the Editorial note to Mr. May's remarks on *Cossus ligniperda* (*ante*, p. 17), I think an article by Mr. Ivy (*Entom.* xxi. 110), in which he describes how he found a number of pupæ in what he calls "sand caps," has been overlooked. At p. 155 of the same volume he describes what he means by "sand caps."—EDGAR J. MEYNELL; Durham.

NORFOLK COLEOPTERA.—Mr. J. Edwards, of Colesborne, Cheltenham, would be glad of records of captures of beetles in Norfolk, for incorporation in a 'Supplement' to his 'List of Norfolk Coleoptera,' which will go to press early in March.

CAPTURES AND FIELD REPORTS.

CHEROCAMPA CELERIO IN SURREY.—I have just received from the Rev. E. V. Bond, for identification, a specimen of *C. celerio* taken at Ewell, Surrey, at the end of August last. It is perfect in condition excepting the thorax, which is rubbed.—F. W. FROHAWK; January, 1899.

MIGRATORY LOCUST IN SUSSEX.—The Rev. E. V. Bond has lately sent me for identification a fine specimen of *Ædipoda migratoria*, captured at Lower Beeding, Sussex, about Aug. 25th last.—F. W. FROHAWK; January, 1899.

GONOPTERYX RHAMNI IN JANUARY.—On Jan. 8th last I saw a male specimen of *G. rhamni* in Reigate Park, owing most probably to the mildness of the season. It was flitting gaily along in the sunshine, now and again settling on bramble sprays, seemingly none the worse for its few months' sleep.—WILLIAM GANDY; Beetch View, Reigate, Surrey.

A specimen of *G. rhamni* was seen on the wing in Dulwich village on Jan. 8th this year, by a friend of ours. I suppose this may be accounted for by the mild weather this month?—F. M. B. CARR; 46, Handen Road, Lee, S.E.

VANESSA CARDUI.—Yesterday, Jan. 8th, I saw a very fair specimen of *Vanessa cardui*, flying along a hedgerow on the downs near here; the sun was shining brightly and the weather very mild, but *cardui* seemed rather out of place among the dead and sodden undergrowth.—P. W. RIDLEY; 3, Manor Road, Salisbury.

COLLECTING IN KENT, 1898.—In January and February nothing at all was done, and in March only *Hybernia progemmaria* was noticed, to which were added, in April, *Larentia multistrigata*, *Anisopteryx æscularia*, *Hemerophila abruptaria*, *Anticlea badiata*, *Gonopteryx rhamni* (hybernated) and *Pieris rapæ*.

In May *Tephrosia punctulata* was taken at Birchwood; and an expedition to Chelsfield and Cudham on the 30th produced *Ligdia adustata*, *Corycia taminata* (one), *Melanippe montanata*, *M. rivata* and *Euclidia glyphica*, although none of these were in any abundance. The males of *Euchloë cardamines* were abundant in the lanes near Chelsfield and Cudham, and three *Thecla rubi* were noticed at Cudham, *Lycæna argiolus* and *Thymele alveolus* were also seen.

In June forty-four species were noticed. On the 5th *T. punctula*, *L. adustata*, and larvæ of *Hylophila bicolorana* and *Cymatophora diluta* were taken at Bexley. On the 8th and 12th *Eupithecia venosata*, *Minoa euphorbiata*, *Tephrosia punctulata*, *T. extersaria*, *T. crepuscularia*, *Melanippe galiata* and *Corycia taminata* were taken (one or two of each) at Chelsfield and Shoreham. On the 19th two *Ephyra punctaria* and two *Acidalia bisetata* were noticed at Bexley, and *Platypteryx falcula*, *Asthena luteata*, *Emmelesia decolorata* and *Anticlea rubidata* were taken singly, whilst *Hylophila prasinana* was abundant.

July was by far the most successful month. *Ligdia adustata*, *Asthena luteata*, *Scotosia vetulata*, *Hylophila prasinana*, *Hepialus hectus*, *Hadena dentina* and *Aplecta nebulosa* were taken on a visit to Hayes and West Wickham, but treacle in West Wickham Wood produced nothing. In the garden here at Lee *Nænia typica* was fairly plentiful, and *Apamea basilinea*, *Hecatera serena* and *Asthena luteata* occurred singly, amongst other commoner insects. At Bexley I took a male of *Limacodes testudo*, two *Calligenia miniata*, *Hepialus hectus*, *Hylophila prasinana*, *Metrocanpa margaritaria*, *Larentia pectinitaria*, *L. didymata*, *Cidaria fulvata*, *Asthena luteata*, *Noctua triangulum* and *Aplecta nebulosa*, larvæ of *Bombyx neustria* and *Notodonta camelina*; and on the 10th I was fortunate enough to take a nearly full-grown larva of *Notodonta chaonia*, which pupated safely. At treacle *Dipterygia pinastri*, *N. festiva* and *Rusina tenebrosa* occurred. *Anticlea rubidata* was seen at Orpington, *Timandra amataria* taken at Grove Park, and *Platypteryx falcula* at Chiselhurst. The 31st July and 1st August were spent at Shoreham, where *Eubolia bipunctata* and *Zygæna filipendulæ* were in swarms. *Geometra papilionaria*, *Scotosia rhamnata*, *Larentia olivata*, *Coremia propugnata*, *Larentia didymata*, *Bombyx neustria*, and *Melanargia galatea* were also taken; and *Hipparchia (Epinephele) hyperanthus* and *Lycæna ægon* were plentiful.

During August *Mania maura* and *Triphæna ianthina*, especially the former, occurred plentifully at Lee, whilst *Pelurga comitata* and *Luperina testacea* were taken singly. *Platypteryx falcula* and *Cidaria silaceata* were taken at Bexley. A specimen of *Smerinthus populi* was captured here on August 6th, and larvæ of *S. populi*, *S. tiliæ*, and *Acronycta megalcephala* were taken.

October 8th I saw a specimen of *Melanippe fluctuata* on a tree-trunk at Dartford—surely rather an unusual date? Oct. 9th some beautifully fresh specimens of *Gonopteryx rhamni* were taken at Shoreham, and I also noticed *Vanessa atalanta* (one) and *Lycæna alexis* (one). Oct. 23rd I noticed two *Vanessa urticæ* in this road. This month was an exceptionally mild one.

In November *Oporabia dilutata*, *Hybernia aurantiaria*, *Cheimatobia brumata*, *Cerastis vaccinii*, *Cerastis (spadicea) ligula*, and *Scopelosoma satellitia* were noticed.

I have omitted from these notes collecting in the New Forest (July 16–27) and treacling in September and October, which have already been referred to in the 'Entomologist' (xxx. 294, 296). The season of 1898 was not very productive, and was much more backward than that of 1897, at least so far as our collecting was concerned. Treacle was an utter failure until September, when it was productive till the end of October. We did not try light very much, and most of our insects were obtained by beating, searching and dusking.—F. M. B. CARR; 46, Handen Road, Lee, S.E.

NOTES FROM NORTH STAFFORDSHIRE IN 1898.—Collecting has been fairly productive in this district during the past season, sugar, however, not being very successful until the autumn. The following is a partial list of insects taken:—Amongst other butterflies taken or seen through the season were *Argynnis selene*, common locally; *Vanessa urticae*, *V. atalanta*, *Euchloë (Anthocharis) cardamines*, *Pieris napi* and *P. brassicae*, which has been very common. Amongst the moths were *Smerinthus populi*, *Sesia tipuliformis*, *Nudaria mundana*, *Bombyx rubi*, *Saturnia carpini*, *Uropteryx sambucata*, *Metrocampa margaritaria*, *Amphidasys betularia* and the black variety *doubledayaria*; *Eupisteria heparata*, *Venusia cambricaria*, not uncommon, but local; *Macaria liturata*, amongst pines; *Halia wavsaria*, *Panagra petrararia*, *Fidonia piniaria*, *Abraxas ulmata*, *Cheimatobia boreata*, *Oporabia filigrammaria*, a few on the moors during August and September; *Larentia multistrigata*, *L. casiata*, *Emmelesia affinitata*, *Eupithecia pulchellata*, *E. subunbrata*, and several other species undetermined; *Thera variata*, *Hyppipetes impluviata*, *Melanthia rubiginata*, *M. ocellata*, *Melanippe tristata*, *M. rivata*, *M. galiata*, *Anticlea badiata*, *Coremia munitata*, one specimen; *Cidaria corylata*, *C. russata*, *C. immanata*, *C. suffumata*, *C. ribesiararia*, *C. fulvata*, *C. pyrallata*, *C. dotata*, *Eubolia bipunctata*, *Cilix spinula*, *Dicranura vinula*, *Notodonta camelina*, *N. dictæa*. On Sept. 5th five larvæ of *N. ziczac* were taken on willows; *Bryophila perla*. Our first night at sugar, on June 20th, produced a fine specimen of *Acronycta leporina* and another was taken at rest on July 3rd. *A. rumicis*, *Leucania impura*, *Miana (Chortodes) arcuosa*, *Charæas graminis*, *Apamea basilinea*, *Agrotis porphyrea*, *Orthosia macilenta*, *Anchocelis rufina*, *Xanthia cerago*, *X. silago*, *Polia chi*, *Agriopsis aprilina*, *Hadena protea*, *H. glauca*, fairly common. *H. dentina*, *H. thalassina*, *Oloantha solidaginis*, *Calocampa exoleta*, *Anarta myrtilli*, *Habrostola urticae* and *H. triplasia*, at flowers of rocket and at light.—J. & W. HILL; 7, Westwood Grove, Leek, Staffs, Jan. 9th, 1899.

SPHINX CONVULVULI IN THE ISLE OF WIGHT, 1898.—This species was very plentiful in Ryde last year, twenty specimens being taken in the garden of Little Appley during the last ten days of September hovering round a bed of *Nicotiana*. A number of other specimens were taken in and near Ryde during the season.—A. BEVIS; 71, Union Street, Ryde.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*December 7th, 1898.*—Mr. R. Trimmen, F.R.S., President, in the chair. Monsieur Léon Candèze, of 64, Rue de l'Ouest, Liège; Mr. C. L. B. Stares, M.R.C.S., L.R.C.P., of the Infirmary, Wandsworth, S.W.; Mr. A. Russell, of the Limes, Southend, Catford; and Mr. C. B. Holman Hunt, of Meddecombra, Watagoda, Ceylon, were elected Fellows of the Society. Mr. McLachlan exhibited a series of specimens of the neuropterous genus *Tetracanthagyna*, De Selys, including a pair of a new species from Borneo, which was the largest known of all recent dragonflies, though it was slightly exceeded in wing-area by the much more slender *Megalopterus carulatus*, a common Central-American species. Mr. A. H. Jones showed about sixty species of Lepidoptera, taken round electric lights at Zermatt, in August. Among the more interesting were *Crateronyx taraxaci*, *Ellopija fasciaria* ab. *prasinaria*, *Cidaria cyanata*, *Hadena maillardi*, a light form of *Dianthecia casia*, and a fine black variety of *Polia flavicincta*. Dr. Dixey exhibited a series of Pierid butterflies from the Neotropical region, to show the existence among them of seasonal forms. The President observed that the exhibit was of special interest, as affording the first recorded evidence of the existence of seasonal dimorphism in Neotropical butterflies. Mr. G. T. Porritt exhibited an extraordinary variety of *Bombyx quercus*, bred in June last by Mr. W. Tunstall, from a larva found near Huddersfield. The specimen was a female of deep chocolate colour, with the band very faintly traced in dark olive. Dr. Chapman, Mr. Lloyd, and Mr. Nicholson exhibited butterflies taken by them in Norway from June 20th to July 22nd, during the past summer, at latitudes 60° 12' and 69° 50'. It appeared from the exhibit that it would have been better to collect a month or so earlier, especially in the more northern locality visited. It was also seen that northern races of butterflies and moths were apt to differ a little from those of the mid-European fauna, but that various named varieties supposed to be characteristic boreal representatives of their species were often rather aberrations, and not the dominant northern type. This was the case in *Vanessa urticae*, *Erebia medusa*, *E. ligea*, &c.; on the other hand, as in *Brenthis selene* var. *hela*, the entire local race was of the variety. Papers were contributed—by Mr. R. McLachlan, entitled "Considerations on the genus *Tetracanthagyna*;" by Mr. M. Burr, entitled "A List of Rumanian Orthoptera;" and by Mr. J. H. Leech on "Lepidoptera Heterocera from China, Japan, and Corea."—W. F. H. BLANDFORD, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*November 24th, 1898.*—Mr. J. W. Tutt, F.E.S., President, in the chair. Mr. Montgomery exhibited a photograph, by Mr. Clarke, of an ovum of *Hesperia comma*; it was smooth, without reticulations. Mr. Adkin, two specimens of *Dicranura bifida*, taken this year in his own garden on the trunk of a poplar tree. Mr. Tutt, additional local forms of *Zygena*, from M. Oberthur. (L.) *Z. trifolii*: 1, a mountain form; 2, an Algerian form, var. *syrausae*; 3, a coast form; 4, a large marsh form from Rennes; and 5, series from the French coast opposite the

Channel Islands. (II.) *Z. filipendulæ*: 1, var. *dubia* form; 2, a fine spotted form from the Pyrenees. (III.) Series of *Z. trifolii* from Waxham, for Mr. Bacot; and from South Wales, for Capt. Robertson; and contributed notes. Mr. Milton, a portion of a stone in which an *Odynerus* sp. was found alive, with its cocoon.

December 8th.—The President in the chair. Mr. Bliss, of Hastings, and Mr. Sich, 65, Barrington Road, Chiswick, were elected members. Mr. Carpenter exhibited some fourteen bred varieties of *Melitæa cinxia*, the only ones out of two hundred that were worthy of note, and not one extreme form. Mr. Brooks, of Rotherham, *Apamea ocellæ*, many varieties: *Euchelia jacobææ*, with a pink flush; a brood of *Amphidasys betularia*, comprising normal, light var. *doubledayaria*, and fine intermediate examples, one being very light and semitransparent; *Triphana fimbria* in great variety; and *T. ianthina*, rich in colour. Rev. S. Tarbat, cocoons of *Plusia moneta*, found in a friend's garden. Mr. Adkin, *Xylina socia* (*petrificata*), *Calocampa vetusta*, *C. exoleta*, *Agrotis segetum*, *Miselia oxyacanthæ*, and *Cidaria siderata*, all typical of the forms from Co. W. Meath, Ireland. Mr. South, three examples of *Abraaxas grossulariata*, bred from larvæ fed on *Sedum*. Most of the larvæ died, and only seven imagines emerged; also a suffused var. of *Melanippe sociata*, comparable to the Hebridean form. Mr. Andrews, a Noctuid from Dartford, supposed to be an extremely dark, blackened form of *Caradrina cubicularis*. Mr. Lucas read notes and observations on dragonflies, illustrating his remarks by a very fine series of slides prepared by himself.

January 12th, 1899.—The President in the chair. Mr. West presented to the Society specimens of 125 species of Hemiptera-Heteroptera, to form a nucleus for a reference collection. Mr. Carpenter exhibited specimens of *Apatura iris*, bred from New Forest larvæ, and read notes on their hibernation. He and other members complained of the damage which was being done by some of the local dealers, who used ropes and a sail with stout cudgels, effectually smashing and destroying the sallows. Mr. Tutt, further specimens of *Zygana* received from M. Oberthur, of Rennes, and read notes on them. Mr. Adkin, specimens of *Cymatophora octogesima* (*ocularis*), bred, from Colchester. Mr. Lucas, specimens of recent uninvited visitors to Kew Gardens—*Periplaneta americana*, *P. australasia*, and *Panchlora maderæ*, from the Belgian Congo; *Anisolabis annulipes?* from Penang; and *Phyllodromia* sp., from Romba, British Central Africa. Mr. Moore, male and female larvæ, larval cases, pupæ and female imagines of the large Psychid moth *Æketicus kirbii*, received from Antigua, West Indies, and contributed notes. Mr. Malcolm Burr, an exceedingly clever imitation of a grasshopper in porcelain, from China, and a case containing a species from each group in the various sections of the Orthoptera to aid in illustrating Mr. Edwards's paper, together with various species, showing protective resemblance. Mr. Edwards, a large number of specimens of Orthoptera, chiefly from Borneo, the Mantidæ and Phasmidæ being very well represented. Among the Loenstidæ which he showed were a number of the curious Phasmid-like *Prosopias*, from South America. Mr. Edwards read a paper on Orthoptera, devoting his remarks chiefly to the Phasmids and Mantids. A discussion ensued, and, among others, Messrs. Burr and

Tutt gave interesting accounts of their observations of the habits of the European representatives of these two families.—HY. J. TURNER, *Hon. Report Sec.*

NORTH LONDON NATURAL HISTORY SOCIETY.—The seventh Annual Exhibition was held at the Sigdon Road Board School, Dalston Lane, on Saturday, Dec. 31st, on Monday, Jan. 2nd, 1898-9, and was very well attended, notwithstanding very unfavourable weather. The exhibits were numerous and interesting, the entomological section being, as usual, a very important one. This department was under the superintendence of Mr. E. M. Dadd, and included, amongst many interesting exhibits, a very fine lot of Lepidoptera collected by Mr. H. S. Woolley in the neighbourhood of New York, some well-filled drawers of British Lepidoptera from Mr. A. J. Hodges, series of *Hydrilla palustris*, Hb., *Leucania vitellina*, Hb., and other rarities, from the same energetic and successful collector; some fine Vanesid aberrations from Dr. Sequeira's collection, lepidopterous life-histories shown by Mr. F. B. Harvey, Coleoptera by Mr. H. Heasler, &c. Lantern illustrations of "Pond Insects" by Mr. R. Marshman Wattson were on view both evenings, and various other attractions further conducted to a very successful gathering.—LOUIS B. PROUT, *Hon. Sec.*

CAMBRIDGE ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—November 4th, 1898.—Mr. Gayner exhibited a collection of Lepidoptera from Northern Sweden and Finland, with some notes on their distribution and occurrence. Argynnidæ were very numerous, especially *Argynnis ino* and sub-species *hela* of *A. selene*. *A. pales* var. *arsilache* was locally abundant in marshy places. Others were *A. aglaia*, *A. euphrosyne* var. *finjal*. Among other insects were an uncertain *Melitæa*, *Polyommatus (Chrysophanus) chryseis*, *P. helle*, *P. virgaurea* var. *oranula*, *L. ægon*, *Plebeius (Lycæna) optilete*, *Cænonympha davus*, *Erebia embla*, *Colias palæus*, *Pieris napi*, *Papilio machaon*, *Vanessa antiopa*. Mr. Richard exhibited cocoons of *Plusia moneta*.

November 18th.—Mr. Gayner exhibited specimens of *Pterophorus rhododactylus* from South England. Mr. Jones, a number of *Senta maritima* from Cambridgeshire, showing some well-marked varieties.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—*Annual Meeting* (held at the Museum, William Brown Street). The President, Mr. Samuel J. Capper, F.L.S., F.E.S., in the chair. After the usual business of the Society had been transacted, the officers for the current year were elected, Mr. Capper being again returned as President. In returning thanks for the renewed honour which had been accorded to him, Mr. Capper said that it was indeed difficult to realise that twenty-two years had elapsed since they had first met as a Society in that room. Of the eleven members who constituted the Society on that evening, only two now remained, *viz.* one honorary member, Mr. William Johnson, of Wigan, and himself. In the Annual Report published in 1881 they had fifty-eight ordinary and twelve honorary members. Societies like theirs were liable to fluctuations, depending to a considerable extent on the number of entomologists in the two counties. He was gratified to be able to state that while the roll of members

was much the same as heretofore, the library had considerably increased, and that during the past session the attendance had been most satisfactory, the papers read had sustained their scientific reputation, and the discussions had created the liveliest interest in the subjects dealt with by the lecturers. The first meeting of the present session had been unusually successful, there not only being a very large attendance, but the specimens brought for exhibition were to be numbered by thousands. Still, to make the Society a permanent success depended very largely, he might say entirely, upon the members themselves. He remembered with pardonable pride that one of their first lectures was delivered by the late Mr. Benjamin Cooke, on the Genital Armature of the Lepidoptera, and he believed this to be the first notice of such a matter brought before any scientific society. Nor could he speak too highly of the work since done by their own much valued and esteemed member, Mr. F. N. Pierce, in this direction. Mr. Capper thought that investigations of this nature would completely revolutionise the present classification of Lepidoptera, and, if not of primary importance in the differentiation of species, was certainly deserving of equal consideration with the unreliable and often erroneous details of wing-marking. As they understood more fully the true philogenetic relationship of the various forms of animal and vegetable organisms to each other, they would be led more and more to the profound conviction that the definition of, not only species, but of families, orders, and so on to the two great kingdoms themselves, is an impossibility. So intimately related are the various forms, either with others non-existent, or with those widely differing in their modes of life, that lines of demarcation vanish. It is, however, only by the help of students each undertaking the study of one particular branch of nature that the furtherance of a true classification may be hoped for. And while he would specially urge upon the younger members to take up some particular line and pursue it, he would add one word of caution: that, is not to get imbued with the idea that his doxy is orthodoxy, and every other man's doxy is heterodoxy, but rather to remember that

"By mutual confidence and mutual aid,
Great deeds are done and great discoveries made."

The President dwelt at some length upon the exhaustive treatise now being published by Mr. Barrett upon the Lepidoptera of the British Isles, which upon completion would be the standard work of reference upon the subject, and mentioned how frequently it happened that a species described as rare often turned up in the greatest profusion as its habits of life became more perfectly understood. Hence he had often expressed the opinion that there was, with few exceptions, no such thing as a rare species. Though he would have to confess that he had sometimes been guilty of giving a few pounds for a moth, it had never been for one that could be called a rarity. His penchant had been for varieties, due in the first instance to his having come into the possession of his late friend Mr. Alfred Owen's collection, who was one of the first who made a speciality of variety collecting. This collection of Owen's is a very wonderful one, and he doubted very

much whether such another would ever be formed again; and he was indeed fortunate in securing a collection of varieties formed by one like Mr. Owen, who had a special perception for the detection of the slightest peculiarity, and he well knew, from his intimate connection with him, that he never admitted any insect into his collection at all doubtful as British, or which was not fully authenticated. He suggested that the desire to record nowadays was much overdone, and it must be a great temptation to dealers, when purchasers insist on a minute record, to make a guess of it. Mr. Capper brought an exceptionally interesting address to a close by relating some of his entomological experiences, and gave several illustrations of the now plentiful abundance of previously scarce and consequently valuable insects. And in most instances it was shown that, whereas they may at some period have easily commanded and readily fetched several pounds apiece, they could at the present day be purchased in numbers for as many pence. The insect fauna of Great Britain was represented by many thousands of species, and it was largely due to the unselfish labours of a little band of specialists that Entomological literature held the important position that it does to-day. He hoped that the younger generation would emulate the industry that characterised the work of those whose names were now a by-word amongst them, who had left them such a legacy of knowledge as would spur them on to a more complete understanding of the vast and minute world with which they were surrounded.—F. N. PIERCE, *Hon. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—November 21st, 1898.—Mr. P. W. Abbott, V.P., in the chair. Mr. P. W. Abbott showed *Hydrilla palustris* taken at Wicken Fen this year, including one fine dark variety, nearly black; also *Agrotis cinerea* from Brighton and from Wyre Forest; those from the latter locality (where he took six or eight), were very different from the Brighton ones, looking like a different insect; they were mouse-coloured, with definite but not conspicuous markings, while those from Brighton were whitey grey in colour with very pronounced markings. Mr. R. C. Bradley, *Methoca melanocephala* (female), from Sutton, with an apterous ichneumon, *Aptesis nigrocincta* (female) which is remarkably like it in general appearance; he said that he had been informed that the ichneumon was a parasite on *Hybernia defoliaria*. Mr. J. T. Fountain, some good series of moths taken in the suburbs close to the busy parts of the town; they were *Calocampa exoleta*, *Cerastis spadicca*, *Miselia oxyacantha* with its var. *capucina*, *Anchocelis pistacina*, and *Phlogophora reticulosa*, long series of the last three.

December 19th—Mr. P. W. Abbott in the chair. Mr. R. Bradley exhibited a box containing a large number of Tortrices and various rare Lepidoptera, presented by Dr. P. B. Mason to the type collection of the Society. Mr. A. H. Martineau showed a specimen of *Sphinx convolvuli*, taken at Solihull recently. Mr. R. C. Bradley, *Chrysotoxum sylvorum* and *C. elegans*, both taken in the New Forest last Whitsuntide. Mr. A. H. Martineau, *Tachytes pectinipes*, male, from Cannock Chase, and female from Nevin, North Wales; also *Salix exaltatus* (females), *Nysson dimidiatus* (female), and *Entomognathus brevis* (female), all from Nevin. Mr. P. W. Abbott, a case containing a number of

fine varieties of Lepidoptera taken by himself and others during 1898; he had himself been unusually fortunate in chancing on varieties; amongst others were the following:—a specimen of *Vanessa io* from South Devon, which was small, dark, and smoky looking, the disc of the wings appearing as if scraped, although all the scales were on, the scales themselves showing dull and colourless under the microscope; *Nonagria arundinis*, a fine dark-brown specimen from Norfolk, bred; *Venilia maculata*, one, from Wyre Forest, with dark brownish and yellow ground colour; *Rumia luteolata*, one, from South Devon, with dark mark right along costa of fore wings; *Hydrella palustris*, one of the so-called black ones, from Wicken; *Larentia viridaria*, one, taken by Mr. A. J. Hodges in South Devon, small and pale, with markings inconspicuous, the bar on fore wings narrow and broadly edged with white; *Zygæna filipendula*, one, with the outside spots confluent, from South Devon, also taken by Mr. A. J. Hodges; dark and obscurely marked *Zonosoma linearia*, bred, from Epping Forest, by Mr. A. J. Mutch; *Asphalia diluta*, from Wyre Forest, one small and dark, with outer half of outer band on fore wings missing, one with two bands confluent across discoidal spot on right wing only. Mr. E. W. Wynn also showed a nice lot of varieties, including a specimen of *Vanessa urtica*, from Teignmouth, with white markings between black spots on costa, discal spots small, and hind marginal band edged with white; *Triphana comes*, from Hepwar Wood, a beautiful specimen with strongly marked transverse lines on fore wings; dark *Polia chi*, from Chatsworth, &c.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

KENDAL ENTOMOLOGICAL SOCIETY.—November 14th, 1898.—Mr. J. Holmes in the chair, the President being unable to attend the first portion of the meeting. There were twenty-one present, and two new members were elected. The chairman made some interesting and instructive remarks upon the seasonable topic of pupa digging, a pursuit which needs constant encouragement, and which, even in this “bug paradise,” is often most disappointing. A general discussion, in which the President and others joined, followed up Mr. Holmes’s notes towards the close of the meeting. This part of the programme was felt to be of such practical value, especially amongst beginners, that it was there and then resolved to hold a fortnightly meeting of an informal nature during the winter months for entomological chat and discussion. Mr. J. Cragg exhibited an almost unicolorous specimen of *Hepialus vellela*, with one white mark on each fore wing. Mr. Graveson and Mr. Smith contributed cases of brilliant Indian Lepidoptera. Messrs. Holmes, Littlewood, Moss, and Wright exhibited autumn captures at treacle and light, including chiefly good series of *Calocampa exoleta*, *Scopelosoma satellitia*, *Cerastis vaccinii*, *C. spadicea*, *Xanthia ferruginæ*, *Diloba cæruleocephala*, and one *Agrotis saucia*. Mr. Moss, three recently bred *Nemeobius lucina*. Mr. Wright, a series of *Arctia caia* (typical), which he had successfully reared from ova of the summer brood by forcing.

December 12th, 1898.—The President in the chair. Mr. Littlewood read an interesting and carefully prepared paper on “treacling,” which opened many points for discussion, at the close of the business

portion of the meeting, as to the best *modus operandi*. A hearty vote of thanks was unanimously accorded. It was decided that the Annual Meeting should be held in January, and that the President should at that meeting each year present an Annual Report, to be subsequently printed and distributed amongst the members, as a retrospect of the yearly proceedings of the Society. An informal meeting for entomological chat and discussion was held on Nov. 28th, and it was decided to continue holding meetings of this kind fortnightly through the winter months. Mr. Holmes and Mr. Littlewood exhibited recent captures; Mr. Graveson and Mr. Smith, cases of S. American Lepidoptera; and Mr. Moss, some 1898 spring Geometræ from Eastham and Delamere, and a drawer of Hepialidæ and Cossidæ.—A. M. Moss, *Sec.*

CARLISLE ENTOMOLOGICAL SOCIETY.—November 17th, 1898 (at Tullie House).—Mr. G. B. Routledge in the chair. Mr. G. Wilkinson exhibited *Nephopteryx angustella* (bred from the fruit of spindle) and *Butalis chenopodiella*, both species from Surrey; *Sciaphila penziana* from Unst, and some Hybernias, including three specimens of *H. marginaria* var. *fuscata*, captured in the district. Mr. M. Dixon, varieties of *Melitæa aurinia*, and some Hymenoptera from the Carlisle district. Mr. F. H. Day exhibited a box of Coleoptera, including *Tropiphorus tomentosus* (*mercurialis*), *Barynotus merens*, *Eriirrhinus bimaculatus*, from around Carlisle. Mr. G. B. Routledge, a fine specimen of *Acherontia atropos*, caught at Gett Hall, Castle Carrock, the residence of Judge Steavenson, on October 10th; also some Coleoptera from the same district, including *Quedius scintillans*, *Q. fulvicollis*, and a *Bembidium* with red spots on the elytra, which had been sent on to Mr. E. A. Newbery for determination, who, in returning it, said it was not *B. littorale* or *B. saxatile*, as it was too small, striæ too finely punctured for *B. littorale*, and the thorax is not transverse enough for *B. saxatile*. Mr. Newbery had specimens from the Swiss Alps, which were very similar, and which he had doubtfully referred to *Bembidium andrea*, which so far has not been considered British. The specimen exhibited was taken on Castle Carrock Fell. Mr. G. Wilkinson read a paper on "Some aspects of Variation."

December 1st.—Mr. G. B. Routledge in the chair. Mr. F. H. Day exhibited Coleoptera taken in the county: *Carabus glabratus* from Honister Crag; *C. arvensis* from Styehed and Honister; *Pterostichus vitreus* from Styehed and Skiddaw; *Clythra 4-punctata* from Keswick; *Liophlaeus nubilus*, *Melanotus rufipes*, *Corymbites pectinicornis*, *Campylus linearis*, from Carlisle district. Mr. J. E. Thwaytes, a series of *Agrotis nigricans* and *Epunda nigra*, which had been very abundant in the Carlisle district this year; also *Tæniocampa gracilis* and *Leptogramma literana*. Mr. Aitken exhibited Coleoptera—*Grypidius equiseti*, new to the local list, from flood refuse on the River Eden in 1896. Mr. Day read a paper, "Entomological Rambles on Mountain, Plain and Shore," mentioning the different species of Lepidoptera and Coleoptera he had come across in the Lake district, round Carlisle and at Silloth, in 1898.

December 15th.—Mr. John Wilkinson showed a series of *Chesias spartiata* taken in October among broom near Carlisle. It was very local, only occurring in two places. Mr. Mawson showed a specimen

of *Amphidasys betularia* var. *doubledayaria* from Keswick, and he had taken another example near Penrith. This form appears to be rare in Cumberland, as very few specimens had come under the notice of the lepidopterists of the Society. In its typical form the species was familiar. The Secretary (Mr. Day) exhibited the following Coleoptera, all from the Cumberland coast:—*Bembidium saxatile*, taken by "swilling" on the banks of a stream; *B. æneum*, on mud-banks; *B. pallidipenne*, under seaweed, &c.; *Homalium rugulipenne*, under shore refuse; *Agabus femoralis*, from ponds; *Anomala frischii* and *Cleonus sulcirostris*, both taken among sandhills.—G. B. ROUTLEDGE.

ENTOMOLOGICAL CLUB.—Since the last report (Entom. xxxi. 76), meetings of this Club were held as follows:—June 21st, 1898, at the residence of Mr. Samuel Stevens, Loanda, Beulah Hill, Upper Norwood. July 15th, at the 'Hand and Spear' Hotel, Weybridge; Mr. G. T. Porritt in the chair. Oct. 19th, at Stanhope, The Crescent, Croydon, the residence of Mr. T. W. Hall. Dec. 2nd, at the residence of Mr. R. Adkin, Wellfield, 4, Lingard's Road, Lewisham. Jan. 17th, 1899, at the Holborn Restaurant; Mr. G. H. Verrall in the chair.—R. SOUTH, *Hon. Sec.*

RECENT LITERATURE.

Contributions toward a Monograph of the Lepidopterous Family Noctuidæ of Boreal North America. A Revision of the Species of Acronycta (Ochsenheimer), and of certain allied Genera. By JOHN B. SMITH, Sc.D., and HARRISON G. DYAR, Ph.D. 8vo, pp. 1–194, plates i–xxii. Washington, 1898 (Proc. U.S. Nat. Mus. vol. xxi.).

In this important paper will be found full descriptions of the North American species of *Acronycta* and allied genera, together with particulars of their earlier stages so far as they are known, and remarks on distribution, and other matters connected with the subject. There are also analytical keys to groups, genera, and species, to larvæ of the *Acronycta*, and a synopsis of groups.

Prof. Smith gives an account of the genus *Acronycta* and its allies, and Dr. Dyar furnishes one on the early stages of Acronyctids. Preceding the consideration of the species of each group in detail, there are some remarks on the special characters, resemblances, or affinities of the units of the group.

The revised classification of the species is based on a study of larval characters, as well as of imaginal structure, and it has been found that this arrangement agrees in the main with that proposed by Dr. Chapman, who founded his classification largely on pupal structure. *A. ligustri*, however, which is the type of Chapman's third section (*Bisulcia*), is rejected as not belonging to the Acronyctids.

The species referred to *Acronycta*, Ochs., are divided into seven groups, and the British species, with the exception of *ligustri* and *megacephala*, fall into three of these as follows:—

Group AMERICANA.—*A. leporina*, Linn. ; *A. aceris*, Linn.

Group LOBELIÆ.—*A. psi*, Linn. ; *A. tridens*, Schiff. ; *A. strigosa*, Fabr. ; *A. alni*, Linn.

Group AURICOMA.—*A. auricoma*, Fabr. ; *A. rumicis*, Linn. ; *A. myricæ*, Guen. ; *A. menyanthidis*, View.

Leporina, which has been twice redescribed by American authors, is stated to be the only species of the genus common to Europe and North America. *Aceris* is somewhat similar in appearance to large specimens of *A. rubricoma*, Guen., and its position would seem to be between that species and *A. americana*, Harris.

Psi and *tridens* belong to the typical section of the Lobeliæ; *strigosa* is regarded as the European representative of *A. connecta*, Grote, and *alni* has relationship with the last named American species, and also with *A. funeralis*, Grote and Rob. Of *myricæ* and the European *euphorbiæ*, it is remarked that they bear the same relation to each other that *A. noctivaga*, Grote, does to *A. sprata*, Grote. *Auricoma* and *rumicis* are both closely allied to *A. impressa*, Walk. *Menyanthidis* appears to lack an American ally, while *megacephala* is "unique and utterly unlike anything represented in the American fauna." *Demas* and *Arsilonche* are retained as genera allied to *Acronycta*.

All the plates are plain, and the first seven are reprints of a chromo set that was prepared for a publication of the Department of Agriculture which it was intended to issue in 1885, but which was never brought out. These coloured plates are also enclosed with copies of Prof. Smith's paper sent to entomologists.

Apart from its value as an authoritative guide to the study of the Acronyctids of North America, the paper will be of great interest to all lepidopterists who are concerned in the work that has been done in the recent past, and is still being carried on, by systematists in preparing a substantial foundation upon which may be built up an approximately permanent system of classification of the Lepidoptera.

Übersicht der Lepidopteren-Fauna des Grossherzogtums Baden (und der anstossenden Länder). Von CARL REUTTI. Zweite Ausgabe, herausgegeben von A. MEESS und Dr. A. SPULER. 8vo, pp. xii, 361. Berlin : Verlag von Gebrüder Borntraeger. 1898.

THIS summary, or catalogue, of the Lepidopterous Fauna of the Grand Duchy of Baden was first published in 1853, and in the edition before us the subject has been brought up to date so far as concerns the entry of species known to occur in the area dealt with. These we find are 2568 in number, nearly half of which belong to the Tineæ.

The main divisions are as follows:—Diurna, 133 ; Sphingæ, 58 ; Bombyces, 135 ; Noctuæ, 403 ; Geometræ, 331 ; Pterophoridaæ, 41 ; Alucitidæ, 6 ; Pyralides, 187 ; Tineæ, 1274.

With some few exceptions the arrangement of families is pretty much the same as that adopted by Staudinger and Wocke (Cat. Lep. Eur. Faun.), but the Diurna are grouped in two sections—A, Rhopa-

locera; and B, Netrocera. In the latter are placed all the species usually referred to Hesperiidæ, and all other species are included in the first section.

The Cossidæ are retained among the Bombyces, but on p. 182 the position of this family immediately before the Tortricoidæ in Tineæ inaculeatæ is indicated, and this, the first subdivision of the Tineæ, also embraces Psychidæ, "Tortricina," and a large number of families of "Tineina." In Aculeatæ, the second subdivision of Tineæ, the families are Incurvaridæ, Tischeriidæ, Nepticulidæ, Micropterygidæ, and Eriocephalidæ. Hepialidæ, corrected to Epialidæ, constitutes the third subdivision of Tineæ.

Pterophoridæ and Alucitidæ are located between the Geometræ and the Pyralides, and there are some changes in the arrangement of the families and genera in the latter division. Thus, for example, *Scoparia* is included in the Botydæ, and this family is interposed between the Crambidæ and the Phycidæ.

In addition to localities for each species, there are notes referring chiefly to the time of appearance of the imago and the food-plant of the larva.

L'Apiculture par les Méthodes simples, par R. HOMMELL, ingénieur agronome, professeur d'Agriculture à Riom. 8vo, pp. 338, with 6 plates and 102 figures in the text. Paris: Georges Carre et C. Naud. 1898.

JUDGING from the elaborate manner in which the book has been prepared, and the clear and explicit instructions furnished, M. Hommell's work should prove exceedingly valuable not only to those who may be contemplating the establishment of an apiary, but the experienced bee-keeper will find a large amount of information connected with all phases of the subject.

THE following papers appear in American publications:—

Proceedings of the U. S. National Museum. Vol. xxi. Washington, 1898:—

"On some New Parasitic Insects of the Subfamily Encyrtinæ." By L. O. HOWARD, Ph.D. Pp. 231-248.

"On the Coleopterous Insects of Galapagos Islands." By MARTIN L. LINELL. Pp. 249-268.

"Report of a Collection of Japanese Diptera." By D. W. COQUILLET. Pp. 301-340.

"American Oniscoid Diplopoda of the Order Merocheta (Myriapoda)." By O. F. COOK. Pp. 451-468, plates xxix-xxxii.

"Japanese Hymenoptera of the Family Tenthredinidæ." By C. L. MARLATT, M.S. Pp. 493-506.

Proceedings of the American Academy of Arts and Sciences. Vol. xxxii.:—

“A Contribution to the Study of Individual Variation in the Wings of Lepidoptera.” By WILLIAM L. W. FIELD. Pp. 389–396.

OBITUARY.

WILLIAM BURGESS PRYER, whose death is announced at Port Said on January 7th, was born on March 7th, 1843. In his earlier days he was an enthusiastic collector of British Lepidoptera. About 1860 he went out to China in connection with the silk and tea house of his relatives Messrs. Thorne Bros., Shanghai, where he remained for twelve years, and devoted considerable attention to collecting the Lepidoptera, of which very little was then known. An account of an expedition he made to the wonderful Snowy Valley appeared in the ‘*Entomologist’s Monthly Magazine*,’ vol. xiv. Among the results of his work in China was the discovery of many new species, which were described by Messrs. Butler, Moore, and others, and a few by himself in a paper in the ‘*Cistula Entomologica*,’ vol. ii. The collection he formed there afterwards passed into the possession of Messrs. Salvin and Godman and the British Museum. After a short experience of business in London he started, in 1877, for North Borneo, and was one of the pioneers of the British North Borneo Company, which founded the new colony at Sandakan. He was appointed British Resident in 1878, and subsequently the British Consular Agent. During the first few years of his residence there, he formed considerable collections of both Lepidoptera and Coleoptera, and wrote several accounts of journeys he made into the interior. His increasing duties in connection with the development of the newly-acquired territory prevented him, however, from doing much in his favourite pursuit of entomology during the last few years. Owing to failing health, he decided to return to England on sick leave; and on the passage home more serious symptoms of his illness necessitated his detention at Port Said, where he succumbed within a few weeks of his arrival. His genial and generous disposition made him many friends who will feel his loss; and his remarkable tact and courage in dealing with the rebellious natives, among whom he proceeded on the occasion of several hostile outbreaks, practically unarmed, was a great factor in the success which has attended the extension of British rule over the large region of North Borneo. He was the elder brother of Mr. H. Pryer, well known in connection with Japanese Lepidoptera, who died in 1888; and was a corresponding member of the Zoological Society since 1880.—O. E. J.

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[No. 480.

BRITISH LEPIDOPTERA.*

HAVING revised some small portions of this book, where my own work was referred to, I am probably in an appreciable degree prejudiced for and against it in various particulars; but as this is the normal condition of most reviewers, it is perhaps hardly necessary thus to refer to it. One's first impression before opening the book is a doubt as to the necessity for more systematic works on British Lepidoptera at present. We have recently had Meyrick's useful and comprehensive volume, and Barrett's ponderous tomes are continually increasing on our shelves, whilst the less aspiring, but very often admirable, little handbooks, of which Mr. Tutt himself is not one of the least prolific authors, are endless. Though the doubt may remain in some of its aspects, there can be no question that the present volume covers a somewhat, I might almost say a quite, unoccupied field. The next impression is as to the gigantic amount of work involved in the whole work if it is ever to be completed. This large volume deals with only eighty species. Man is mortal, but this volume, with Hampson's and Barrett's works, remind us strongly that no man believes he himself is.

The volume begins with nine chapters (112 pages) of general matter concerning the structure of Lepidoptera at all stages, and their varieties, protective resemblances, &c. The author, in fact, incorporates in a series of special essays the leading facts that have been published during the past twenty or thirty years by Dyar, Scudder, Poulton, Dixey, Speyer, Walter, Packard, Hampson, and a host of others. Many of these chapters are very full, especially those treating of the larvæ, both as to their internal

* 'A Natural History of the British Lepidoptera: a Text-book for Students and Collectors.' By J. W. Tutt, F.E.S. Vol. i. pp. 560. London, 1899.

and external anatomy, and their various modifications for protective and defensive purposes. Not only have we here a great gathering of facts from various sources, but they are treated and marshalled by the author with much philosophical insight, and with the addition of new material of his own, and obviously very frequently a verification by actual observation of the facts quoted from other authorities.

The discussion of Dyar's work on larval tubercles, and of Packard's tabulation of the forms into which they are modified, will be very useful to those who are unable to study the scattered papers in which these are published, and will be materially assisted by the critical views of the author.

The discussion of the meaning and use of the special structure of the geometrous larva states some interesting and, I think, original views of the author, which appear to be so conformable to the facts that they may be provisionally accepted. He points out that the Geometer as a tree-feeder is specially fitted to travel quickly, and so shorten the periods during which it loses by movement its protection by resemblance to a twig, mid-rib, &c. The tree-feeders amongst the Sphinges, Saturnids, &c., obtain their protection by moving with extreme slowness, as well as by terrifying attitudes, &c. The young *Noctua* larvæ that are geometrous are shown to have very similar necessities to the tree-feeding Geometers, and have independently made an approach to the same structure.

We altogether miss any serious account of the imaginal structure, and there is little or no reference to neuration. Though the author nowhere gives a hint to that effect, we conclude that these will form the subject of the general chapters in some future volume. The materials to be collated and philosophically considered are still no doubt meagre; Bodine, Reuter, Jordan, and others are, however, getting series of facts together. Neuration, which has held systematists so largely its worshippers, has had no formal treatment since Spuler's investigations, until Comstock and Grote's more recent monographs. Still, for practical classificatory purposes, a large mass of information seems to be in the hands of many persons who tell us nothing, except what we can gather from the use they make of it. A comprehensive essay on the subject is much to be desired. Our author's silence is perhaps to be interpreted as the result of a desire to give a rest to an overworked aspect of his subject. The great value of this part of the work is that it brings together in readable form a mass of information only to be got from a multitude of different sources. The same feature marks equally the rest of the work dealing with families and species. It involves a great mass of matter, which is an evil, but it brings together in notes on life-history, structure, and especially on habitats and date of occurrence, an immense number of facts, culled from

transactions, magazines, and other sources, which must have involved enormous labour to the author, and will save just so much to anyone who wants to know them—either the “mere collector” who desires information as to when and where he must go for his specimens, or the student of geographical distribution or of life-histories. Each species is treated of under the headings of Synonymy (often half a page of closely printed references), Original Descriptions, Imago, Variations, Comparisons with Allied Species, Ovum, Habits of Larva, Larva (with sub-headings), Cocoon, Pupa, Food-plants, Habits and Habitats, Times of Appearance, Localities, Distribution.

The most valuable and original division of this portion of the work is the section on the *Anthroceras*. This is a very full discussion of our British representatives and the allied continental species and varieties, a subject of which Mr. Tutt has made a special study, and amounts to an exhaustive monograph of the group. With regard to the *Trifolii*, *Lonicerae*, *Filipendulae* section, it would appear that there are here one, two, three, or four species, or even many more, according to the test one accepts of what a species is; that there is great plasticity throughout the group, with a strong tendency to form local races according to locality or food-plant. These races are often very puzzling as to what species they are forms of, or whether they are distinct species. The matter is a very complicated one, which the author has done much to unravel, and towards indicating the necessary lines for further investigation.

The account of the *Nepticulae* is also of great value, as it incorporates much material which is referred for authority to Fletcher and Wood, which there is much reason to believe would have largely escaped publication had not our author induced these authorities to assist him.

Amongst the *Nepticulae* there is described a new species under the name of *N. fletcheri*; this insect has hitherto been confounded with *N. anomalella*, but its distinctness has been established by the work of Mr. W. H. B. Fletcher, in compliment to whom it has received its name. *Anomalella* is a red-headed insect attached to *Rosa canina* and sundry garden roses, whilst *fletcheri* has a black head, and has *R. arvensis* as its more especial food-plant. When once the distinction is seized, there is abundant difference to be detected in all the stages, and in the outline of the mine and the disposal of the frass within it.

The author's classification and arrangement will no doubt meet with even more objection than Mr. Meyrick's did. The chief but really unimportant objection will be that it mixes up insects of all sizes, and makes cabinet arrangement of specimens a painful problem. This is really all nonsense; a cabinet arrangement must be linear, no natural arrangement is. Therefore, so long as each group or family is kept together, and one

knows where to find them, it is quite immaterial in which order the families follow each other in the collection.

Meyrick begins at the top and works downwards, Tutt begins at the bottom and works upwards; and, so far as meeting old time prejudices goes, Meyrick is decidedly the wiser in his generation. Had he only twisted the stirps containing the butterflies to the front, he might perhaps have entirely avoided the opposition a new arrangement meets with. Tutt begins at the bottom, and flaunts this difficulty in our faces; perhaps he feels that he will disarm the danger by boldly grasping his nettle.

The phylogenetic tree given at p. 112 embodies so many points that I have myself insisted upon, that it would be ungrateful to criticise it. By adopting the form of an actual tree with a thick stem, as all good trees ought to have, some difficulties are avoided; for instance, I might claim that it adopts my view of the probably polyphyletic origin of the neo-Lepidoptera; it might equally be said that it does not. An uncertainty of this sort, considering the paucity of conclusive facts, is perhaps praiseworthy rather than otherwise. Eupterotidæ and Psychidæ are placed twice over tentatively. I should certainly agree with that that assigns the Psychidæ to the Tineid branch. Though there are several positions about which I am sceptical, such as that of the Drepanulidæ and Pterophoridæ, there are none that appear to be impossible, that is, no position given requires, as far as my knowledge goes, that any structure should have evolved backwards, if an awkward phrase may be used to express an awkward hypothesis. The process is one the impossibility of which in nature is clearly brought home to us by a familiar device of the cinematographist, when, by reversing his apparatus, the scattered feathers, for example, after a pillow-fight, collect themselves together and return into the pillow-case from which they had issued.

One may wish the work could have been less voluminous, but there can be no doubt it marks an important step forward in the treatment of the British Lepidoptera, recognising more fully than any previous treatise that a complete study of all the stages of the insects, not only structurally, but physiologically, in their habits, changes, variations, distributions, &c., is now essential to further progress. The groups selected for treatment lend themselves especially to this demonstration.

The work is produced in a very satisfactory form. I have no doubt that its merits will secure it a reception that will induce the author to proceed with the remaining volumes.

T. A. C.

NOMENCLATURE—PHYLOGENY—SYNONYMY.

By J. W. TUTT, F.E.S.

THERE are many interesting matters in the 'Entomologist' this month (No. 429, February) relating to the Phylogeny and Synonymy of the Lepidoptera, of which the paper by Mr. South on "The Nomenclature and Arrangement of British Butterflies" is not the least so. The arrangement of the British butterflies, if original and not carried out on some previously arranged list, as is generally the case (certainly so in some of the works compared by Mr. South), includes, or rather illustrates, the author's opinion of the phylogeny of the group. What we want is not so much a comparison of authors' (? book-makers') *opinions* on nomenclature, as a critical comparison, based, say, on the Merton rules of nomenclature, and their application to the names in use. This would give us at least a standard for our few British butterflies. I am not aware that anyone except Scudder, Kirby, and Grote have so studied our species, and most of their differences should be easy of settlement. The list published by Mr. South itself shows that, with the exception of *Erebia æthiops*, *Cænonympha tiphon*, *Polyommatus astrarche*, *P. icarus*, *P. bellargus*, *Nomiades semiargus*, *Cupido minima*, *Syrichthus malvæ*, *Thymelicus thaumas*, and *Carterocephalus palæmon*, there are no points of issue as to specific names. The agreement of Meyrick and Tutt (who at least have attempted to apply the law of priority) in the case of *Erebia æthiops*, *Cænonympha tiphon*, *Polyommatus astrarche*, *P. icarus*, *P. bellargus*, *Nomiades semiargus*, *Cupido minima*, *Syrichthus malvæ*, *Thymelicus thaumas* (which, by the by, has a much older synonym), and *Carterocephalus palæmon*, in which they agree with the 'Entomologist' list, throws the onus surely of proving their incorrectness on Mr. Barrett (who disagrees with them), Mr. Newman's book* being now nearly thirty years old, and certainly not to be included fairly in Mr. South's title of being written by a "recent author"; and the matter of whether *minima* or *alsus*, *malvæ* or *alveolus*, *thaumas* or *linea*, *palæmon* or *paniscus* should be applied would surely not prove a very difficult subject of enquiry.

It is in the matter of genera, however, that authors "run amuck." I have already formulated my opinions in a paper read before the South London Entomological Society in 1897, as to what genera are, and on what data they should be based. This paper has never been seriously criticised by any of the authors who prefer to follow the old lists, and one can only suppose that they have no objection to its principles, or are too lazy

* In the List of British Butterflies (*ante*, p. 32) Newman was cited to show that his arrangement did not differ in any material respect from that of Meyrick.—R. S.

to test its correctness, or think it beneath contempt. Neither opinion matters much, but those who wish to see a rational method of genera adopted must certainly dissociate the large tribal groups, now masquerading as genera, by the application of characters derived from the eggs, larvæ, pupæ, and imagines; and if this be done the proper generic application must be obtained on similar lines to those of species. My off-hand criticisms of the difference of genera noticed would be—*Anthocharis* used by Barrett, *Euchloë* used by Meyrick and Tutt; *Anthocharis* belongs to a group of entirely different structure from that of *Euchloë*. *Leptidia*, used by Grote, is a matter of priority; probably Grote's name has priority over *Leucophasia*. *Colias* and *Gonepteryx*, a matter of application of types; *Colias* being applied to *rhamni*, and the next available name *Eurymus* being used for the "clouded yellows." *Argynnis* is a tribe, not genus, and structurally differentiable into many genera, of which we have at least three (perhaps four)—*Brenthis* (*selene* and *euphrosyne*), ? *Issoria* (*lathonia*), *Argynnis* (*aglaia* and *adippe*), and *Dryas* (*paphia*). The same holds good of *Vanessa*, *Erebia*, *Epinephele* (as used by Staudinger), *Thecla*, *Polyommatus*, and *Hesperia*. What one wants here are a comparison of the terms used by Grote, Kirby, and Scudder, and a critical discussion of the differences by a competent specialist.

Arrangement depends upon phylogeny. The data for our present knowledge of the phylogeny has been given us by Scudder, Chapman, Reuter, and others during the last ten years. The arrangement of the old lists was the phylogeny so far as the imagines gave superficial characters. Any arrangement based on these old lists, therefore, has nothing in common with the modern notions of phylogeny (*i. e.* relationship), *e. g.* according to Mr. South's list, Mr. Barrett places the Lycanidæ next the Pieridæ; Dr. Chapman has shown that the former are a very distinct branch of the butterfly stem connected somewhat closely with the Limoniidæ, whilst the Nymphalids, which are closely united with the Pierids, are separated by Mr. Barrett by the major part of the fauna from each other. These are some of the off-hand suggestions that occur to me. The arrangements, therefore, of Newman and Barrett (and, may I add, of the 'Entomologist List'), are certainly not arrangements at all on recent phylogenetic work, and do not reflect the work and conclusions of "recent authors." The lists published by Scudder, Reuter, Chapman, Grote, &c., would reflect such conclusions, and a comparison of these would be of the highest value.

There are other points that arise in looking through the 'Entomologist.' On p. 31, Mr. Kirby records "*Zygæna*" *phegea* as being taken at Wei-Hai-Wei. Now, *phegea* is a specialised Syntomid (Arctiid). On p. 26, Dr. Chapman congratulates Sir George Hampson for "rescuing the Syntomidæ from their tra-

ditional but absurd place beside the *Zygænas* (*Anthrocera*), and placing them with the Arctiidæ and Noctuidæ." Now, whether Dr. Chapman wrote "*Zygænas*" or not in his original paper matters little (although if this had been struck out and the more correct *Anthrocera* had stood alone, it would have taken away the point of this criticism), but here we have on p. 26 and p. 31 two entirely different uses of the term *Zygæna* by eminent specialists, one applying it to one of the highest groups of the Arctiid or Syntomid stirps, the other to the generalised Anthrocerid stirps, just as far away from each other in real relationship as two moths very well can be. As bearing on this point, I see I am credited (pp. 42 and 43) with exhibiting certain species of "*Zygæna*" at the South London Entomological Society's meetings of Nov. 24th, 1898, and Jan. 12th, 1899. Now, for many months I have been making a very special study of these moths, and I am certain that I have never used the name "*Zygæna*" personally for these moths for a considerable time, as I always now apply the term *Anthrocera* to avoid confusion. At any rate, the point is this—the *Zygæna phegea* (p. 31) and the *Zygæna trifolii* (p. 42) bear infinitely less relation to each other than, say, *Sphinx ligustri* and *Saturnia pavonia*, which are at least members of the same stirps.

In conclusion, I do not ask for an uniform code. That I know is impossible, and my private opinion that "synonymy is of the devil" has already been quoted in this magazine. Entomologists of the old school do not follow the modern expansion of the science, and to these the work of Chapman, Reuter, Packard, and Dyar is not acceptable. Others, again, do not know anything about the work of these men, and will always send their lists of captures, named according to any book (out of date or otherwise) that they may have; but I do ask that in matters of importance, such as that of *Zygæna* mentioned above, the same name be not applied to insects belonging to two entirely different stirpes of the Lepidoptera. Let us call the Burnets *Anthrocera* and the Syntomids *Zygæna*, or the Burnet *Zygæna* and the Syntomid *Syntomis*, but not both the Burnet and Syntomid *Zygæna*. If Mr. Kirby is right about the naming of "*Zygæna phegea*," then Dr. Chapman's criticism shows that the Burnets want another name to separate them absolutely from the Syntomids in question.

THE NOMENCLATURE OF BRITISH LEPIDOPTERA.

For some years past the North London Natural History Society has officially recognised the 'Entomologist Synonymic List' as its authority for the nomenclature of the Lepidoptera; but as so many changes have subsequently been proposed by

Mr. Kirby and others, it was found desirable some time ago to appoint a special Nomenclature Revision Committee, consisting of Messrs. Nicholson, Robbins, Woodward, and Prout, to investigate these changes, and recommend the adoption of such as they found to be incontrovertibly correct. The first revision of the Macro-Lepidoptera has now been completed, and adopted by the Council; no claim is made of finality, and indeed many of Kirby's generic changes—such as the resuscitation of names from Hübner's 'Verzeichniss,' which contains so many "mixed genera"—have been left untouched until more biological work has been done at the question of natural genera; and some necessary changes also have been deferred until some recognised British authority has brought them before the notice of the entomological public in this country.

The following is the list of alterations from South's 'List' (which is still to form the basis of the Society's nomenclature) thus far adopted. The references give a brief indication of the literature consulted in sifting the questions raised, but is of course very far from exhaustive, one or two references to accessible works being made to suffice; whereas in the work of the Committee it was frequently necessary to verify quotations by consulting the original descriptions, &c. :—

1. The generic grouping and nomenclature of the Rhopalocera to follow Tutt's 'British Butterflies,' with the few exceptions noted below.

2. *Adopæa*, Billb. (1820), to replace *Thymelicus*, Hb. (Kirby, Handb. Lep. iii. 19).

3. *Plebeius argus*, Linn., for *ægon*, Schiff.; *P. argyrognomon*, Bgstr., for *argus*, Auct., not yet recorded as British (Kirby, Handb. Lep. ii. 88, 89).

4. *P. alexis*, Scop. (1763), for *astrarche*, Bgstr. (*l. c.*, p. 99).

5. *Pontia*, Fb. (1807), *daplidice*, for *Pieris daplidice* (*l. c.*, p. 151).

6. *Leptidia*, Billb. (1820), for *Leucophasia*, Steph. (*l. c.*, p. 178).

7. *Erippus*, Cram., var. *menippe*, Hb. = *archippus*, Fb., *nec* Cram. = *plexippus*, Scud., *nec* Linn., for *archippus*, Fb. (Kirby, Entom. xxix. 189).

8. *Satyridi* and *Satyrus*, Latr., for *Hipparchiidi* and *Hipparchia*, Fb.; *Hipparchia*, Fb., for *Enodia*, Hb. (Kirby, Handb. Lep. i. 131; South, Entom. xxx. 275; Moore, Entom. xxx. 326).

9. *Lineata*, Fb., to be deleted as synonym for *Deilephila livornica* (Kirby, Hand. Lep. iv. 28, 30).

10. *Amorpha*, Hb., *populi*, L., for *Smerinthus populi* (*l. c.*, p. 58).

11. *Dilina*, Dalm., *tiliæ*, L., for *S. tiliæ* (*l. c.*, p. 56).

12. *Hemaris*, Dalm. (1816), for the separation of the bee-hawks from *Macroglossa stellatarum* (Kirby, Handb. Lep. iv. 4).

13. *Fuciformis*, Linn., and *tityus*, Linn., for the species of *Hemaris*, as indicated in Entom. xxix. 39.

14. *Ægeriidae* for *Sesiidae*; *Ægeria*, Fb. (1807), for *Trochilium*, Scop.; and *Trochilium*, Scop. (1777), for *Sesia*, Fb. (Kirby, Handb. Lep. v. 284-290).

15. *Anthrocera*, Scop., for *Zygæna*, Fb. (*op. cit.*, iii. 86).

17. *Purpuralis*, Brunn (1764),* for *pilosellæ*, Esp. (*tom. cit.*, p. 97).

18. *Ænistis*, Hb., as generic name for *quadra*, L. (*tom. cit.*, p. 161).

19. *Phragmatæcia*, Newm. (1840), for *Macrogaster*, Dup., *nom. præocc.* (*op. cit.*, iv. 144).

20. *Porthetria*, Hb. (?1822), for *Ocneria*, H.S. (*op. cit.*, iii. 197).

21. *Pavonia-minor*, L., for *pavonia*, L. (*op. cit.*, iv. 105).

22. *Habrosyne*, Hb. (1822), as generic name for *derasa*, L. (*op. cit.*, v. 4).

23. *Ocularis*, L.,† for *octogesima*, Hb. (Tutt, Brit. Noct. i. 3).

24. *Apatelidae* for *Acronyctidae*; generic nomenclature just as in Entom. Rec. viii. 37.

25. *Paludis*, Tutt, Entom. xxi. 308 (1888), to be inserted as a subspecies in *Hydræcia*, after *nictitans*, L.

26. *Xylæna*, Hb. (?1810), for *Xylophasia*, Steph. (Grote, Entom. Rec. vi. 285).

27. *Pabulatricula*, Brahm. (1791), for *connexa*, Bkh. (Tutt, Brit. Noct. i. 86).

28. *Ypsilon*, Rott. (1776), for *suffusa*, Bkh. (Tutt, *op. cit.*, ii. 158).

29. *Primulæ*, Esp. (1788), Bkh., for *festiva*, Hb. (Werneburg, Beitr. ii. pp. 44, 177).

30. *Nænia*, Sph., as generic name for *typica*, L. (Tutt, Brit. Noct. iv. 40).

31. *Cerasi*, Fb. (?1775; 1781), for *stabilis*, View. (Kirby, Handb. Lep. v. 49).

32. *Fissipuncta*, Hw., for "Orthosia" *upsilon*, Bkh., *nec* Rott. (Tutt, Brit. Noct. ii. 158).

33. *Dyschorista*, Led., as generic name for *fissipuncta* and *suspecta* (*l. c.*, pp. 156, 158).

34. *Helvola*, L., for *rufina*, L. (*l. c.*, p. 162).

35. *Glaæa*, Hb. (?1810), for *Cerastis*, Ochs. (Kirby, Handb. Lep. v. 52, 53).

36. *Ligula*, Esp., for *spadicea* of South's 'List' (Tutt, Brit. Noct. iii. 4).

37. *Citria*, Hb., *Tiliacea*, Tutt, and *Mellinia*, Hb., for *Xanthia*; the species being distributed as in Entom. Rec. viii. 17, but with ? as to position of *aurago*.

38. *Icteritia*, Hfn. (1767), for *Citria fulvago*, L., *nec* Cl. (Kirby, Handb. Lep. v. 58).

* Kirby gives 1776; but the species was first named in Pontoppidan's 'Danske Atlas' in 1764.—L. B. P.

† Linné's type confirms this traditional interpretation.—L. B. P.

39. *Lutea*, Ström. (1783), for *Citria flavago*, Fb. (Entom. Rec. ii. 224).
40. *Xanthia*, Hb. (? 1810), for *Cosmia*, Ochs. (Entom. Rec. viii. 17).
41. *Cosmia*, Hb. (? 1810) for *Calymnia* (Kirby, Handb. Lep. v. 60).
42. *Conspersa*, Esp., for *nana*, Rott. (Tutt, Brit. Noct. iii. 36, 37).
43. *Diphthera*, Hb. (? 1810), for *Agriopis*, Bdv. (Kirby, Handb. Lep. v. 65).
44. *Hyppa*, Ochs., as generic name for *rectilinea* (Tutt, Brit. Noct. iii. 95).
45. *Lithophana*, Hb. (? 1816), for *Xylina*, Ochs. (Grote, Entom. Rec. vi. 30).
46. *Scoliopteryx*, Germ. (1810), for *Gonoptera*, Latr. (Tutt, Brit. Noct. iii. 97).
47. *Erotyla*, Hb. (? 1810), for *Agrophila*, Bdv. (Kirby, Handb. Lep. v. 86, 87).
48. *Olivana*, Schiff. (1776), for *argentula*, Esp. (*l. c.*, p. 92).
49. *Anthophila*, Hb. (? 1810), for *Thalpochares*, Led. (*l. c.*, p. 97).
50. *Lars*, Hb. (? 1810), for *Uropteryx*, Leach (*l. c.*, p. 201).
51. *Ennomos*, Tr., for *Eugonia*, Hb., *nom. præocc.* (*l. c.*, p. 208).
52. *Bistortata*, Goetze, for *biundularia*, Bork., = *laricaria*, Dbld. (Prout, Entom. Rec. viii. 76).
53. *Cyclophora*, Hb.* (? 1810), for *Zonosoma*, Led. (Kirby, Handb. Lep. v. 223).
54. *Testaceata*, Don., for *Asthena sylvata*, Hb., *nom. præocc.* (Staudinger, Cat. p. 190).
55. *Interjectaria*, Gn., for *Acidalia dilutaria*, Auct. (Prout, Entom. Rec. vii. 124).
56. *Spilota*, Hb. (? 1810), for *Abraxas*, Leach. (Kirby, Handb. Lep. v. 241).
57. *Denotata*, Hb., for *campanulata*, H.-S. (Heinemann, Schmett. Deutsch. i. 802; Entom. Rec. vii. 249).
58. *Chloroclystis*, Hb. (? 1822, as genus for *coronata*, *rectangulata*, and *debilitata* (Meyrick, Handb. pp. 182, 183).
59. *Gymnoscelis*, Mab. (1869), as generic name for *pumilata* (*l. c.*, p. 183).
60. *Sexulata*, Retz. (1783), for *sexalisata*, Hb. (Werneburg, Beitr. i. 193).
61. *Furcata*, Thnb. (1784), for *sordidata*, Fb. (Prout, Entom. Rec. ix. 86).
62. *Autumnalis*, Ström. (1783), for *trifasciata*, Bkh. (Entom. Rec. ii. 224).

* Hulst (Trans. Amer. Ent. Soc. xxiii. p. 300) considers this name preoccupied in Mollusca. But as the form there used was *Cyclophorus*, both can stand; *vide* Walsingham & Durrant, 'Merton Rules,' No. 23.—L. B. P.

63. *Rheumaptera*, Hb. (? 1810), as generic name for *has-tata*, L. (Kirby, Handb. Lep. v. 249).

64. *Implicata*, Vill. (1789), for *montanata*, Bkh. (Prout, Entom. Rec. vii. 249).

65. *Spadicearia* (Schiff.), Bkh. (1794), for *ferrugata* (? Cl.), Haw. (Meyrick, Handb. p. 229).

66. *Ferrugata*, L. (1761), for *unidentaria*, Haw. (*l. c.*, p. 229).

67. *Pyraliata*? (Fb.), Bkh. (1794), for *dotata* of South's 'List' (Prout, Entom. Rec. ix. 201).

68. *Ortholitha*, Hb., for *Eubolia*, Dup. (Tutt, Brit. Moths, p. 284).

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February 4th, 1899.

DRAGONFLIES IN 1898.

BY W. J. LUCAS, B.A., F.E.S.

IN several respects the dragonfly season of 1898 was of more than ordinary interest. Though of a different nature, the late, ungenial spring had its effect on these insects as on the Lepidoptera and other orders. Owing to the fact that during the winter, except in the coldest weather, the nymphs are more or less active, and may perhaps feed to some extent, a cold spring would not of itself harm them so long as it was possible to put off the final change. Some of the early species certainly tried to appear soon after their proper time; whether many did so and perished, I cannot say—probably not, though perhaps one or two of the earlier species seemed less common than usual.

Whereas in early seasons *Enallagma cyathigerum*, *Pyrrhosoma nymphula*, *Brachytron pratense*, *Libellula depressa*, and *L. quadrimaculata* appear at the end of April, in 1898, except for an odd specimen here and there, they were a month later. I saw two specimens of *E. cyathigerum* on May 18th, and they continued increasing from that date, but were hardly well out till early in June. As regards *P. nymphula*, I found an empty nymph-case on May 8th, but did not see an imago till May 21st; this species also began to be plentiful early in June. Except for an empty nymph-case on May 28th, *B. pratense* escaped me altogether; nor did I meet with *L. depressa* except on July 2nd, and perhaps again on Aug. 11th. A single specimen of *L. quadrimaculata* was certainly taken on May 11th, but I did not find it common till June 5th.

Towards the end of June the later dragonflies began to put in an appearance at the proper time, unaffected apparently by the prolongation of the cold weather, and in consequence the times

of certain species overlapped more than they usually do. The season thenceforward was a most satisfactory one, and owing to the fine autumn was late in closing. The last dragonfly I saw was on the wing in Richmond Park, on Oct. 23rd, and the species was *Sympetrum striolatum*. In 1897, however, I saw it at Esher as late as Nov. 14th, and I have no doubt that, had I sought for it, this species, if not others, might have been taken at least as late this year.

Orthetrum cancellatum was received from a new locality between New Malden and Kingston in Surrey. A female *Anax imperator*, with blue abdomen, was taken as late as Aug. 10th in the New Forest. The capture of a male *Lestes sponsa* at the Black Pond, near Esher, on Oct. 2nd, adds yet another to the list of species found at that prolific locality. At the beginning of August *Orthetrum cærulescens* was particularly common in the New Forest, especially over marshy ground, and I received the species for the first time from Surrey.

In the New Forest, on July 30th, and during the early days of August, *Agrion mercuriale* was common in the locality referred to in 1897, and it was traced to another centre, where, owing to the nature of the place, it will probably be well able to hold its own. Out of some 100 or 150 insects perhaps that were noticed, but a small proportion were females.

Near Sandwich, in Kent, towards the end of August, for the first time I made acquaintance with *Sympetrum sanguineum*, a rather small bright crimson dragonfly, much constricted at the base of the abdomen, and dilated towards the extremity. It skips about from plant to plant along the ditches, and, though rather jerky and restless, was not difficult to secure. It was, however, rather worn. On Sept. 9th I took a male at Wisley Pond, in Surrey, making a new record for the locality, and an empty nymph-skin found there on July 16th may belong to the same species. Others were taken at previously unrecorded localities in the south-east of England, the fact pointing possibly to a small immigration.

On Aug. 22nd, a very hot morning, as I was making my way towards the sand-hills near Sandwich, a blue-bodied dragonfly settled on some reeds by the side of one of the numerous streams. Thinking it was a late *L. depressa* or *O. cancellatum*, I approached it, and made an easy capture. Judge of my delight when I found that it was neither of those insects, but *Libellula fulva*—a male with the full blue colouring—though rather a worn specimen. This, however, mattered little, seeing that I have only been able to find six previous localised records of its capture, and these generally as single specimens, though a few other specimens unrecorded, and sometimes not localised or dated, are to be found in collections.

After patiently watching for a long time, I managed, on

Sept. 12th at Wisley Ponds, to capture a male *Æschna mixta*. This small *Æschna* is accustomed to fly rather high round the fir-trees, and so seldom gives one a chance to come within striking distance. It is a pretty insect, the markings being particularly bright and distinct; moreover, if it is eviscerated, it fades but little. Though it was rather plentiful in 1898 in a certain locality near the east coast, and appeared to be represented by not quite solitary specimens in two localities in Surrey, yet I fear it must be looked upon as quite an uncommon insect.

On Sept. 9th I paid a visit to Wisley Ponds, and after a time noticed a small dull-reddish dragonfly, distinct amongst the specimens of the common *Sympetrum striolatum*. On capturing one it was found to be a male *S. flaveolum*. On that day and the 12th I took several specimens, all of which were males. It is a small *Sympetrum*, whose flight is not long sustained, but resembles that of *S. sanguineum*. When captured it may be easily recognised by the fact that the basal third (sometimes more or less) of the hind wings and a part of the fore wings are suffused with bright saffron. Another was seen later near Elstead, in Surrey; while a capture was made near Oxford, and another near Colchester. In all probability they formed part of a migration into this county, for this species seldom, if ever, breeds here.

On previous occasions I have called attention to the capture of dragonflies by the insect traps set by *Drosera rotundifolia*. On June 22nd, at the Black Pond, near Esher, my attention was taken by a bed of this plant, which had secured quite a number of the smaller dragonflies. Those identified were one *Pyrhosoma nymphula*, one *Agrion puella*, and a number of *Enallagma cyathigerum*. All were males.

On Sept. 11th, at the larger of the Penn Ponds, in Richmond Park, one or two females of the large brown dragonfly, *Æschna grandis*, were observed to be ovipositing in the shallow water close to the margin. This they did by settling either on a floating weed, or on one that stood but little out of the water, and then bending the abdomen so as to dip its extremity perpendicularly below the surface. The operation seemed to be performed deliberately, as if the eggs were being carefully placed, which they no doubt were, and which is suggested by the possession of an ovipositor by this dragonfly, and by the cylindrical form of its egg, fitting it for insertion within the substance of soft tissue.

Near Byfleet, on July 16th, I observed, over the Canal, a pair of Agrionine dragonflies united *per collum*. They settled on a weed, and shortly afterwards I noticed the female in the act of descending below the surface of the water. She went down one or two inches at least, and appeared to be ovipositing. To make quite sure of the species, I tried to catch the male, which was

hovering over the spot. By so doing I frightened the female, and she came to the surface. The water did not seem to have wetted her body; in fact, when under the water, she appeared to glisten as if surrounded with a coating of air. After making the stroke, I found in the net a male *Enallagma cyathigerum*, and so conclude that that was the species. Needless to say, I was extremely pleased to observe this rather striking phenomenon. It has been more than once mentioned of the genus *Agrion*, and once at least of *Lestes*; but it is a proceeding one would so little expect that to have seen it is most satisfactory.

About a week later, at the Black Pond, two or three pairs of *Pyrrhosoma nymphula* caught my attention. They were flying united *per collum* along a narrow ditch draining into the pond. Presently one of these pairs went down to the water, and the female settled on a floating leaf of *Potamogeton*, whilst the male still held her, and remained with its body vertical and wings horizontal. The female then moved the anal extremity of her abdomen about over the leaf as if ovipositing. After two or three minutes they flew away. On the under side of the leaf were two roundish egg-like bodies; but the insect did not appear to touch the under side, nor did I expect an egg of *nymphula* to be of that shape. On opening the abdomen of a female I found a large number of cylindrical bodies with one end pointed and the other rounded, about 1 mm. in length and .25 in greatest breadth. They were colourless and semi-transparent, the contents being granular, and no doubt were the eggs. On plucking the leaf I could not at first find the eggs that had been laid. On the next day, however, when it had withered, I closely examined the dry leaf, and found some little ridges, which contained a long cylindrical body resembling in size and appearance the bodies I had taken from the female. These, which it is reasonable to conclude were the eggs, were between the two cuticles of the leaf, and therefore within its substance, where no doubt they were out of the way of many enemies.

Again, about a fortnight later, in the New Forest, I noticed a pair of *Platynemis pennipes* united *per coll.* resting on a yellow water-lily blossom. The female was again moving the anal extremity of her abdomen along the surface of the stem, and, I concluded, inserting eggs in it. After considerable difficulty I managed to secure the blossom. The stem was closely examined, both fresh and withered, but not an egg could be seen, though I think they must have been there. Supposing oviposition was taking place, it is worthy of note that the female was laying her eggs above the water, although when the blossom of the water-lily had withered the stem would be submerged again, for the fruit of the yellow water-lily comes down to the surface, even though the blossom may stand some inches out of the water.

On June 1st, at a few minutes to 1 p.m., I noticed that a

Libellula quadrimaculata had just begun to emerge, and I was able to watch almost the entire process. After about ten minutes the whole of the imago was out except two or three of the hind segments of the abdomen, and the head and thorax were thrown back as if the insect were helpless. For nearly an hour it "rested" in this apparently uncomfortable position, looking as if it might fall head foremost into the water at any moment. A *P. nymphula*, whose emergence was watched on April 27th, did not fall back in this way, and the "rest" only lasted about twelve minutes; while an *Agrion puella*, caught apparently in the "resting" position, was erect also. To return to *quadrimaculata*. The insect (a female), without any warning, suddenly swung itself forward, seized the nymph-case, and drew out the rest of its abdomen, and in the position assumed seemed to be clinging to its own dead body. About half-past two the wings were of full size, but opaque, while the body had increased in length but little, and it was still short when I was forced to leave. The wings were then adressed to one another, as in the resting position of the Agrionidæ. In the evening they were spread out flat, as is usual with the Anisopterid dragonflies; the body was of full length, and the colours were well on their way. On the following evening the wings were still glossy, but otherwise the insect had practically assumed its mature colouring. Though the body sways from back to front, and gives occasional twitches while growth is taking place, I have never seen the expanding dragonfly walk forward up its support, as described by some authors, to assist in the process of expansion, which, however, is always a most interesting proceeding, and cannot but call to mind Tennyson's beautiful lines from the "Two Voices":—

"To-day I saw the dragonfly
Come from the wells where he did lie.
An inner impulse rent the veil
Of his old husk; from head to tail
Came out clear plates of sapphire mail.
He dried his wings; like gauze they grew;
Thro' crofts and pastures wet with dew
A living flash of light he flew."

SOME NEW GENERA AND SPECIES OF PHYTOPHAGOUS COLEOPTERA FROM INDIA AND CEYLON.

BY MARTIN JACOBY.

Lema gahani, sp. nov.

Dark metallic blue; the antennæ, tibiæ, and tarsi black; thorax very minutely punctured on the disc; elytra scarcely depressed below the base, the anterior portion distinctly punctate-striate, the posterior half simply striate, the interstices convex near the apex. Length, 6 mill.

Of a uniform dark blue colour; the head impunctate, the neck scarcely constricted, with traces of fulvous colour; eyes very prominent, the lateral grooves very deep; clypeus impunctate, labrum and palpi nearly black; antennæ very short, black, the third joint one-half longer than the second, but shorter than the fourth, four lower joints shining, the rest pubescent and robust; thorax not much longer than broad, moderately constricted at the sides, the anterior angles rounded, the basal sulcus deep and sinuate, the disc extremely minutely and remotely punctured, rest of the surface impunctate; scutellum small, black; elytra parallel, with a very feeble depression near the suture below the base, regularly and rather strongly punctured at the anterior half, the punctures gradually diminishing in size and their places occupied by striæ at the posterior portion, the interstices convex at the latter place, impunctate; below dark blue, as well as the legs, sparingly clothed with grey pubescence; the posterior femora not extending beyond the second abdominal segment; ninth row of punctures at the elytra entire.

Hab. Khasia Hills.

The single specimen which Dr. Kraatz kindly sent me differs from any of its similarly coloured Eastern relations in the short antennæ, finely punctured disc of the thorax, and the sculpturing of the elytra, which are only partly punctate-striate.

Lema westwoodi, sp. nov.

Metallic dark blue; the abdomen flavous; antennæ and legs nearly black; thorax finely rugose-punctate near the base only; elytra with deep basal depression, finely punctate-striate, the punctures nearly obsolete near the apex, ninth row entire. Length, 5 mill.

Head not constricted posteriorly, the vertex finely punctured at the sides with a short longitudinal central groove; eyes large, subquadrately notched, the surrounding space rugose; labrum black; antennæ long and slender, black, the third and fourth joints equal; thorax subquadrate, not longer than broad, very moderately constricted at the sides, the latter nearly straight when viewed from above, widened towards the apex, the anterior angles very minutely tuberculiform, the surface obsoletely sulcate near the base, the latter finely rugosely punctured, the middle of the disc with a few fine punctures, which are also visible near the anterior angles; scutellum broader than long, smooth; elytra strongly foveolate near the suture below the base, the basal portions very feebly raised, the surface distinctly punctate-striate, the punctures larger within the depression, much finer and more elongate posteriorly, where the interstices are convex; below and the legs nearly black; the abdomen fulvous or flavous.

Hab. Ceylon.

I know of no species of *Lema* from the East in which the thorax is similarly sculptured, nor of any from other parts of the world; this character and the colour of the abdomen will easily distinguish the species. In the Oxford Museum collection and that of my own.

Pantocometis viridicollis, sp. nov.

Metallic dark green, finely pubescent; the labrum, basal joints of the antennæ, and the legs fulvous; head and thorax minutely punctured, finely pubescent; elytra strongly punctured, fulvous, a spot on the shoulder, another before the middle, and a transverse band below the latter, dark blue. Length, 6 mill.

♀. Head very finely longitudinally strigose at the vertex, metallic green, finely rugose and pubescent between the eyes; labrum fulvous; eyes reniform; antennæ extending to the base of the elytra, black, the lower four joints fulvous, second and third joints small, the third less rounded, the other joints strongly transversely serrate; thorax twice as broad as long, the sides straight anteriorly, strongly rounded at the base as well as the posterior angles, the surface obsoletely transversely depressed anteriorly and obliquely so near the posterior angles, very minutely punctured and finely pubescent, metallic green; scutellum raised, finely pubescent, its apex truncate; elytra strongly and closely punctured, fulvous, a round spot before the middle near the suture and two others more or less connected below the middle, dark blue; below dark bluish, closely covered with silvery pubescence; legs robust, fulvous, the first joint of the posterior tarsi scarcely as long as the following two joints together.

Fem. Larger, the elytra much more finely punctured, the spots larger, an extra one placed on the shoulders.

Hab. Khasia Hills.

The general appearance of this species is that of *Gynandrophthalma*, but, excepting that the pubescence of the entire upper surface in *Pantocometis* is here confined to the head and thorax only, I cannot find differences to justify a separation from the last-named genus; it is true that in *Pantocometis* the hairs are long and erect, while in the present species the pubescence is very fine and adpressed, but that distinction in itself is of no generic value; the elytra are distinctly lobed also below the shoulders. The female varies a good deal from the male in the much finer and more distant punctuation of the elytra, the extra spot on the shoulders, and the much larger size of the other elytral markings which form nearly a broad transverse band below the middle. I received the specimens from Dr. Kraatz.

Chrysolampra thoracica, sp. nov.

Piceous below; the antennæ and legs fulvous; the head, thorax, and elytra metallic green, the thorax very finely and closely punctured; elytra strongly punctate-striate, the interstices at the sides very strongly transversely rugose, anterior femora strongly dilated and toothed. Length, 6 mill.

Head very closely punctured, the vertex with a longitudinal groove; clypeus rugose-punctate, its anterior margin slightly concave; labrum fulvous; antennæ nearly extending to the apex of the elytra, fulvous, the third joint slightly longer than the fourth; thorax twice as broad

as long, of even width, the sides rounded, the surface finely and very closely punctured, the punctures rather more crowded at the sides, but not larger; elytra slightly transversely depressed below the base, with closely approached rows of deep punctures, the interstices strongly transversely rugose at the sides, costate at the apex; legs fulvous.

Hab. Silhet, India.

A rather small-sized species, of which I possess a single male specimen; and distinguished from its allies in the finely, closely, and evenly punctured thorax, in connection with the fulvous legs.

Chrysolampra flavipes, sp. nov.

Dark æneous below, the breast metallic greenish; antennæ, labrum, and legs fulvous, above cupreous; thorax strongly and subremotely punctured; elytra subgeminata, punctate-striate near the suture, the sides strongly and closely punctate and semirugose.

Fem. Sides of the elytra strongly rugose, the punctures confluent. Length, 6-8 mill.

♂. Head finely and somewhat closely punctured, cupreous, the vertex with a central longitudinal groove; clypeus scarcely more strongly punctured, its anterior margin nearly straight; labrum fulvous; antennæ entirely fulvous (the last three joints wanting), basal joint strongly thickened, second very short, third and fourth equal, elongate, fifth joint longer; thorax twice as broad as long, the sides strongly rounded, the surface strongly but not very closely punctured, the punctures of equal size, nearly absent at the lateral and basal margins; elytra very feebly depressed below the base, punctured like the thorax near the suture, where the punctures are slightly arranged in irregular double rows, the sides more strongly punctured, and the interstices very strongly transversely rugose, those near the apex of the elytra not raised, and impressed with single rows of punctures; below piceous, the breast more or less metallic green; the legs pale fulvous, the anterior femora strongly dilated.

♀. Larger; the elytral interstices more strongly rugose, those at the apex longitudinally costate; the breast and abdomen obscure æneous.

Hab. Khasia Hills.

This is another species which does not agree with any of its congeners; the punctuation of the thorax is different, the sides of the latter might almost be called subangulate, and the legs are entirely fulvous. I received both sexes from Dr. Kraatz.

(To be continued.)

NOTES AND OBSERVATIONS.

INFORMATION AND MATERIAL WANTED.—Now that the first volume of my new work on 'British Lepidoptera' is completed, and entomologists have an idea of the scope of the work contemplated, I should be glad of help in every possible form with regard to the Plumes, the Psychids,

the Lasiocampids, the Endromids, the Saturniids, and the Sphingids; notes on the egg (and egg-laying), larva (and habits of larva), pupa and cocoon; also actual dates of appearance, localities of capture, parasites, food-plants, variation, and other interesting details, would be exceedingly welcome. Probably some one lepidopterist knows some particular species better than anyone else. I am anxious to get such information as is available brought together, so that the entomologist has not to waste so much time as at present to discover what is known of each species. If the time spent on volume i. is to be a criterion to following volumes, their production will be a very slow matter, although already a fair amount of the available material relating to the families mentioned above is already in hand. I particularly want at present cases of Psychids for description, eggs relating to any of these groups, and newly hatched larvæ. I have done most of the pupæ and some eggs, but if entomologists will kindly keep my requirements in mind during the next three or four months I shall be very grateful, and a complete life-history of most of the species dealt with should be available, say in twelve months' time. I need not add that tabulated dates and localities are better for reference than those enclosed in letters on general subjects. In giving localities, please add counties. The schoolmaster is abroad, we know, but I have learnt more geography (relating to outlying districts in the British Islands) than I had previously considered possible, and have just begun to fathom my own ignorance in this direction.—J. W. TURR; Westcombe Hill, S.E.

PUPATION OF *COSSUS LIGNIPERDA*.—I can corroborate Dr. May's observation as to the pupation of *C. ligniperda* (*ante*, p. 17). The full-fed larvæ have frequently been dug up in my garden in the autumn, but always at a considerable distance from any tree or bush of any description. I have also constantly had them brought to me, and have also often seen them myself, when wandering about evidently searching for a suitable place in which to burrow. I have then placed them in a box half full of earth, in which they pass the winter, and do not spin their cocoons, which are composed of silk and earth, until the following April. The imagines emerge in June.—EDWARD RANSOM; Sudbury, Suffolk.

CONTINENTAL LOCALITY FOR *LYCÆNA ARION*.—With regard to the information required by Mr. Dallas (*ante*, p. 38), I may mention that I captured *Lycæna arion* in two localities in Switzerland last year. At Montana, above Sierre, it was just emerging between June 17th and 25th, and it was tolerably common at Zermatt from June 25th to July 4th. I believe that I also took it at Evolena from the 7th to the 13th of the latter month, but of this I cannot be sure, as some of my specimens were unfortunately destroyed.—(REV.) WILLIAM W. FLEMING; Coolfin, Portlaw, Co. Waterford, Feb. 11th, 1899.

LYCÆNA ARION.—On reading Mr. Dallas's enquiry concerning the rearing of *L. arion* I remember that in August, 1897, I had noted a larva that I had found when searching among thyme for the larva of *Eupithecia constrictata* after sundown. The larva was probably full-fed, as on Aug. 18th it spun two strong silk threads, pulling the muslin

together on the top of my rearing-cage, and proceeded to make a loose silk hybernaculum in which to pass the winter. This it accomplished, for in March, 1898, it was still alive. During April I was, unfortunately, unable to attend to it, and in May it was shrivelled up and dead. I think there can be little doubt that it was the larva of *L. arion*, and that therefore the spring months would be the best time to look for it, and that the help of a lantern might be called in if daywork was unsuccessful. The following are my notes on the larva:—Colour, pale apple-green, surface roughened, white-sprinkled, dorsal line faint, spiracles brownish; head bilobed, brown, mottled with darker; body attenuated at extremities, swollen in the middle, sparsely covered with short hairs. Length $\frac{3}{4}$ in. when extended.—E. B. NEVINSON; 3, Tedworth Square, Chelsea, S.W.

PUPATION OF *SMERINTHUS POPULI*.—In a communication from my brother, Mr. H. L. Sich, dated Whitby, Aug. 11th, 1898, he describes the process by which a larva of *S. populi* assumed the pupa stage as follows:—

“Just watched a larva of *Smerinthus populi* change into a pupa. I noticed the skin of the larva around the claspers had previously become loose. The pupa then began to draw up its body within the larval skin until the latter split on the back of the third segment. This slit increased at both ends, and when it reached the first segment the head of the pupa was withdrawn from the skin; this then slipped down the body, which wriggled out of it. The pupa at first was light green in colour. It was able to move the head both laterally and vertically. The antennæ and legs were very distinct. The terminal half of both organs were standing away from the body of the pupa. On the body, below the wing-cases, could be seen the grooves in which the margins of the wing-cases rest. Afterwards the body was drawn up to meet the wings, which then assumed the usual position. The pupa, which was then lying on its side, turned on its back and subsequently became quite normal.”

This larva had duly gone down, but owing to my brother leaving Whitby it had to be taken from the earth before the pupa was formed.—ALFRED SICH; “Brentwood,” 65, Barrowgate Road, Chiswick.

SYNONYMICAL NOTE ON *COLIAS EDUSA* AND *C. HYALE*.—Dr. Chr. Aurivillius (Entomol. Tidskrift, 1898, pp. 61-4) has recently discussed at some length the synonymy of two species of *Colias* usually known to British Lepidopterists as *hyale* and *edusa*. The conclusions arrived at are as follows:—

1. *COLIAS HYALE*, Linn. 1758 & 1761; God. 1819; Boisd. 1836, etc.
palano, Esper, 1777; Hübn. 1798-1805.
kirbyi, Lewis, 1872; Kirby, 1896.

2. *COLIAS ELECTO*, Linn. 1763.
electra, Linn. 1767.

var. *CROCEUS*, Fourcr. 1785.

hyale, Esper, 1777; Hübn. 1798-1803.

edusa, Fabr. 1787; God. 1819; Boisd. 1836, etc.

so that the species enumerated in the list of British butterflies (*ante*, p. 32) as *C. edusa* will apparently be known in future as *C. electo* var. *croceus*.—G. W. KIRKALDY.

CAPTURES AND FIELD REPORTS.

PIERIS RAPÆ IN JANUARY.—An example of *P. rapæ* (which has been examined by Mr. John Sandison) flew across a room in a house at Wimbledon on January 29th (a dull and rather cold day). It is presumed that it arrived concealed among some plants.—G. W. KIRKALDY.

PHLOGOPHORA METICULOSA IN WINTER MONTHS.—On February 7th a specimen of *Phlogophora meticulosa* was taken in a greenhouse at Cobham. It was in such fine condition that it could have but just emerged.—N. O. GURNEY; Broad Street, Teddington, Feb. 10th, 1899.

[A Liverpool correspondent informs us that he took an example of this species from off a garden wall on December 21st last. When first observed the wings were not quite expanded; but when fully developed the insect proved to be unusually dark in colour.—ED.]

NOTE ON EPHESTIA KÜHNIELLA.—Larvæ of *E. kühniella*, in various stages of growth, were found this month infesting a packet of Florida food and another of Quaker oats, which had been laid aside for some time. The larva is smooth and of a reddish tint, and spins a white web amongst the food. I noticed occasional specimens of the moth about the house during last summer and autumn; and a specimen was flying here on February 8th. On referring to former volumes of the 'Entomologist,' I learn that this insect has been imported with rice or flour; that it was first noticed in this country in 1887, and appears to be spreading.—W. PASKELL; 96, Studley Road, Forest Gate, E.

NOTES FROM NORTH WALES.—Seeing a list of Lepidoptera taken by Mr. Barraud at Aber in August (*ante*, p. 20), I thought it might not be altogether out of place to send a list of my own captures at a place not far distant, Colwyn Bay. The time was between May and July, including the last two weeks of the former and first three of the latter. Of the butterflies I noted the following:—*Pieris brassicæ*, not at all common. *P. rapæ* and *P. napi*, both fairly plentiful. *Euchloë cardamines*, plentiful in the Nant-y-glyn valley, which is situated at the east end of the town, and runs in an almost due south direction. *Argynnis selene* and *E. euphrosyne* were both found in the same valley as *E. cardamines*, but the latter is much more plentiful than the former. *Vanessa urticæ* is found almost everywhere; and I took the larvæ of *V. io* in large quantities in 1897. *V. atalanta* and *V. cardui* were also met with, but were not common. *Pararge egeria* and *P. megæra* were both common. *Satyrus semele* was exceedingly plentiful on the western side of Bryn Eurian, a small hill situated to the west of Colwyn Bay, between the Conway and Llandudno roads. *Epinephele ianira* swarmed in almost every field; while *E. tithonus* was found in the fields to the west of Bryn Eurian and east of Pabo. *Polyommatus phlæas*, *Lycæna icarus*, and *Nisoniades tages* were all common. I also took a few *L. minima*; while a friend of mine showed me a specimen of *Hesperia sylvanus*, but this is the only specimen ever taken or seen in the neighbourhood, as far as I can ascertain. The "hair-streaks" seem to be wanting in this locality. Of the moths I obtained about fifty species, the best of these being *Macroglossa stellatarum*, not very common; *Nemeophila plantaginis*; *Cossus ligniperda*, one female specimen; *Geometra papilionaria* and *G. vernaria*; *A. sylvata* and *Ennychia octomacualis*, the latter on the side of Moel Shiabod, near Dolwyddelan.—OSCAR WHITTAKER; Morelands, Heaton, near Bolton.

NOTES FROM THE SOUTH-WEST OF ENGLAND IN AUGUST, 1898.—While at Lyme Regis in Dorset, early in August last, I saw three specimens of *Colias edusa* on the cliffs between that place and Seaton. One of the three, a fresh male, I captured on August 11th. In the evenings *Miana bicoloria* was very abundant on the waste ground above the beach just outside Lyme. In the middle of the month I found a dense colony of *Lycana corydon* along the banks of the main road between Salisbury and Wincanton just on the edge of the plain. A few perfectly fresh *Vanessa cardui* also occurred in the same place. I saw *Colias edusa* again, about August 20th, in a clover field near Taunton. *Gonopteryx rhamni* was very abundant in the same neighbourhood. During the last fortnight of the month we found the electric light at Taunton very attractive to moths. Most of them were of the commoner Noctuæ, *Plusia gamma* swarming on some nights; but among better moths we took *Dicranura furcula*, *Notodonta dictæa* (common), *Acronycta rumicis*, *Agrotis puta*, *Noctua c-nigrum*, *Eugonia alniaria*, and *E. fuscantaria*.—ALFRED S. TETLEY; Newtown, N. Wales.

INFORMATION WANTED.—I am anxious to devote next summer to making as good a collection of English and European butterflies as can be managed, personally, in the time. I should be very grateful if any reader of the 'Entomologist' could tell me the most likely places to go to, and the most favourable dates.—C. B. WILKIESON; Queen Anne's Mansions, Westminster, S.W., Feb. 17th, 1899.

LEPIDOPTERA IN THE HALIFAX DISTRICT.—Mr. Edward Halliday, in a note to the 'Halifax Naturalist' (February, 1899), states that the past year was a bad one for Lepidoptera in his district. He writes:—"All the butterflies, except the common whites, have been rare. On the moors the emperor moth was less plentiful than usual; and other local moths, such as *Celana haworthii* and *Scodiona belgiaria* have been more scarce than I have ever known them. . . . I met with very few *Dasypolia templi* in October this year."

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—January 18th, 1899.—*Sixty-sixth Annual Meeting*.—Mr. Roland Trimen, F.R.S., President, in the chair. The balance-sheet of the Society's accounts, showing a large balance in favour of the Society as against a nominal one in January, 1898, was read by Mr. A. H. Jones, one of the auditors. The Report of the Council was next read, from which it appeared that during 1898 the Society had lost three Fellows by death and eight by resignation, while three honorary Fellows and thirty four ordinary Fellows had been elected. This was the largest addition to the Society's ranks in any year, except 1886, when the circumstances were exceptional. The number of Fellows now stood at 424, of whom twelve were honorary. The 'Transactions' for the year formed a volume of 444 pages, and comprised twenty-two papers, contributed by nineteen authors, and illustrated by nineteen plates. The library had been largely augmented during the year by the bequest of the late Mrs. H. T. Stainton of such books in her husband's large entomological library as were not pre-

viously in the Society's possession. It was announced that the following gentlemen were elected as Officers and Council for 1899:—President, Mr. G. H. Verrall; Treasurer, Mr. R. McLachlan, F.R.S.; Secretaries, Mr. J. J. Walker and Mr. C. J. Gahan; Librarian, Mr. G. C. Champion; and as other Members of Council, Mr. W. F. H. Blandford, Dr. T. A. Chapman, Mr. H. St. J. K. Donisthorpe, the Rev. Canon W. W. Fowler, Mr. A. H. Jones, Mr. F. Merrifield, Mr. E. Saunders, Mr. R. Trimen, F.R.S., Mr. J. W. Tutt, and Mr. C. O. Waterhouse. The Address of the retiring President was then read by the Secretary. In this, after a review of the present position of the Society, an account was given of the various experimental researches and observations made on the subject of seasonal dimorphism in Lepidoptera from those of Weismann down to the evidence recently brought forward by Dr. Dixey on the existence of this phenomenon in Neotropical Pierinæ. The Address concluded by the repetition of the recommendation made on the previous occasion—that biological stations should be established in tropical countries for the study of seasonal dimorphism, mimicry, and kindred phenomena. The proceedings terminated with the passing and acknowledgment of votes of thanks to the retiring President and the Officers.

February 1st.—Mr. George H. Verrall, President, in the chair. The President briefly returned thanks for the honour conferred upon him by his election, and announced that he had nominated the Rev. Canon Fowler, M.A., F.L.S., Mr. Edward Saunders, F.L.S., and Mr. Roland Trimen, F.R.S., as Vice-Presidents for the session. Mr. Henry William Andrews, of 9, Victoria Road, Eltham, was elected a Fellow of the Society. Mr. Champion exhibited three specimens of an interesting species of Fulgoridæ, *Atalanta auricoma*, Burm., recently received from British Honduras, from M. Blancaneaux; and stated that he had found lepidopterous larvæ in the white waxy matter attached to the body of an allied species, *Enchophora stellifer*, Burm., in Central America, of which insect he exhibited a specimen, together with a larva taken from it. This larva was very like that of *Epipyrops anomala*, Westw., a species of Arctiidæ which is attached to *Fulgora candelaria* in a similar way. He also showed numerous specimens of both sexes of an undescribed species of *Apiomerus* (family Reduviidæ) found by himself in Chiriqui, and pointed out some of the more interesting peculiarities of each sex. Mr. Tutt exhibited, on behalf of the Rev. G. H. Raynor, a large series of *Spilosoma lubricipeda*, Linn., inbred from specimens originally captured in Lincolnshire. Its chief interest seemed to be its demonstration of the fact that the extreme aberrations of this species could be produced by inbreeding from comparatively normal forms, a fact of all the more importance considering how much uncertainty there had been as to the real origin of the race which was first sent out from Yorkshire, and is now to be seen in many collections of British insects. He also exhibited, for Mr. Raynor, an aberration of *Epinephela tithonus*, taken at Hazeleigh in August, 1892, in which the bright fulvous areas were pale yellow in colour; and a somewhat strange aberration of *Noctua rubi* which showed considerable difference from the normal form in the arrangement of the transverse lines of the fore wings. Mr. Tutt then exhibited a number of closely-allied forms of *Anthrocera*, recently received from M. Oberthür of

Rennes, and comprising among others the following:—*A. medicaginis*, Dup., *A. medicaginis*, Bdv., *A. charon*, Dup., and *A. charon*, Bdv. The first two of these, as probably also the fourth, Mr. Tutt referred to *medicaginis*, Bdv. (Mon. des Zyg.), considering them to be possibly forms of *Anthrocera lonicera*; while the specimens of *A. charon*, Dup., taken at La Roche in August, 1896, were, he stated, almost indistinguishable from typical *lonicera*. Having shown also some examples of *A. seriziati* from Collo, and one, with very dark hind wings, from Bona, he said he had no hesitation in referring these to *Anthrocera palustris* as an extreme southern form. Mr. Tutt next exhibited specimens of *Anthrocera filipendula*, captured by Mr. W. H. Harwood near Colchester, which showed remarkable colour-aberrations extending from terra-cotta red to orange, as described at length in the account which he had recently given of the genus. He remarked on the peculiarity of these specimens, insomuch that they appeared more closely to resemble Lederer's well-known Asiatic races of the species than any other yet described. Mr. A. H. Jones exhibited a fine specimen of *Sphæria robertsi*, one of the pyrenomycetous fungi, attached to the larva of *Charagia virescens*? Mr. Percy T. Lathy communicated "A Monograph of the genus *Calisto*"; and the Rev. F. D. Morice, papers entitled "Illustrations of specific characters in the armature and ultimate ventral segments of *Andrena* ♂," and "Notes on *Andrena taraxaci*, Giraud."—J. J. WALKER and C. J. GAHAN, *Hon. Secs.*

RECENT LITERATURE.

1. *Biology of the Coprophagous and Necrophagous Diptera.* 2. *Studies upon Lucilia bufonivora*, Moniez, parasite on anurous batrachia. (In Russian.) "Trud 'i russk. éntom. Petersburg," 1898, vol. xxxii. pp. 225-79; 9 figs. By J. Portschinsky.

It has been known for some time past that the larvæ of a dipteron (*Lucilia silvarum*, Meig.) are occasionally found in the nostrils and eye-cavities of toads (*Bufo*), when the fleshy parts of the head are more or less eaten away. The presence of these larvæ is merely accidental, the ova being deposited only when the batrachians suffer from open wounds. After referring to this, and giving an historical account (of 7 pp.), the author proceeds to recount a similar case in which two species of *Rana* were attacked so determinedly by another parasitic dipteron that these frogs became almost extinct near Petersburg. In this latter case the larvæ were the cause and not the concomitant of the mortality, and the "disease" was apparent in many cases by the presence of deformities, such as a large bump on the top of the head, caused by the masses of larvæ beneath. This fly is *L. bufonivora*, Moniez, and, although practically indistinguishable from *L. silvarum* in the imaginal state, differs widely from it in the egg and larval stages. *L. bufonivora* is double-brooded, and each female deposits about sixty to eighty ova in rows on the backs of the frogs; the majority of these are broken or rubbed off, but the few that hatch (in about a day and a half) locate themselves in the eye-cavities and nostrils and start at once eating away the fleshy parts circumjacent. The frogs die in about three days. G. W. K.

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THE GENUS *CIGARITIS* AND ITS APPLICATION.

By A. G. BUTLER, Ph.D.

THE name *Cigaritis*, as M. Donzel noted in 1847, was originally proposed by Boisduval for certain undescribed African Lycaenidæ, but, until M. Donzel's description of *C. zohra* was published, it remained a mere manuscript name; nor did M. Donzel give any characters to the genus, or indicate in any way which of the African species was supposed to be the type of the undescribed genus.

In 1849 M. Lucas described two species, *C. masinissa* and *C. siphax*, figuring the latter as "*Zerythis siphax*" (sic); but still giving no characters for the genus.

In 1850 M. Lucas described *Cigaritis*, and gave a figure of *C. masinissa*. The genus having now received characters for the first time, and *C. masinissa* being the only species noted, this, as Dr. Staudinger most reasonably decides, becomes the type.

In his 'History of the Genera of Butterflies,' Dr. Scudder seems utterly to ignore the importance of a description for a genus, and actually credits Boisduval with the authorship of *Cigaritis*, and Donzel with the authorship of its type, which he declares judicially to be *C. zohra*; whereas there is nothing whatever to show that the *Cigaritis* of Boisduval manuscript was not intended for some African *Zeritis* or *Chrysophanus*; and, in common sense, one must conclude that until a genus is described it has no legal existence.

The species now placed by Dr. Staudinger under *Cigaritis* represent merely two sections of the genus *Spindasis*. If *Cigaritis* be retained at all, it can only be used for *C. siphax*, *C. masinissa*, *C. zohra*, and *C. cilissa*, in which the secondaries are more

rounded than in the typical forms of *Spindasis*, to which *C. acamas* and all the well-known types belong.

Of African species which have been referred erroneously to *Cigaritis*, *C. leroma* falls into Wallengren's genus *Crudaria*, which chiefly differs from typical *Chrysophanus* in the tailed secondaries; whereas *C. zeuxo* and *C. abbottii* appear to differ in no respect from *Chrysophanus*.

Zeritis lycegenes, *Z. lyncurium*, and *Z. pyroeis* of Trimen (which have been placed in *Cigaritis* in collections) differ in structure, and may be placed in—

PÆCILMITIS, gen. nov.

Allied to *Chrysophanus*, but differing in having five (instead of four) branches to the subcostal vein of primaries. Type, *Z. lycegenes*.

I have not examined *P. lyncurium*, but, judging by the figures, it must be nearly related to *P. lycegenes*.

TWO NEW RHYNCHOTA (REDUVIIDÆ AND CORIXIDÆ)
FROM JAPAN, AND DIVERSE NOTES.

By G. W. KIRKALDY.

1. *Ischnonyctes prædicator*, sp. nov.

♂. Lobes of head subequal in length, apical margin of posterior lobe emarginate; rostrum reaching beyond apical margin of prosternum, first segment nearly one-half longer than second, third slightly longer than first. Pronotum at the base with a very distinct collar (sinuately margined anteriorly); meso- and metathorax fused, a pronounced carina between the intermediate coxæ, and another between the posterior coxæ. Anterior femur with a very long (one-tenth of the length of the femur) spine, not quite one-half of the entire length of the femur from its base, and a double row of medium-sized spines and of small spinelets, extending from the longest spine to the apex. The long spine is directed distinctly anteriorly, the others are nearly perpendicular. Anterior tibia reaching (when folded) to three-tenths of the length of the femur from its apex, tarsus reaching not quite so far as the long spine. Tibia dilated towards the apex (which is provided with a short tuft of hair) and armed beneath, along its entire length, with short subequal spinelets. Intermediate and posterior femora and tibiæ somewhat obsoletely spined, the tibiæ slightly curved outwards; claws, two on each tarsus, anterior very minute, others longer, falcate. Elytra rudimentary, not reaching to base of metanotum. Dorsal sutures of first five abdominal segments very obsoletely indicated.

Proportionate measurements.—Head 30 (15 + 15); pronotum 45 (40 + 5), meso- and metathorax 65; abdomen 230. Antennæ 125 :

85 : 12 (?) : 40 (?). Anterior coxa 60, femur 100, tibia 35, tarsus (apparently unisegmentate) 20; interm. femur 146, tib. 175, tarsus 11 (10 : 6 : 9), claws 2. Posterior femur 195, tib. 235, tarsus 12 (5 : 3 : 4), claws 2. Total: anterior leg 215; interm. leg 345; post. leg 455. Length 17 mill.; width at int. coxæ 0·8 mill.

Japan. Niigata: Sept. 14th, 1881. Mr. Distant's coll.

Pale luteous, with a broad blackish lateral band on head and thorax. Head with two submedian brownish-black bands; thorax with a slender crimson median line; abdomen with one median and one lateral crimson line, obsolete in places. Sterna stramineous, with a broad median and a rather irregular lateral black band, somewhat obsolete on the prosternum. Anterior legs sordid flavous, irregularly infuscate; spines whitish, black-tipped; spinelets blackish. Intermediate and posterior legs fusco-flavous, apical half of femora and basal half of tibiæ annulated with brownish-black or brownish-yellow, tarsi blackish. Abdomen rufo-fuscous, mottled with brown and stramineous.

I have placed this fine species in *Ischnonyctes*, Stål (a genus hitherto known only from Algeria and Corsica—two species being enumerated in Lethierry and Severin's 'Catalogue,' iii. p. 75, although Puton considers them (1880 and 1886) to be probably the same), as it agrees quite well with Stål's brief description (1874, 'Svensk Vetensk. Ak. Handl.,' 12, no. 1, pp. 94 & 96), except that the surface of *I. prædicator* appears to me distinctly, though very minutely, granulate.

2. *Gerris lacustris* (Linn.), Stål.

There is a specimen in Mr. Distant's collection, from Japan, which appears to me to be indistinguishable from ordinary British and French examples of the above species.

3. *Notonecta montandoni*, Kirk.

Burma, Ruby Mines (collections Distant and Kirkaldy).

4. *Corixa distanti*, sp. n.

Belonging to subgenus *Basileocorixa*, Kirk., to the group of *striata* (Linn.).

Elongate; pronotum and elytra (membrane excepted) somewhat strongly rastrate. Macropterous. Lateral and posterior angles of pronotum rounded. Metaxyphus long, isosceles-triangular, reaching to about two-thirds of the length of the posterior coxæ, rounded basally. Intermediate femur more than twice as long as the tibia, which is one-third longer than the tarsus, claws one-sixth longer than the tarsus. ♀. Palæ cultrate. Length 11 mill.; width 3·7 mill.

Japan. Hako (coll. Distant).

Pronotum dark brown (lateral margins flavous), with about nine yellow lines, fairly entire (middle lines split). Elytral designs very clear, yellow lines of the corium not divided into series by brown longitudinal lines. Yellow lines of clavus and those at the base of the

corium fairly parallel; those of the membrane and towards the apex of the corium abbreviated, interrupted, undulated. Head, legs, &c., pale yellowish; mesosternum (margins excepted), metanotum, base and middle of dorsal aspect of abdomen blackish.

I have great pleasure in dedicating this fine species (readily separable by its size from the other *Basileocorixa*) to my friend Mr. Distant, whose name is so happily associated with the Rhynchota of the Japanese subregion.

5. *Corixa mercenaria*, Say.

Bolivia (collections Distant and Kirkaldy). Imported as bird food. Now known to me from California, New Mexico, Texas, Mexico, and Bolivia.

SOME NEW GENERA AND SPECIES OF PHYTOPHAGOUS
COLEOPTERA FROM INDIA AND CEYLON.

BY MARTIN JACOBY.

(Concluded from p. 70.)

Rhyparida khasianensis, sp. nov.

Fulvous; terminal joints of the antennæ black; thorax transverse, very sparingly punctured; elytra strongly punctate-striate, the interstices impunctate; femora unarmed; tarsi piceous. Length, 6 mill.

Head impunctate; the clypeus very broad, subquadrate, distinctly separated from the face, impunctate, its anterior margin semicircularly emarginate; antennæ very long, nearly extending to the apex of the elytra, flavous, the last seven joints black, second joint very short, the third nearly three times as long, the following joints nearly of similar length; thorax transverse, more than twice as broad as long, but little widened at the middle, the sides nearly straight, the anterior angles slightly tuberculiform, the surface very sparingly and finely punctured, fulvous; scutellum broad, impunctate; elytra wider at the base than the thorax, not depressed below the base, the shoulders prominent, the surface rather strongly punctate-striate, the punctures closely placed, the interspaces slightly convex, impunctate; below and the legs fulvous; tarsi more or less darkened; prosternum broad,

Hab. Khasia Hills, India.

Very few true species of *Rhyparida* from India have been described; the present one, although agreeing in every other respect with the genus, differs somewhat in the short second joint of the antennæ, which in most other species of the genus is distinctly longer. I received a single specimen from Dr. Kraatz.

Corynodes pretiosus, Baly.

Metallic blue or purplish; the head and disc of the thorax cupreous; elytra closely punctate-striate, reddish cupreous, a broad trans-

verse band at the middle, another near the apex, and the suture narrowly purplish, margined with green. Length, 9-10 mill.

Head cupreous, remotely punctured, the vertex with a deep central groove; the spaces surrounding the eyes and the clypeus metallic blue or green, the latter closely punctured; labrum and mandibles black; antennæ dark purplish, the last five joints gradually and broadly dilated; thorax about one-half broader than long, slightly narrowed in front, the anterior angles produced, the surface convex, strongly and remotely punctured, the sides and the base nearly impunctate, the latter portion metallic green, the anterior part cupreous, or the entire surface of the former colour; scutellum purplish, impunctate; elytra not depressed below the base, rather strongly and closely punctate-striate, reddish cupreous, with a transverse purplish band at the middle, which narrows greatly towards the suture without extending to the latter; another similarly coloured band of curved shape extends across the suture near the apex, but not to the lateral margins, the suture itself also narrowly purplish and margined like the bands with metallic green; below and the legs varied with purplish or green; claws appendiculate.

Hab. Burmah and India.

I have given here a more detailed and correct description of this handsome species than Baly has done, who described the head and legs as black, which certainly is not the case in the type contained in the British Museum. Two other specimens I received from Herr Bang-Haas.

Chrysomela gahani, sp. nov.

Very convex, black; head and thorax impunctate, sides of the latter with a deep longitudinal sulcus; elytra dark fulvous, entirely impunctate. Length, 9 mill.

Head subquadrate, black, shining, impunctate; clypeus distinctly separated from the face; antennæ slender, black, the terminal joints elongate, gradually thickened; thorax more than twice as broad as long, the sides straight, the anterior angles produced but blunt, the anterior margin straight at the middle, the disc entirely impunctate, the sides thickened, bounded within by a deep sinuate longitudinal groove; scutellum broader than long, blackish; elytra very strongly convex at the middle, dark fulvous, impunctate; under side and legs black, shining, impunctate; prosternum narrowly elongate.

Hab. Ceylon.

This species, of which I possess a single example, will not be difficult to recognise on account of the entirely impunctate upper and under surface, a rare instance in species of this genus.

Haltica semipiceus, sp. nov.

Below and the legs piceous; above dark blue; basal joints of the antennæ flavous; thorax very finely punctured, the sulcus obsolete; elytra very closely and distinctly punctured. Length, 3 mill.

Head impunctate at the vertex, the frontal elevations narrowly transverse, interrupted at the middle by another transverse groove;

the clypeus strongly raised, deflexed anteriorly, more or less flavous, as well as the labrum and the palpi; antennæ extending beyond the middle of the elytra, black, the lower four or five joints more or less flavous, third and fourth joints equal, both not much longer than the second joint, the latter thickened; thorax about one-half broader than long, slightly narrowed anteriorly, the sides straight, the anterior angles produced, the surface finely and somewhat closely punctured, the basal transverse sulcus obsolete; elytra much more distinctly and rather closely punctured, the interstices very slightly wrinkled here and there; below and the legs piceous, sparingly pubescent, the posterior femora strongly incrassate, the spine at the apex of the posterior tibiæ large.

Hab. Khasia Hills.

One of the smallest species of the genus, which may be known from other Eastern forms in the piceous, not blue, under surface and legs, the flavous basal joints of the antennæ, and the obsolete transverse sulcus of the thorax. I have received several specimens from Dr. Kraatz.

Podagrira ceylonensis, sp. nov.

Pale flavous or testaceous; thorax with a few minute punctures, the base with a perpendicular groove at the sides; elytra finely punctate-striate. Length, 2 mill.

Head entirely impunctate, obliquely grooved above the eyes, frontal tubercles obsolete; clypeus triangular; palpi slender; antennæ flavous, extending to the middle of the elytra, the third and fourth joints equal, the following scarcely longer, the terminal joint thickened and elongate; thorax twice as broad as long, the sides rounded before the middle, constricted at the apex, anterior angles slightly oblique, posterior ones acute, the disc convex, with a few very minute punctures, the basal margin with a well-marked longitudinal groove at each side, the base narrowly marginate; elytra slightly widened at the middle, wider at the base than the thorax, regularly and finely punctate-striate, the interstices very slightly convex; under side and legs flavous; prosternum narrow and elongate.

Hab. Ceylon.

A very small species of uniform coloration, and probably identical with one of Motschulsky's unrecognisable Ceylon insects, of which I hope the above description will give a better idea. The species might perhaps equally well be placed in *Nisotra*. In the collection of the Oxford Museum and my own.

Haplosoma sexmaculata, sp. nov.

Pale fulvous; the antennæ (the basal joints excepted), the breast and abdomen, and the tarsi piceous: thorax sulcate, impunctate; elytra finely rugose-punctate, flavous, a spot near the middle and two others near the apex of each, black. Length, 8 mill.

Narrow and elongate, the head impunctate, frontal elevations strongly raised, trigonate; clypeus triangular; antennæ nearly ex-

tending to the apex of the elytra, black, the basal three joints flavous, fourth joint nearly twice as long as the third, the latter double the length of the second; thorax subquadrate, one-half broader than long, the sides straight, the angles thickened, the disc transversely depressed in shape of three nearly united broad foveæ, a small one also placed at the middle of the base, the surface entirely impunctate; scutellum piceous; elytra finely rugose, flavous, with a small black spot placed immediately before the middle, and two other larger ones placed transversely near the apex; elytral epipleuræ comparatively broad at the base, much narrowed posteriorly; breast and abdomen piceous, the segments of the latter margined with fulvous; legs flavous, the apex of the posterior femora and all the tarsi piceous; claws bifid.

Hab. Khasia Hills.

The single female specimen kindly sent by Dr. Kraatz differs from any of its allies in the design of the elytra, and the broader epipleuræ of the latter.

KHASIA, gen. nov.

Body elongate, widened posteriorly; antennæ slender, longer than the body; palpi robust; head very broad; thorax subquadrate, strongly constricted at the base, the surface deeply bifoveolate; scutellum large, broader than long; elytra glabrous, impunctate, widened posteriorly, without any epipleuræ; legs very elongate and slender, the tibiæ with a small spine, the first joint of the posterior tarsi as long as the following three joints together; claws appendiculate; prosternum extremely narrow, the anterior coxal cavities open.

This is one of the most peculiar looking Galerucide on account of the long filiform antennæ and legs, and the quite unusual shape of the thorax, as well as the absence of any elytral epipleuræ; the genus will perhaps best find its place in Chapuis's 18th group, the Rupilinæ, near *Ellopia* and *Arima*; the female differs from the male in the greatly dilated abdomen, similar to that of several of the genera in the group where I have placed it.

Khasia kraatzi, sp. nov.

Head and abdomen black; antennæ (their apical joints excepted), the thorax, and legs more or less fulvous; elytra black, shining, impunctate, the basal portion deeply depressed. Length, 4-5 mill.

Head broad, the vertex swollen, impunctate, black, the frontal elevations narrowly oblique; eyes very prominent; palpi strongly incrassate; antennæ much longer than the body, flavous, the terminal three joints black, basal joint thickened, stained with piceous above, second very short, third joint twice as long, the fourth and following joints more elongate; thorax scarcely broader than long, the sides straight, strongly constricted at the base, the basal margin concave, slightly thickened, anterior angles thickened, the surface entirely impunctate, dark fulvous, very shining, with two deep oblique depressions near the base, interrupted by a narrow central ridge;

scutellum large, transverse, convex; elytra widened towards the apex, black, shining, impunctate, the basal portion deeply concave, raised near the suture, the sides costate from the shoulders to the apex; legs very elongate and slender, flavous.

Hab. Khasia Hills.

THE NEW WORK ON BRITISH LEPIDOPTERA.

By F. MERRIFIELD, F.E.S.

I HAD proposed to offer you a rather full notice of the recently published first volume of Mr. Tutt's 'Natural History of the British Lepidoptera,'* which, in comprehensiveness and fulness of detail on all points of interest to the biologist, the systematist, and the collector, is, as regards the particular subjects treated, without a rival. My friend Dr. Chapman, however, who is infinitely better qualified than I am, has forestalled me, leaving a few points to which it may not be out of place to call attention. Among these is the fulness with which Mr. Tutt treats of the egg stage, which is greatly relied on by the author as a leading element in classification, and the information collected by him on which, much of it the result of original enquiry, is extremely valuable.

Mr. Tutt appears, in preparing this volume, to have fully availed himself of the vast and varied information which recent researches have supplied, in the shape of the treatises, transactions of learned societies, and magazine articles published in this and other countries. The whole subject is treated with wideness and appreciativeness of view, and the authorities from whom Mr. Tutt differs, as he often does, but perhaps not more than they differ among themselves, must feel that he is not without good reason for his opinions. It would be giving a wrong impression if this remark led to the inference that the controversial element is a prominent one in this work. Quite the reverse. One of the chief merits of the book is the fulness with which it sets forth the views of other authorities, and the reasons for the choice which it is necessary to make between them and the views, in many cases original, of the author.

In the general introductory part, occupying 112 pages, there is one subject that will be missed; there is no chapter on the pupa, that marvellous stage, it may be of only four or five days' duration, during which the creeping larva—the highly specialised product of millions of generations—seems to be almost resolved into primal elements and reorganised into the form of the imago,

* Published by Swan Sonnenschein & Co., London; Friedländer & Sohn Berlin.

the active and beautiful winged creature, endowed with senses beyond human ken, that fills the summer air with brilliancy of colour and grace of movement. Mr. Tutt is doubtless fully sensible of the importance and interest that belong to this pupal stage, and one can only suppose that in the next volume he will devote a chapter to it; but the reader would have liked to have been told so.

There is the usual element of confusion arising out of the frequent changes of names in recent years, but that is no fault of the author, who only observes the "law of priority" which seems to have been imposed on systematists, untempered by a "statute of limitations" such as the common sense and experience of mankind have imposed on laws of wider application. As one who necessarily learned the entomological language of an earlier epoch, it is quite a pleasure to the writer to meet with an old friend respectable enough to have only one alias, *Anthrocera filipendule*, and this species is treated in a most exhaustive way, twenty-six closely printed pages being devoted to it and its various stages, variations, and habits, &c. The other species, about one hundred in number, described in the volume are treated with similar copiousness.

I do not find that in all cases the author gives the wing expansion, and venture to think that this is a particular which should always be stated. Surely size is a material element in description?

What has been stated of the treatment of *A. filipendule* will serve to show the completeness with which the subjects are worked out. The author probably had his reasons, but one is inclined to doubt whether there is not too much particularity and minuteness; not that abundance of material is ever to be regretted by those who wish to know, but that it is natural to desire that the work be completed, and to doubt whether it would be practicable to carry the rest of the work through on the same scale. The price is moderate for the amount of matter, and no doubt the separate volumes will be complete and valuable in themselves; but the finished work on this scale would be of such a voluminous character that one fears it would be beyond the reach of many in whose hands one would like to see it. However, if the experience gained with this volume shows that condensation is desirable, it can be practised in the volumes that will succeed. And there are so many public libraries, institutions, &c., in England, in America, on the European continent, and even elsewhere, to which the possession of this work will be absolutely indispensable, that it may be hoped that the demand will justify the great expenditure of labour and time that has been made upon it. It should be in every reference library in the provinces professing to be of a comprehensive character.

A FORTNIGHT IN THE HIGHLANDS.

BY G. T. PORRITT, F.L.S., F.E.S., &c.

A long-hoped-for collecting expedition to that classic ground to entomologists—Rannoch—was realized in June last. Some time previously Mr. C. A. Briggs of Lynmouth, Mr. J. J. F. X. King of Glasgow, and myself had arranged to visit the locality, the chief inducement being that we might capture our own series of the two local and up to that time rare dragonflies, *Æschna borealis*, Zett. (*cærulea*, Ström.), and *Cordulia arctica*, Zett. Monday, June 6th, therefore saw me on my way to Glasgow, where, at the railway station, Mr. King met me; and during the evening I had the rich treat of looking over his collections of Neuroptera and Trichoptera. Next morning we were up betimes to take the early West Highland train to Rannoch, and soon had the satisfaction of being joined by Mr. Briggs, who had been travelling all night in order to meet us. A journey through lovely Highland lake scenery brought us in due time to Rannoch, from which place we had a ten miles' drive before us to Camghouran, a small hamlet close to the famous Black Wood, on the south side of Loch Rannoch, and almost midway between the two ends of the lake, the distance indeed being about ten miles from Loch Rannoch at the west end, and eight miles from Kinloch Rannoch at the east end. At Camghouran Mr. King had already engaged for us comfortable "quarters" at the farmhouse of Mrs. Cameron, and there we spent nearly a fortnight in the wildest and most romantic spot it was ever my lot to be located in. Some collecting was done on the loch-side on the day of our arrival, but next morning we "set-to" in earnest to try to find the grand *Æschna borealis*. Not a trace of it could we then discover, and as we knew we were on the right ground, we were forced to the conclusion that it was not yet out. This proved to be the explanation, and nearly a week elapsed before we were absolutely certain we had even seen it. One morning, however, Mr. Kenneth J. Morton, of Edinburgh, who had joined us for a few days, called out that one had passed him, and a few seconds later Mr. King had it in his net. From that time the species emerged rapidly, due no doubt to the much hotter weather, and by the middle of our second week had become fairly abundant. But, like most species of the genus *Æschna*, *borealis* was most wary, and excessively difficult to catch. It does not, like *Æschna grandis* and *Æ. cyanea*, hawk for its prey in a forward and backward movement over the same ground, and so, unlike them, cannot be "waited for" until it comes within reach of the net. It flies at a terrific rate, but fortunately has a habit of settling on the ground, on tree-trunks, and perhaps oftenest of all on the dead trunks of felled trees. In such a situation we

often saw two, and now and then even three close together, but very fortunate indeed were we if we managed to secure one out of the lot! Up to the time of my leaving, on June 20th, about sixty had been secured among us—many more, no doubt, than had hitherto been taken in Britain altogether; but still we must have *seen* at least two hundred more specimens than we captured. We could not at all satisfy ourselves as to where the species bred; they occurred all over the Black Wood and the immediate district, and seemed indeed equally plentiful on the high moorland above the wood, and in the lowest parts of the wood, sometimes even getting into the main road at the bottom. We never saw one actually on the loch-side, nor did they seem at all to frequent the lochan Rusg-a-Bhiora, above the Black Wood; hence they apparently did not breed in the “big” waters. They were, too, equally absent from the small almost stagnant ponds so frequent in and near the wood, and where a number of *Libellula quadrimaculata* could almost always be found busy over domestic affairs. The Black Wood, although on a fairly steep hillside, is excessively damp, and the same may be said of the moorlands; and my own inclination is to believe that the species breeds in the wet mossy ground, and not in the ponds, although I admit it is difficult to conceive of so large a larva as *borealis* must have, being altogether comfortable in such situation.

Cordulia arctica has an altogether different flight to *Æ. borealis*, and is much easier to catch. Our difficulty with this species was to find specimens, and altogether we only managed to secure some sixteen examples among us out of perhaps twice that number seen. I do not think we saw a single specimen in the Black Wood, although all were taken on the higher and generally more open ground in the immediate vicinity. Still they were almost invariably seen near trees, and some certainly in the thick plantation of firs above the Black Wood. A common habit the species had was to ascend spirally to a considerable height, generally near a tall tree, and unless netted on its first rising from the ground was usually lost. The first day on which we saw the species, evidently when it was just beginning to emerge, Mr. King had the good fortune to secure six in a very short time; but no other similar fortune occurred to any of us, our captures afterwards being generally singly, and at long intervals. The other dragonflies taken were comparatively of less interest. The local *Leucorrhinia dubia* was common on the ponds, and about the heath near the lochan Rusg-a-Bhiora; and the pretty and variable *Libellula quadrimaculata* was abundant on both the high and low grounds. The fine *Cordulegaster annulatus* was common on the heaths, a beautiful object as it flew leisurely in the sun, its golden rings showing out conspicuously. A curious *Æschna juncea* was taken, so much like a *borealis* that it may be a hybrid, especially as no other *juncea*

occurred to any of us, and it was early for the species. The smaller species were represented by *Pyrrhosoma minium* and *Agrion cyathigerum* in fair quantity.

A trichopteron we were all anxious to take was the very rare *Limnophilus elegans*, but all our searching resulted in the capture of two specimens only, one by Mr. Morton, the other by Mr. King. As both were rather worn, probably we were a little late for it. Another interesting species in this group was *Apatania wallengreni*, which was found to be fairly common by beating trees on the side of Loch Rannoch, which as yet seems to be its only known British locality. The other Trichoptera included *Phryganea obsoleta*, several on Rusg-a-Bhiorna; *Neuronia ruficrus*, a few on the moors, &c.; *Colpotaulius incisus*, *Grammataulius atomarius*, *Limnophilus flavicornis*, *L. griseus*, *L. sparus*, *L. centralis* and *L. luridus*, *Stenophylax lateralis*, *Philopotamus montanus*, *Plectrocnemia conspersa*, and *Rhyacophila dorsalis*.

Among the Perlidæ, we had one day probably a "record take" of *Isogenus nubecula*, which we found in great profusion by turning over stones close to the water on the loch-side; often six or seven specimens were found under a single small stone. The fine *Perla maxima* was found in a similar way under stones at the side of a broad burn which flowed close by the farm at which we were stopping; and beating trees along the burn-side produced *Chloroperla grammatica*, *Isopteryx torrentium*, *I. tripunctata*, *Tænipteryx risi*, *Leuctra fusciventris*, *Nemoura variegata*, *N. cinerea*, and others, including a *Hemerobius* which I have been unable to determine.

Mr. Briggs was the only one of us who paid any attention to the Ephemeriidæ, and he had his reward in the fortunate discovery of two species which have since been determined as quite new to Britain. One of them (*Leptophlebia meyeri*) attracted the notice of all of us, from its abundance near the lochan Rusg-a-Bhiorna; but of the other species (*Ameletus inopinatus*) Mr. Briggs seems to have taken only one specimen, on the shore of Loch Rannoch (see Ent. Mo. Mag. March, 1899, p. 69). *Tettix bipunctatus* occurred on the moors, but was the only orthopteron of which note was taken.

Lepidoptera were regarded as of only very secondary importance in the daytime, and practically only such species as came in our way when working at the other orders were taken, except, indeed, on several occasions when Mr. William Reid, of Pitcaple, joined us. Of butterflies, *Argynnis euphrosyne* and *Thecla rubi* forced attention by their abundance, the latter always among bilberry, on which, at Rannoch, its larva feeds. The Bombyces were represented by plenty of both larvæ and imagines of *Bombyx callunæ*, and I netted a beautiful male *Saturnia carpini* so late as the third week in June; a large batch

of eggs of the species were hatching on ling just about the same time, so it had probably been on the wing for a considerable period. Larvæ and cocoons of *Orgyia fascelina* were also not uncommon on ling, and a few larvæ of *Trichiura crataegi* occurred. A fair number of Geometræ were picked up. *Eupithecia satyrata* var. *callunaria* was abundant, and *E. nanata* and *E. pumilata* fairly common, many of the latter being very highly coloured. *Melanippe tristata* was common, but, from its brown colour, not nearly so conspicuous as our blacker Yorkshire form; *M. hastata*, *Macaria liturata*, *Fidonia carbonaria* worn and apparently nearly over; *Scodionia belgiana*, much paler and quite a different looking species to our Yorkshire moth; lovely forms of *Thera variata*, *Emmelesia blandiata*, and many others. Larvæ in this group included a very curious *Crocallis clingularia*, in pattern and colouring a perfect imitation of the lichen-covered rail on which I found it resting, though no doubt it had come from an overhanging, also lichen-covered, tree; it produced a very pretty variety of the moth, unlike any other I have seen. *Ellopiæ fasciaria* and *Thera firmata* were beaten in plenty from pines, *Geometra papilionaria* on alder, *Thera juniperata* on juniper, and many others. We did not work at all for *Sesia scolioformis* and *Pachnobia alpina*, but Mr. Reid was taking pupæ of the former and larvæ of the latter in some quantity at the time of our visit. Of Noctuæ observed in the daytime, *Anarta melanopa* occurred in abundance on one of the mountains, but, owing to the nature of the ground and the wild flight of the insect, not many were caught. A few *A. cordigera* were also about, but the species was evidently getting over; whilst *A. myrtilli* occurred sparingly on the moors. *Phytometra cænea*, fine and very highly coloured, was common; and from tree-trunks, &c., *Acronycta menyanthidis* and *A. glauca* were occasionally picked. Among the other genera, the pretty *Euchromia mygindana* was common among bilberry above the Black Wood; and *Pyrausta purpuralis*, *Botys fuscalis*, *Scoparia ambigualis*, *S. muralis*, *Sericoris daleana*, *Cnephasia musculana*, *Phoxopteryx biarcuana*, *P. myrtilana*, *Pterophorus acanthodactylus*, and many others were observed. During our second week Mr. King and I sugared on most evenings, and it was on those occasions that our interest became really centred on Lepidoptera. Noctuæ were attracted in fair quantity, and especially interesting to myself, from the circumstance that I had never before seen them alive in a wild state, were *Hadena rectilinea* and *Acronycta myricæ*. Both species were in perfect condition, and the former was plentiful; a beautiful object it was on the sugared trees, though on some of the lichen-covered trunks they were so difficult to see that over and over again they would have been missed had it not been for a common habit they had of dropping to the ground when the light was turned on them. *Myricæ* only occurred during our last few days, and was

just getting well out. In point of numbers *Hadena adusta* took a good lead, and was in fine order, many of the specimens being very large and almost quite black. They were carefully looked over on the trees on the chance of *Crymodes exulis* being among them, but none of us were fortunate enough to get one. A plentiful and very interesting species too was *Rusina tenebrosa*, the specimens being generally smaller and much darker than any I had seen elsewhere; many of them were almost black with scarcely any marking, and quite a contrast even to our West Yorkshire examples. Very pretty forms of *Hadena pisi* and *H. dentina* occurred in moderate numbers, and a very welcome and not uncommon visitor was *H. contigua*. Only one *Acronycta leporina* was taken, perfectly fresh, and, to our surprise, of quite the pale southern type. The other visitors included *Cymatophora duplaris* and very dark *C. or.*, *Acronycta menyanthidis*, very pretty forms of *Xylophasia rurea*, *Agrotis porphyra*, *Gonoptera libatrix*, and a number of other ordinary species. *Platypteryx lacertula* or *P. falculea* (both, I think), *Ephyra pendularia*, and other common species were also taken at dusk. Mr. King and Mr. Reid had one evening's larva-hunting high up in the Black Wood, and found, mostly on bilberry, those of *Fidonia pinetaria* in plenty, a few of *Noctua sobrina* and *N. neglecta* (Mr. Reid), *Cloantha solidaginis* (?), *Cidaria populata*, and some, also on bilberry, which I think (and I had some feeding at home at the time) were *Oporabia filigrammaria*, though I am not aware that this species has been recorded from Rannoch. We were told that larvæ of *Aplecta occulta* had been common shortly before our arrival, but, judging it was then too late, we made no attempt to search for any. We ascertained too that a few imagines of *Petasia nubeculosa* had been taken in the spring, but that the species had been much scarcer than in some previous years.

The fact that *Hadena adusta* and *Rusina tenebrosa* were so much darker in the Highlands than in the West Riding of Yorkshire showed that, notwithstanding all that has been said and written during the past dozen or more years as to the probable cause of melanism in Lepidoptera, we know but little more than we did at the beginning. Both the species occur, the former commonly, in the same wood near my residence, in which are found almost absolutely black *Boarmia repandata*, *Amphidasys betularia*, *Hypsipetes elutata*, *Cidaria immanata*, *Miana strigilis* (only a very occasional specimen of this being other than var. *æthiops*), and other species; and yet on the same ground *Hadena adusta* and *Rusina tenebrosa* are paler than at Rannoch, where the air is as nearly absolutely free from smoke or anything of that character as possible. On the other hand, I believe all the species I have mentioned as being so dark here are, excepting possibly *Miana strigilis*, of quite ordinary type at Rannoch. The much paler *Melanippe tristata*, too, gave the moth quite a different

appearance when on the wing to ours; and the specimen of *Acronycta leporina* was of the palest South of England form, whereas Yorkshire specimens are all of the dark variety *brady-porina*. The only *A. psi* taken was also an exceptionally pale one. In the Huddersfield wood alluded to, *Cidaria populata* occurs plentifully, and on the near moorlands is in the greatest profusion, but I have never yet seen one at all approaching the dark unicolorous Highland form.

Rannoch is a charming collecting district, but to those interested in Lepidoptera only I should recommend the last week in June and through July as likely to be much more productive than the time of our visit.

Crosland Hall, Huddersfield: March 3rd, 1899.

NOTE ON THE LIFE-HISTORY OF NEMEOBIUS LUCINA.

By REV. A. M. Moss, M.A.

WHILE taking *Nemeobius lucina* last summer at Witherslack, I captured a pair "in cop.," the female of which I preserved alive in a glass-topped box, kept in the sunshine. After providing her with a couple of primrose leaves laid on soil, I was pleased to find that she fell in with my suggestion and laid me a score of eggs. They were deposited at intervals, about half a dozen at a time, spotted about the leaves, and all on the under side, the furry and uneven texture of the leaf being well adapted for this purpose, and affording an excellent shelter. From pale green they changed to pink; and in a fortnight or more, previous to emergence, the shells which had become semitransparent revealed little leaden-coloured larvæ curled up within.

Never had I less difficulty in breeding any insect; and I would strongly recommend any who are in want of a good series of *N. lucina*, to remember the story of the goose that laid the golden egg, next time a female turns up. Only one larva died in moulting, and one I preserved. I kept them in a flat biscuit tin on soil, very slightly moistened, and all I had to do was to supply them with a fresh primrose or cowslip leaf once a week. They pupated in due course, attached with the usual silken band, some to the leaves and some to the sides of the tin.

Having seen several records of the autumnal emergence of this species in captivity (*vide* Entom. xxviii. 338), I experimented with three or four pupæ during the last ten days of September, placing them beside a kitchen boiler. At the end of that period, no longer possessing any facility for forcing, I replaced them with my other pupæ in the more or less normal temperature of

my sitting-room. No change was yet observable in their appearance, the pupæ remaining white like the rest. However, the process of formation had evidently been going on, for in another fortnight three had begun to change colour. The length of time between this stage and the point of emergence varied from seven to fourteen days or thereabouts (*cf.* an interesting article in *Ent. Rec.* vi. 257); and the noticeable changes were three in number as follows:—

(1) More opaque, and creamy in colour.

(2) Faint pink and grey square marks on wing-cases, and thorax^r darkening.

(3) Uniform dark leaden colour all over.

The removal to cooler temperature apparently did not affect them, except perhaps in retarding their emergence for a few days.

Furthermore, I found that at intervals though November and December all my other unforced *Lucina* were forming, the ordinary temperature of my room (without any moisture) evidently being sufficient to bring them out before their time. So, out of eighteen larvæ I have seventeen perfect imagines (the majority females), only one producing a malformation.

NOTES AND OBSERVATIONS.

LYCÆNA ARION.—I have experience of larvæ of this species for some three years, rearing them (up to a certain point) from the ova laid by females taken by myself; and although I have hitherto failed to get them to pupate, I have had larvæ nearly, if not quite, full-grown. The larva described by Mr. E. B. Nevinson in the last number of the '*Entomologist*' (*ante*, p. 71) does not accord with those I have had. The colour of the larvæ I have had was more or less lilac, this colour becoming more brilliant as the larvæ increased, until it might almost be described as violet. At this period they spun together the seed-heads of the thyme, but I never succeeded in finding them alive in the spring following. The imago would scarcely be over by Aug. 18th, the date on which Mr. Nevinson's larva was probably full-fed.—A. B. FARN; Mount Nod, Greenhithe, March 2nd, 1899.

NOTE ON THE LARVA OF PHORODESMA SMARAGDARIA.—Some time since I had the opportunity of observing the method by which a larva of *P. smaragdaria* dresses itself with the fragments of food-plant which form its protective covering. When it has changed its skin, the larva is seen to have a number of tubercles on its back; these tubercles secrete a sticky fluid. Having, of course, shed the old adornment with its skin, and requiring to redecorate itself, it at once proceeds to do so by seizing a fragment of the food-plant attached to its cast-off skin, and, removing this, places it on its back, moving it to and fro until the particle adheres to one of the tubercles, through the

medium of the sticky exudation. As soon as the first fragment is fixed, it proceeds to remove a second piece from the cast-off skin, and places this on its back as it did the first; this process is continued until the larva is satisfied with the amount of covering it has acquired.—H. S. FREMLIN; Grosvenor Laboratories, Chelsea Bridge.

THE COCCIDÆ OF THE SANDWICH ISLANDS.—Last year (Entom. xxxi. 239) I gave a list of Sandwich Island Coccidæ, and indicated five species as being only known from thence. Already, three of these have turned up elsewhere; *Kermicus* (formerly *Spharococcus*) *bambusæ* has been found by Mr. Green in Ceylon, by M. d'Emmerez de Charmoy in Mauritius, and by Dr. Noack at Campinas, Brazil; *Dactylopius vastator* has been identified by Professor J. D. Tinsley from Mauritius, where it was collected by M. de Charmoy; and *Mytilaspis hawaiiensis* has been found by Mr. Koebele at Amoy, China. Two species are to be added to the Sandwich Islands list. On Feb. 3rd, 1899, Mr. A. Craw found a palm (*Seaforthia elegans*), which arrived at San Francisco from Honolulu, to be infested with Coccidæ. I have examined the material, and it is *Aspidiotus* (*Evaspidiotus*) *transparens*, Green, and *A.* (*Hemiberlesia*) *greenii*, Ckll., with also a very young *Icerya*, indeterminate.

Corrections.—*Ante*, p. 12, for "Two new genera of Lecaniine Coccidæ" read "Two new genera of Coccidæ." P. 13, at bottom, for "*Aspidiotis*" read "*Aspidiotus*."—T. D. A. COCKERELL; Mesilla Park, New Mexico, U.S.A., Feb. 14th, 1899.

ICHNEUMONS WANTED.—Will lepidopterists and others who may breed or otherwise capture ichneumons during the coming season be so kind as to send them, with, where possible, their host's names, to Claude Morley, F.E.S., Crescent, Ipswich, who is commencing the study of these interesting parasites?

CUCULLIA CHAMOMILLÆ.—A correspondent (*ante*, p. 20) writes requesting information upon the finding of larvæ of *Cucullia chamomillæ*. This at once throngs my mind with many pleasant, and in the main successful, hunts after the species; and I hasten to contribute my small experience, with the hope that it may be of use to him and others. I first made the acquaintance of *chamomillæ* larvæ ten years ago, at Rossall, near Fleetwood. The chamomile grew in abundance on a part of the sea wall, and I traced the whereabouts of my first caterpillar by the frass lying on the sand under one of these plants. It was full-grown, very brightly coloured, and completely hidden in its green thicket. Afterwards, however, I found others quite exposed, even at this stage of growth. Roughly speaking, for the first half of their brief larval existence they always live exposed, and seem to rejoice in lying in a half-circle on the crown of unexpanded flower-heads. Green is then the predominant colour, with a varying degree of white and darker markings, not unlike the larva of *Anarta myrtilli*. With its growth the caterpillar becomes a very beautiful object; red or yellow, and in some specimens both, being added to the former colours, and the skin becoming smooth and shining. Like others of the genus, *chamomillæ* is endowed with electric activity. The larvæ, at any rate

in their earlier stages, are perfectly easy to find, if one is fortunate enough to hit on the locality at the right time; and with this species the last consideration is all-important, for I know of no larva that possesses more marvellously quick growing powers. Finding larvæ of an inch in length, I have had them full fed and about to bury in a week's time.

Let me refer my reader to Newman's excellent notes on the species—'British Moths,' page 435. I can corroborate exactly what he gives as regards date; possessing records in 1897, a somewhat backward season, of both small and full-grown larvæ on June 20th and 28th. I think the middle of June may be looked upon as the time to begin searching. It is certainly a fastidiously local species; and on this point again I find Newman correct to the letter, having taken it in dockyards in the heart of Birkenhead. I have also taken it on the sand at Abergele, at Crosby near Liverpool, and in abundance at Bidston, Birkenhead, and near the mouth of the Wyre, Fleetwood; which experience leads me to suppose that it has a preference for the coast.

One word more in respect to the pupæ. Until 1897 I had never succeeded in rearing a single moth, the pupæ always drying up just before emergence. In that year I bred a fine series of fourteen by keeping them buried in a tin of moistened soil. They all emerged in November and December, some being expedited by gentle forcing. I have lately been subjecting a greater number of *C. asteris* pupæ to the same treatment, with the fatal result that nearly all have succumbed to mould. Truly one lives and learns. The moral, therefore, seems to be—keep *asteris* (and I might also add *umbratica*) dry, for you cannot bring them out before their time; but leave *chamomilla* buried in damp sandy soil.—(Rev.) A. M. Moss; 12, Greenside, Kendal.

CURIOUS INSTANCE OF "ASSEMBLING."—I thought perhaps the following might prove of some interest. On August 2nd, 1896, a female specimen of *Orygia antiqua* emerged in the breeding-cage in my bedroom. The window of the room was closed, but on going into it about 4 p.m. I was surprised to find three males of *O. antiqua* flying wildly about. The door was open, and the only open window was on the staircase about six stairs further down, and at right angles to the wall of my room, in which the door is. The window was only open three or four inches.—F. M. B. CARR; 46, Handen Road, Lee, S.E.

LARVA DEVOURING DEAD MOTH.—In looking through my diary for 1897, I see the following note on a larva of *Chelonia (Arctia) caia*. I placed a good-sized larva of *C. caia* in a box containing a dead female *Amphidasys betularia*, and forgot to put in any food for it. When I opened the box next day I found that the larva had nearly entirely demolished the wings of the dead moth, and had also eaten part of the body.—F. M. B. CARR.

THE PRESERVATION OF WICKEN FEN.—In an interesting article in 'Science Gossip' for March, Mr. Herbert Goss asks for the co-operation of naturalists in assisting the National Trust to secure such portions of Wicken Fen as may be offered for sale from time to time.

CAPTURES AND FIELD REPORTS.

PIERIS RAPÆ IN JANUARY.—On March 7th I saw a specimen of *P. rapæ* sitting upon a wall drying its wings, and quite close to the chrysalis from which it had just emerged. Is this not very early?—MARJORIE MATHEW; Royal Naval School, Twickenham, March 15th, 1899.—[Mr. Kirkaldy, who recorded the occurrence of a specimen of *P. rapæ* on January 29th (*ante*, p. 73), informs us that another example was taken in the same house some time during the first week in March.—ED.].

LEPIDOPTERA CAPTURED AT LIGHT IN 1898.—In accordance with my annual practice, I send a list of a few additional insects taken at light during the past year, and not previously so recorded by me, viz.:—*Sphinx ligustri*, *Hylophila bicolorana* (female), *Hepialus sylvanus*, *Notodonta chaonia* (female), *Xylophasia rurea*, *Dianthæcia carpophaga*, *Xylina ornithopus*, *Plusia pulchrina*, *Rivula sericealis*, *Zonosoma annulata*, *Cledeobia angustalis*, *Scoparia resinæa*, *Amblyptilia acanthodactylus*, *Tortrix cratægana*, *T. xylostæana*, *T. heparana*, *T. ribeana*, *T. forsterana*, *Dichelia grotiana*, *Pædisca rufimitrana*, *Micropteryx subpurpurella*, *Depressaria applanata*, *Dasycera sulphurella*, *Endrosis fenestrella*, *Ornix betula*, *Lithocolletis pomifoliella*, *L. cramerella*. On the whole the season for light was a very poor one, but the following were more plentiful than usual, viz.:—*Notodonta trepida*, *N. trimacula*, *N. dictæoides*, *Hypenodes albistrigalis*, *Boarmia abietaria*, *Cidaria dotata*.—G. F. STUDD: Oxton, Exeter, Feb. 25th, 1899.

CHÆROCAMPA CELERIO IN 1898.—On January 3rd I was shown a fine example of *C. celerio*, which was taken by a chemist at Southborough, near Tunbridge Wells, in October. It flew in at his shop-door, doubtless attracted by the light, and he immediately secured and chloroformed it. It was shown to me on my return home, by the Rev. R. Bull, of St. Andrew's, Southborough, to whom the chemist had given it, and whose collection it now adorns.—H. W. SHEPHEARD-WALWYN; West Downs, Winchester.

MACROGLOSSA STELLATARUM IN 1899.—I think the following rather a curious appearance of the above-mentioned moth. On the 3rd of January last I was at the Hereford Hunt Ball, and during supper I noticed a specimen of *M. stellatarum* sitting upon the collar of a gentleman at the same table. I called my partner's attention to it, and he obtained an empty match-box from a waiter and secured it. This testifies to the extraordinary mildness of the winter in this neighbourhood up to Jan. 3rd.—E. BERTHA VAUGHAN; The Skreen, Erwood, R.S.O., Radnorshire, South Wales.

A medium-sized specimen of *M. stellatarum* was taken here on Feb. 18th by the Rev. A. B. Sole. The insect was hovering over the blossoms of yellow jasmine, and appeared to be a freshly-emerged example.—H. W. SHEPHEARD-WALWYN; West Downs, Winchester.

NOTES FROM NORTH WALES: ON THE SEASON 1898.—I found Lepidoptera much scarcer in North Wales during last year than has been the case in either of the three preceding seasons. Not until September could insects be said to be at all abundant. The early moths were con-

spicuous by their absence; while nightly visits to the shallows during the last fortnight in March produced nothing but the commoner species of *Taniocampa*. Of *T. munda*, so abundant in 1897, I saw not more than two or three altogether. On April 2nd I found *Amphidasys strataria* on oak trunks: and from ova deposited by one of the females I managed to rear a large brood during the summer. The resemblance of the larvæ to the dark grey twigs of oak was very striking. A week later I was at Capel Curig in Carnarvonshire, and found moths fairly common at the shallows. *Pachnobia rubricosa* occurred most frequently of the spring moths, along with an occasional *Taniocampa gracilis*. Several hibernated species also turned up, including *Triphosia dubitata*, and odd specimens of *Agrotis suffusa*, *Oporina croceago*, *Calocampa vetusta*, *C. exoleta*, *Xylina socia*, and *Cidaria miata*. One specimen of *Asphalia flavicornis* was attracted by light. On April 21st I observed, near Portmadoc, specimens of *Euchloë cardamines* and *Pieris napi*, together with many hibernated *Vanessa io*. On the following day I boxed a lovely specimen of *Asphalia ridens* on the side of the road between Barmouth and Machynketh. The first three weeks of May were cold and wet, and insects in the neighbourhood of Newtown were very scarce. In fact, Rhopalocera have been very scarce here all the season, with the exception of *Pieris brassicæ* and *P. rapæ*, which were most abundant during the autumn. *Vanessa c album* I saw once, on May 7th. Common Geometræ began to turn up on May 25th, when I also took *Cymatophora duplaris* and *Pterostoma palpina*. *Macroglossa bombylifformis* was very scarce; I took four specimens on June 3rd and 5th, all at flowers of *Pedicularis sylvatica*. Noctuæ began to turn up at light on June 7th; and during the rest of the month *Leucania comma*, *Grammesia trigrammica*, and *Hadena dentina* occurred in some numbers. Sugar was a complete failure during June and July. Two visits during the same months to Dinas Mawddwy, a charming village among the mountains in the south of Merionethshire, produced little of note. In 1897 the pine woods there swarmed with Geometræ, such as *Bupalus piniaria*, *Macaria liturata*, and *Thera firmata*; but this year they produced nothing beside *Larentia viridata*, *Melanippe montanata*, and *Hepialus hectus*. On the moorland above the village I came across *Plusia festuæ* and *Pseudoterpna pruinata*. *Melanippe tristata* was common during the first week in July in the locality where I discovered it last year, as was also *Melitæa artemis* a fortnight earlier. During July light was more productive, among the better moths that turned up being *Plusia iota*, *P. pulchrina*, *Neuria reticulata*, *Cidaria prunata*, *C. dotata*, and *C. associata*. During August I was in the South of England; but on my return here in September I tried sugar again. I began on September 13th, and sugared almost every night until October 24th. The trees I sugared were some half-dozen apple trees in my own garden, and a number of oak trees in a small copse on a hill at the back of my house. On the first few nights *Amphipyra pyramidea* was common, but worn. *Anchocelis pistacina* was the most abundant moth, and occurred in every conceivable variety. *A. rufina* and *A. litura* were also quite common; but of *A. lunosa* I got but two. The best moths I took were *Xanthia aurago* and *X. gilvago*. Of the former I secured about twenty specimens, all, except one, in the copse above mentioned; while of the latter I got eight or nine examples, which came singly on separate evenings, and all but one in the garden. Two or three specimens each of *Agrotis saucia* and *A. suffusa* also turned up, with a few *Hydræcia micacea* and *Agriopsis*

aprilina; while *Amphipyra tragopogonis*, *Triphæna comes*, *Orthosia macilenta*, *Xanthia circellaris*, *Miselia oxyacanthæ*, and *Phlogophora meticulosa* were all very abundant. During October *Cerastis vaccinii*, *C. ligula* (= *spadicæ*), and *Scopelosoma satellitia* largely replaced them. Occasional specimens of *Caradrina quadripunctata*, *Agrotis segetum*, and *Orthosia lota* complete the list. Two of the best nights were September 17th and 27th. The former was a mild, still night; whereas on the latter the wind was N.N.W. and cold, with bright moonshine. *Himera pennaria* occurred frequently at light in October; and *Cheimatobia brunata* was very abundant here and there on mild November evenings.—ALFRED S. TETLEY; Llwynon, Newtown, N. Wales.

A LOCUST IN A CAULIFLOWER.—Yesterday, February 26th, my cook informed me that she had found a very large and strange insect in the leaves of the cauliflower she was preparing for cooking. As she was certain it was not a dragonfly, I requested her to look for it in the dustbin, where she had thrown it with the leaves. In a few minutes a locust was brought to me alive and uninjured; it is of full size, and I am keeping it in a warm place. I am informed that the cauliflower came from Italy.—H. PERRY DUPREY; Fort House, Green Lanes, Stoke Newington, N.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*February 15th, 1899.*—Mr. G. H. Verrall, President, in the chair. Mr. James E. Collin, of Sussex Lodge, Newmarket, was elected a Fellow of the Society. Mr. B. A. Bower exhibited perfectly black melanic examples of *Boarmia abietaria*, Hb., bred from ova laid by a female of the ordinary Box Hill form, which was captured on the 9th of July, 1897. They were part of a brood of seventeen, seven of which were of the black aberration; and for comparison with them he showed specimens from Box Hill, South Devon and the New Forest. Mr. Blandford exhibited some lumps of common salt burrowed by larvæ of *Dermestes vulpinus*, to which he had incidentally referred in a letter just published in "Nature." They were sent to him by Sir H. T. Wood, Secretary of the Society of Arts, who received them from a correspondent writing from a preserved-meat factory in Australia. It was a mistake to suppose, as this correspondent had done, that the larvæ burrowed in the salt for the sake of obtaining food; he himself had on various occasions called attention to depredations of *Dermestes vulpinus*, arising from a habit the larvæ had of burrowing through different materials in order to find a shelter in which to undergo pupation, though this was the first time that salt, as a substance attacked in that way, had come under his notice. Mr. J. J. Walker, in remarking upon the exhibit, said he believed one of the earliest references to injuries caused by *Dermestes* was to be found in "The Last Voyage of Thomas Candish," published in Hakluyt's Collection of Voyages, where there was an interesting though somewhat exaggerated account of certain worms which, bred from a stock of dried Penguins, proceeded to devour the whole of the ship's stores, and then to gnaw into the timbers, creating great alarm lest the ship should

spring a leak. This voyage took place in the year 1593; and the worms, he thought, could only have been the larvæ of *Dermestes vulpinus* or some closely allied species. Dr. T. A. Chapman read a "Contribution to the Life-history of *Micropteryx* (*Eriocephala*) *amanella*, Hubn."

March 1st.—Mr. G. H. Verrall, President, in the chair. Mr. G. J. Arrow, of the British Museum (Natural History); Mr. G. B. Chalcraft, of Leicester; Mr. C. E. Collins, of Stoneham, Calcot, Reading; Mr. Percy W. Farmborough, F.Z.S., of Lower Edmonton; Mr. Montague Gunning, of Narborough, Leicester; Mr. Harry Moore, of 12, Lower Road, Rotherhithe; and Mr. H. S. Woolley, of 7, Park Road, Greenwich, were elected Fellows of the Society. Mr. J. J. Walker exhibited a specimen of a rare British beetle, *Quedius longicornis*, Ktz., recently taken at Cobham Park, Kent. Mr. M. Jacoby exhibited a Halticid beetle from Sumatra, of the genus *Chalonus*, Westw., and called attention to the remarkable position of its eyes, these organs being placed at the end of two very distinct lateral processes of the head, somewhat resembling the stalked eyes of crabs and other Crustacea. He said this character was peculiar to the male sex, and was very exceptional in Coleoptera, not being met with in any other genus of Phytophaga, and only occurring in a few Anthribidæ, and in isolated cases in one or two other families. He also showed a beetle from Peru, which was sent to him in a collection of Phytophaga, and which, superficially, was very like certain members of that group; but, from the structure of the antennæ and other characters, it appeared to be out of place in the Phytophaga, and probably belonged to some other family. Mr. Gahan remarked that this beetle, to whatever family it might prove to belong, was very interesting, not only from its structural peculiarities, but also from the fact that it had the colour and markings characteristic of certain species of Galerucidæ, a family to which it undoubtedly was not in any way closely related. This fact seemed to show that it was a mimetic form, and thus helped to explain the present obscurity surrounding its affinities. Mr. J. J. Walker read a short extract from the account given in "The Last Voyage of Thomas Candish," to which he had referred in the course of his remarks on Mr. Blandford's exhibit at the previous meeting. Mr. G. J. Arrow contributed a paper "On Sexual Dimorphism in Beetles of the Family Rutelidæ," and sent for exhibition a series, including both sexes, of six species of *Anomala*, selected to illustrate the subject of his paper.—J. J. WALKER and C. J. GAHAN, *Hon. Secs.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—
—*Annual Meeting, Jan. 26th, 1899.* Mr. J. W. Tutt, F.E.S., in the chair. A very satisfactory balance-sheet was adopted, and the Council's Report, giving a résumé of the past year's work, having been read, the following gentlemen were declared elected to fill the various offices in the Society:—A. Harrison, F.L.S., F.E.S., &c., President; Dr. Chapman, F.E.S., and J. W. Tutt, F.E.S., Vice-Presidents; T. W. Hall, F.E.S., Treasurer; H. A. Sauzé, Librarian; W. West, Curator; Stanley Edwards, F.L.S., F.E.S., and Hy. J. Turner, F.E.S., Hon. Secretaries; R. Adkin, F.E.S., F. Clark, H. S.

Fremlin, M.R.C.P., F.E.S., W. J. Lucas, B.A., F.E.S., H. Moore, A. M. Montgomery, and R. South, F.E.S., Council. The President then read his Address.

February 9th.—Mr. A. Harrison, F.L.S., President, in the chair.—Mr. Russell exhibited a specimen of *Plusia moneta* taken at Southend, near Catford, in July, 1898. It was noted how rapidly the species was spreading. Mr. Adkin, a series of *Hadena pisi* from Aberdeenshire, with S. English forms for comparison. They were of a blackish brown or dull purple, showing a strong contrast to the red English form. Mr. Lucas, a series of *Rhyarobia (Panchlora) maderia* taken at Kew Gardens in a packet received from the Belgian Congo, and contributed notes on its distribution. Mr. Main, specimens of the brilliant Coleopteron, *Aspidomorpha sanctæ-crucis*, from Bombay, which had been preserved in a dilute solution of formalin. A discussion ensued as to the amount of formalin in the solution, and also as to its action. It was thought that no more was necessary than just sufficient to sterilize the water, say 1 per cent. Mr. Harrison, a bred series of *Pseudoterpna pruinata (cytisaria)* from New Forest larvæ. Mr. Fremlin read a note received from Mr. Chadwick, in Devonshire, giving an account of an observation of *Amphipyra pyramidea* swimming across a stream at least thirty yards wide. In the discussion which ensued, Mr. Tutt and others gave various instances of the swimming capabilities of several species of Lepidoptera. Dr. Chapman read a paper entitled "Some Points in the Evolution of the Lepidopterous Antennæ," illustrating his remarks by blackboard diagrams and numerous figures of antennæ sculpture. A discussion took place, and it was considered that the paper was one of the most important of the series of evolutionary studies which Dr. Chapman had for some time been contributing to various societies and magazines.

February 23rd.—Mr. A. Harrison, F.L.S., President, in the chair. Rev. F. H. Wood, Bromley Park, Kent, was elected a member. Mr. Sauzè exhibited a specimen of the Heteropteron, *Acanthosoma hæmorrhoidalis*, taken alive a few hours before at Brixton. Mr. Harrison exhibited a long series of *Parnassius apollo*, both bred and captured, arranged to show the variation in the large central ocellus on the hind wings. He also exhibited series of *Papilio podalirius* and *P. machaon*, both species from Meiringen. Mr. West, of Greenwich, a long series of the four species of the Homopterous genus *Philænus*, including some hundred different varieties of the common garden spit-fly, *P. sputarius*. Mr. Moore, a preserved larva of *Papilio cresphontes* of North America. Mr. Step gave a series of notes and observations he had made during the last few years on our larger British Crustaceans, and he illustrated his remarks by admirable lantern slides from his own photographs.

March 9th.—Mr. R. Adkin, F.E.S., Vice-President, in the chair. Mr. Adkin exhibited males, imagines, and cases of *Psyche villosella*, *P. opacella*, and *P. graminella*. Mr. Tutt communicated a paper on "The Nature of Metamorphosis."—HY. J. TURNER, *Hon. Report Sec.*

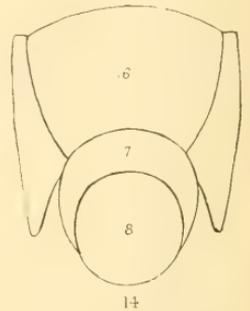
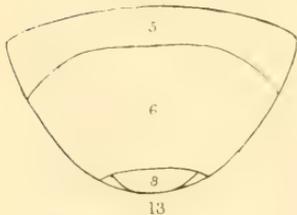
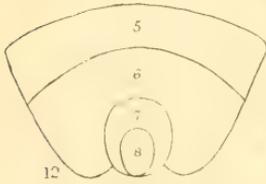
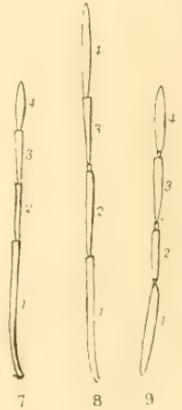
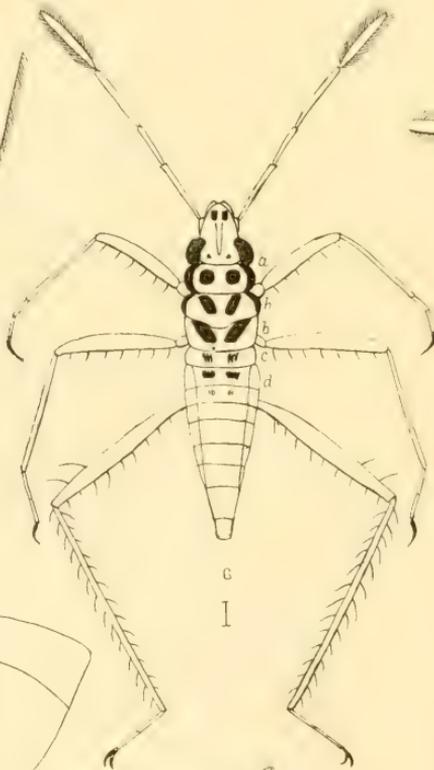
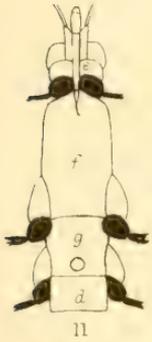
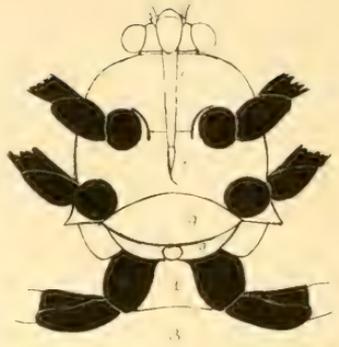
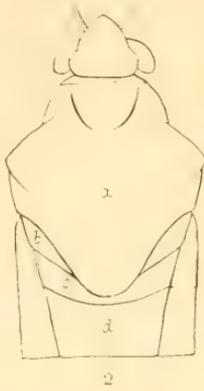
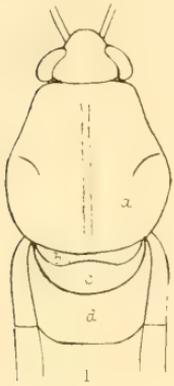
CAMBRIDGE ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*February 3rd, 1899.*—Dr. Sharp exhibited a number of stag-beetles (Lucanidæ),

from various parts of the world, calling attention to the trimorphism conspicuous among the males of many species. They differ not only in size, but also in the form of the mandibles, and can be usually placed in three well-marked groups in each species. He also exhibited some bees of the genus *Koptorthosoma* from Ceylon, in which in the female a cavity is formed in the anterior end of the abdomen by an involution of the skin. The abdomen is pressed so close against the thorax that in the normal position this cavity is invisible, but it can be seen by bending down the abdomen or by cutting it off. The cavity varies in form in different species, but is found throughout the genus in the female, and always contains a number of large *Acari*. It is not known whether these parasites have any connection with the development of the structure in question. Dr. Harmer exhibited an Amphipod Crustacean of the genus *Nipharqus* found in a well at Norwich. This genus is only known to occur in deep wells, and in the complete absence of pigment from all parts of the body, including the eyes, it resembles a cave animal.—L. DONCASTER, *Hon. Sec.*

KENDAL ENTOMOLOGICAL SOCIETY.—*January 9th, 1899. Annual Meeting.*—The President in the chair. The following officers were elected for the year:—President and Secretary, Rev. A. M. Moss, M.A.; Vice-President, Mr. F. Littlewood; Treasurer, Mr. A. Graveson. The President gave as his Address a retrospect of the past years and the work of the Society since its foundation in June. Mr. Holmes moved the adoption of the Report, which is now being printed for circulation amongst the members.—Rev. A. M. Moss, *Hon. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*January 16th, 1899.*—Mr. G. T. Bethune-Baker, President, in the chair. Mr. R. C. Bradley exhibited two drawers from the type collection which had been filled, one with Tortices principally from Dr. P. B. Mason's collection, the other with Pyrales from his own collection and that of Mr. F. W. Moore. Mr. P. W. Abbott exhibited a series of *Camptogramma fluviala*, bred from Devonshire; also *Heliorthus armigera* and *Leucania vitellina*, from the same county. Mr. G. T. Bethune-Baker showed a box of Lycænidæ including forms of *Lycæna icarus*, *L. bellargus*, and *L. corydon*, from many localities in Europe and Turkestan.

February 6th. Mr. Bethune-Baker, President in the chair. *Annual Meeting.* The Annual Reports were presented, that of the Treasurer showing a smaller balance in hand than last year. Mr. G. T. Bethune-Baker, F.L.S., F.E.S., was reelected President, and Mr. P. W. Abbott Vice-President, and the other officers as follows:—Treasurer, Mr. R. C. Bradley; Secretary, Mr. C. J. Wainwright, 2, Handsworth Wood, Handsworth; Librarian, Mr. A. H. Martineau; other members of Council, Messrs. G. H. Kenrich, W. Harrison, H. Willoughby Ellis, and H. J. Sands.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*



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NOTES ON *EMYDIA CRIBRUM*, L.

By EUSTACE R. BANKES, M.A., F.E.S.

IN the course of his observations on this species in Entom. xxv. pp. 269–271 (1892), Mr. Fowler says: “Stainton’s ‘Manual’ gives Blandford and the New Forest as localities, which I think decidedly wrong; I have a fair knowledge of each, but have never seen a specimen in either. It would be interesting to know whether it still exists in either of these localities.” I believe I may safely say that *E. cribrum* has never to this day been taken, either in the immediate neighbourhood of Blandford, or in any part of the New Forest, although hundreds of ova have at various times been turned out in the latter district. Both these localities were entered in Stainton’s ‘Manual’ on the authority of the late Mr. Frederick Bond, and both can be easily explained, thanks to information kindly given me by the Rev. O. P. Cambridge, who was an intimate friend and frequent companion of Mr. Bond.

1. “Blandford,” as there used, really means “Bloxworth, Dorset,” the foundation for the record being the fact, well known to Mr. Bond, that several single examples of *E. cribrum* were taken on Bloxworth Heath, by the Rev. O. P. Cambridge, in 1855. Bloxworth is about seven miles, as the crow flies, to the south of Blandford. Mr. Bond used often to stay with Mr. Cambridge at Bloxworth Rectory, and always, for strategical reasons, gave “Blandford” (the then post-town of Bloxworth) as the locality for the more important captures made by himself, or others, at Bloxworth, or elsewhere in that rather wide district. Mr. Cambridge tells me that he knows as a fact that

Mr. Bond was never in the Blandford district—properly so called—in his life.

2. "New Forest" should be interpreted to mean "near Ringwood," the exact spot of heathland where Mr. Bond used, year after year, to work for the insect, accompanied by George Gulliver and sometimes by the Rev. O. P. Cambridge, being well known to me. It is situated in Hampshire, though very near the boundary of Dorset, and although not within the limits of the New Forest, it is only about four miles from the western edge of that tract. In 1892, for the second time within comparatively recent years, the range of heath in which it lies was entirely destroyed by an extensive fire.

I fully agree with Mr. Fowler that the insect is only single-brooded in this country. No doubt the reason why some have thought that there is a second brood is because, in certain of its colonies, the moths always emerge several weeks earlier than in others, which lie in the same part of the country, and in some cases even further south. Thus, it has been taken by my friends or myself in May (in the exceptionally early season of 1893), June, July, and August, but, in my experience, the moths in any given colony emerge at about the same date, and are, in that particular spot, only obtainable during one or two consecutive weeks in the course of the year.

As regards the food-plants of the larva, we learn, from some interesting notes in Ent. Mo. Mag. 2nd ser. i. pp. 255-6, and p. 298, some of the following facts, the rest having been communicated to me (*in litt.*) by friends:—

1. On the Continent.—Larvæ found by Mr. G. T. Baker in Switzerland feeding "on a broadish-leaved grass," there being no heath in the vicinity, were successfully reared by him on various kinds of grass, while Herr Konewka, of Berlin, who in nature has found the larva on *Calluna vulgaris* only, reared the moths, from eggs laid in confinement, by feeding the larvæ on lettuce leaves. In Lep. der Schweiz. p. 80 (1880), Professor Frey says, "Larva on *Calluna* and low plants."

2. In England.—The following curiously different results have been obtained by those observers who have tried to rear larvæ, resulting from ova laid by females captured on the heaths in West Hants or East Dorset:—The Rev. E. N. Bloomfield found that the larvæ apparently would not touch *Calluna vulgaris* or *Erica cinerea*, but began to feed on *Poa annua* and *Aira flexuosa*, after which their lives were ended by an accident. Mr. H. Goss got larvæ to feed well on both *Erica cinerea* and *E. tetralix*, but they all died off when *Calluna vulgaris* was given them as a substitute. Mr. J. H. Fowler fed some young larvæ on lettuce for a time, but they all died off; he could not induce them to feed on any kind of heath or lichen, and fancied that a

wiry kind of grass that grows on the heaths might be the natural food-plant. Mr. W. H. B. Fletcher, to whom I have sent all the eggs that I have obtained, found that the young larvæ fed well for a time on *Calluna vulgaris*, and has more than once reared them on it until they went into hibernation, but never further. One of the New Forest collectors—a member, I believe, of the well-known family of Gulliver—told me that he had succeeded in rearing the larvæ on a mixed diet of *Calluna vulgaris* and lichen, but that they invariably pine away and die unless supplied with lichen in the spring; he added that they should also be kept out of doors. I know no one else who has bred the moth from British larvæ.

From the above facts it appears probable that one reason why *E. cribrum* is so extremely local, and the chief reason why it has proved so very difficult to rear in confinement in this country is that British larvæ of it must have lichen, as well as ling (which I am inclined to think is its usual food-plant) or heath, when feeding up in the spring; perhaps the necessary lichen is a grey one that grows on the stems of ling and heath in certain spots on the moors frequented by the insect.

Mr. Fowler (*l. c.*) says he has noticed that *E. cribrum* is “not confined to certain spots, but is generally distributed over a particular area”; some areas, however, where I have studied its range carefully, are so very restricted that they may well be called “spots.”

As regards the variation in the imago, I can fully endorse Mr. Fowler's remark that his variety “5” is very scarce, for only one example of it has ever fallen to my lot. My collection, however, contains a still scarcer aberration of the male, taken near Ringwood in 1890, which is apparently unknown to him. The ground colour is white; the second and third black transverse “bands” are placed near together, and are both so exceptionally broad that the usual pale area between them is reduced to a narrow and much-interrupted white line, and they appear as a black central double fascia, which stands out very conspicuously against the white ground colour on either side of it. Among the hundreds of specimens that I have examined, I have never seen another example of this conspicuously black-banded form.

The Rectory, Corfe Castle:
January 30th, 1899.

THE EARLIER STAGES OF *LYCÆNA ARION*.

By F. W. FROHAWK, M.B.O.U., F.E.S.

ON July 22nd, 1895, my friend Mr. A. B. Farn very kindly sent me some ova of *Lycæna arion*, which he had just found deposited upon the flower-heads of wild thyme. The following interesting extract is from his letter received at the time:—"The ova deposited by females under perfectly natural conditions are laid singly (except in one case), and are inserted somewhat deeply among the clusters of buds of thyme. I could not discover any ova on thyme in full blossom, and it would seem that the buds are chosen so that the hatching of the larvæ and the opening of the buds should be contemporaneous."

Again, on July 9th, 1896, I received several more ova from Mr. Farn. These hatched on the following day. The ovum measures one-forty-eighth inch in width, and one-eightieth inch in height. It is of a very compressed globular form, sunken in the centre; so much so, that, to the naked eye, the operculum appears as a dark central spot. The entire surface is finely and beautifully reticulated by an irregular net-work pattern. The colour is pale bluish white.

July 13th, 1896. I placed the larvæ upon thyme blossoms, and found they soon began to feed. The next day I saw one eating into the base of the calyx, so that only the last few posterior segments of its body were exposed. On the 18th I noticed a few feeding, and a good deal of frass was adhering to the blossoms, which were more or less eaten, especially the petals.

July 22nd. Examined the flower-heads, and found only two larvæ; one in the second stage measuring one-twelfth inch long, and one in the third stage one-eighth inch long. The following is a description of the former. The first and last segments are flattened, projecting, and rounded, overlapping the head (which is withdrawn while at rest) and the anal claspers. The body is much arched, having a medio-dorsal ridge considerably elevated; the sides are flattened and sloping to a lateral ridge; the under surface is also flattened; the ground colour is of a pearly-white, thickly studded with very minute blackish points; and scattered over the whole surface are a number of bristles, varying in length, all having bulbous dark shining brown bases; the longest are situated on the dorsal and lateral regions; the spiracles are shining dark brown; the segments are beautifully marked with purplish pink, forming longitudinal stripes, the most conspicuous being the medio-dorsal and lateral stripes; the three other stripes, two above and one below the spiracles, are made up of oblique markings. The head and prolegs are brown, and the claspers whitish.

A remarkable similarity exists between the buds of thyme blossom and the larvæ, both in the colouring and the pubescence of each, so much so that it requires very close examination to discern the little larvæ; and they generally conceal themselves inside the bloom, making detection all the more difficult; but generally a small hole is eaten through the calyx, when the larva may sometimes be seen with only the anal segments protruding.

The second larva, measuring one-eighth inch, being in the third stage, is similar in colouring, pattern, and structure, excepting that it is brighter, and the hairs a good deal longer, and the head is shining black.

Upon supplying them with fresh sprays of thyme, the larger of the two soon commenced feeding on the downy portion as well as the calyx of the bloom, which seems to be generally the first part to be eaten through, apparently to enable the larva to feed at once upon the base of the petals.

The largest larva moulted for the third time on July 26th. Twenty hours after moulting it still measures only one-eighth inch when fully extended. The general colouring is now more uniformly ochreous pink and duller; the second and third segments are humped; the first segment is sloping to the front, sunken in the middle, and rounded, overlapping the head, and it has a large black oval patch in the centre; the three posterior segments are also compressed and sunken; each segment is humped sub-dorsally, forming a deep longitudinal medio-dorsal furrow; the sides are concave, and the lateral ridge projecting and overlapping the entire length, hiding from view the legs and claspers; there are four longitudinal rows of long curved hairs, one row being sub-dorsal, and one lateral; each row is composed of a single hair on each segment from the fourth to the ninth inclusive, on which segment the sub-dorsal series terminates; the first three segments have each a set of three sub-dorsal hairs, those on the first segment curving forwards; the lateral series are likewise formed of one on each segment, and all directed laterally and surrounding the extremities of the larva; the hairs have the bases of remarkable formation, resembling glass-like pedestals with fluted sides. The entire upper surface of the body is densely studded with extremely minute pyriform glassy processes; the under surface is equally as densely clothed with very short stoutish hairs. The head is ochreous with dark brown markings in front; the prolegs dusky, and the claspers are unicolorous with the under surface.

In this stage (after the third moult) the larvæ persistently refuse to remain on the blossoms or any other part of the plant, and appear to have a tendency to hide in the ground. Although thyme and various other plants were supplied to them, they refused to feed, so, leaving them with a growing plant of thyme, and keeping them under conditions as natural as possible, trust-

ing they would hibernate in that stage, I left them undisturbed ; but subsequently nothing more was seen of them.

It will be seen from the above descriptions taken from my note-book (which corroborate Mr. Farn's note in the last number of the 'Entomologist,' p. 92) that the larva described by Mr. Nevinson does not at all correspond to the larvæ of *Lycæna arion* which I had under observation.

April 3rd, 1899.

ON NEW *SPILOSOMA* HYBRIDS.*

By A. v. CARADJA.

Spilosoma mendica, L. hybr. *crassa*, Caradja (Pl. ix. f. 1-4). This form originated from a pairing between *S. mendica* hybr. *standfussi*, Car. ♂ and *S. sordida* ♀

The hybrid form *standfussi* I described in the 'Societas Entomologica,' 1894, p. 49: it originated from a cross-breeding of *S. mendica* female with male of var. *rustica*, Hüb. *Spilosoma mendica*, L., hybr. *viertli*, Caradja (Pl. ix. f. 5-11), which I dedicate to my friend Herr Hauptmann Adalbert Viertl, originated from a combination of *S. mendica*, var. *rustica* ♂ and *S. sordida* ♀

By crossing hybr. *standfussi* ♂ and *sordida* ♀ eight fruitful pairings were obtained ; the contrary crossings of *S. sordida* ♂ and hybr. *standfussi* ♀, as well as of *S. sordida* ♂ and var. *rustica* ♀, were unfruitful.

Of the sixteen to seventeen thousand ova of the nine broods obtained, all acquired at the sixth day a darker colouring, a sure sign that they were fertilized ; and this was further confirmed by a supplementary observation of the same ova previous to hatching, for in these the development of the tiny larvæ was more or less advanced.

From each of the nine broods, in about equal numbers, only 12-13 per cent. of the larvæ actually hatched out ; a greater number had begun to bite through the egg-shell, so that the head-shield was already to be seen at the smaller opening, but most of the larvæ had not the strength to break through the egg-shell. Of the larvæ that hatched, about 25 per cent. did not touch the food at all, and died. The others proved themselves to be healthy, and developed normally up to the pupation later on. The larvæ grew up very irregularly, some requiring only forty-eight days, others seventy-two to seventy-six, the majority finding sixty days ample for their development from the egg to the pupa. I obtained altogether twelve healthy pupæ of the hybrid *crassa* and 114 of the hybrid *viertli*. To my regret, the

* 'Iris,' x. pp. 371-373, pl. ix. figs. 1-11. (Translated by G. W. Kirkaldy.)

majority of these pupæ perished through the awkward handling of my servant during my bimonthly absence; from the few rescued only two pairs of hybrid *crassa* resulted (those figured); as well as a few pairs of hybrid *viertli*; of the latter the four males and three females figured are the most diverse.

A description of these two hybrids will be unnecessary, on account of the illustrations, in which the patterns, black spots and stripes, are most accurately reproduced. Also the colouring, especially the more or less lighter grey of the males (the females are about as white as the females of *mendica*), stands out clearly in the illustrations. The darkest are the hybrid *crassa* males, which are dark grey on the anterior wings like some of the lighter *sordida* males, while their posterior wings are not so unicolorously dark, almost grey-black, but somewhat mixed with lighter grey. Of the hybrid *viertli* males, fig. 5 is the darkest, being about as dark as the male of *mendica* usually is, while the male portrayed in fig. 8 is the lightest, with yellow-grey anterior wings, which are about as light (but more yellowish) as the lightest examples of hybr. *standfussi*. The posterior wings of the male portrayed in fig. 7 are extraordinarily darkly striped.

I call attention here, further, to the fact that the ovaries of these hybrid females appear to be quite normally developed. One of these females I crossed with a male of the var. *rustica*; it laid 193 eggs, that is to say, as much (or as many) as was laid on an average by the *mendica* or *sordida* females. Each of these eggs produced a healthy larva, which, at the present time (middle of June), after precisely seventeen days, are already on the verge of the last skin-casting.

Upon the larvæ of these hybrids I noted the following:— Before the first skin-change, the larva (here in Rumania) of *mendica* var. *rustica* has a light yellow head-shield and light yellow fore feet; its body has a bright grey-greenish, almost translucent colouring. The *sordida* larva is much darker grey, and has a black head-shield and black fore feet. The hybrid larvæ occupy an intermediate position between the two; their body is light grey, their fore feet and the head-shield are reddish brown. After the first and second skin-changes, the colouring of the body becomes darker grey, that of the fore feet and head-shield brown; on the back and on the sides (always one) appear somewhat obliterated, brighter longitudinal lines, which are much more distinctly yellow-brown-bordered on the ninth segment.

After the third skin-change the hybrid larva (*crassa* as well as *viertli*) copy the larva of *sordida* accurately in the arrangement of the designs; they are, however, more brightly coloured. The dorsal stripes and the two lateral stripes are sharply marked, bordered with orange-yellow; the two last segments are reddish

yellow; the head-shield and the fore feet are reddish, or chocolate brown.

After the last skin-change the hybrid larvæ acquire an altogether different dress from *sordida*, corresponding to the great mutual modifications. Many were fox-red-haired (like the larvæ of *mendica*); in the majority the hairs were dark brown or brown-gray; some were light gray. In all the light, yellow-bordered longitudinal stripes (dorsal and lateral) were as sharply marked as in *sordida*, the last segments were reddish yellow laterally; the two last marks appear to be characteristic of these hybrid larvæ.

In general, they do not occupy a position exactly in the middle between the progenitors, but much nearer to the larvæ of *sordida*, only some examples were nearer to those of *mendica* (var. *rustica*) than those of *sordida*.

A GUIDE TO THE STUDY OF BRITISH WATERBUGS (AQUATIC RHYNCHOTA).

By G. W. KIRKALDY.

PLATE I.

(Continued from p. 8.)

POLYMORPHISM.

The phenomenon of Polymorphism—or the occurrence, in the same species, of two or more different imaginal forms—obtains to a very large extent among certain Heteroptera, and is associated with the greatest alteration in structure in the semi-aquatic species. Although there are more noticeable differences in some exotics—*e.g.* the remarkable *Ptilomera laticaudata* (Hardwicke) and the still more extraordinary *Metrocoris stali* (Dohrn)—both from the Oriental Region,—nevertheless a very fair example is afforded by the British *Velia rivulorum* (Fabr.) = *currens* (Fabr.), a species well distributed over the British Isles. Plate i., fig. 1, represents the head, thorax, etc., of the ordinary apterous form; fig. 2, the same parts of the rarer macropterous form. In the former the pronotum is short (not completely concealing the mesonotum in the middle, and leaving the metanotum totally exposed), rather flat, gently rounded at the sides, the base slightly rounded. In the latter the pronotum is produced posteriorly over the mesonotum (which it conceals except near the postero-lateral angles) and a part of the metanotum, is irregularly angular laterally, and is somewhat convex. The powerful elytra and alæ require strong working and supporting muscles, which are contained inside the prothorax; when, however, the flight-organs are altogether absent, or present only

vestigially, the thorax is much smaller and simpler, on account of the more or less rudimentary condition of the alar muscles. This distinction is even more remarkable in *Hebrus*, *Mesovelia*, and *Hydroëssa*, but not usually so marked, though sufficiently noticeable, in the British species of *Gerris*.

Not only may the same species be *dimorphic* (comprehending *macropterous* and *apterous* forms), but even *polymorphic*, through the occurrence also of brachypterous individuals; * in the last, the elytra may be only slightly shorter than the fully-winged form, and the alæ be present and functional, or the elytra may be represented merely by short pads, the alæ being absent, or there may be various intermediate degrees between these. In this respect, *Gerris lacustris* (Linn.) has provided me with more variations—at least six, from apterous to macropterous—than any other species.† It is noteworthy that in the brachypterous forms, the two abbreviated elytra are not always equal in length and development (in the same specimen).

It is not difficult to understand something of the causes that underlie this remarkable variety of structure.

The intermediate and posterior pairs of legs afford to the “surface-skaters” an ample means of progression on the streams and sheets of more or less still water which they frequent, ‡ and the absence of wings is (considering their environment) not only an advantage, but, I apprehend, necessarily ensues from the operation of Natural Selection in tending to weed out the macropterous and brachypterous forms.§ Under certain circumstances, however, the results of Natural Selection will prove deleterious to the species, by producing only apterous individuals, so that local (perhaps even total) extermination of the species will ensue when the conditions of their habitat are altered for a sufficiently prolonged period of time. Upon large sheets of water, with many inlets and other places favourable to the flourishing of these species, winged forms will be superfluous, and will, in course of time, only appear rarely. In small wayside pools or streamlets which dry up periodically, it is obvious that the apterous inhabitants will die out unless their habitat is sufficiently near to a larger stream or pond; a severe drought occurring over a fairly large area, prolonged sufficiently to dry

* μάκρος (*mākros*), long; βράχης (*brachus*), short; ἀ (*a*) privat.

† See Miall's ‘Natural Hist. of Aquatic Insects,’ fig. 103, No. 1, and fig. 104, No. 8, where a macropterous *Gerris thoracicus* and a brachypterous *G. lacustris* (?) are figured.

‡ So far as my own observations go—and I am not aware of any published researches that tend to invalidate them—the *Hebridæ* and *Gerridæ* always escape from danger by the employment of their legs, never by flight, the wings being used only for migration.

§ F. B. White was undoubtedly wrong in supposing that the apterous represent the primitive forms.

up all the water within that area, would cause all the species represented in that year by apterous individuals only to become extinct. Such cases will be familiar to those who have studied the aquatic Rhynchota-fauna of any locality for a consecutive number of years. Where, however, there are a few macropterous individuals, these will be able to emigrate to "pastures new" to found a fresh colony, which in course of time may, or may not, repeople the original habitat.

In confirmation of this, it may be noted that the occurrence in comparatively large numbers, or the apparently complete disappearance, of the macropterous individuals, does not seem to have any connection with the dryness or wetness of any particular year or years.

Æpophilus bonnairii is, as one would expect, always (so far as yet known) brachypterous, practically apterous. Its habitat never dries up and its range along the sea-shore is to all intents limitless; thus migration is unnecessary, and the organs of flight have become reduced to their present vestigial condition.

Migration usually takes place during the night, and waterbugs (like other aquatic insects) are often misled by the reflection of the moon to mistake the glass roofs of conservatories and other similar buildings for the surface of still water. Electric light, or indeed any very strong light, proves a great attraction, causing (particularly at its first installation) a migration of certain water insects from outlying habitats to ponds near the light. This was especially remarked—owing chiefly to the great size of the objects—some years ago in Washington (U.S.A.), where specimens of the Giant Waterbugs (*Belostoma* and *Benacus*) were often found lying on the pavements of the city in the early morning.*

Mr. Malcolm Burr, while travelling last summer in Hungary, captured and forwarded to me a specimen of *Gerris thoracicus*, Schumm., which had alighted upon the dinner table, and Mr. E. E. Green has given me an example of a new bug (*Gerris tristan*, Kirk.) taken under similar circumstances in Ceylon.

MESOVELIA Mulsant & Rey,† is another genus of uncertain position, having been referred indifferently to the Hebridæ and to the Gerridæ. One species, *M. furcata*, M. R., is British and is usually apterous, being then a slender thin-legged green creature, readily distinguished—with *Hebrus*—from the other semi-aquatic genera by the possession of two ocelli. The coxæ are practically contiguous, and the mesonotum is not concealed by the pronotum. The thoracic structure in the winged forms is

* 'Proc. Ent. Soc. Wash.' iii. pp. 87-8. See also Fletcher, 1884, in 'Entom.' xvii. p. 21.

† μέσος (*mēsos*) middle, and "velia"; of the latter I do not know the derivation—possibly from French *velours* (velvet), in allusion to the pubescent under-surface of the body; or, more probably, from the Latin *velum*, a sail: e.g., *vela dare*, to set sail, as an appropriate name for a waterbug.

remarkable. According to Douglas and Scott, the mesonotum comprehends the two basally-rounded plates posterior to the pronotum, but this view has not apparently been confirmed by other authors. In my own collection I possess apterous forms only, and have examined but a single macropterous individual (of the specific identity of which I am not certain), so that I cannot add anything as yet to our knowledge of this genus. Detailed descriptions will be found in the 'Ent. Mo. Mag.,' iv., 1867, p. 5, Plate i., fig. 1 (brachypterous), and in Saunders's 'Heteroptera,' p. 146 (brachypterous form figured in the large edition, Plate xiii., fig. 7). The apterous form, which has not to my knowledge been previously delineated, appears on Plate i., fig. 6, where the ♂ is figured; the ♀ is a little broader, and differs in the structure of the genital segments. *Mesovelia furcata* has been recorded from Burton-on-Trent, Woking Canal, and near Windsor. I have twice searched for it at Woking, but without success; this may be due to the fact that the canal has been cleaned out somewhat frequently of late years.

Some interesting observations by E. A. Butler were published in the 'Ent. Mo. Mag.,' 1893, xxix., pp. 232-6. The insects were found on a pond near Windsor, on the leaves of *Potamogeton natans*, from which, however, they were with difficulty distinguished. They are carnivorous, according to Butler, feeding upon *Smynthurus* and other small insects.

HYDROMETRA* (= *Limnobates*) is yet another genus of doubtful position, containing one species—*H. stagnorum* (Linn.), upon which the following specific names have also been inflicted at various times, viz.: *acus*, *alata*, *angusta*, *angustata*, *lineola*, and *pallipes*! As it cannot be mistaken for any other British waterbug, it will not be necessary to linger here upon its structural peculiarities. It is described and figured in Douglas and Scott (Plate xix., fig. 7), in Saunders, and also in Miall (fig. 102), and is, moreover, beautifully figured in Curtis's 'British Entomology.' Mr. Saunders has kindly called my attention to a mistake in a former part of this "Guide" (Entom., 1899, p. 6), where I wrote: "in all the aquatic forms . . . the anterior legs are raptorial. In all the femora are dilated." The present genus had escaped my memory, as, of course, the anterior legs are very slender and very similar to the other two pairs. Although doubtless they are employed for holding the food during feeding, they cannot be said to be noticeably modified for raptorial purposes. *Hydrometra* is a very timid bug, keeping close to the banks of the stream or ditch which it frequents, and moves with a slow, careful, almost pensive tread, very distinct from the jerky sprawl of *Gerris*; it is moreover not so gregarious as are most of the other semi-aquatic species.

* ὕδωρ (*hūdōr*), water; μέτρον (*mētron*), measure.

Two brief papers* have been published by ARROW and PALUMBA upon the habits, etc., of the species before us.

Arrow has observed that some ova hatched in three weeks (May 25th), the first nymph maturing June 27th. The young nymphs live on *terra firma*, occasionally making excursions on to the water, but keeping near the edge. Until almost full-grown, their food consists of the Black Water Springtail (*Smythurus niger*), which seems to form the staple nourishment of most small aquatic insects.

H. stagnorum seems well distributed in England, and has been recorded from Moray and Perthshire, in Scotland, and from Armagh in Ireland. The head is figured on Plate i., fig. 10, and the right anterior tarsus on fig. 5.

The semi-aquatic forms which, up to the present, we have considered—viz. *Hebrus*, *Aëpophilus*, *Mesovelis*, and *Hydrometra*—form a very heterogeneous group; they have, however, several features in common, which they do not share with the succeeding genera, viz.: *Velis*, *Hydroëssa*, and *Gerris*. The former move opposite legs alternately, in the act of progression; the latter move them together. The claws are inserted at the apex of each tarsus in the former, considerably below the apex in the latter. (Plate i., figs. 4 and 5.) The constituents of the former group are but little related to one another and perhaps still less to the latter group, but with the scanty knowledge we possess at present of their metamorphoses, habits, and anatomy, it seems useless speculating upon their affinities, and convenient to place them all in one family, GERRIDÆ (= *Hydrometridæ* auctt. + *Hebridæ* auctt.).

The following table will readily separate them:—

- | | |
|---|---------------------|
| 1. Claws inserted at the apex of each tarsus (fig. 5);
opposite legs moved alternately in progression | 2 |
| — Claws inserted below the apex of each tarsus
(fig. 4); opposite legs moved together in progression | 5 |
| 2. Coxæ practically contiguous | 4 |
| — Coxæ widely separated | 3 |
| 3. Antennæ with five distinct segments; head short,
ocelli present; tarsi with two segments.
Found in <i>Lemna</i> , <i>Sphagnum</i> , etc. | <i>Hebrus</i> . |
| — Antennæ with four segments; head very elongate
(figs. 10 and 5), ocelli absent; tarsi with
three segments. Found near the edges of
ditches and streams... .. | <i>Hydrometra</i> . |

* Arrow, "Habits of *Hydrometra stagnorum*," (sic), 'Science Gossip,' 1895, ii. pp. 201-3. Palumba, "Gli amori del *Hydrometra stagnorum*," 'Rivist. Ital. Sc. Nat.' 1891, xi. p. 1. There is, apparently, also some information anent the habits, etc., in Griffini's 'Gli Insetti Acquaioli' (Turin) 1894, which I have not seen.

4. Ocelli absent; antennæ long and thick. Marine.
 Found under stones, etc., below high-water
 mark *Aëpophilus*.
- Ocelli present; antennæ long and slender. Fresh-
 water. Found on *Potamogeton*, etc., in ponds
 and canals (fig. 6) *Mesovelia*.
5. Prosternum, mesosternum, and metasternum more
 or less equal to one another, all well developed
 (fig. 3); posterior femora not reaching apex
 of abdomen 6
- Prosternum and metasternum very short, meso-
 sternum generally much longer than the other
 two sterna together (fig. 11); posterior femora
 reaching far beyond apex of abdomen *Gerris*.
6. Elongate; first segment of antennæ long, curved;
 anterior tarsi with three distinct segments
 (fig. 4) *Velia*.
- Short; first segment of antennæ short; anterior
 tarsi with one segment and two minute
 "nodes" between the tarsal segment and the
 tibia *Hydroëssa*.

HYDROËSSA Burm. 1835 (= *Microvelia* Am. & Serv. 1843)* bears a striking though superficial resemblance to *Hebrus*. There is only one British species, viz. *H. pygmaea* (Dufour), figured in the British works above-mentioned. It has also been described under the names *reticulata* and *pusilla*. The apical segments of the venter (♂ and ♀) are figured here on Plate I., figs. 12 & 13.

It is gregarious and widely distributed from Perth to Hampshire and from Norfolk to Armagh, though it can scarcely be considered common. The macropterous form is rare. I found a small colony in a large reed-fringed pond in Woolmer Forest (Hampshire) on Easter Monday last, and observed them for a little over half an hour in their natural habitat. Unfortunately, I was not able to stay longer (having to return from a short holiday), but I captured a few individuals to continue my observations upon them—and they are now before me.

They were assembled in a small inlet fringed exteriorly with reeds, a luxuriant mass of *Sphagnum* concealing the margin of the pond. In the water were masses of *Ceratophyllum demersum* (hornwort). The tiny blackish insects, specked with pale bluish, are very conspicuous in the water; they disdain any foreign support as they move about—so lightly that there is scarcely even the slightest dimple impressed on the surface. Their gait may be described best as a "scuttle," a series of very quick,

* *Microvelia* was founded by Westwood in 1834 (Ann. Soc. Ent. France), as a section or subgenus only; he refers to the species as "*Velia pygmaea*" or "*Velia (Microvelia) pygmaea*" throughout.

short steps, the femora being almost horizontal. They move very rapidly, but rarely sustain the effort long—the opposite legs are moved alternately (see p. 112). They seem, however, to have very feeble adherent powers; if placed on a piece of paper or bit of rough cork and allowed to run about, they always tumble off immediately when the cork or paper is gently inverted, and they are apparently unable to mount a perpendicular glass surface. The macropterous form is rather smaller than the apterous, and moves with a somewhat greater rapidity.

The condition of the pubescence with which these insects are clothed, and of the various longer hairs on the legs, antennæ, &c., their smoothness and their freedom from all kinds of extraneous matter, are of prime necessity, and consequently a very large portion of their energies is directed to that end. The cleansing is performed entirely by means of the legs, and may be described as a "dry-wash." The antennæ receive especial attention—these are clothed with short, fine hairs, directed forwards from their base; the *Hydroëssa* deals with each separately, bringing its anterior legs together, almost touching at the apices of the femora. The antennæ are thus loosely held in position, while the tarsi are employed to smooth forward any disarranged hairs into their natural position. I have not observed any special cleaning structure, such as that which obtains in certain Hymenoptera, &c. During this, the insect is distinctly raised up in front by means of the intermediate legs.

One of the individuals I am observing has lost the apical two segments of the left antennæ, and, although this seems to have no absolutely deleterious effect upon the bug, it is evidently causing her a great amount of anxiety. She appears to be much perplexed at the shortness of the antenna, and repeatedly strokes it between the two anterior legs; there does not, however, seem to be any actual pain connected with the loss. The antennæ are probably auditory organs—certainly not tactile—as directly the bug approaches an obstruction, the antennæ are thrown back out of harm's way, almost at right-angles to the longitudinal plane of the body. It may be noted that the eyes are enormously developed in this genus and its allies.

The legs are cleaned in much the same manner as the antennæ. The pubescence on the head is smoothed by the tarsi of the posterior legs (one at a time), the latter being very long and flexibly-segmented. The attitude of *H. pygmaea* during this part of its toilet is very funny, reminding one irresistibly of a dog scratching his ear. The posterior tarsi are also brought into play for the cleansing of the connexival (and abdominal) pubescence. In the macropterous individuals, the flight-organs are slightly lifted up, the posterior legs (one at a time) moving underneath them, arranging the pubescence.

Attention to the ventral parts of the body is a rather more

delicate matter. The body is tilted up on one side by means of the anterior pairs of legs and one posterior leg; the other posterior leg (that on the uptilted side) performing the work.

Hydroëssa does not, I think, move very far out from the water's edge, and scuttles in under the shelter of the bank upon being disturbed.

One specimen (macropterous) appeared to have been drowned;—on removing it from the water it remained perfectly motionless. I then placed it upon its back for the purpose of examining the ventral surface; after a few moments, first one of the legs, and then another—finally five and one antenna—began to pulsate feebly but rhythmically. The bug appeared to be quite dead, but the pulsations nevertheless accelerated (unequally in the different legs) and increased in vigour. Upon tapping the support, the movements ceased, but recommenced after a short interval. Unfortunately, an accident prevented more extended observations. These pulsations are well known to occur in the Rhynchota,* and are quite distinct from the ordinary muscular movements.

EXPLANATIONS OF PLATE I.

FIG.

1. *Velia rivulorum* (Fabr.); head, pronotum, &c., of apterous form.
2. Head, &c., of macropterous form of same species.
3. Sterna of same species.
4. Anterior tarsus, same species.
5. " " *Hydrometra stagnorum* (Linn.).
6. *Mesovelvia furcata* Muls. & Rey, ♂, apterous form (dorsal view).
7. Antenna of *Gerris najas* (De Geer), Kirk.
8. " *G. rufoscutellatus*, Latr.
9. " *G. lacustris* (Linn.), Stål.
10. Head and antenna (dorsal view) of *Hydrometra stagnorum* (Linn.).
11. Sterna of *Gerris najas* (De Geer), Kirk.
12. Apical segments of abdomen (ventral view) of *Hydroëssa pygmaea* (Duf.) ♂.
13. Apical segments of abdomen (ventral view) of *Hydroëssa pygmaea* (Duf.) ♀.
14. Apical segments of abdomen (ventral view) of *Velia rivulorum* (Fabr.) ♂.

a. pronotum, b. mesonotum, c. metanotum, d. first segment of abdomen, e. prosternum, f. mesosternum, g. metasternum.

* See W. A. Loey—"Observations on the pulsating organs in the legs of certain Hemiptera"—(Amer. Nat., 1884, pp. 13-9, Plate i.).

(To be continued.)

DESCRIPTIONS OF NEW SPECIES OF SYNTOMIDÆ IN
THE COLLECTION OF MR. H. J. ADAMS, F.E.S.

By PERCY I. LATHY.

Syntomis sulana, sp. nov.

♂. Blackish with a purple gloss; antennæ whitish towards tips; thorax with lateral crimson patches; abdomen with only faint indication of crimson on basal segment; complete crimson bands on next three segments; terminal segments with bands incomplete dorsally. Fore wing with long wedge-shaped hyaline patch in end of cell; a larger oblong patch below cell; an oblong patch above vein 6, and two patches between veins 3 and 5. Hind wing with two small elliptical hyaline spots below cell, and divided by vein 2.

Hab. Sulla Mangola (type); Sulla Besi.

This species may be distinguished from *S. celebesa*, Walk., by the two hyaline spots of the hind wing, and from *ab. gracilis*, Röber, by the abdominal bands being incomplete dorsally.

Sarosa xanthotarsis, sp. nov.

♂. Head and thorax black; frons and thorax with patches of olive yellow; thorax at side and legs with patches of metallic blue; minute metallic blue points on tegulæ; tarsi completely orange; abdomen black, with olive yellow patch on first segment and narrow bands on the others; dorsal and sublateral series of metallic blue spots, and one or two metallic blue spots on ventral surface; wings yellowish hyaline, the veins and margins black. Fore wing with minute metallic blue basal spot just below costa; the inner area orange; veins orange towards base; the terminal band very wide on apical area, and expanding slightly at tornus. Hind wing with the terminal band expanding between vein 2 and tornus.

Hab. Venezuela.

Closely allied to *S. sesiiformis*, Walk., but may easily be distinguished by the completely orange tarsi and orange inner area of fore wing.

Cosmosoma rubrobasalis, sp. nov.

♂. Head black, with metallic blue on frons and vertex; antennæ white at tips; tegulæ black, with metallic blue points; thorax scarlet, the patagia rather widely fringed with blue-black; fore and mid-legs blackish brown marked with scarlet; hind-legs scarlet marked with black; abdomen black with a series of large subdorsal scarlet patches except on last two segments, leaving dorsal and lateral triangular black patches containing metallic blue spots; ventral valve white; wings hyaline, the veins and margins black. Fore wing with the base scarlet, extending slightly along costa and inner margin; discocellulars with rather more black than other veins; terminal band very wide on apical area, and expanding at tornus. Hind wing with terminal band expanding at apex and tornus.

Hab. Ecuador, Angamarca.

Very near *C. sectinota*, Hamps., but may be distinguished by scarlet basal marking of fore wing.

Cosmosoma pellucida, sp. nov.

♀. Head, thorax, and abdomen black; frons white; tegulæ, patagia, and thorax with patches of metallic blue; fore coxæ white in front; legs streaked with blue; abdomen with sublateral red stripe extending along first five segments; ventral surface white excepting last two segments; wings hyaline with veins black, and margins broadly black. Fore wing with terminal band very wide on apical area, and expanding considerably at tornus; inner margin heavily bordered, especially near base; a hyaline streak between costal vein and costa; a large discocellular patch. Hind wing hyaline, with terminal band very wide on apical area, and expanding at tornus. Under side of fore wing with short metallic blue streak on costal vein, and metallic blue patch in and above basal part of cell of hind wing below.

Hab. Brazil.

This species bears a superficial resemblance to *Pheia sperans*, Walk.; but the hind wing has vein 3, which is given off from 4 just before margin.

Euchromia ccelipunctata, sp. nov.

♂. Black; frons white; white patches on coxæ; abdomen with crimson dorsal patch on first segment; a lateral crimson spot on second segment, and ventral and lateral crimson bands on next three segments. Fore wing with a minute metallic blue spot at base near costa, and small blue spot on discocellulars; a small hyaline spot below base of cell; a spot in cell, and patch below it; a spot above vein 6, and two spots between veins 3 and 5. Hind wing with hyaline patches in and below cell and on inner area; an oblique macular band beyond cell between veins 2 and 6; a small blue patch on discocellulars.

Hab. Bouru.

This species resembles *E. bourica*, Boisd., *E. amboinica*, Hamps., and *E. dubia*, Röber, in the crimson bands being incomplete dorsally; it differs, however, from each of these species in having a dorsal crimson patch on first segment, and no abdominal blue bands.

Euchromia fulgens, sp. nov.

♂. Black; neck, patagia, tegulæ, and thorax with patches of metallic blue; frons and patches on coxæ white; abdomen with orange dorsal patch on first segment, and brilliant metallic blue-green bands on remaining segments; ventral and lateral crimson bands on third, fourth, and fifth segments. Fore wing brilliant blue at base, and extending along veins beyond first hyaline spot; a brilliant blue patch on discocellulars; hyaline spots below base of, and in and below cell; a spot above vein 6, and two spots between veins 3 and 5. Hind wing with hyaline patches in and below cell, and on inner area; a wide

oblique macular band beyond cell, between veins 2 and 7; a brilliant blue spot on discocellulars.

Hab. Masor Island, Geelvink Bay.

Allied to *E. dubia*, Röber, but may be distinguished by all the segments after the first having dorsal blue bands.

Trichura fulvicaudata, sp. nov.

♂. Black; frons, vertex of head, tegulæ, patagia, thorax, and coxæ with patches of metallic green; palpi in front, fore coxæ, mid and hind trochanters orange yellow; abdomen with dorsal and lateral series of metallic green spots; ventral surface of two basal segments orange yellow, and sublateral orange yellow patches on third; anal appendage bright fulvous towards extremity; wings hyaline, with veins and margins black. Fore wing hyaline yellow; a basal orange spot below median vein; a discoidal black bar; terminal band expanding slightly towards apex, and below vein 2. Hind wing hyaline blue, with apical black patch and inner area black.

Hab. Paraguay.

May at once be distinguished from any other species of *Trichura* by the fulvous extremity of anal appendage.

Metastatia azurea, sp. nov.

♂. Black; palpi in front, sides of frons, head behind eyes, and a spot on vertex, coxæ and streaks on femora greyish white; abdomen shot with brilliant blue; dorsal and lateral bluish grey lines; anal segment and tufts crimson; ventral surface greyish white; wings shot with brilliant blue. Fore wings with wedge-shaped hyaline patches in and below cell and between veins 2 and 3; a slightly curved oblique band beyond cell extending from just below costa to vein 3 near tornus. Hind wing hyaline, with veins, upper part of cell and rather wide terminal band black, shot with brilliant blue.

Hab. Ecuador, Angamarca.

May be separated from *M. pyrrhorhœa*, Hübn., by greater extent of hyaline markings, the black more brilliantly shot with blue, and crimson anal segment.

Eriphioides viridis, sp. nov.

♂. Black-brown; vertex of head, neck, tegulæ, patagia, thorax and legs with patches of metallic green; fore coxæ and palpi with white spots; abdomen shot with cupreous green; a sublateral series of white patches on each segment, becoming smaller towards anus. Fore wing with basal half brilliant cupreous green; below with inner area covered by lobe of hind wing whitish; a metallic green patch in and about cell. Hind wing with costal half whitish; below with basal costal region metallic green.

Hab. Ecuador.

May be distinguished from other species of the genus by having sublateral white markings on each segment, and brilliant green basal area of fore wing.

Eriphioides albipunctata, sp. nov.

♂. Black; white spots on tegulæ, shoulders and thorax above; antennæ blue-black; fore and hind coxæ white; abdomen shot with metallic green; a large lateral white spot on first segment, and sub-lateral white patches on first five segments. Fore wing shot with metallic green along costa and submedian interspace; a small hyaline spot towards lower end of cell, another below it, and a third between veins 3 and 4; below with inner area covered by lobe of hind wing whitish; apical area shot with metallic blue-green. Hind wing with costal half brownish white, and basal part of inner margin white; below with costal half metallic blue-green; inner area white.

Hab. Ecuador, Balsapamba (type); Angamarca.

The hyaline spots of the fore wing at once serve to distinguish this species; in the specimen from Angamarca the hyaline spot between veins 3 and 4 is wanting.

Antichloris purpurea, sp. nov.

♂. Black; vertex of head, thorax, patagia, shoulders and legs with patches of metallic green; a few crimson hairs about neck; fore coxæ white; abdomen cupreous green; dorsal white patches on first two segments, and large lateral white spot on first segment; ventral surface of first four segments white. Fore wing shot with rich purple at base, becoming greenish towards termen; below with inner area covered by lobe of hind wing, and streak along costa brownish white; apical area shot with blue-green. Hind wing shot with blue-green; costal half brownish white; below shot with blue-green, especially costal half.

Hab. Ecuador.

May be distinguished from *A. scudderi*, Butl., by dorsal white patches.

Coreura adamsi, sp. nov.

♀. Black; palpi crimson in front, excepting terminal joint; a few red hairs about neck; legs striped with metallic blue; abdomen metallic blue. Fore wing with oblique crimson fascia beyond cell, extending from subcostal vein to near tornus; this fascia is narrower at tornus, and has a slight suffusion of orange scales; cilia at apex white; below shot with metallic blue, especially in upper part of cell and submedian interspace, to crimson fascia, which is much wider. Hind wing shot with brilliant blue, especially at base and along inner area; cilia crimson; below scarcely shot with blue; a narrow, irregular, terminal crimson band.

Hab. Ecuador, Banos.

Allied to *C. lysimachides*, Druce, but may be separated by absence of terminal crimson band of upper side of hind wing.

Neacerea elegans, sp. nov.

♂. Black-brown; front of palpi, sides of frons, minute spots at base of antennæ, and fore coxæ white; legs streaked with white; neck crimson; abdomen with dorsal metallic blue patches on first

and anal segments, and dorsal metallic blue points on remainder; ventral surface white. Fore wing with large quadrate hyaline patch in end of cell; two hyaline patches between veins 3 and 5; cilia and margin at apex white; below with basal part of cell and submedian interspace brilliant metallic blue. Hind wing with narrow elongated hyaline patch in cell, a large patch below, and another narrow one on inner margin; a wedge-shaped patch at base of vein 2; below with hyaline markings bordered with brilliant metallic blue, widely on costa, and at tornus.

Hab. Ecuador, Banos.

This species is very distinct from any other in the genus, owing to the beautiful metallic blue markings of the under side.

Neacerea suffusa, sp. nov.

♂. Dark brown; back of head with paired crimson spots; patches on coxæ crimson; abdomen with series of subdorsal metallic blue-green patches. Fore wing with small quadrate hyaline patch toward end of cell, a wedge-shaped patch below cell, a patch between veins 2 and 3, and two patches between veins 5 and 7 just beyond cell; between veins 2 and 5 are three elongated semihyaline patches. Hind wing hyaline, with veins and margins black, the black expanding widely at apical area and just before tornus.

Hab. Demerara.

Allied to *N. dizona*, Druce, but may be distinguished by the crimson patches on coxæ, subdorsal metallic blue-green patches, and dark brown ventral surface.

Eucereon ruficollis, sp. nov.

♂. Head and thorax greyish, marked with fuscous; back of head with two orange patches; neck crimson; tegulæ with fuscous spots, and patagia edged with fuscous; fore coxæ pink; abdomen crimson, with lateral series of black spots, and extremity black; ventral surface dull orange-yellow; anal tuft greyish yellow. Fore wing grey; a curved series of four fuscous spots near base; just beyond this a series of five spots, and again beyond this a series of four spots; in this latter series the upper spot, which is in the cell, is nearer the base than the other three which run obliquely from near base of vein 2 to inner margin; an irregular wide fuscous band crossing wing, the inner edge of this band being within cell; beyond this and not far from apex a rather wide macular band extending from costa to vein 5, and two spots below it between veins 3 and 5; a marginal series of six spots; cilia spotted with fuscous. Hind wing semihyaline strongly suffused with fuscous, especially at apex.

Hab. Venezuela.

Near to *E. balium*, Hamps., but may be distinguished by crimson neck, and ventral orange surface of abdomen.

Eucereon inconspicuum, sp. nov.

♂. Head and thorax greyish; neck and coxæ orange-yellow; tegulæ fuscous; abdomen orange, with last two segments and ventral

surface of last four segments black. Fore wing greyish; a large fuscous spot on costa near base; an irregular fuscous patch in cell; costa above terminal half of cell fuscous; an irregular curved line from base of vein 2 to inner margin not far from base, from this line another just above vein 1 towards base, but branching into a Y long before it; beyond cell a curved irregular band crossing wing, terminating on inner margin near tornus; a large patch on costa not far from apex extending to vein 5; a series of small elongated marginal patches. Hind wing fuscous, approaching semihyaline in and about cell.

Hab. Demerara.

Appears to be nearest *E. aoris*, Möschl., but in that species the terminal segment only is black, and the ventral surface is white.

Lynton Villa, Sydney Road, Enfield.

MORPHO CACICA, STAUDINGER.

THIS beautiful species has been regarded by many collectors as only a variety or local form of *rhetenor*, Cramer. I have, however, recently received some specimens from Peru, and amongst them a very fine female, which, compared with that of *rhetenor*, exhibits some very striking differences, leading to the inference that the species are distinct.

The main points are that the anterior wings of *cacica* are a very light fulvous, the cell black to near the apex, where there is a distinct fulvous spot quite absent in *rhetenor*, and in the latter species the basal dark fulvous is suffused over the remainder of the wing, whereas in *cacica* it stops sharp short at the cell. A further pronounced difference is in the hind marginal band, which in *rhetenor* is almost entirely black, with very small spots; that in *cacica* has large fulvous wedge-shaped markings throughout the band on both wings. A further point is that this band in the posterior wings of *rhetenor* extends right to the outer edge; whereas in *cacica* it is well cut off by a wide fulvous line, intercepted in the centre by a narrow black one. Generally the two species can be at once distinguished by the very much darker colouring in *rhetenor*.

The males received are all uniformly much larger than the largest *rhetenor* examined, and all have the conspicuous submarginal and costal white wedge-shaped markings.

The sexes being therefore differently marked to their congener, I think that Dr. Staudinger's name is a sound specific one.

The specimen has been added to the museum of Mr. H. J. Adams, of Enfield.

WILLIAM WATKINS.

Eastbourne: March 30th, 1899.

ON THE LARVÆ OF CERTAIN BRITISH MOTHS.

BY J. ARKLE.

Tephrosia crepuscularia (*bistortata*) = *T. biundularia*.—A scarce form of the larva of this species is inky-black, except in the ever-present pale (in this case whitish) blotch above and upon the claspers of segment 10. I put six of these in a pot by themselves, to see if the resultant moths turned out to be the black variety of the imago (Entom. xxxi. 27). These larvæ unfortunately failed to produce moths.

Hybernia marginaria (*progemmaria*) var. *fuscata*.—“The larvæ are nearly full-grown. They vary in colour very much—perhaps most are an ochreous-hazel, with a series of paler dashes of that tint along each side, and a dorsal configuration or stripe of diamond pattern stretching centrally along the back; others are a reddish purple and unicolorous, without pattern; others are sooty black, unicolorous, and without pattern. Finally, there are intermediate colour forms of larvæ between these types” (Note-book, June 16th, 1897). These larvæ were pure descendants of moths dating 1895. Some of the imagines of 1897 showed a disposition to revert to the type (*marginaria*). About half of those for 1898, whether from black larvæ or not, were midway in colour between the variety (*fuscata*) and the type—the rest were true *fuscata*—all of which does not increase my faith in the evolution of species. I have observed a still more rapid and complete reversion to the typical insect, that is, in the space of a year, in the following varietal forms,—*olivacea* back to *Polia chi*, and *gothicina* to *Teniocampa gothica*. I am very curious to know if *doubledayaria* behaves similarly in reverting to the typical *Amphidasys betularia*—both parents, of course, to be true *doubledayaria*.

Asteroscopus nubeculosa.—A few eggs from Rannoch moths hatched on April 25th, 1897. The larvæ should be sleeved out, as the species is difficult to rear; but I decided to try them (1) *after hatching* in a glass tumbler with muslin over the top fastened by an elastic band, a piece of glass nearly covering the muslin so as to allow for ventilation, whilst preventing the food (birch) from withering; (2) *afterwards*, a well-ventilated cage with the twig of food in a little water; (3) *lastly*, a good-sized flower-pot three parts full of soil, with net over the top, food-plant and other arrangements as in (1). The young larvæ, ten all told, nearly all died off under the treatment marked (2). The disease was diarrhœa, owing, I believe, from past observations, to the food having to be placed in water. My survivors were three. One met an accidental death, and the remaining two pupated June 30th in the soil of the flower-pot. The first moth emerged March 18th, 1898, but the wings failed to fully develop. The

second appeared March 28th, 1899, having been two winters in pupa, a peculiarity often occurring, and just as partially, with many of our spring moths, regardless of out-door temperature, as *Endromis versicolor*, *Saturnia carpinii*, *Asphalia flavicornis*, *Nyssia zonaria*, and *Tephrosia crepuscularia (bistortata) = T. biundularia*. The following description, from my note-book, of the larva of *A. nubeculosa*, just before pupation, may be interesting:—"Head pale green. Body apple-green; a dorsal line of white-yellow spots from 4th to 12th segment. Segments, beginning with the 3rd, spotted dorsally with pale yellow; an oblique primrose-yellow mark on each side of the 4th segment, a similar mark above each anal clasper, and one also straight across from side to side on the 12th segment. Spiracles white with black rings. Legs reddish brown; claspers apple-green, each with a faint black circular mark."

Agrotis ashworthii.—Another difficult species. Fifty-three eggs began to hatch on July 22nd, 1897. They are spherical, dull whitish after a few days, being first white. They are closely ribbed. There is an apical irregularly-shaped blotch of reddish brown, and an irregular blotched and sometimes interrupted ring of the same colour round the widest part of the egg. All had hatched by the 25th. Treatment as in *A. nubeculosa*, (1) and (2). Food, dandelion; but I find the broad-leaved plantain best when the larvæ are well grown. On hatching the larvæ are pale brown, with a slight scattering of black short hairs. On the 25th those first hatched had changed to dull green. They looped like geometers. Up to this period they are semi-transparent, with a brownish head. The 2nd segment is unmarked; the 3rd is bounded by two rings of closely-arranged black spots dividing the segment from the 2nd and 4th. After the 3rd each segment has, dorsally, four black spots, two near the front and two near the rear, the rear couple being farther away from each other than the two in front. When making this observation (through a strong lens) the larvæ raced up to the edge of the tumbler. One got outside and quickly dropped, using the thread of silk from its mouth common to so many caterpillars. A strong breeze did the rest, and I lost it.

July 30th.—About half the number of larvæ reached the second stage. Head pale brown, with a distinct pink shade. Dorsal surface dull pale green, but darker towards the sides; a paler indistinct median line, and a similar line on each side of it. A pale whitish green subdorsal stripe along the middle of each side, then a dull pale green under surface. Legs and claspers correspond with colour of dorsal surface. The black spots are smaller in comparison to the increased size of the caterpillar.

Aug. 10th.—Third stage reached by about a third. Head pale brown. Dorsal area pea-green, smoky green, or dull green.

Segments 5, 6, 7 often with yellowish divisions. Under surface, legs, and claspers pea-green; along each side is a broad silvery white stripe. Immediately above this stripe the dorsal surface is black, but tones off rapidly into the pea-green, smoky, or dull green. On each segment, dorsally, except the 12th and 13th, are two outward-bent, wedge-shaped, black marks pointing in the direction of the head. These marks are longest on segments 10 and 11; on the others they stretch along half the length of each segment, except on segment 2, where they are usually small and indistinct. The caterpillar is smooth and cylindrical.

I may as well continue my notes on these caterpillars:—

Aug. 13th.—They are not eating so much. They remain motionless for long periods, which looks as if they are nearing hibernation. 20th.—A few have entered the fourth stage. The green of the caterpillars is now very dark olive—in fact, blackish. The broad silvery white stripe remains, but the dorsal, wedge-shaped, bent, jet-black marks are larger and more distinct. In other respects the larvæ resemble those in the third stage. 26th.—A small one, in its second skin, died. A few laggards are still in the second stage, and some in the third. 28th.—Two, in the third stage, died. The diseases are the same which carry off so many of the wild full-grown larvæ when confined, viz. diarrhœa and constipation. 30th.—Another small one died.

Sept. 1st.—Another died (third stage), making the fifth death. Removed the rest into an airy breeding-cage with moss at the bottom. They now eat little, and appear about to hibernate. The larger ones, which are about half the total number, have now reddish heads, and are very like what we get in spring; they are smaller, dusky olive-green, but, although they have the two black wedge-shaped dorsal marks on each segment, they still retain the mid-side stripe of white. This is still the fourth stage. 30th.—Two imagines of *Orthosia lota* emerged. The larvæ were found when feeding *A. ashworthii* larvæ, in spring, on sallow-catkins. The two caterpillars of *O. lota* were then almost microscopic, and were feeding inside the catkins.

Oct. 9th.—Only nine larvæ of *A. ashworthii* seen in the cage. 17th.—Five larvæ only seen, but they appear to be doing fairly well; they prefer dandelion. 31st.—Fine and warm, but only four poor-looking larvæ appeared at night; none by day.

Nov. 4th.—Saw eight in the cage to-night. 11th.—All the larvæ seem to have retired for the winter. 28th.—Two healthy-looking *ashworthii* larvæ in the cage, at night only, on dandelion and grass-leaves. I have often seen the caterpillars eat grass, but sparingly.

Dec. 1st.—Totally disappeared. 11th.—If living they are hidden under the moss in their cage. We have had no frosts yet, although it has often been very cold.

Jan. 22nd, 1898.—Turned out the contents of the cage, and found all the *ashworthii* larvæ dead, dry, and shrivelled up.

The following description, from my note-book, may also be of interest. It represents the caterpillar in the final stage, and just before pupation in the soil, between the middle and end of May. Although I have sometimes noticed spring-collected larvæ change their skins once, still the description will stand good for all collected for me after natural hybernation:—"Head shining, reddish russet. Upper and under side of body dark slate-colour, sometimes with a greenish tinge. Legs dull red. Spiracles cream-colour, with reddish tint. On the back of each segment are two large, velvety black, outward-bent, wedge-shaped marks. When the segment is extended in crawling, these marks are seen to stretch down, or along, half the dorsal length of each segment; their outer boundaries describe a right angle, the inner boundary is a curved outward-bent line. On the 2nd segment there are no marks. On the 4th, at the points of the wedge-shaped velvety black marks, are two well-defined but irregular spots of the same velvet-black. The wedge-shaped marks become gradually broader towards the 12th segment (inclusive), but on the 13th or anal segment they are narrower and leaf-shaped." The moth appears about the end of June

Callimorpha hera —On Oct. 9th, 1897, I had two dozen young larvæ. The great point was to get them through the coming winter, so I planted some ground-ivy and dandelion in a large flower-pot. I then bent over crosswise a couple of willows, covering all with gauze, which I fastened to the pot with string. The ground-ivy ultimately died under the gauze, but the dandelion kept up a few green leaves to the last. Hybernation with this species seems to be intermittent. My caterpillars thinned off mysteriously. On Jan. 1st, 1898, the survivors awakened up, but I was able to count only thirteen. As the ground-ivy was dead and withered, I gave them a few dock leaves, which they evidently partook of freely, returning to hybernation under their shelter. On Jan. 23rd I counted fifteen; they were all in the second stage. On Feb. 27th I could only see eight. On March 20th I counted nine, and discovered a small beetle in the pot. He was promptly ejected, and I blame him to this day for most of the mysterious disappearances. Cannibalism, although I never detected it, may account for the rest. On April 29th I had eight left, and I put them into a cage with a couple of inches of moss at the bottom. I now fed them upon groundsel, which they preferred to all other plants. On June 9th they began to spin up, but in every case *among the moss*. July 29th to Aug. 3rd (an uncommonly warm summer), seven fine moths emerged. Two were of the variety *lutescens* (with yellow under wings). This species is, I think, the most curious to deal with I ever met. There was very little to observe about the larvæ, as they kept

themselves motionless and as much out of sight as possible by day. I never succeeded once in finding them actually feeding, although their growth between April and June was rapid. So it was with the moths: they emerged from the chrysalis, developed, closed their wings, and settled themselves as if for ever at the back of the cage. But disturb them, and they took off at once. One made straight for the window, which was open not more than half an inch, and got clear away. My opinion of their intelligence improved after this. I should not say they fly *fast*, but they fly *well* when they get a start—that is, they appear to be masters in the art of dodging and getting away.

Trichiura crategi.—This is not only an interesting but easy species to rear from the egg, as its life-history occupies only five of the spring and summer months—that is, from the middle of April to the middle of September. A tumbler-glass, and afterwards a cage, are all the accommodation necessary. The larvæ are at first gregarious, and even in appearance they remind one very much of *Eriogaster lanestris*, to which species they are evidently closely related. The eggs I had hatched April 16th, 1898. I fed the larvæ on blackthorn, and all went well till I nearly lost them about the end of June. I had read somewhere that they made their cocoons among the food-plant, but they declined this hint altogether, and wandered restlessly about. I then put a couple of inches of moss in the bottom of the cage, and they at once disappeared in it. The moths emerged between the 7th and 14th of September.

Teniocampa gracilis.—On June 24th, 1898, in Sealand Road, near Chester, I observed the unopened blossom-heads of meadow-sweet growing in the ditches to be spun together. On opening them I found each to contain a caterpillar more than half-grown of some noctuid. They presented the following appearance on July 2nd:—Head pale green, the face reticulated with brown. Dorsal and subdorsal areas grass-green, the subdorsal area paler. A mid-side black stripe. Below this black stripe there is a pale green stripe containing the blackish spiracles. Legs and claspers green. On July 13th they had reached the next or final stage, and began to pupate in the soil of the flower-pots. The following is a description:—Head and dorsal area warm pale brown, rather olive-brown. Subdorsal area paler. A mid-side black stripe toning off rapidly into the brown dorsal area. Below this black stripe is a pale brown stripe containing the white spiracles, which are surrounded by black rings. Legs and claspers brown. Newman gives a description similar to this as a varietal form, but *all* my caterpillars assumed this coloration. Some authors appear to describe the larva from the preceding or green stage, and I can nowhere find meadow-sweet (already fresh and green) given as a pabulum. My idea was that these caterpillars were most likely *Anhocelis litura*, but when

September passed and no moths appeared, I saw I must wait through the winter. They are coming out as I write (April 6th). The first emerged on April 2nd. Some have beautiful rose-coloured wing-fringes, but the tint quickly fades after death. I have always found *T. gracilis* to be comparatively scarce, and yet the caterpillars are evidently plentiful enough among the unopened flowers of meadow-sweet.

All the species I have referred to were kept from the first in the open air.

Chester: April 6th, 1899.

A NEW WAX-SCALE FROM WEST AFRICA.

By T. D. A. COCKERELL, N. M. Agr. Exp. Sta.

Ceroplastes egbarum, n. sp.

Waxy female scales often crowded on the twigs, two or more coalescing; about 11 mm. long, 10 broad, and 6 high, the wax extremely thick, not at all divided into plates, snow-white, here and there with a suffused pinkish stain.

♀. Denuded of wax $5\frac{1}{2}$ –7 mm. long, 4 broad, $2\frac{1}{2}$ –3 high, very dark, with a dorsal hump but no lateral humps; anal horn a mere mammiform prominence. Boiled in caustic soda, the denuded females give a purple colour, which on dilution with water appears pink, and soon forms a flocculent pink precipitate. On adding nitric acid a flocculent white precipitate appears, but the pink precipitate is not altered. Skin after boiling remains yellowish brown, chitinous, with scattered minute gland-dots. Stigmatic areas with numerous crowded gland-spots, and many short and rather thick simple spines, but no capitate spines. Legs dark brown, the parts measuring thus in μ : Coxa, 120; femur with trochanter, 180; tibia, 128; tarsus with claw, 96 to 114. Tarsal digitules $60\ \mu$, slender, with a small knob. Claw digitules with very large round knobs, extending about $15\ \mu$ beyond tip of claw. Antennæ apparently only 6-segmented, but the segmentation towards the end very obscure. The segments measure in μ : (1.) 45; (2.) 60–69; (3.) 66–78; (4.) 51; (5.) 69; (6.) 72. Segment 5 has a deep notch which makes it look as if divided into two.

Young larvæ under female about $430\ \mu$ long and 230 broad, tinged with a warm reddish colour. Male. Scales small, elongate, and glassy.

Hab. On *Mimosa*, near Abeokuta, the great city of the Egbas, W. Africa; collected by Dr. H. Strachan.

This is a fine wax-producing species, fully equal in this respect to the *C. ceriferus*, which produces the Indian white wax. On superficial examination it would be taken for *C. ceriferus*, but it differs in the dorsal hump of the female, and in the proportions of the antennal segments, 2 and 3 being subequal, whereas in *ceriferus* 3 is very much longer than 2.

Mesilla Park, New Mexico, U.S.A.: April 5th, 1899.

NOTES ON AMERICAN BEES.

By T. D. A. COCKERELL,

Professor of Entomology, New Mexico Agricultural College.

Nomia nevadensis, Cresson.—La Luz, N. M., July 27th, 1898. (C. M. Barber.)

Nomia arizonensis, n. sp.—♂. In my table of *Nomia* ('Entomologist,' February, 1898) this runs to *N. compacta*; but the wings are very clear, with very dark broad contrasting hind margins. It is surely a distinct species, by this character, and the locality. Arizona. (C. F. Baker, 2304.)

Andrena chromotricha, n. sp.

♀. Length a little over 9 millim.; breadth of abdomen $2\frac{3}{8}$ millim. Belongs to the group with the *mesothorax* and *abdomen* minutely tessellate, not punctured: the enclosure of metathorax triangular, granular, defined only by a line, with only the extreme base very slightly wrinkled; the process of labrum broad and truncate, the truncation broadly submarginate, the sides sloping; the clypeus with a smooth median line, its sides on each side of the line distinctly but not closely punctate, its anterior margin with a pair of long and strong yellowish bristles projecting downwards; the front beneath the ocelli strongly striate; the tegulæ very dark brown; the wings with the apical margin smoky; the abdomen with continuous but thin pale hair-bands; the apical fimbria sooty.

This species is closely allied to *A. apacheorum*, the description of which (Entom. 1897, p. 306) applies to it with these exceptions: it is a little smaller, especially in the abdomen; the pubescence of the *mesothorax* and *scutellum* is a lively reddish orange; the hair of the abdominal bands is hardly so long; the impunctate line on the clypeus is well-defined; the vertex is a little narrower; the pubescence of the tarsi is entirely very pale yellowish, like that of the tibiæ; the frontal striation is stronger. The first segment of the flagellum is about or hardly twice the length of the second, whereas in *apacheorum* it is a little over twice the length. The nervures are very dark brown, the stigma somewhat lighter.

Hab. Forks of Ruidoso Creek, New Mexico, July 30th, 1898. (C. M. Barber.) It is just possible that this is an extreme variety of *apacheorum*, but its characters seem specific. The two conspicuous clypeal bristles also occur in *apacheorum*, *fimbriata* (*americana*), *electrica*, *macgillivrayi* (rather small), *vicina*, &c.

Halictus lerouxii, Lep.—♀. Colorado. (Gillette, 2441.) *H. parallelus* of Ashmead's Colorado list is doubtless the same.

Halictus ligatus race *townsendi* (Ckll.).—To my surprise, Mr. C. M. Barber took two females of this in Mesilla, New Mexico, along with many ordinary *ligatus*. The insect was described (as *H. townsendi*) from Tropical Mexico.

Panurginus pauper var. *flavotinctus*, Ckll. — Prof. C. H. T. Townsend took two males at Dripping Spring, Organ Mountains, N. M., Aug. 10th. I formerly thought they might belong to *P. asteris*, Rob. The female of *flavotinctus*, taken at Santa Fé in August, differs from the male in the broader flattened abdomen, and the wholly dark face. It will be distinguished from the female of *albitarsis* by its small size (about 5 millim.), and the flagellum being ferruginous beneath after the fourth segment.

Panurginus albitarsis subsp. *fortior*, subsp. nov.

♂. About 6½ millim. long. Differs from Santa Fé *albitarsis* in being more robust, with a broader abdomen, having indeed the build of a female rather than of a male. Wings quite clear; stigma and nervures rather pale brown; face-markings a deep chrome-yellow, whereas in the Santa Fé insect they are pale lemon-yellow. Flagellum entirely black.

Hab. Mescalero, N. M., July 22nd, 1898. (*C. M. Barber.*) This is probably a valid species.

Panurginus barberi, n. sp.

♂. Length about 7 millim., black, with a thin short greyish pubescence, making the insect appear dusty; abdomen narrow with subparallel sides; head, mesothorax, and scutellum with large and rather dense punctures, not dense enough, however, to obscure the shining surface; metathorax with its middle part shining and impunctate, its base with a narrow transverse channel crossed by little ridges at frequent intervals; abdomen shining, with only a few small scattered punctures at the sides of the first segment, the other segments with the anterior half rather thickly but minutely punctured; antennæ entirely black; face scarcely hairy, clypeus (except two black dots, and the pale brown anterior margin) and lateral face-marks bright lemon-yellow; lateral marks rapidly narrowing above the level of the clypeus, ending in a sharp point (at an angle of about 45°) on the orbital margin just below the level of the antennæ; labrum mostly yellow; mandibles simply yellow at base, otherwise reddish brown, with a conspicuous tuft of hair on the lower margin about the middle; tubercles yellow with a hyaline spot; tegulæ testaceous: wings smoky, especially on the apical margin, nervures and stigma piceous; marginal cell with a long appendicular nervure; second submarginal cell receiving the recurrent nervures near the end of its first and beginning of its last fifths; legs black, bases of last four tibiæ, all the knees, basal two-thirds of anterior tibiæ in front, and basal joints of all the tarsi, pale yellow.

Hab. Mescalero, New Mexico, July 12th, 1898. (*Chas. M. Barber.*) In my table of *Calliopsis* and *Panurginus* this runs to *P. bidentis*, Ckll., but it will be easily known from that by its larger size, and the absence of the strong yellowish tint of the wings.

Calliopsis obscurellus, Cresson, 1879.—Three males and three females from Pasco, Wash., May 25th, 1896. (*T. Kincaid.*)

(To be continued.)

NOTES AND OBSERVATIONS.

'ENTOMOLOGICAL NEWS,' which is in charge of the Entomological Section of the Academy of Natural Sciences, Philadelphia, and the American Entomological Society, has just entered on the tenth year of its existence. In the January number of the current volume, the editor, in referring to the present status of the journal, remarks:—"We are not infrequently confronted with the criticism that the subject has lost its poetry and the delicate touch of nature has been swept away, and, in its place, there is left a dreary list of scientific names, whose meaning can only be known to a favoured few, with large scientific libraries at their elbow. We try to remedy this in 'The News,' but receive no help from the critics; they talk, but do not act. We admit that descriptions of new species are as dry as dust under an infested specimen; but we owe more to the systematic worker than to the growler, who proclaims from the housetops what should be, but has never put pen to paper."

We can sympathize with our American contemporary, because we occasionally experience the same trouble ourselves.

Entomological magazines are the media through which all interested in the subject may communicate whatever they have to make known to the entomological public. It follows, therefore, that the contents of such serials are largely regulated by contributors themselves. Editors, as a rule, can only deal with such material as is voluntarily sent in for publication, or that can be obtained as a personal favour from workers in special branches. The practical part of entomology is perhaps most generally affected, and possibly those who are interested in field work far outnumber those who prefer the higher branches of the study. Consequently, it is perhaps a matter of surprise that the magazines are not more frequently furnished with accounts of collecting expeditions, or with communications dealing with new facts in life-histories or habits of insects. Judging from the exchange lists, it cannot be supposed that there is less active work in the field than formerly, but it must be admitted that collectors are far more reticent as regards their doings than they were.

Among the causes that have led up to this stagnation in field records, &c., the "Protection Committee," the present unsettled condition of nomenclature, and new systems of classification have been mentioned. As adverted to in a former note (*ante*, p. 16), the "P. C." cannot be charged with muzzling the collector, and as regards the other matters they have always been with us, and, so far as one can see ahead, are likely to continue to perplex us for many years to come.

Those who undertake the task of settling, or endeavouring to settle, intricate questions of synonymy, are entitled to our greatest respect, even although the result of their labour, owing to the difference of opinion that obtains among synonymists as to accepting or rejecting certain works of early authors, is sometimes of questionable value. Systematists, too, are necessarily not quite in accord in their methods, and the result is that in classification the arrangement of one author is transposed by another; this has been very forcibly exemplified during the last few years. All things considered, then, there is no

immediate occasion to materially alter our present nomenclature, and the arrangement of our collections may quite well remain as it is.

We hope that those of our correspondents whose letters have so far not been answered in any other way will find replies to their communications in the foregoing remarks.

THE NOMENCLATURE OF BRITISH LEPIDOPTERA.—May I be allowed a corner in the 'Entomologist' to correct an error which has unfortunately crept into the work of the North London Natural History Society on nomenclature (*antea*, 59–63)? No. 43 will have to be deleted altogether, as Mr. Kirby has made an unaccountable mistake, which we were unwise enough to follow without due investigation. *Aprilina*, Hb., is = *orion*, Esp., and therefore the generic name *Diphthera* is in nowise applicable to *aprilina*, L. On the *C. hyale* question we arrived at exactly the same results to which Prof. Aurivillius has since given the weight of his authority (*antea*, p. 72); while as regards the genus *Graphiphora*, Hb. (Kirby, Handb. Lep. v. p. 45), we find that its type, *G. nun-atrum*, Hb. 112 = *gothica*, Hb. Verz., is the true *gothica* of Linné, and not *c-nigrum*, Linn., as indicated by Mr. Kirby. If, therefore, the name *Graphiphora* is resuscitated, it will have to supplant *Teniocampa*, Gn. (*vide* Grote, Abh. Nat. Ver. Bremen, xiv. Heft. i. p. 49.—LOUIS B. PROUT; 246, Richmond Road, N.E.

In reply to Mr. Prout's objections, I have to make the following observations:—

1. I plead guilty to having overlooked the fact that *aprilina*, Hb., is *orion*, auct., and consequently the latter would be the type of *Diphthera*.

2. It appears to be now established that the Tentamen is well before Ochsenheimer, vol. iv. I adopted O.'s use of *Graphiphora*, in which case Hübner's action (if later), having in view the confusion of the names *gothica* and *nun-atrum*, would make the type as I indicated it; but if the Tentamen is earlier, then O.'s use of *Graphiphora* must be ignored.

3. I adhere to my previously expressed opinion that the original *hyale*, Linn., is really *C. edusa*, auct., notwithstanding Prof. Aurivillius' opinion to the contrary. It is not the only case in which I have not been able to accept his conclusions respecting Linnean species. As regards Linné's citations for *hyale*, the case is as follows:—

Syst. Nat. (ed. x.), i. 1758. Petiver, Gaz. t. 14, f. 11 (*edusa*, ♀); Roesel, iii. t. 46, f. 4, 5 (*ed. ♀ col.*); Ray, Ins. p. 112, n. 6. Ray's insect is described as yellow, and the female as white, which might apply to *hyale*, auct.; but Petiver's figure is quoted, with the words "Papilio croceus, apicibus nigricantibus." Ray appears to have described *hyale*, auct., and quoted Petiver's figure and description of *edusa*, auct. Uddman, p. 56 (description only).

Faun. Suec. ed. ii. (1761), only Petiver and Ray quoted, under *hyale*, Uddman's description being referred to *palæno*: but Edw. Aves, t. 304, f. 1, 2, is quoted by error.

Syst. Nat. (ed. xii.), i. (2), 1767. Here the references given are to Scopoli, Petiver, Ray, Schæffer, Geoffroy, Edwards, and Roesel.

Edwards' figure is quoted in error; it belongs to *Callidryas erubule*, and is correctly referred to lower down on the same page; and this insect is called "luteis," though it does not differ in colour from other

butterflies called "flavis" on the same page. The reference to Schæffer is wrong, and S. figures both species on one plate. Scopoli describes *edusa*, auct., treating Roesel's as the typical figure, but calls *hyale*, auct., the female. Geoffroy also describes *edusa*, quoting Petiver's and Roesel's figures, and making *hyale*, auct., var. *C*. We thus see that while the authors of the Linnean period confounded both species, they invariably gave *C. edusa* the foremost place, and quoted its figures as typical of *hyale*, Linn.; and Linné himself referred to their works as representing his species. I am still of opinion that these figures must be recognized as typical of the true *C. hyale*, Linn. L.'s own descriptions I have discussed in full elsewhere.—W. F. KIRBY.

PRESERVATION OF LARVÆ.—The following method of preserving larvæ is described by Mr. C. Abbott Davis in the March number of 'Entomological News':—"Drop the larvæ as soon as collected into a pint or quart jar of 2 per cent. formalin solution. Date the same and let it stand for a week. Remove the larvæ, putting several of each species into a 6 or 8 dr. 'shell bottle,' filling with fresh 2 per cent. formalin. Soak all corks in paraffin and keep bottle upright." The writer states that he has been especially successful with light green Sphingidæ and Bombycidæ, some of which were treated in July, 1897, and are in perfect condition at the present time. He adds, "Live pupæ may be injected and placed in the same bottles, making an inexpensive but beautiful collection."

THE NOMENCLATURE OF BRITISH BUTTERFLIES.—Mr. H. J. Elwes, writing on this subject (Ent. Rec. xi. 78), observes:—"Personally, I hold the opinion that it is impossible to apply the rules of priority strictly, and that it is much better to use a specific name long applied, and generally known to Continental as well as British entomologists, than to attempt to make changes on account of doubtful and often trivial questions of priority or identification." With regard to the question of uniformity in nomenclature, Mr. Elwes suggests that the London Entomological Society should appoint a committee to consider the matter. Referring to generic names as used by Staudinger and in the 'Entomologist Synonymic List,' he considers that it will be necessary to alter some of these, but adds, "I cannot follow any of the authors' reasons for the generic names they have adopted [*antea*, pp. 32-37]. I am sure, however, that before one begins cutting up the old genera, one must study the whole of them thoroughly, and even then it will be found that it is hard, if not impossible, to say what constitutes a generic difference."

ENTOMOLOGY OF THE ISLES OF SKYE AND LEWIS.—Any information concerning the entomology of these isles would be gladly received by G. W. KIRKALDY, St. Abbs, Wimbledon, Surrey.

DO INSECTS FEEL PAIN?—"Some time ago an appeal for assistance to advance the interests of entomology was asked from a wealthy woman in this city [Philadelphia], and such assistance declined, on the ground that 'she had never wavered from a dislike to amateur collections of insects immolated on pins and whose long suffering no one could realize.' Now all this raises the question as to whether the lady is correct in her ideas on the subject. Even if entomologists did immolate live insects on pins, it is probable that they would not suffer

pain; but as a matter of fact they are killed before being pinned, as otherwise they would be ruined as specimens. While insects do have sensory nerves, they are probably by no means as well developed as the motor nerves, which are essential in such active creatures. In the higher orders of animals and those which bring forth few young, pain is necessary to protect life, and the loss of this protection in insects is compensated for by fecundity. There are also direct experiments to prove that insects do not suffer pain. It is said that a dragon-fly will eat from the end of its abdomen as far as it may be fed to it. Also if the same insect be deprived of its abdomen and supplied with one of wax of the same size and weight, the insect will go about its business and pursue mosquitoes for food as though its anatomy had not been abbreviated. The nocturnal moths are also very tolerant of pins thrust through them in daytime, but when night comes they endeavour to depart, pin, tree and all, if pinned to the latter. The writer has been accused of cruelty by lady friends in starving to death the large bombycid moths, which, by the way, have no mouth parts, and only feed in the larval condition."—('Entomological News').

CAPTURES AND FIELD REPORTS.

EASTER (1899) IN THE NEW FOREST.—Arriving at Lyndhurst Road Station about 7.50 p.m. on Thursday, March 30th, my father and I were met by Mr. J. Wiltshire, of Bank, who was to drive us there. Bank is a small place about a mile from Lyndhurst. We arrived at our destination about 9.20, and after supper had a look at the sallows. *Taniocampa stabilis* was very abundant, but a nice series of these and a single *T. gothica* completed our captures for that evening. A specimen of *Selenia illunaria* and several *Cerastis vaccinii* were also seen.

March 31st, we took two beautiful specimens of *Xylocampa lithorhiza* at rest on a birch-trunk a few inches from the ground, one *Xylina rhizolitha* in very fresh condition on a post, and a fine male of *Brephos parthenias* which my father took flying along the road. At sallows in the evening *Panolis piniperda* (two), *Xylocampa lithorhiza* (one), *Taniocampa stabilis* and *T. pulverulenta (cruda)*, *Phlogophora meticulosa* (one, exceptionally large) were taken, and *Selenia illunaria* was seen. *Taniocampa stabilis* far outnumbered anything else every night, and perhaps the next in numbers was *Cerastis vaccinii*.

April 1st was a gloriously fine day, the sun coming out very strongly, and this was the only occasion on which we saw any butterflies. *Gonepteryx rhamni* (males) were absolutely swarming, a few *Pieris rapæ* were seen, and one *Vanessa urticae*. After a very slow day's work, and just as we had folded our nets up and were approaching Lyndhurst, a specimen of *Vanessa polychloros* came up within easy striking distance. We came across a colony of *Brephos parthenias* among birches, but found them exceedingly difficult to catch. They flew quite out of reach, and we only succeeded in netting one, a female. A specimen of *Lobophora lobulata* was taken from a birch-trunk. We tried treacle as well as sallows in the evening, and saw the following insects at it:—*Taniocampa munda* and *T. stabilis*, several *C. vaccinii* and *Scopelosoma satellitia*, and one *Eupithecia abbreviata* (?).

On subsequent nights treacle only produced a very few *C. vaccinii*. At sallows *Tæniocampa stabilis*, *T. pulverulenta*, *T. gothica*, *T. rubricosa* (one), *Gonoptera libatrix* (one, fine), *C. vaccinii*, and *Larentia multistrigaria* (males) were seen. Several of the *T. stabilis* fell into a pond and were observed swimming on the surface. Is it usual for Lepidoptera to swim?

April 2nd was a failure so far as day-work was concerned, one specimen of *Xylocampa lithorhiza* on a birch-trunk being the only insect seen. At sallows the common *Tæniocampas* before mentioned turned up, also *T. rubricosa* (one), *X. lithorhiza* (one), and *Anticlea badiata*.

On April 3rd we revisited the place where we had found *Brephos parthenias* in the hopes of taking more, but again only succeeded in taking one, a rather small male. We found nineteen specimens of *Xylocampa lithorhiza*, eighteen on fir-trunks and one on birch. With the exception of one, all these insects were taken within twelve inches of the ground. *Xylina rhizolitha* (a fine specimen), *T. stabilis*, *Larentia multistrigaria*, and *L. lobulata* were also seen on tree-trunks. In the evening we tried the sallow where we had taken *P. piniperda*, and succeeded in taking four more. We should probably have taken others but for the help (?) of two of the forest men who were out on night duty—they have to keep a watch in the dry season in case of a fire. The bush being a large one, we had to shake only one branch at a time, so that the insects should fall as much as possible on the umbrella and newspaper; but one of the men to whom we had been talking was very anxious to help: " 'Alf a minute, sir," says he; " 'Beggard' if I doan't get oop and give 'un a shake," whereupon, in spite of our protestations, up he gets and shakes with such good will that every moth in that bush and half the bloom must have come down. We also saw, among other things, this evening, *X. rhizolitha* and *A. badiata*. We returned home on Tuesday, after having spent a very pleasant, though not wonderfully productive holiday.—F. M. B. CARR; 46, Handeu Road, Lee, S.E., April 7th, 1899.

LOCUST IN HULL.—On March 3rd a locust, *Acridium ægyptium*, was found alive on the pavement in Charlotte Street, Hull, by a Mr. Slater, but it died the next day. Mr. Slater gave it to me a few days afterwards.—J. W. BOULT; 28, Wainfleet Terrace, Fountain Road, Hull.

CHÆROCAMPA PORCELLUS IN SPRING.—On March 20th ult. I was sent a freshly emerged specimen of *C. porcellus*, taken in a garden at Limpsfield, Surrey.—H. W. SHEPHEARD-WALWYN; West Down, Winchester.

RHYNCHOTA AT WOOLMER FOREST.—I stayed during Easter at my favourite southern haunt—Selborne, a pretty and secluded place itself, and within easy walking distance of Woolmer Forest. In some ponds in a private enclosure (over which I trespassed) in the latter I captured *Corixa bousdorffii*, *limitata*, *semistriata*, *venusta*, *scotti*, &c. (none of them by any means common species in the south), and in the forest itself I captured a number of macropterous and apterous individuals of *Hydroëssa pygmæa*, from a large reed-fringed pond. It was too early for very many land species, and I obtained nothing of much value, but I think that during August and September a number of good bugs ought to turn up, especially on Bramshott Common and from the little-worked neighbouring districts.—G. W. KIRKALDY; Wimbledon.

PHLOGOPHORA METICULOSA IN WINTER MONTHS.—On referring to my note-book I find I captured a fine specimen of *P. meticulosa* on Nov. 16th,

1894. A full-fed larva was found in my garden in the early part of last January which emerged a few days ago. The specimen mentioned by Mr. Gurney as having been caught in a greenhouse (*antea*, p. 73) was probably introduced there in the larval state when feeding on some plant. I have often found them feeding on the geraniums in my greenhouse during the winter. It is a hardy species and one of the easiest to breed. I have frequently reared them during the winter. The ova are deposited about Sept. 24th and hatch in eleven days, and with a little protection from the cold nights they will continue to feed without interruption until full-fed, which will be about the first fortnight in December. The imagines will emerge towards the end of February, but it will be necessary to let them have some artificial heat if the weather is very cold.—EDWARD RANSOM; Sudbury, Suffolk, April 11th, 1899.

BUTTERFLIES FROM NATAL.—My friend Mr. Henry Watt, Malvern, Natal, was so kind as to collect for me the butterflies which appeared at a fruit farm in the vicinity of Malvern during April and May, 1898. These he sent me in papers, in order that I might pick out a selection for the Elgin Museum. As the specimens were not singled out by him, but taken as they came, I think this list may interest your readers:—*Papilio demodocus*, Esp. (*demoleus*, L.), *P. lyæus*, Doubl., *P. cenea*, Stoll.; *Fieris severina*, Cram., *P. severina* var. *boquensis*, Feld., *P. agathina*, Cram.; *Terias zoë*, Hopff., *T. senegalensis*, Geyer; *Catopsilia florella*, Fab., *C. florella* var. *rhadia*, Bois.; *Teracolus omphale*, Godt., *T. theogone*, Bois.; *Danaïs chrysippus*, L.; *Nebroda echeria*, Stoll., var. *albimaculata*, Butl.; *Acræa natalica*, Bois., *A. cabira*, Hopff., *A. burtoni*, Butl.; *A. encedon*, L., *A. mahela*, Bois., var. *neobule*, Doubl., *A. punctatissima*, Bois., *A. ecebria*, Hew.; *Atella phalanta*, Don.; *Hypanartia hippomene*, Hüb.; *Pyrameis cardui*, L.; *Junonia cebrene*, Trim., *J. clelia*, Cram.; *Precis cyrene*, Bois., *P. sesamus*, Trim., *P. archeia*, Cram., *P. natalica*, Feld.; *Salamis anacarii*, L.; *Eurytela hiarbas*, Don.; *Hypanis ilythia*, Don.; *Hypolimnas misippus*, L.; *Euralia mimas*, Trim., *E. wahlbergi*, Wall.; *Crenis drusus*, Fab., *C. boisduvali*, Wall.; *Crenidomimus rosa*, Hew.; *Charaxes candiope*, Godt., *C. cithæron*, Feld.; *Palla varanes*, Cram.; *Mycæsis safitza*, Hew.; *Aphnæus natalensis*, Doubl.; *Plebeius thespis*, L.; *Tagiades fesus*, Fab. The only species calling for comment is *C. rosa* (one female), which Dr. Butler has been so good as determine, and which is now in the collection of the British Museum.—HENRY H. BROWN; Elgin, Scotland.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—March 15th, 1899.—Mr. G. H. Verrall, President, in the chair. Mr. William Martin Geldart, M.A., of Norbiton; and Mr. Hugh Main, B.Sc., of Old Charlton, Kent, were elected Fellows of the Society. Mr. J. J. Walker exhibited several specimens of *Longitarsus rutilus*, Ill., a rare British species of Halticidæ, taken by him on March 11th at Halstow in Kent. Mr. Tutt exhibited a very fine series of *Epunda tutulenta* captured by the Rev. C. R. N. Burrows last autumn near Mucking in Essex. This series, while agreeing in the main with Borkhausen's typical form, varied *inter se* in such a manner as to give almost parallel forms to those so well known from Scotland and Ireland, yet they had the ordinary blackish-

fuscous ground colour, and not the intense black ground colour peculiar to the latter. Mr. Merrifield showed some Lepidoptera collected in the latter half of May and the first week of June near Axolo (Venetia), Riva, and Bozen. They included some very fine specimens of *Syrichthus carthami*, a very large *Syntomis phegea*, and examples of *Pararge egeria* intermediate in colour between the Northern and Southern European forms. Mr. G. T. Porritt exhibited a series of extreme forms of *Arctia lubricipeda* var. *fasciata*, and also some examples of what appeared to be a new form of the species, of which he had bred a few during each of the past two seasons. Mr. O. E. Janson exhibited an inflorescence of *Arauja albens*, Don., together with a butterfly which had been entrapped by getting its proboscis jammed in the slit between the anther-wings of one of the flowers. It was found by Mr. C. J. Pool at Monte Video. Mr. Gahan stated that, having since examined the beetle from Peru shown by Mr. Jacoby at the previous meeting, he was now able to say definitely that it was a Longicorn, and represented a new genus to be placed in the group Acanthocinides of the family Lamiidæ. He exhibited this beetle along with a species of *Diabrotica* and a species of *Lema* from Peru, in order to show the remarkably close resemblance in coloration between the three species.

April 5th.—Mr. G. H. Verrall, President, in the chair. Dr. Frederick George Dawtrey-Drewitt, M.A., M.D., F.R.C.P., F.Z.S., of 2, Manchester Square, W.; Mr. William E. Ryles, B.A., of 11, Waverley Mount, Nottingham; and Mr. Albert Wade, of 1, Latham Street, Preston, were elected Fellows of the Society. Mr. Blandford exhibited insects of different orders collected by Dr. Albert L. Bennett in West Africa, and read some notes by Dr. Bennett on the habits of the Goliath beetles. In reply to the remarks which followed, Dr. Bennett stated that the male beetles use their cephalic horns in fighting with one another, as well as for puncturing the bark of vines in order to bring about a flow of the sap, upon which they feed. The Rev. Canon Fowler showed a photograph of a large bee's nest found in an open hedge near Wragby in Lincolnshire. Mr. McLachlan exhibited young larvæ of a "locust" received from Mr. E. A. Floyer, Director-General of Telegraphy in Egypt, and said by him to have caused the *Calotropis* trees in Nubia to be in a moribund condition. The larvæ were identified by Mr. Burr as those of a species of *Pacilocerus*, probably *P. vittatus*, Klug. Mr. Burr exhibited a specimen of *Acridium ægyptium* which was found at Maidenhead. He also showed a remarkable clay model of a Locustid with a Chinese inscription underneath, and requested information as to the origin of such models. Mr. Blandford gave an account of a paper by Dr. A. Ribaga, published in the 'Rivista di Patologia Vegetale,' v, p. 343, on an asymmetrical structure occurring in the adult female of the common bed-bug, and apparently hitherto overlooked, although it communicated with the exterior by a conspicuous notch in the fourth abdominal segment, midway between the median line and the lateral margin. This structure consisted of a large quasi-glandular mass of unknown nature in which was encapsuled an organ consisting of fibres, the free ends of which terminated in minute chitinous spines in a recess lying under the fourth abdominal segment. The adjacent margin of the fifth segment was thickened and set with

strong teeth. The non-glandular part of this singular structure was conjectured by its discoverer to be a stridulating organ; but no evidence of stridulation had been obtained. It was certainly far more complex than most, if not all, other stridulating organs known to exist in insects. Mr. G. J. Arrow communicated "Notes on the Rutelid genera *Anomala*, *Mimela*, *Popillia*, and *Strigoderma*."—J. J. WALKER and C. J. GAHAN, *Hon. Secs.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*March 23rd, 1899.*—Mr. J. W. Tutt, F.E.S., Vice-President, in the chair. A communication was read from Mr. T. D. A. Cockerell, of New Mexico, sent with the idea of raising a discussion. After stating the facts that tropical species are, as a rule, much more easily separated than the species of temperate regions, and that holartic groups were especially polymorphic, he went on to discuss the causes of these phenomena. He noted that owing to conditional changes, such as the various glacial desolations, in the temperate regions, species were ever answering to this environment and being newly formed. In the tropics, on the other hand, the environment was more stable, and no doubt had been so for an indefinite period, hence the easier definability of the species in those regions. In the discussion which ensued, numerous Palæartic groups of very closely allied species were mentioned, and the necessity of naming the various forms, as a matter of convenience for study and reference, was generally conceded. Mr. Montgomery read notes on a series of broods of *Pieris napi*, reared originally from ova deposited by a female from Enniskillen, compared with bred series from Middlesex, to show the typical dimorphism. The Irish specimens were especially noticeable for the brilliancy of the yellow on the under sides. A long discussion ensued, and the members present considered that it was most necessary, in all experiments of this nature, that every specimen bred should be preserved with its label giving full details. Mr. F. N. Clark exhibited specimens of the mite, *Psoroptes longirostris*, taken from a rabbit, on which it produced a skin affection and suppuration. Mr. Adkin, a wasp's nest of several cells, found in a hand of tobacco from Kentucky. It was made of mud, and no doubt the inhabitants were killed during the smoking process over wood fires. Mr. Montgomery, numerous coloured drawings of the eggs and first instar of the larvæ of several species of British butterflies.

April 13th.—Mr. A. Harrison, F.L.S., President, in the chair. Mr. Crabtree, F.E.S., of Levenshulme, Manchester, was elected a member. The evening was devoted to microscopy under the direction of Mr. Scourfield, F.R.M.S.—HY. J. TURNER, *Hon. Rep. Sec.*

CARLISLE ENTOMOLOGICAL SOCIETY.—*March 2nd, 1899.*—Mr. James Murray in the chair. The Chairman showed several species of the genus *Anaspis*, viz. *frontalis*, *melanopa*, *fasciata*, and *ruficollis*, from Carlisle. Mr. F. H. Day showed *Bembidium monticola* and *B. rufescens*, taken on the banks of the Eden; *Carabus granulatus* and *Cychrus rostratus*, from rotten wood at Durdar; *Philonthus fulvipes*, *Stilicus orbiculatus*, *Quedius attenuatus*, and *Q. cinctus*, from flood-refuse on the banks of the Petteril. Mr. G. Wilkinson exhibited *Micropteryx calthella*, *M. aurentella*, *Eriocrania caledoniella*, *E. sangii*, *E. semipurpurella*, *E. purpurella*, *E. subpurpurella*, and *E. sparmanella*, all taken in the Carlisle

district. A paper was read, on Lepidoptera taken at sugar and light in 1898, by Mr. J. E. Thwaytes.

April 6th.—Mr. James Murray in the chair. Mr. F. H. Day exhibited Coleoptera—*Rhagium inquisitor*, *Ocyppus brunnipes*, *Lampyris noctiluca*, from Keswick; *Rhizophagus cribratus*, taken near Carlisle, from fir bark; *Erirrhinus bimaculatus*, *Lesteva sicula*, *Dyschirius salinus*, taken on Easter Monday at Burgh Marsh. Mr. Murray showed *Saprinus maritimus* and *S. aneus*, from Silloth; *Omosita discoidea* and *O. colon*, from Carlisle, and *Liodes humeralis*, from Gelt and Newbiggin. Mr. H. Mawson, *Tephrosia bistortata* and *T. crepuscularia* (*biundularia*), from a fir wood at Portinscale, near Keswick. Mr. J. Wilkinson read a paper on Mimicry.—G. B. ROUTLEDGE, *Hon. Sec.*

KENDAL ENTOMOLOGICAL SOCIETY.—February 13th, 1899.—The President in the chair. After the preliminary business, the Rev. A. M. Moss made some remarks upon the early spring Geometræ, urging the members to lose no time in at once restarting some active outdoor work, and then securing good series of some of the commoner species, too often rather neglected owing to the hibernating propensities of man at this time of year. He exhibited three drawers containing the Amphidasydæ, Hybernidiæ, and Larentiidæ, by way of illustrating the species referred to, and a general discussion was enthusiastically joined in. The exhibits also included a case of newly relaxed and set South American Lepidoptera, by Mr. T. Smith, and a brightly coloured specimen of one of the Pieridæ from Singapore by Mr. Macrea. Towards the close of the meeting, Mr. Moss made some suggestions as to his method of blowing and preserving larvæ.

March 13th.—The President in the chair. Two new members were elected. The Rev. A. M. Moss gave some practical hints on "sallowing," and a keen discussion followed. Mr. Graveson exhibited some fine Indian and South American butterflies, recently relaxed. Mr. Holmes, an exceptionally large male of *Phigalia pilosaria*. Mr. Littlewood, many specimens reared from ova and recently forced, including good series of *Euplevia lucipara*, *Noctua plecta*, *Hadena thalassina*, *Smerinthus populi*, and *S. ocellatus*. Mr. Smith, larva of *Agrotis porphyrea*. Mr. Wright, a new relaxing tin of his own invention. Mr. Moss, a sample case of the genus *Taniocampa*, and many other species to be met with at this time of year.

April 10th.—The President in the chair. A paper by Mr. H. B. Prince, of the Lancashire and Cheshire Entomological Society, was read before the Society, dealing with some of his varied experiences in 1898, and especially with his success at sugar on the Wallasey sandhills, at a time when sugar was of no avail whatever in the Kendal district. Mr. Moss reported having found apparently fresh remains of an imago of *Euchelia jacobae* in an oak plantation on April 3rd. Mr. Littlewood showed a fine series of recently forced *Pieris brassicæ* and *P. rapæ*, and odd specimens of *Sesia cuticiformis*, *Friogaster lanestris*, and several noctuæ. Mr. Moss, a drawer of Sphingæ, and recent captures. Mr. Wilkes, *Amphidasys prodromaria*.—A. M. Moss, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—March 13th, 1899.—The President in the chair. After the reading of the minutes, the President reviewed the first volume of Mr. Tutt's new work on

British Lepidoptera, and recommended it to all students of that Order. Mr. Burgess-Sopp, of Hoylake, read his paper on "Our Cockroaches." Beginning with the most ancient known form, *Palaeoblattina douvillei*, found in the Caradoc beds of Calvados, in France, he traced the history of the order as shown by fossil remains through the carboniferous, mesozoic, and cainozoic periods down to the present. The Blattodea were most numerous in the carboniferous period which he designated the "Age of Cockroaches." Since then the number of species has gradually dwindled away, until at the present day we cannot boast of more than three truly indigenous to the British Isles. Throughout this vast period the change undergone in their structure has been very small indeed, consisting chiefly in the thickening of the anterior pair of wings into elytra. He enumerated ten species now found in Britain; three of these—*Ectobia livida*, *E. lapponica*, and *E. panzeri*—being indigenous; four introduced, viz. *Blatta orientalis* (the common cockroach), *Periplaneta americana*, *P. australasiae*, and *Phyllodromia germanica*; and three occurring as occasional visitants from abroad, viz. *Rhyparobia maderæ*, *Leucophaea surinamensis*, and *Blabera gigantea*. He then gave an account of the life-history of *Blatta orientalis*, illustrating his remarks by means of well-executed figures. He also exhibited a case containing the species mentioned in his most interesting paper. Other exhibits were, a delicate green cockroach by Mr. F. N. Pierce; remarkable varieties of *Camptogramma bilineata*, by the President; British Carabidæ, including the rare *Carabus auratus*, *C. nitens*, and *C. clathratus*, by Dr. J. W. Ellis; Lepidoptera by Mr. H. B. Prince, and *Rhagium bifasciatum*, taken in February by Mr. F. Birch.

April 10th.—In the absence of the President and Vice-Presidents, the Rev. R. Freeman, M.A., occupied the chair. Owing to a sudden attack of illness the lecturer for the evening, Mr. Robert Newstead, of the Grosvenor Museum, Chester, was not able to be present, and the members were thereby deprived of the pleasure of hearing his lecture on "The San José Scale and newly introduced Scale Insects," to have been illustrated by oxy-hydrogen light. Mr. F. N. Pierce read some interesting notes from Mr. Louis B. Prout on the much disputed species of the genus *Oporabia*, and showed many specimens of the forms *dilutata*, *autumnaria*, and *filigrammaria*. Other exhibits were—of the order Lepidoptera, specimens from the Delamere, Eastham, and Knowsley districts, by Mr. F. C. Thompson, Mr. H. B. Prince, and the Rev. R. Freeman respectively, local forms and interesting varieties being well represented; of the order Orthoptera, *Blabera gigantea*, taken in the Liverpool Docks, and *Panasthia javanica*, received from abroad by Mr. E. J. Burgess-Sopp; of the order Coleoptera, Mr. R. Wilding exhibited his collection of Bembideous Carabidæ, which is a model of neatness and order, and contains many local, rare, and otherwise interesting species. *Carabus glabratus*, from Sty Head Pass, Cumberland, was shown by Mr. F. Birch. It was resolved that the meetings be adjourned till October 9th, on which date the chief exhibitional meeting of the year will be held.—FREDERICK BIRCH, *Hon. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*February 20th, 1899.*—Mr. P. W. Abbott, Vice-President, in the chair. Mr. R. C. Bradley showed some rare Phycidæ, Galleridæ, &c., presented by Dr. P. B. Mason to

the type collection. Mr. J. T. Fountain, *Sphinx lugustri*, from Salford Priors. He said that he had found larvæ there in 1897, on privet; on searching in the same place for more, in 1898, he found they had apparently forsaken the privet, for he could only find two on it, but found a number on ash. Mr. A. H. Martineau said that he had found them at Solihull on the leaves of a small spineless holly, and reared them on it. Mr. P. W. Abbott showed a series of *Apamea unanimitis* taken at Wicken, and including one dark specimen. Mr. Fountain also exhibited *Hybernia marginaria* var. *fuscata* and *H. rupicaprariva*, taken the night before at Small Heath. Mr. Martineau, photographs of butterflies in the kromsköp.

March 20th.—Mr. G. T. Bethune-Baker, President, in the chair. Mr. P. W. Abbott showed *Epinephela hyperanthus*, under sides, from Carlisle, three being var. *arete*, and three being very pale with usual sized spots; also three typical specimens for comparison. Mr. Bethune-Baker, a lot of *Lycænide*, including a big series of *L. icarus* from many localities, with blue forms of the females from North Wales, and others from Brusa, Asia Minor, in which the females showed a shade of blue; also nice forms of *L. corydon* from Spain &c. Mr. R. C. Bradley, *Paraponyx nymphæata* and *P. stagnata*, from various localities, including two white *P. stagnata*, small in size, with the markings very faint, locality unknown. Mr. G. H. Kenrick read a paper upon "Some Phases of Variation among the Lepidoptera." He divided varieties into seven different kinds—(1) permanent variation of double broods=seasonal dimorphism; (2) permanent local forms not occurring with the type, such as *Lycæna salmæcis*; (3) persistent variations occurring with the type, such as *Argynnis valesina*; (4) species which occur in two or more well-marked forms, sometimes connected by intermediates, sometimes not, such as *Apamea oculatea*, *Miana strigilis*, &c.; (5) occasional and yet persistent varieties, such as yellow *Zygænas*, *Arctias*, &c.; (6) permanent food-plant forms, of which *Teniocampa gracilis* apparently presents an example; (7) the rare erratic abnormality. He exhibited four drawers of insects, including good examples of each class, and described them more or less at length.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

The Lepidoptera of the British Islands: a Descriptive Account of the Families, Genera, and Species indigenous to Great Britain and Ireland, their Preparatory Stages, Habits, and Localities. By CHARLES G. BARRETT, F.E.S., &c. Vol. V. *Heterocera Noctuæ*. 8vo, pp. 381. London: Lovell Reeve & Co. 1899.

THE present volume deals with the Trifidæ section of the Noctuina group, and comprises reference to one hundred and eleven species and forty-five genera, commencing with *Celæna haworthii* and concluding with *Xanthia ocellaris*.

The arrangement of genera is not quite that we have been accustomed to, neither does it agree with the system of any other recent author. The changes in this particular that have been made are not likely to cause the reader very much trouble, and there are but few alterations

of the generic names that students of British Lepidoptera have been in the habit of using.

In his remarks on the variation of *Hydræcia nictitans* (p. 64), our author says:—"Some entomologists profess to be able to separate some of the forms, as a distinct species, under the name of *lucens*, but for this there is not, in my opinion, any ground." In this view we quite concur, and think that the endeavour to specifically separate *lucens* from *H. nictitans* is about as unreasonable and as much opposed to fact as was the suggestion that *Miana fasciuncula* was simply a form of *M. strigilis*, to which Mr. Barrett also refers (p. 17). We are rather surprised, however, that when he points out the differences between the two last-named species, he does not mention the tufts on the back of the abdomen, which serve to distinguish one species from the other more readily (because more easily examined) than do the sexual organs.

Bondii, Knaggs, is retained in *Tapinostola*, and *morrisii*, Meyrick, is given as a synonym. *Brevilinea*, Fenn, is included with *lutosa*, and *phragmitidis* in *Calania*. *Suspecta* and *upsilon* are removed from *Orthosia* and placed in *Dyschorista*, whilst *ferruginea*, *rufina*, *pistacina*, *lunosa*, and *litura* are associated with *lota* and *macilenta* under *Orthosia*. *Prodenia littoralis*, *Leucania l-album*, *Mesogona acetosella*, and *Caradrina superstes* are each mentioned, but neither of them recognised as strictly indigenous to our islands.

The remarks concerning habits, &c., of the species are often of an exceedingly interesting character, as the following extracts will show. Thus, in discussing *Celena haworthii*, our author says (p. 4):—"The male in its favourite moorland haunts is a very lively creature, and flies briskly about among heather and cotton-grass in the afternoon sunshine; after a short flight, evidently for its own pleasure, it settles on the tip of one of the long leaves of the *Eriophorum*, and instantly runs down its under side to the ground, where it is quite concealed; or when it rests on the heather, taking the same course on the smallest alarm. But its favourite time of flight is early dusk, and then it dashes about in multitudes, and at the wildest speed, over the moors. But Mr. Stott has recorded, in the 'British Naturalist,' that the moment a wild flying male passes a tuft in which a female is concealed, its flight becomes slow and steady as it examines the tuft, and that by watching such a tuft hundreds of males may easily be taken. I had on one occasion a more singular experience than this: the moths were in full flight and passing continually, when I noticed that several were running over a small mound of earth like an old ant-hill, covered with short grass and a few tufts of *Eriophorum*. These I secured, and other specimens at once came; so, kneeling down to box them easily, I found that the fresh arrivals in their fatuous eagerness actually ran over my hands while I was boxing their companions, so many as I cared for. Yet no female was there, and though I dug up and examined the tufts of cotton-grass, pulling them thoroughly to pieces, and also dug up the turf, no pupa nor pupa-skin, nor any indication of the presence of a female, could be found, though without doubt some trace of its recent presence must have been perceptible to the other sex. In fact, the only females which I obtained at all were those which climbed up and hung upon blades of grass and of cotton-grass, or sprigs of heather, earlier in the evening,

before the flight of the males. This species is readily attracted by sugar placed on the trunks of pine trees in its haunts, or on the herbage; it also frequents heather bloom, and the blossoms of ragwort and thistles, by day as well as by night, and is strongly attracted by light. In the fens, where it is rare, this last is the only method by which I have known it to be obtained."

Then, in connection with *Miana captivuncula*, Mr. Barrett (p. 25) gives the following information, supplied to him by a correspondent:—"It is a day-flier; but no one has, as yet, proved that it is not also a night-flier; we used to think that it did not fly after mid-day, but now know better. It begins to fly about noon, and rarely continues much later than 4 o'clock p.m., but its habit of flight is most erratic. You may go to the bank where you know that it occurs, upon an apparently faultless day, and wait for an hour without seeing a single specimen, and then suddenly see them dashing about in all directions. It is no easy matter to catch them, as they fly quickly and are difficult to follow, and are sure to disappear as suddenly as they came. Then the best plan is to look upon the grass stems, where a few may be picked up. After a short time they will suddenly appear again for a short flight. If you are so fortunate as to get near where a newly-emerged female is sitting, you may stand still and catch them as they come, with unerring instinct, from all directions."

On p. 266 we have a *résumé* of the known British history of *Hydrilla palustris*, which, having regard to the occurrence of the species in Wicken Fen last year in fair numbers, it may be interesting to give it in its entirety:—"The first specimen known to have been obtained in this country was captured in a moist place at Stockton-in-the-Forest, about four miles from York, by a young man in the employment of Mr. T. H. Allis. He seems to have met with other examples, but, not knowing the species, had retained this one specimen only, unset, until Mr. Allis's return from a journey, when it was placed in his collection, and doubtless is still in existence in the York Museum. Although Mr. Allis most emphatically affirmed, and indeed proved, the capture of the specimen, he seems never to have recorded the year in which it took place; but this was certainly before 1855. So far as can be ascertained, the next specimen taken was recorded by Mr. H. Jenner-Fust, who says that it was obtained in Quy Fen, Cambs, in May, 1862, by Mr. Schofield; and that it was disturbed from among some half-dried grass which had been cut a day or two, and when disturbed, which was in the daytime, flew pretty quickly. Another specimen, which may possibly have been antecedent to this, or even to the Yorkshire specimen, was taken by the late Richard Weaver, but where is not known. It had remained unset in the collection of the Rev. Henry Burney for many years before it was recognised as a female of the present species. In June, 1869, I had the peculiar pleasure of capturing a male specimen just outside the city of Norwich. It was fluttering about a gas-lamp in a suburban road towards midnight, having doubtless being attracted by the light from some moist meadows. In June, 1877 and 1878, Messrs. F. D. Wheeler, W. H. B. Fletcher, and others, took, in all, between a dozen and twenty specimens in Wicken Fen, by the aid of a strong collecting lamp. They found that a lamp placed upon the ground was the most useful

as regards this species, since it seems to have a curious habit of creeping and fluttering about among grasses and coarse herbage, so as to be most difficult to capture; yet it is hardly ever to be seen on the wing. Dr. Wheeler says:—‘It creeps up through the herbage, and dodges and sneaks about the lamp in a very troublesome way. I took two, both of which came on nights so bad that nothing but a strict sense of duty took me out; indeed, on one of these nights, from 9 p.m. till 2 a.m., only two moths came to my lamp. One of these was *H. palustris*, the other *Macrogaster arundinis*. Of fifteen *H. palustris* taken in the fen this year (1878), one only was taken flying, ten feet above the ground, over a lamp. We all placed our lamps very low for this species; and some had two lamps—one high in the air, the other on the ground; in which case the latter always was the one sought by *H. palustris*. . . . There is an old specimen, of which the record seems to be lost, in the collection of the late Mr. H. Doubleday, in Bethnal Green Museum [*cf.* p. 380, where it is stated that this example was taken by Mr. English at Quy Fen in 1871]; and in the cabinet of Mr. P. M. Bright is another, labelled as having been taken at Ringwood, Hants, flying by day, but without date of capture or name of captor. Two of the more recent specimens of which I have any knowledge were exhibited at a meeting of the Entomological Society of London in February, 1898, by Mr. G. B. Routledge. These, both of which are females, were captured in 1897, fluttering among grass about 5 p.m., in a meadow a few miles from Carlisle.’

Report of Observations of Injurious Insects and Common Farm Pests during the Year 1898, with Methods of Prevention and Remedy.
By ELEANOR A. ORMEROD, F. R. Met. Soc. &c. 8vo. pp. 138.
London: Simpkin, Marshall, Hamilton, Kent & Co. 1899.

IN this the twenty-second Report there is a mass of information that will certainly prove of much usefulness to the farmer and fruitgrower. As regards the kinds of insect-attack during the year 1898, these appear to have been more than usually varied. Altogether about seventy sorts of infestation are mentioned, the majority of which are species of Coleoptera or Lepidoptera. Amongst those attacks that were more severe than usual, Aphides would seem to have held the first place, while larvæ of *Pieris brassicæ* and *P. rapæ* occurred in abnormal numbers. In some parts of the country *Pulex irritans* appeared in strong force, and from certain localities was reported as a plague.

A rather troublesome caterpillar, which, by the way, has not been previously much noticed, is that of *Laverna atra*. The larva of this moth, we are told, effects considerable injury to apple-blossoms by boring into the young growing shoots and eating the pith, thus cutting off nourishment from the flower-buds, and causing the whole cluster to droop and die.

In the chapter on the ‘Murrain Worm’ some interesting particulars are given of the larva of *Cherocampa elpenor*, which, in Ireland, is erroneously credited with causing sickness in cows. With regard to this popular but mistaken belief in the harmful nature of the larva in question, Miss Ormerod says:—‘Methods of prevention and remedy

are not needed; . . . but—looking at the widespread belief of illness to cattle being caused by their eating some small creature or caterpillar, which, when sent for identification, proved to be the larva of the elephant hawk-moth, which most especially feeds on plants growing by ditches or in wet places—it would appear to be worth while for some qualified observer, when opportunity should occur, to find whether the illness—the so-called “murrain”—may not be attributable to some poisonous water-plants, which, if known of, could be removed.”

As usual in these Reports, the illustrations are excellent.

Bulletins (New Series) issued by the United States Department of Agriculture. Division of Entomology, Washington, 1898:—

No. 15. “The Chinch Bug: its Probable Origin and Diffusion, its Habits and Development, Natural Checks, and Remedial and Preventive Measures, with Mention of the Habits of an Allied European Species. By F. M. WEBSTER.” Pp. 82, 12 figures in the text, and 7 maps showing distribution.

No. 16. “The Hessian Fly in the United States. By HERBERT OSBORN.” Pp. 58, pls. 2, map, and 8 figures in text.

No. 17. “Proceedings of the Tenth Annual Meeting of the Association of Economic Entomologists.” Pp. 104.

No. 18. “Some Miscellaneous Results of the Work of the Division of Entomology. III.” Pp. 101, 17 illustrations.

OBITUARY.

CHARLES STUART GREGSON died on January 31st, 1899, in the eighty-second year of his age. Like most of his colleagues, Gregson was a man of great powers of endurance, and in this lay much of the secret of his success. He appears to have commenced writing so long ago as 1842, when he published a note in the ‘Annals of Natural History’ on *Nyssia zonaria*, and he seems to have written over fifty notes and papers considered sufficiently valuable to have secured a place in the Royal Society’s Catalogue of Scientific Papers, but these are exclusive of innumerable shorter contributions to the various periodicals. He took a warm interest in the Natural History Societies of his district, and at one time, as secretary of one of them, issued reports of the meetings, lithographed by himself. He amassed a magnificent collection, wonderfully rich in varieties and aberrations, and this he sold in 1888 to Mr. Sydney Webb, his eyesight having failed. It was estimated to contain approximately 28,000 specimens. But he immediately started afresh, and had formed another collection of about 5,500 specimens after he had turned seventy-two, and we are told that his sight practically recovered. He was a keen naturalist in a wider sense than a collector of British Lepidoptera. At one time he published a list of the Coleoptera of his district. It may truly be said of him that he had in him all the requirements for a scientific entomologist.—E. M. M.

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EUCHLOË GRÜNERI AT CANNES.

By T. A. CHAPMAN, M.D.

ON March 3rd, 1899, I took, at Auribeau, near Cannes, a *Euchloë* which puzzled me. I entered it as *euphenoides*, because I felt sure it was not *cardamines*, and no other species seemed possible. Still, I could not persuade myself it was *euphenoides*, and so imagined it was perchance a hybrid between those species. Taking it to M. Constant, to compare with his collection, it agreed almost absolutely with specimens from Eastern Europe, labelled *grüneri*. Suggesting that it was an unlikely species to be taken so far west, he said, "Why not?" and pointed out that I was in a position that reminded me of the English schoolboy who takes *Pieris daphidice* whilst the ordinary collector does not, because he never looks at a white butterfly. He said he should never think of bagging a *cardamines* or a *euphenoides*, and *grüneri*, if it appeared but rarely, would escape along with these from any Provençal collector. The *grüneri* at South Kensington have no specimens agreeing precisely with mine, or with those like it in M. Constant's series. They are smaller, and the pale portions of the fringes are whiter.

My specimen is like a *cardamines*, with a wash of yellow on the upper surface, not so deep as that of *euphenoides*. The discal spot is very large, as in *euphenoides*, and accompanied by a dark shade across the wing, as in that species, continuous with a dark shading along the costa. The black at the wing bases is also more extensive than in *cardamines*. Beneath it resembles *cardamines* most, but the green markings of hind wing are somewhat more restricted, with wider and more open clear spaces,

though just along the costa more numerous and darker, as often occurs in *euphenoides*.

I cannot entirely get rid of my first impression that this is a hybrid between *cardamines* and *euphenoides*. The date of its appearance was a fortnight earlier than *euphenoides* this year, and three weeks before *cardamines*, which this year was very late—later than *euphenoides*, though it is usually earlier. Though these two species are exceedingly distinct, the little I have done to elucidate this specimen leaves me with an impression that a series of these species, and of *grüneri*, *damon*, and one or two others from a sufficiently great number of different stations, would result in some difficulty being experienced in precisely demarcating them. Under this impression the further hypothesis as to my specimen arises, that it is an atavistic aberration of, say, *cardamines* that occurs in Eastern Europe as the defined species *grüneri*, which has at least two forms—that I saw in M. Constant's collection, and that, that is well represented in the British Museum.

Betula, Reigate : April, 1899.

[Dr. Chapman has been good enough to allow us to examine this very interesting specimen, and we are quite disposed to believe with him that it is a hybrid *cardamines* × *euphenoides*. In general respects the specimen is perhaps more *cardamines* than *euphenoides*, but at the same time it exhibits fairly strong traces of certain *euphenoides* characters.

With regard to yellowish colour, it may be mentioned that *cardamines* (*thibetana*, Oberth.) from Western China is of this tint, whilst some examples of *cardamines* from Syria (coll. Leech) have traces of a black internal edging to the apical patch.—ED.]

HYALE OR EDUSA.

BY HENRY H. BROWN.

THIS vexed question is revived in the 'Entomologist' for May. I propose to call a witness who has not hitherto been directly adduced in the controversy—Prof. Bergstrasser. The second part of his 'Nomenclatur und Beschreibung der Insecten in der Grafschaft Hanau-Munzenberg,' published at Hanau in 1779, contains well-executed figures of two species now included in *Eurymus* (*Colias*). These are thus named by him:—

Plates 2 (figs. 3 and 4) and 18 (fig. 1) :

HYALE P. D. C. alis integerrimis rotundatis flavis, posticis macula fulva, subtus puncto sesquialtero argenteo. Linn. S. N. 2, 764, 100 ; Fabric. 477, 148 ; Rai, 112, 6 ; Mouffet, 100 ; Uddm. Dissert. 56.

Papilio alis luteis, &c., Geoffr. 2, 112, 48

Der Pomeranzenvogel, Mull. N. G. D. I. 593, 100; Fuesl. 554.

Calais, Cramer, tab. 53, c, d.

Der Geisstaudenfalter, W. S. 165, 3.

Das rare Gelbe, O. Gladb. Pr. 60, Kr.

Der pomeranzen gelbe Heuvogel, Esper, p. 71, t. 4, f. 3.

Plate 2 (figs. 5 and 6):

PALÆNO P. D. C. *alis integerrimis rotundatis flavis, apice nigris, margineque fulvis, posticis subtus puncto argenteo*. Linn. S. N. 2, 764, 99; Fabric. 476, 147, Uddm. Dissert. 56

Papilio alis sulphureis, &c., Geoffr. 2, 112, 6, c.

Palæno, Cramer, t. 14, F, G.; Schœff. Ic. 149, f. 4, 5.

Der Silberpunct. Mull. N. G. D. I. 593, 99.

Der Kronwickenfalter, W. S., l. c.

Das gemeine Goldne, O. Gladb. Pr. 8, Kr.

Der schwefelgelbe Heuvogel, Esper, p. 68, t. 4, f. 2.

Comparing these species with those in Mr. Kirby's 'Handbook to the Order Lepidoptera' (1896), it is clear that Bergstrasser's *hyale* is identical with the *hyale* of the 'Handbook,' the hind-marginal black border extending to the posterior angle of the anterior wings, and intruding upon the inner margin over an orange-yellow ground colour. His *palæno*, on the other hand, corresponds exactly with *kirbyi* of the 'Handbook,' the *hyale* of Curtis, and others. It therefore appears that Bergstrasser, writing in 1779, had arrived at the same conclusion as Mr. Kirby, namely, that the butterfly called in England the "clouded yellow," and known as *edusa*, was the *Papilio hyale* of Linnæus. If any of your readers should wish to examine the original, I shall be glad to put them in communication with the owner of the copy of Bergstrasser's scarce book, from which I have been quoting.

Rosefield, Elgin.

NOTES ON THE INDO-AUSTRALIAN PAPILIOS IN THE
COLLECTION OF MR. H. J. ADAMS, F.E.S., WITH
DESCRIPTIONS OF NEW SPECIES.

BY PERCY I. LATHY.

Troides fasciculatus, sp. nov. (♂, ♀). — Closely allied to *T. dohertyi*, Ripp., but may be distinguished by the adnervular whitish streaks of fore wings below being merged together, thus forming a wide fascia. *Hab.* Salibaboo.

T. flavicollis, Druce. — Type of ab. loc. *olympia*, Honr.

Papilio polydorus, Linn. — Two pairs from Batjan.

P. annæ, Feld. — A single specimen of the male differs from the description given by Mr. Rothschild, Nov. Zool. ii. p. 243, in

the following particulars:—Cellular spot small, only occupying lower end of cell; five discal white markings, of which the three centre ones are the largest; all the submarginal spots below are reddish.

P. phlegon, Feld.—Differs from the preceding in the more rounded apex of the fore wings; cellular spot occupying two-thirds of cell. Seven discal spots, of which the third, sixth, and seventh are the largest. Submarginal spots whitish, the two posterior ones reddish below; tails shorter and less spatulate.

P. camorta, Moore.—A series from the Andamans.

P. neptunus, Guér., ab. *sumatranus*, Hagen.—A male from Sumatra, with only one very small red spot on hind wings, between second and third median nervules.

P. fehri, Honr.—Type. ♂.

P. kühni, Honr.—Types. ♂, ♀. East Celebes.

P. malayanus, Wall.—Specimens from Burmah and Siam belong to this form.

P. artaphernes, Honr.—Type. ♂. Bangkei.

P. beccarii, Oberth.—Co-type. ♂. Dorey, New Guinea.

P. albinus, Wall.—The series of this species includes the type of *P. sekarensis*, Honr.; Honrath treated ab *lesches*, G. & S., as typical *albinus*, Wall.

P. lowi, Druce, ♀, ab. *suffusus*, ab. nov.—I propose this name for the dark form of the female. Nov. Zool. ii. p. 321.

P. schmeltzi, Herr.-Schäff.—A series of eleven males and three females, which exhibit considerable variation. Several males have on the fore wings a faint yellowish white line extending from costa to first median nervule; in others this is much shorter, and in two specimens entirely absent. The light patch on hind wings also varies considerably in size. The orange lunules of hind wings below are large and distinct in some, and in others small and obscure. The females vary in a similar manner.

P. lunifer, Rothsch.—♀. Similar to male, but paler; the light band of fore wing extending to costa, this feature being especially noticeable below. *Hab.* Salibaboo.

P. telesicles, Feld.—Type of ♀ ab. *leucothoides*, Honr.

P. gyas, Westw.—A gynandromorphous specimen, the left hind wing being male, the remainder female.

P. arctofasciatus, sp. nov. (♂).—Close to *P. pamphylus*, Feld., but may be distinguished by the much narrower median band; the spot between costal and subcostal nervules of hind wing is also much smaller. *Hab.* Sulla Mangola.

P. bathycloides, Honr.—Type. ♂.

P. chiron, Wall.—Type of ab. *chironides*, Honr.

P. milon, Feld.—Type of ab. *milonides*, Honr.

P. sulaensis, sp. nov. (♂).—Near *P. milon*, Feld., but the spots composing median bands of both wings much smaller, and of a more bluish tint. *Hab.* Sulla Mangola.

P. seminiger, Butl.—Type of *ægistiades*, Honr.

P. obliteratus, sp. nov. (♀).—Allied to *P. ligatus*, Rothsch., but may be separated by the four lower discal spots of hind wing being absent above and below, and the streak between second and third median nervules minute; and the submarginal spots below are very much smaller. *Hab.* Rossel Island.

P. neopommeranius, Honr.—Type. ♀.

P. macareus, Godt., ♀ ab. *masformis*, ab. nov.—Differs from typical female in having the following additional whitish markings:—Fore wing: cellular markings as in male; three round spots just beyond cell; five median streaks, and two small spots above first median nervule. Hind wing: cell almost filled; a long wide streak between costal and subcostal nervures; five discal streaks, of which the centre is the smallest, and another long wide streak between median and submedian nervures. *Hab.* Java. The example of this form of the female is, I believe, unique; it was taken by Fruhstorfer, who sent it to the late Ed. G. Honrath, of Berlin, and came into Mr. Adams's possession with the Honrath collection.

P. striatus, sp. nov. (♂).—Allied to *P. indicus*, Rothsch., and *P. macaristus*, Grose Smith. From the former it may be separated by all the pale markings being very much narrower, and the cellular streaks of fore wing being mostly broken up into spots. From the latter it differs in the larger discal markings of the fore wings, and larger discal markings and submarginal lunules of hind wings. *Hab.* Siam. Specimens from Perak belong to *P. indicus*, Rothsch., and not this form.

P. interjectus, Honr.—Type. ♂.

P. ramaceus, Westw.—The series includes type of *P. schönbergianus*, Honr.

P. similis, sp. nov. (♂).—*P. megarus*, Dist. nec Westw., Rhop. Malayana, t. xlii. f. 9, pp. 468, 469. Near *P. megarus*, Westw., from which it differs in the much wider cellular and discal markings of the fore wing; while the cell of the fore wing below is marked as above. *Hab.* Perak (type); Siam.

I am indebted to Dr. Karl Jordan for very kindly looking through this paper.

Lynton Villa, Sydney Road, Enfield.

FURTHER NOTES UPON *EMYDIA CRIBRUM*.

BY J. HY. FOWLER.

I WAS most interested in the perusal of the notes on *Emydia cribrum*, by Mr. Bankes (Entom. xxxii. 101-103). This species being one of my favourite insects, I have spent a great deal of time in observing it since I wrote the note referred to (Entom. xxv. 269-271), and can safely say that I know its life-history right through; I have found larvæ several times and know it well. I do not think Mr. Bankes can have read my "Further Observations upon *Emydia cribrum*," in the 'Entomologist' for 1894 (xxvii. 307), and I think they will show that this species has been bred from British larvæ, and the aberration mentioned as apparently unknown to me is represented by a similar one in my cabinet, but it is extremely rare. Mr. Bright, of Bournemouth, has one also, I believe.

I am pleased to add that I have quite recently discovered two things, by the merest accident, in connection with *cribrum*, which will also be likely to clear up two doubtful points, *viz.* its food-plant, and a New Forest locality. I must confess I was agreeably surprised at the event, as I have collected at various times over the same ground scores of times, but not during the time when *cribrum* is upon the wing. I rode my bicycle some miles into the Forest for a spin, dismounted, and strolled over a heath to see what insects were upon the wing. I saw a few of the common species, such as *carpini*, *nânata*, and others; and upon my lying down upon the heath for a rest, I was casually looking around, and upon a clump of lichen close by was a nearly full-grown larva of *cribrum* feeding. I watched it for some time; then brought it home for comparison with my preserved specimens, and found them identical. The lichen was quite different from that which grows upon the heath-stems; this grows upon, and in fact carpets, the ground all about; grows several inches high; in appearance it resembles the well-known lichen which *Cleora glabraria* feeds upon, on oak-trees, &c., but is a little coarser.

I may add that I have well-preserved larvæ, pupæ, ova, and the parasites in my cabinet; also over two dozen of the perfect insect which I bred. A few seasons ago I found five larvæ upon a clump of *Aira cæspitosa*, near Verwood, and bred them through; but to go and collect them upon the heaths is like looking for the proverbial needle in the bundle of hay. The locality in the New Forest which I have discovered is known only to myself, I believe, and I hope to get a good series there during the first week in June. I will publish the results.

Ringwood, Hants: May 4th, 1899.

A GUIDE TO THE STUDY OF BRITISH WATERBUGS (AQUATIC RHYNCHOTA).

BY G. W. KIRKALDY.

(Continued from p. 115.)

VELIA, Latreille, is closely allied to the preceding genus. There is a single British species, usually known as *V. currens* (Fabr.); as, however, I am unable to distinguish it structurally from *V. rivulorum* (Fabr.), and as no structural differences have, to my knowledge, been mentioned by earlier authors, I record it here as *V. rivulorum* (Fabr.). It has also been described under the names *affinis*, *aquatica*, *aptera*, *impennis*, *major*, and *ventralis*! It is dimorphic, the head and thorax of each form being portrayed on Pl. 1, figs. 1 and 2. The anterior tarsus is shown on fig. 4 (compare with that of *Hydrometra*, f. 5), and the sterna on fig. 3 (compare with the sterna of *Gerris*, f. 11). The apical segments of the venter, in the male, are delineated on fig. 14; in the female they are not very dissimilar from those of the same sex of *Hydroëssa*, except that apical margin of the connexivum of the 6th segment is produced acutely as in the male.

Velia progresses in a very similar manner to *Hydroëssa*; Meinert states* that it also readily moves beneath the surface of the water, in the usual position and also back downwards. It is then encased in a silvery air-bubble, and has very much the appearance of the water-spider [*Argyroneta aquatica* (Linn.)].

Velia rivulorum chooses habitats of a very diversified nature: streams—swift-flowing or slow—seem to form its usual haunts; but it may be found almost everywhere that fresh water occurs—in the swirling pools at the foot of rushing cascades, on stagnant meres, in solitary rock-pools left by the summer contraction of mountain torrents, under stones at (and indeed some little distance from) the margins of lochs and ponds. As has been previously remarked, many of the Gerridæ conceal themselves—in fact, “hibernate”—under moss, stones, &c., often far from water, during the winter. I do not think this has been noticed in the present species; in fact, Fallén records† its occurrence in some numbers (in the apterous form), running about quickly on the water, at a time when snow was lying on the frozen earth. Of course they may, as a rule, hibernate like their allies.

In the British Isles the apterous form is exceedingly common, and well distributed from the Shetland Isles to the southernmost

* “Vandløberne, Hydrometridæ, deres Færd og Leven” (in Entom. Medd. i. p. 95, 1887), a valuable paper, to which I will refer later at some length.

† Hemipt. Svec. 1829, p. 161; see also Meinert, *l. c.* p. 96, and Reuter, 1888, Ent. Medd. i. pp. 123-4, “Några ord om Hydrometridernas öfvervintring.”

portions of England, and from Lincolnshire to Connemara; the macropterous form is usually very scarce, though occasionally occurring somewhat plentifully.

GERRIS, Fabr., 1794,* is the last gymnokeratous genus with which, for the present, we will be concerned.

The short (compared with that of *Hydrometra*, Latr.) head, the very long mesosternum, and the very long intermediate posterior legs, readily distinguish it from its allies. There are ten British species, forming three well-marked subgenera; the latter are separable as follows:—

1. First segment of antennæ much longer than the second and third together; nearly as long as second, third, and fourth together (Pl. 1, f. 7). [Sixth segment of connexivum produced into a long spine] ... *Aquarius*, Schell.
- First segment subequal to, or slightly shorter than, the second 2
2. Antennæ short, subequal to, or shorter than, head and thorax together (Pl. 1, f. 9); sixth segment angular, not spinose ... *Gerris*, in sp.
- Antennæ long (when turned back reaching to posterior coxæ) (Pl. 1, f. 8); sixth segment produced into a long curved spine
Limnoporus, Stål.

As the habits of the various species appear to be very similar, the following account (drawn up largely from Meinert's paper, confirmed and extended by one or two other small publications and the few observations I have been able to make) is to be taken as applying to any species, unless specially indicated:—†

While *Hydrometra* and *Hydroëssa* disport themselves almost constantly at the margins of the pond or stream they inhabit, *Gerris* (and, to some extent, *Velia*) venture out into the open, though they hold themselves continually in readiness to dart back to the shelter of the shore.

The legs of *Gerris* are very remarkable, the two hinder pairs being very long, thin, almost thread-like (*filiform*), and destitute of the swimming-hairs which are such a marked feature of the more specialised kryptokeratous forms. Such lengthy appendages would be a serious obstacle to rapid progression in insects

* = *Aquarius*, Schell. 1800 = *Hydrometra*, Fabr., 1803 = *Tenagogonus*, Stål, 1868. The word "Gerris" is doubtless a modification of the Latin *Gerres* (see Entom. 1898, p. 103).

† See Meinert, *l. c.* pp. 81–100; Reuter, *l. c.*; De Geer, 1773, 'Mémoires,' iii. pp. 311, *et seq.*; Amyot and Serville, 1843, 'Hémiptères,' pp. 409–23; Amyot, 1846, Ann. Soc. Ent. France; Miall, 1895, Nat. Hist. Aquat. Ins. pp. 349–51.

habitually moving in the water,* but are eminently adapted to insects skimming lightly over the surface. The anterior legs do not seem to be, as states De Geer, usually employed for the capture of prey, though they hold in position the dead insects upon which *Gerris* apparently generally feeds. Meinert states that, although the anterior legs are structurally similar in both sexes, their principal use, in the male sex, is to hold the female firmly during copulation. I have not, however, been able to find, among the males, any specially modified clasping organ, such as obtains in certain Coleoptera.

The normal position of *Gerris* on the water is as follows: the posterior legs slope somewhat backwards, the middle legs sloping strongly forward, so that the tarsi come to rest nearly as far forward as the head, but directed outwards to the side. The anterior legs are nearly perpendicular, the tarsi almost touching at their bases, thence diverging. *Gerris* rests on all six legs, elevated upon them to a considerable height from the surface, all the species, especially the larger kinds in their adult state, depressing the surface of the water, and forming a moderately deep oval "bowl" or "dimple" for each leg. The length, or larger diameter, of each dimple is proportionate to the length of that portion of the leg wherewith they rest on the water, *viz.* to the length of the tarsi in the case of the anterior and intermediate legs, and to the length of the tibiæ and tarsi in the posterior legs. The width, or smaller diameter, is half that of the larger diameter.

Movements are of three kinds—(1) drifting or floating, (2) skating or rowing, and (3) leaping.

In the drifting or passive movement the bug is carried forward on flowing water, and even on stagnant ponds, by the undulating ripples caused by puffs of wind.

The commonest of the active movements is that by which the bugs do not lift themselves from the surface of the water by means of their legs, but make a few strong synchronous strokes with the intermediate pair of legs; while the anterior and posterior pairs are quiescent, or move so feebly that the motion can be observed only with difficulty. A proof of the fact that the legs are not upraised from the water is that the dimples wherein they stand retain their form and size, as may be seen clearly both in nature and in captivity. When the bug stands on the surface of a shallow sandy pool (or a glass vessel with a sandy bottom) in the sunshine, the dimples throw shadows on to the bottom, each surrounded by a bright ring, caused by the refraction of those rays which pass through the curved surface. The central shadow thrown by the body is not surrounded, however, by a bright ring, and so, when the bug moves, no bright ripples

* *Cf.* the short stout posterior legs of *Notonecta*, *Corixa*, and *Dytiscus*, &c.

appear about the central shadow, such as accompany the movements of the legs.

Gerris can also, by a powerful stroke of one of the intermediate legs, perform side-movements with perfect ease, and even turn right round, executing strategic movements to the rear with great agility.

The other active movement is the leaping, whereby the bugs tear themselves loose from the surface of the water and make a spring up into the air. According to Meinert, *G. lacustris* (Linn.), Stål, can leap a couple of inches on the water, but on dry land it exceeds this to some extent, springing to a greater height, with increased rapidity, and with more continuous movement; one often finds on a hunting excursion that these bugs can leap right out of the net.

Gerris does not, as a rule, voluntarily enter beneath the surface of the water, but it is evident that its usual position must expose it to the frequent danger of being overwhelmed by sudden squalls, or other disturbances, and swamped. The short, close, velvety pubescence with which they are usually almost completely covered forms—if it be in good and clean condition—an investment well-nigh impervious to water,* and they are thus able to rise to the surface unharmed, breaking the surface-film † with some little degree of effort.

(To be continued.)

NOTES ON AMERICAN BEES.

By T. D. A. COCKERELL,

Professor of Entomology, New Mexico Agricultural College.

(Concluded from p. 129.)

✓ *Colletes nautlanus*, n. sp.

♀. Length about $9\frac{1}{2}$ millim., rather broad and compact, shining black. Head broader than long, inner orbital margins quite strongly concave; face with short white pubescence, rather dense and strongly plumose at the sides; clypeus with rather strong punctures, more or less running into striæ; vertex with sparse punctures of two sizes; many black, strongly plumose hairs behind ocelli; cheeks with white pubescence; antennæ short, entirely black, scape punctured; clypeus

* The elytra are provided with short close hairs along the nervures, but, despite this, they are apt to become soaked and unmanageable when swamped with water; and this is one of the reasons why I have considered (*ante*, p. 109) that apterous forms will tend to supplant the others. In some macropterous and brachypterous individuals I have examined, pubescence is scarcely developed at all on the dorsal surface of the abdomen.

† See Miall, *l. c.* pp. 12-15; Scourfield, 1894, in Journ. Linn. Soc. Lond. xxv. pp. 1-19, Pl. 1 & 2.

with the anterior margin not emarginate; labrum with a row of weak pits; apical portion of mandibles dark reddish; space between base of mandible and eye very short, almost reduced to nothing; mesothorax with large and very strong punctures, dense in front, less so behind, hind part of disc without punctures; scutellum impunctate in front, with large punctures behind; post-scutellum coarsely roughened; basal enclosure of metathorax narrow, bounded by a sharp rim, and crossed at intervals by sharp ridges; posterior face roughened, almost malleate; pleura with very dense large punctures; prothoracic spine long and sharp; pubescence of thorax white at sides, dense on tubercles and on sides of metathorax, black just beneath the tegulæ, on dorsum thin but strongly plumose, black mixed with greyish white, the white conspicuous at the suture between mesothorax and scutellum, and (greyish) on post-scutellum, the black most conspicuous on the scutellum; tegulæ shining piceous; wings hyaline, nervures and stigma black; stigma small, marginal cell with an appendicular nervure, second submarginal cell about as long as third, third narrowed about one-half to marginal, second recurrent nervure strongly bent; legs with white pubescence; hind femora with an abundant, white, beautifully plumose flocus; second joint of hind tarsi triangular; abdomen broad, very shiny, minutely but strongly and quite closely punctured, except on anterior part of disc of first segment; segments nude, except very narrow snow-white apical bands, and white hair at base and sides of first segment, and a few scattered black hairs on the apical segments; venter with a very thin hoary pubescence.

Hab. San Rafael, on the Rio Nautla, State of Vera Cruz, Mexico, last of June. (*C. H. T. Townsend.*) This has less black hair than *C. æthiops*, and the abdomen is not "rapidly narrowed to apex." It has no trace of the dense ochraceous pubescence found on the breast of *C. mexicanus*. Curiously, *C. nautlanus* has a very strong resemblance to *C. nudus*, Rob., from Illinois, differing, however, by the shining and closely punctured abdomen.

Colletes gilensis, Ckll.—♂. Prude's Summit, White Mountains, N. M., July 29th, 1898. (*C. M. Barber.*) Prude's Summit is not on the maps; it is the top of the divide between Ruidoso and Mescalero.

Colletes bigeloviæ, Ckll.—♀. Prude's Summit, White Mountains, N. M., July 29th, 1898. (*C. M. Barber.*) My original types were badly worn; a new specimen, in excellent condition, has a shiny black abdomen, with very distinct but narrow snow-white bands on the apical margins of the segments, interrupted in the middle on the first. The punctures of the abdomen are very much smaller than in *C. gilensis*. The third discoidal cell is much less bulging at its end than in *C. nautlanus*.

Nomada edwardsii, Cresson, 1878.—Mr. T. Kincaid sends me eighteen specimens; three from Seattle, Wash.—two males, May 13th, one female, May 17th, 1896; the rest from Olympia,

Wash., May 11th and 23rd, and June 24th—mostly females. Cresson's description, though stated to be of a male, applies to the female. The male has the mesothorax all black, the scutellum with only a pair of yellow spots, the post-scutellum black, the yellow spots on metathorax smaller, and the black bands on the abdomen broader. The basal portions of the legs are largely black, where in the male of *N. superba* they are red. The flagellum of male *edwardsii* is black above and red beneath, and this is the only red about the insect.

Nomada maculata, Cresson, 1863.—Mr. T. Kincaid takes at Seattle and Olympia, Wash., May 23rd–June 25th (the last date being that of a Seattle male), a species which agrees with *maculata*, but is 10 millim. long or slightly over. Robertson, in Illinois, found the insect to not exceed 8 millim. in either sex; but I have a female from Franklinville, Pa., May 19th, identified as *maculata* by Mr. Fox, which is quite as large as the Washington form. The mandibles are bidentate, and the last abdominal segment in the male is bifid, as Robertson indicates.

Sphcodes dichrous, Smith, 1853.—Mr. T. Kincaid sends me very numerous examples from Olympia, Wash., mostly taken in June, the dates running from May 25th to July 2nd; also a few from Seattle, Wash., one as early as April 17th; also one or two from Pasco, Wash., May 25th; and a somewhat larger and darker individual (female) from Comano I., Wash., collected by N. L. Gardner, May 25th, 1896. It would be interesting to ascertain whether the Comano I. specimens are uniformly of rather large size and dark colour, constituting a local race.

Bombus nevadensis, Cress.—Mescalero, Indian Agency, N. M. (Otis).*

Bombus ternarius, Say.—One from Seattle, Wash., April 3rd, 1897. (T. Kincaid.) The pubescence of the head is mostly black.

Bombus sonarus, Say.—Forks of Ruidoso Creek, N. M., July 30th. (C. M. Barber.) Also taken by Prof. C. H. T. Townsend. New to the United States.

* The Mescalero Indian Agency, on Tularosa Creek, N. M., is an interesting locality for bees. In addition to the species mentioned in the body of this article, Mr. C. M. Barber took the following at the Agency in July, 1898:—*Sphcodes mandibularis*, Cress., *Agapostemon texanus*, Cress., *Halictus ruidosensis*, Ckll., *H. forbesi*, Rob., *H. meliloti*, Ckll., *H. perdificilis*, Ckll., *H. ligatus*, Say, *Andrena apacheorum*, Ckll., *Prosapis tridentula*, Ckll., *Heriades carinata*, Cress., *Melicta miranda*, Fox (about nests of *Podalirius occidentalis*, on which it is evidently parasitic), *Podalirius occidentalis*, Cress., *P. cardui*, Ckll. (the second specimen known), *Megachile fortis*, Cress., *M. fidelis*, Cress., *M. pugnata*, Say, *Anthidium maculosum*, Cress., *Osmia faceta*, Cress. (new to N. M.), *Melissodes crenulaticornis*, Ckll., *M. tristis*, Ckll., *Xenoglossa pruinosa*, Say, *Clisodon terminalis*, Cress., *Monumetha borealis*, Cress., *Bombus marrisoni*, Cress., *Apis mellifera*, L.

Bombus fervidus, Fabr. — Three from Pasco, Wash., May 25th, 1896. (T. Kincaid)

✓ *Psithyrus cevallicæ*, n. sp.

♂. Length 18–22 millim., black, with yellow and black pubescence. Antennæ entirely black, about 10 millim. long, first two joints of flagellum short and equal, each about two-thirds the length of the third; orbits parallel, facial quadrangle somewhat longer than broad; front and vertex quite densely punctured, but a shining impunctate area on each side of the ocelli, which are placed in a gentle curve; pubescence of head black, mixed with pale grey on the face, especially on the clypeus; thorax above with a broad black band between the wings, all before this band is yellow, behind it is yellow mixed with black; pleura extremely densely punctured, with long black hair more or less mixed with dull white; wings fuliginous; legs black, anterior femora with black hair, middle femora with black hair in front and long yellowish-white hair behind, hind femora with sordid yellowish hair, short and black underneath at base; tibiæ and tarsi with short black pubescence on the outer side, and pale reddish on the inner; first five segments of abdomen clothed with mustard-coloured hair, sixth with black, apex with shining orange-ferruginous; venter with sparse short black hair, some pale along the margins of the segments; claws very deeply cleft.

Hab. East of Las Cruces, New Mexico, in the *Larrea*-zone, Aug. 23rd, at flowers of *Cevalia sinuata*, two males taken, others seen, by C. H. T. Townsend and the present writer. On Nov. 10th I took a specimen at Mesilla Park, N. M., at flowers of *Aster canescens* var. *viscosus*; this differs in having the meta-thoracic pubescence almost all black, except a yellow tuft just behind the wings, and the hair of the apex of the abdomen black.

This is certainly a true *Psithyrus*, but it closely resembles the so-called *Apathus elatus*, which is the male of *Bombus fervidus*.

This is the only *Psithyrus* I have ever found in southern New Mexico. *P. variabilis* (Cress.), described from Texas, extends thence northward; I have specimens of it from Stillwater, Oklahoma, at flowers of *Prunus americana* (coll. C. E. Regnier, com. E. E. Bogue), and Baldwin, Kansas (*J. C. Bridwell*). I have a single small male of *variabilis* from Tuerto Mountain, near Santa Fé, New Mexico, at an altitude of 8200 ft., Aug. 7th, at flowers of *Senecio* (Ckl. 4313); this has yellow hair on the anterior part of the pleura, black on the hinder part, and a patch of yellow hair on the front.

Melissodes obliqua, Say. — Mesilla, N. M., July, 1898; many specimens. (C. M. Barber.)

Melissodes crenulaticornis, Ckl.—What I take to be the female of this species was found by Mr. C. M. Barber at the Forks of Ruidoso Creek, N. M., July 30th, 1898. In my table of N. M. *Melissodes* (female) it runs at once to *M. gilensis*; but it differs

from that in being smaller (length 10 millim.), no black hair on vertex, flagellum wholly black, dark hair of mesothorax and scutellum dark brown instead of black, stigma less developed and piceous, bases of third and fourth abdominal segments with scanty hair which is entirely black, apical bands of pubescence on second to fourth segments white and well-defined. The hair of the last two abdominal segments is black, except at the extreme sides, and the brush of the hind tarsi is orange-fulvous.

This female is referred to *crenulaticornis* instead of to *ruidosensis*, on account of its small size, and also because the venation is as in the former species, whereas *ruidosensis* has a much larger second submarginal cell.

Alcidamea simplex (Cresson).—This is the *Heriades simplex*, Cress., and the *Alcidamea producta*, Cress., the former specific name having priority.

Megachile relativa, Cresson, 1878.—One female. Forks of Ruidoso Creek, N. M., July 30th, 1898. (C. M. Barber.) New to New Mexico.

Megachile wootoni subsp. *calogaster* (Ckll.).—When describing *M. calogaster* I omitted to notice the close resemblance between its male and that of *M. wootoni*; they may be separated thus:—

Spurs of hind tibiæ ferruginous; vertex more closely punctured	<i>wootoni</i> .
Spurs of hind tibiæ piceous; vertex less closely punctured	<i>calogaster</i> .

The two are doubtless geographical races of one well-marked species.

Megachile sidalceæ, Ckll.—A female was taken by Mr. C. M. Barber in Mesilla, N. M., July 4th, 1898. It resembles the male except in the usual sexual characters. The face has short white hair instead of a dense pale yellow brush; the ventral scopa is white, with a few black hairs at the extreme tip.

Megachile casadæ, Ckll. — Mr. C. M. Barber took a female in Mesilla, N. M., July 4th, 1898. It resembles the male except in the usual sexual characters. The ventral scopa is white, even to the tip.

✓ *Megachile fidelis*, Cr., var. n. *concinnulla*.

♂. Length about $9\frac{1}{2}$ millim., black, with thin dull white pubescence. Head large, a little broader than thorax, eyes mottled, facial quadrangle a little longer than broad, narrowing below; face, including clypeus, densely covered with yellowish-white hair; vertex dull, strongly punctured, with erect hairs, some of which in certain lights seem black, but this is deceptive; cheeks with thin white pubescence, a dense tuft behind near base, but the area above the

base of mandibles is hairless; antennæ black, last joint not broadened; mandibles striato-punctate, black, fringed beneath with orange-fulvous hair; a tooth behind mandibles; mesothorax and scutellum dull, with numerous shallow punctures, thinly clothed with erect dull white hair; no bands of pubescence at sutures; tegulæ piceous; wings dusky, darkest at apex, nervures brown, second submarginal cell receiving first recurrent nervure almost at its extreme base, and the second very near its apex; legs black, pubescence on femora white, on tibiæ short, thin, and fulvous; spurs light ferruginous; the four hind tarsi ordinary, the pubescence on inner side of hindmost strongly orange-fulvous; anterior femora ordinary, black, with long white hairs; anterior tibiæ black, with a short sharp spine at apex; anterior tarsi honey-colour inclining to ferruginous, last joint and apical half of the one before fuscous; first joint deeply hollowed, canoe-shaped, produced and somewhat curved at end, its rounded apex resembling a finger-tip; inner margin of the hollow with a continuous fringe of short black hairs, outer margin darkened, but having only fulvous hairs; hind margin with the usual long fringe of white hairs, none of which are black at ends; second and third joints flattened, with a conspicuous dark spot beneath; fourth joint simple; anterior coxæ with a long spine, no patch of bright hair near its base; middle coxæ unarmed; abdomen short, well punctured, with rather long thin dull white hair on basal segment above and beneath, but not at sides, and more or less on sides of ventral segments to the apex; hind margins of second to fourth dorsal segments with a narrow yellowish hair-band, very well defined; last segment concave in the middle, its margin with a deep but rather narrow emargination, the margin on each side of this minutely denticulate; the subapical ventral teeth obsolete.

Hab. Colorado Springs, Colorado, middle of July. (*Ckll.* 3558.) Differs from *fidelis* in the face being more narrowed below and the venation. Mr. Fox has also seen this variety from California.

Mesilla Park, New Mexico, U.S.A.

THE GENUS *LEUCERONIA* OF AURIVILLIUS.

BY A. G. BUTLER, Ph.D.

IN a paper upon the African genera of Pieridæ (*Ent. Tidskr.* 1895, p. 256), Prof. Aurivillius places *Teracolus* next to his new genus *Leuceronia*, under a section having only eleven veins to the front wings. Had the author consulted a paper which I wrote some years previously, "On the inconstancy of a generic character in *Nepheronia arabica*" (*Ent. Mo. Mag.* 1886, p. 259) he would have discovered that the eleven-vein peculiarity which exists in some examples of *L. buquetii* and its racial or seasonal forms was altogether abnormal.

In typical *L. buquetii*, with the heaviest black borders to the primaries, I find decidedly more examples with twelve than with eleven veins; in the slightly narrower bordered Arabian form there are more examples with eleven than with twelve veins; in all the South African forms, whether broadly bordered, narrowly bordered, or without borders, I have found twelve veins.

I note, however, that vein 11 (the first subcostal branch), whenever present in *L. buquetii* and its forms, is anastomosed for a short distance with vein 12 (the costal vein); yet this anastomosis would seem to be of recent date, inasmuch as, when examined with the wing facing the light, both veins seem to exist separately, the culmen of each vein being apparently indicated. When damped with benzine and held between the eye and the light the anastomosis appears to be normal, the ridges not being visible. In some examples only a portion of vein 11 is present.

Prof. Aurivillius gives a second character by which he distinguishes his genus *Leuceronia*, viz. :—"Veins 8 and 9 out of 6, 10 only free from the discoidal cell."

This is probably a misprint for "veins 8 and 9 out of 7," because, if veins 8 and 9 forked from 6, it would be difficult to account for vein 7. One might imagine that veins 6 and 7 coalesced throughout, but in such case the learned Professor would have had to describe his genus as possessing ten veins only; whilst it would be impossible to assert positively that vein 7 (rather than 6) had disappeared.

Apart from the anastomosis of vein 11 with 12, there is nothing to distinguish *L. buquetii* generically from *Eronia argia*, and, as this anastomosis necessarily disappears entirely where vein 11 is not present, it may be questioned whether the *argia* group ought to be excluded from *Leuceronia*. I think not. As to whether these forms should be considered distinct from *Eronia*, I think, matters little; they have a very different aspect.

THE ENTOMOLOGICAL CLUB.

A SHORT account of this Club was given in the 'Entomologist' for 1892 (xxv. pp. 4-9), and it was then mentioned that a certain portion of the archives were missing. Recently, we are happy to say, a minute-book, with a small account-book, have been discovered, and it is now therefore possible to furnish some items of information that were not available when the aforesaid brief history of this venerable institution was penned.

Turning first of all to the cash-book, we find that although it is simply a small volume of thirty-six leaves, it contains particulars of receipts and expenditure during thirty-eight years (*i. e.* from 1836 to 1874), and many of the pages are still blank.

As has been already remarked, this Club, since it was founded in 1826, has been conducted without entrance-fees or subscriptions. Funds for the purposes of the Club were supplied by members and hon. members in the form of voluntary contributions. In 1836, for example, the donations amounted to the sum of fifty-two pounds (eight donors), and the greater part of this amount was expended during the year in boxes and part payment of a cabinet. As the requirements of the Club grew less, so the cash contributions fell off, until in 1874 (the last entry) the year opens with a balance of eight shillings and fourpence, and this was increased by a whip round to thirty-three shillings and fourpence, so that the Secretary's "little bill" might be settled and a small amount remain in hand against contingencies.

The recovered minute-book records the doings of the Club from October 21st, 1841, to November 12th, 1851, and we here note that in the first-named year the property of the Club was insured to the value of £700. The general collection at this time was located in the dwelling of Mr. Newman, at Peckham, and the other effects at Mr. Walker's house at Southgate.

In March, 1842, Mr. Hanson presented the Club with some valuable insects from Smyrna; a collection of minute British Coleoptera was also presented by Mr. S. Stevens.

At a meeting held in October, 1843, Mr. Newman intimated his intention of resigning the office of Curator, and Mr. Doubleday gave notice that at the next meeting he would submit the following proposition:—

"That on the appointment of a new Curator, the preservation and completion of the British Collection belonging to the Club shall be considered a special and primary object of its members; and that as the Foreign Collection cannot without great expense be brought to a state of even tolerable completeness, and as great difficulties lie in the way of its preservation, it is desirable that it should be disposed of in the manner most advantageous to the interests of the Club and of Entomology.

"That with this view, after allowing (in accordance with the fourth rule) donors to reclaim such of their respective donations as they may think fit, those specimens which may be desiderata to the collection of the British Museum be presented to the Trustees of that Institution, on the understanding that the Club shall receive from them a return of such specimens from among their duplicates of British insects as may be desiderata to the Club's collection.

"That the remainder of the Foreign Collection, and such boxes as may not be needed for the use of the Club, be then disposed of by sale, in the manner that may be deemed most advisable; and that the produce of the sale be applied, in the first place, to the purchase of an additional cabinet for the British Collection, and, secondly, to the increase of that collection, so that it may become what it was originally intended to be, valuable as 'a model named-collection of insects unquestionably British.'"

The foregoing resolution was brought forward by Mr. Doubleday at a meeting held at his residence on Nov. 16th, 1843, and, after the paragraph referring to "duplicates of British insects" had been reworded so as to include foreign examples of species reputed to be British, was carried without dissent. A Committee was then appointed to deal with the selection of specimens for the National Museum, the question of disposing of the remainder of the foreign insects being postponed for a future meeting to consider.

At a meeting held in December, 1843, it was decided to request members wishing to obtain the return of insects given to the Club to send the Secretary notice to that effect, together with particulars; but, according to the report of the Selection Committee, which was presented on Feb. 15th, 1844, it would seem that some members had thought that the result of the proceedings at the meeting held in the previous November warranted them in acting at once, and they had therefore secured possession of the insects which they had presented to the Club.

The foreign insects having been deposited at the British Museum to "enable the officers of that establishment to make a selection," it appears that they did so, as the Report continues:—

"That they have since set apart, and deposited in nine large boxes, all such as they consider (on a liberal construction of the word) to be desiderata to the public collection, and which will form a handsome and acceptable addition thereto, being generally in good condition, many of them rare, and including a considerable number of authenticated typical specimens of insects first described by Mr. Newman.

"That they have properly limited themselves to as small a number as is required to illustrate each species in those cases where the Club collection contained many specimens. The total number of specimens set apart by them appears by Mr. Doubleday's statement to be upwards of 5700.

"That Mr. Gray is prepared to recommend to the Trustees of the Museum to present to the Club, from amongst the duplicates of British and reputed British insects in the public collection, specimens of all such as are desiderata to the Club. The Committee had not any means of judging how far this may extend, but Mr. Doubleday is of opinion that some few truly native specimens of great rarity may be so obtained, although no idea of the number of the reputed British insects can be formed until the whole of their general collection shall have been examined.

"No portion of the selected insects are at present appropriated to the Museum, but the whole await the final determination of the Club.

"It appears that among the selected insects there are about one hundred species of Coleoptera, collected by Messrs. Doubleday and Foster in North America, which the former gentleman wishes to send to Dr. Harris at Boston, U. S., for examination by him, and it will probably be thought desirable that these should not be given up to the Museum until they may be returned from Dr. Harris.

“The remainder of the Foreign Collection is at present dispersed through eighteen drawers and one hundred and twelve boxes, and contain a very considerable number of fine insects, generally in good condition, although many of them are affected by mouldness which it might be desirable should be (as far as practicable) removed before measures are taken for disposing of them. The Committee do not think it necessary at present to offer any estimate of the number remaining, as that may probably be left until the Club may have decided as to their disposal. It must, however, be observed that the boxes are throughout interspersed with reputed, or recorded (although doubtful), British species, which, in accordance with the resolutions of the 16th November, should be carefully selected and removed to the Curator.”

The Report then deals with the drawers and boxes, of which there seems to have been over one hundred and thirty; eighteen of the former and forty-one of the latter were stated to belong to Messrs. Walker, Newman, and others, “and of course held at their disposal. Of the remaining seventy-four boxes which belong to the Club, seventy-two are mahogany, double-corked boxes of uniform make and size, about 18 by 12 in., and are said to have cost, when new, eleven shillings each.” It may be observed here that forty-two boxes were purchased by the Club in 1836, at a cost of £23 11s.; twelve others in 1837, at half a guinea each. In 1838, £10 0s. 6d. was paid for boxes.

Following the reading of the Report, from which the above extracts have been made, it was resolved—

“That the several suggestions contained in the Report should be adopted.”

“That the insects which have been selected be presented by the Secretary, in the name of the Club, to the Trustees of the British Museum.

“That the remainder of the foreign collection (after the removal of the reputed British insects) be sold without reserve, and with as little delay as possible, by auction at the rooms of Messrs. Stevens.”

“That some person be employed (previously to their removal) to clean and in some degree to arrange them, and in concert with the auctioneers to lot them.”

“That thirty-six of the best of the boxes be retained for the future use of the Club, and that the remainder of them be included in the sale.”

“That Mr. Newman, Mr. Doubleday, Mr. Walton, and Mr. Marshall are appointed a Committee to carry these resolutions into effect, with full power to act in the business as they may think proper.”

The sale took place on the 2nd and 3rd days of May, 1844, and on May 16th the members of the Club met at the residence of Mr. Hanson, when a marked catalogue of the sale of the Club's collection was placed on the table, and the announcement made that the sum realised was £58 3s. 6d., from which duty and expenses amounting to £14 5s. had to be deducted, leaving a balance of £43 18s. 6d.

It was decided at this meeting that the British collection, the cabinets, books, and other property of the Club should be henceforth insured for the sum of £300 only instead of £700.

(To be continued.)

NOTES AND OBSERVATIONS.

THE LEPIDOPTERA OF THE LONDON DISTRICT.—I have undertaken to edit and bring up to date the list of the London District Lepidopterous Fauna, commenced a few years ago by Dr. F. J. Buckell, and which is now about to be published by the City of London Entomological and Natural History Society. I shall be glad if those entomologists who assisted Dr. Buckell will kindly furnish me with any recent additions; and shall also be thankful for the assistance of any other entomologists who may be able to add further records from their own personal knowledge. The district comprises roughly a ten-mile radius from Charing Cross. I shall be pleased to give more exact information in answer to inquiries.—LOUIS B. PROUT; 246, Richmond Road, N.E., May 20th, 1899.

THE COCCIDÆ OF THE SANDWICH ISLANDS.—I have just come across a pamphlet by Mr. A. Koebele, entitled "Report of the Entomologist of the Hawaiian Government," published in 1898. In it the following Coccidæ are mentioned which are new to the Sandwich Islands list (cf. Entom. xxxi. 239; xxxii. 93):—*Dactylopius calecolaria*, Mask.; *D. adonidum*, L. (but is probably *citri*); *Eriococcus araucaria*, Mask.; *Ceroplastes ceriferus*, Anders., and *C. floridensis*, Comst. (these two often introduced, but not established); *Lecanium hemisphericum*, Targ.; *L. mori*, Sign.; *L. tessellatum*, Sign.; *Parlatoria zizyphus*, Luc.; *P. proteus* var. *pergandei*, Comst.; *Mytilaspis beckii*, E. Newman (*M. citricola*, Pack.); *Aspidiotus rapax*, Comst.; *A. duplex*, Ckll. There are also mentioned two unidentified species of *Pulvinaria*.—T. D. A. COCKERELL.

INSECTS AND FUNGI.—Entomologists are all doubtless well acquainted with the experiments that have been made with a view to the extirpation (or, at least, diminution in numbers) of certain insect pests by means of various fungi. As an example may be taken the chinch bug, *Blissus leucopterus* (Say), whose ravages are so dreaded in many parts of North America.

The fungi (*Sporotrichum*) are presumed to enter the bodies of the insects through the stigmata, and by their growth in the interior to destroy the life of the attacked bugs, then pushing through to the outside, where the spores are developed. The presence of these fungi is known by the grey powder (not to be confounded with ordinary white mould), which often completely covers the dead bugs.

For the details of the manner in which the disease is spread by human agency, I would refer the reader to the Nineteenth Report of the Illinois State Entomologist, 1895, pp. 5-189, plates ii-xi; "The Chinch Bug," by F. M. Webster (Fifteenth 'Bulletin,' New Series, U. S. Dept. Agriculture, 1898, pp. 1-82); and "The Chinch-bug," by

H. Garman (Seventy-fourth 'Bulletin,' Kentucky Agric. Exper. Sta., 1898, pp. 45-70, figs. 2-8), as being perhaps the most comprehensive and accessible of the already enormous mass of literature on the subject.

M. Künckel d'Herculeis has quite recently published (1899, C. R. Acad. Sci., Paris, cxxviii. pp. 620-2) some interesting notes relating to this fungus attack.

In attempting to infect the nymphs of a grasshopper (*Schistocerca peregrina*, Ol.) with the spores of a fungus discovered on the imago, M. d'Herculeis found that repeated moultings (every eight days) made the fixation of spores on the integument a matter of great difficulty. When one reflects that in moulting even the internal lining of the tracheæ is cast, it is evident that ecdysis must be an important factor in insect economy as an effective riddance from parasites.—G. W. KIRKALDY.

TAN-PIT LIQUOR ATTRACTIVE TO MOTHS.—Last year I went over a large tan-yard. While walking about between the pits I noticed that in every one of them there were many Geometers and Noctuæ floating upon the surface of the liquor. Now, as this liquor contains the essence of oak bark, &c., I feel confident that if collectors would procure good liquor, and use it in the same way that we do treacle, it would be an excellent attraction. Collectors can but try, and publish results.—J. HY. FOWLER; Poulner, Ringwood, Hants.

DIPTERA OF SCOTLAND.—Under the title "Diptera Scotica," Mr. Percy H. Grimshaw, in the 'Annals of Scottish Natural History' for April, commences a list of the Diptera found in Perthshire. In the first instalment nineteen families and one hundred and twenty-three species are referred to.

COLEOPTERA OF SUFFOLK.—Mr. Claude Morley, author of "A List of the Hymenoptera-Aculeata of the Ipswich District" (Entom. xxxi. pp. 12-17 and 38-41), has just published a most useful annotated list of Coleoptera found in Suffolk. This work is further referred to under "Recent Literature."

CANNIBALISM OF *ARCTIA VILLICA* LARVÆ.—Some larvæ of *Arctia villica* which I was rearing last spring, although plentifully supplied with food, exhibited cannibalistic tendencies. Some of their number made no cocoon, but assumed the pupal form on the bottom of the box. When these had cast off their larval skin, and before the pupal envelope had hardened, they seemed to offer an irresistible temptation to their companions' appetites, and while thus helpless were partly devoured by them.—ALBERT MAY; Hayling Island.

CAPTURES AND FIELD REPORTS.

CAPTURES AT SALLOW-BLOOM NEAR COVENTRY.—As I have not seen any record of captures at willow-bloom in this neighbourhood in the 'Entomologist' of recent years, I send the following notes:—From April 1st to 22nd I visited some willow-bushes between Kenilworth and Stone-

leigh almost every evening, and I was rewarded by taking the following:—Fine series of *Taniocampa gothica*, *T. stabilis*, and *T. pulverulenta (cruda)*; only ten specimens of *T. incerta (instabilis)*; twenty *Pachnobia rubricosa* in very fine condition; four *T. opima*, two *T. munda*, one *Cerastis pistacina*, and six *Anticlea badiata*. The nights were, as a rule, rather cold.—E. A. LAXON; Vereroft, Coventry, May 5th, 1899.

LOPHOPTERYX CARMELITA AT WALTON-ON-THAMES.—On May 6th I took a specimen of *L. carmelita* on a fence, close to the ground, at Walton-on-Thames.—C. N. HUGHES; 36, Compayne Gardens, South Hampstead, N.W., May 8th, 1899.

COLLECTING IN GLOUCESTERSHIRE, 1898. — Nothing was done in January and February, but on March 4th one *Anticlea badiata* was taken. On March 13th one female *Amphidasys strataria* was found at rest on an oak. On the 14th the willow was searched, but only being partially out no Noctuae were seen. An excursion to the willow on the 16th yielded two *Anticlea badiata*, two *Hybernia marginaria*, and one *Taniocampa gothica*; while three *H. marginaria*, and five *Anisopteryx ascularia* were boxed off the gas-lamps. On the 30th, at willow, one *Taniocampa populeti*, one *T. munda*, one *T. gothica*, one *Scopelosoma satellitia*, and one *A. badiata* were observed.

On April 3rd a visit to the woods resulted in the capture of two *Brephos parthenias*, two male *A. strataria*, one *Xylocampa areola*, and one *Asphalia flavicornis*. This last was found on a small oak about the thickness of a walking-stick. It was so restless in the box in which it was conveyed home that it was practically useless as a specimen. This species evidently will not travel quietly when boxed. During this month *A. badiata*, *Selenia bilunaria*, *Taniocampa gracilis*, *T. munda*, *T. populeti*, *Xylina ornithopus* (hibernated), *Taniocampa miniosa*, *Calocampa exoleta* (hibernated), *Vanessa c-album* (hibernated), *Gonopteryx rhanni* (hibernated), *Vanessa urticae* (hibernated), *Hemerophila abruptaria*, *Taniocampa instabilis*, *Tephrosia crepuscularia*, *Pieris rapæ*, *Vanessa io* (hibernated), *Triphosa dubitata*, *Tephrosia consonaria*, *Drepana binaria*, *Euchloë cardamines*, *Demas coryli* (at rest on a small beech), and *Pararge egeria* were also seen.

The following were observed during May:—*Anticlea nigrofasciaria*, *Melanippe fluctuata*, *Eucosmia certata*, *Cidaria suffumata*, *Cilix glaucata*, *Eupithecia albipunctata*, *Macroglossa bombylifformis* (narrow bordered), *Thecla rubi*, *Eupithecia vulgata*, *Spilosoma lubricipeda*, *Euchelia jacobæ*, *Arctia mendica*, *Tephrosia punctularia*, *Asthena candidata*, *Acidalia remutaria*, *Lomaspilis marginata*, *Coremia designata*, *Melanippe montanata*, *Eurymene dolobraria* (at rest on oak), *Hepialus lupulinus*, *Heliaca tenebrata*, *Drepana cultraria*, *Lobophora halterata* (at rest on aspen), *Spilosoma menthastri*, *Cidaria corylata*, *Bapta temerata*, *Iodis lactearia*, and *Numeria pulveraria*.

The captures in June included *Rumia luteolata*, *Melanippe sociata*, *Eupisteria obliterata*, *Zonosoma linearia*, *Lycæna bellargus*, *L. astrarche*, *Phytometra viridaria*, *Ino geryon*, *Nemeophila plantaginis*, *Argynnis euphrosyne*, *Sesia tipuliformis*, *Trochilium crabroniformis*, and *Odonestis potatoria*.

During July, *Nudaria mundana*, *Melanargia galatea*, *Thecla w-album*, *Arctia caia*, *Agrotis exclamationis*, *Caradrina morpheus*, *Cidaria fulvata*, *Larentia viridaria*, *Xylophusis monoglypha*, *Plusia gamma*, *Abraxas grossu-*

lariata, and *Eugonia quercinaria* were the only species observed, owing to cricket and other attractions.

During August nothing was done, but in September *Xylina ornithopus* and *Agriopsis aprilina* were taken.

In October *Miselia oxyacanthæ*, *Orthosia lota*, *Phlogophora meticulosa*, and *Anchocelis pistacina* were taken on the ivy.

Some of my November captures have been already recorded in the 'Entomologist' (xxxii. 19), and in addition I may mention *Cidaria miata*, *Cheimatobia brumata*, *Pæcilocampa populi*, and *Oporabia dilutata*.

On Dec. 12th fourteen *P. populi* and one *Hybernia defoliaria* were taken off the gas-lamps. The same method of capture yielded on the next evening three *P. populi* and one *H. defoliaria*. On the 17th four more *P. populi* and one *H. defoliaria* were the result of an evening's lamping.

To sum up, I consider the season was a very fair average one here, but, owing to pressure of business and other causes, I was unable to devote as much time as usual to collecting, as otherwise I have little doubt my list would have been much longer.—C. GRANVILLE CLUTTERBUCK; 1, Spa Villas, Gloucester, May 16th, 1899.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*May 3rd*, 1899.—Mr. R. McLachlan, F.R.S., in the chair. Dr. A. L. Bennett exhibited various insects which he had collected in the French Congo. They included a species of Mantidæ remarkable for its very striking resemblance in coloration to a piece of bark. Mr. F. Enoch exhibited a living specimen of *Nepa cinerea* infested with a number of minute red *acari* on the ventral surface of the abdomen. He also showed eggs of *Nepa* and *Notonecta* lying *in situ* in decayed leaf-stalks of *Alisma*, and described the mode of oviposition as observed by himself in both of these genera. He then exhibited a living example of the remarkable aquatic Hymenopteron, *Prestwichia aquatica*, Lubb., and said it was one of a brood of nine, including eight females and one male, that issued on May 1st from a single egg of *Colymbetes* found on September 5th, 1898. Mr. Merrifield showed some specimens of *Hemaris bombyliiformis*, Esp., with the scales still covering the central portions of the wings. He said these scales, which are present immediately after the emergence of the insect but soon become detached, may be rendered adherent by allowing a very weak solution of indiarubber in benzoline to run over the wings. Mr. C. H. Dolby-Tyler communicated a paper on "The development of *Ceroplastes roseatus*, Towns. and Cockl."—J. J. WALKER and C. J. GAHAN, *Hon. Secs.*

RECENT LITERATURE.

Proceedings of the South London Entomological and Natural History Society for 1898. Part II. Hibernia Chambers, London Bridge. April, 1899.

This contains a hundred and ten pages, and proves considerable activity and vigour on the part of the Society. The abstract of pro-

ceedings shows that much is done at the meetings, not only by many interesting exhibits, but by short papers and comments, to make the work of members available for general instruction. Amongst these, Mr. Lucas's demonstration of dragonflies, and especially of their early stages, and Mr. Clark's lantern slides of microscopic preparations, may be referred to as instances of valuable original material. It may further be mentioned that the illustrations on p. 95 are process reproductions of enlarged photographs by the latter member.

Two papers are reported in full; one on "The Scientific Aspects of Entomology," by Mr. Tutt, and one entitled "Lazy Days by the Sea," by Mr. Adkin. Under the latter unpretentious title, Mr. Adkin gives some interesting notes on insect life at Eastbourne, especially particulars of the habits of *Bryophila perla* and *B. muralis* as affecting walls in Eastbourne and its vicinity. Mr. Tutt's paper is supplemented by his presidential address. The latter, amongst other matters, deals in a thoughtful way with some present aspects of questions of natural selection. The most interesting perhaps is a discussion founded on a passage in Bateson's work, in which that author says that "the differences between species are specific, and are differences of kind, forming a discontinuous series; whilst the diversities of environment to which they are subject are, on the whole, differences of degree, and form a continuous series." After noticing the entire begging of the question involved in the first half of this passage, Mr. Tutt addresses himself to pointing out that environment varies in precisely the same way. He devotes some space, with copious instances, to show that what we unthinkingly, at first view, regard as identical environments of two different organisms, because forsooth they occupy the same place, are, for these two organisms, owing to a difference of habit, as different environments as if they occupied opposite sides of the planet. A change of food-plant would be a discontinuous change, though all else remained identical; a different season of emergence and many other such differences make the same place and climate a very different environment to its different inhabitants. We have not space to follow up this demonstration, and must refer our readers to the address itself, whilst congratulating the Society on the energy and vitality it displays in this volume.

The Coleoptera of Suffolk. By CLAUDE MORLEY, F.E.S. Pp. i-xiv, 1-113. Plymouth: James H. Keys. 1899.

COLEOPTERISTS, especially those residing in Suffolk, will be grateful to Mr. Morley for producing this county list. It appears to have been prepared with care, and the compiler has not only given exact localities, but in very many cases has added useful notes concerning habits, &c., of the species. One thousand seven hundred and sixty-three species are referred to; this is rather more than half the number known to occur in Britain. In the introductory pages there are short notices of some Suffolk coleopterists, and remarks on the geology and physical features of the county. There is also a map of Suffolk, on which the "districts" mentioned in the list are indicated.

THE ENTOMOLOGIST

Vol. XXXII.]

JULY, 1899.

[No. 434.

MECOSTETHUS GROSSUS, LINN.

= *flavipes*, GMEL., DON., STEPH.

= *germanicus*, STOLL.

= *rubripes*, DE GEER.

By W. J. LUCAS, B.A., F.E.S.

(PLATE II.)

IN 1889 Mr. Eland Shaw wrote:—" *M. grossus* is distributed widely over Northern Europe and in Spain in marshy localities, and will, I expect, be found fairly plentiful in our fen districts when properly looked for."* Recent captures shew that this prophecy seems likely to be fulfilled, and, in order to enable any collector who should visit boggy collecting-grounds during the coming August to identify the insect, our editor has kindly placed at my disposal part of this month's magazine for figures of the species, and a few notes upon it.

At the date mentioned above, Mr. Shaw knew of but two modern captures of this species: one specimen taken by Mr. R. McLachlan in the fens of Norfolk, and one by Mr. H. N. Ridley in Co. Kerry; the latter recorded in the Ent. Mo. Mag. vol. xx. p. 215, as *Pachytylus cinerascens*. Previous to this date, however, the late Mr. J. C. Dale took the species at Whittlesea Mere, Parley Heath, and in the New Forest; while Mr. C. W. Dale recorded it as occurring on the Dorset heaths and in the Isle of Purbeck, the last specimens he took in the latter locality being captured on July 27th, 1880. He says further that it "has occurred in the West of Ireland, and in the counties of Dorsetshire, Hampshire, Huntingdonshire, Cambridgeshire, and Norfolk; and in former years in the marshes close to London."†

* Ent. Mo. Mag., 1889, p. 413.

† Entom., 1895, p. 333.

On September 10th, 1892, one male was taken at Irstead in Norfolk amongst tall rank grass close to the bank of the River Bure, this being the first recorded capture of the species in Britain since the taking of the Kerry specimen, which was recorded by Mr. Ridley in January, 1884. In July, 1895, it occurred in abundance in the West of Ireland, as recorded in the 'Irish Naturalist,' vol. iv. pp. 228 and 258, by Mr. M. G. H. Carpenter; while in September of the same year Mr. B. G. Rye took the species in Norfolk in some numbers by sweeping the bog-myrtle (*Myrica gale*). The next year Mr. Wm. Jeffreys took several in a bog, a few miles from Lyndhurst, in the New Forest; and he has also found it in another spot on the same side of the Forest (*in litt.* 1897). Finally, in the beginning of August, 1898, Mr. J. J. F. X. King and myself found the species fairly common in two bogs on the other side of the Forest. In that season, which was a rather late one, it commenced to appear in the imaginal form just about the beginning of August: as the days went on it seemed to increase in numbers, but immature specimens were still taken. Possibly in early years it may be in the winged condition at the end of July.

Perhaps the fact that *M. grossus* loves the wettest and therefore often the least accessible parts of the bogs, may have caused it almost to escape notice for so long. As mentioned above, it has been taken amongst bog-myrtle and rank grass, but these conditions do not seem so much a necessity as a very wet state of the soil. It readily takes to the wing when disturbed, and then usually makes short but rapid flights of about ten or a dozen yards; but it will not move unless the sun is shining. On the ground its colours harmonise so well with the grass and rushes that it is extremely well protected, and, unless it took to the wing, it would be seldom seen. When flying, however, it is so conspicuous an insect that it is bound to be noticed.

M. grossus is a bulky insect, varying greatly in size. Length varies from 22 to 32 mm., and expanse of wings from 42 to 55 mm., the females being usually in both respects larger than the males. Top of the head triangular, the blunt apex being forward. Antennæ filiform; longer in proportion in the male than in the female. Pronotum somewhat narrowed in front; lateral ridges nearly straight; median ridge prominent; transverse furrow anterior to the middle: hind margin bluntly rounded. Elytra more or less tinted with brown, especially at the apex; a yellow streak along the basal two-thirds of the costal region; in other parts nervures brown. Wings brownish at the tip; more or less hyaline elsewhere; anterior nervures brown; hinder ones mostly colourless. Fore and mid legs brownish. Femur of hind legs carmine beneath, with an internal black streak; swollen junction of femur and tibia black; tibia yellow, generally with two black rings; spines black. Valves of the ovipositor elongate. The



W. J. Lucas del.

MECOSTETHUS GROSSUS, Linn.

(NAT. SIZE.)

general appearance of the living insect is yellowish-green and brown with crimson hind femora: immature specimens are often almost entirely rosy red.

Unfortunately there has been considerable confusion in the nomenclature of this species. Several specimens are in the British Museum Collection, in the Hope Museum at Oxford, and in the Dublin Natural History Museum, in each place labelled *flavipes*. This is due no doubt to Donovan, who gives a good figure of the species (Don. Nat. Hist. Brit. Ins. xii. p. 87, tab. 391), but applies to it Gmelin's name *flavipes*. Mr. H. N. Ridley's Kerry specimen was recorded as *Pachytylus cinerascens*, Fab., which error probably arose through his finding, either in Fisher's 'Orthoptera Europæa' or in Brunner's 'Prodromus der europäischen Orthopteren,' *Locusta flavipes* given as synonymous with *Pachytylus cinerascens*—a mistake of both authors, the second probably being due to the former (vide Eland Shaw, Entom. Mo. Mag. 1889, p. 412; 1893, p. 20).

12, Caversham Road, Kingston-on-Thames:
June, 1899.

TWO NEW SPECIES OF CHARAXES.

BY THE HON. WALTER ROTHSCHILD, Ph.D.

1. CHARAXES NORTHCOTTI, sp. nov.

♂. Allied to *C. kheili*, Staud. Fore wing on the upper side with a series of heavy marginal pale blue patches; a post-discal series of spots, of which the upper four are small and more or less white, the others larger and pale blue; a discal series of five spots down to lower median vein, the upper two white shaded at edges with blue, the posterior three pale blue, the second and third the smallest, the third closer to the cell than the others; two dots at apex of cell, separated from one another by the disco-cellular vein. On the hind wing there is a large discal pale blue patch from upper radial vein to near anal angle, about 6 mm. wide anteriorly, extending basad to near base of upper median branch, with a small spot in front, its outer edge somewhat concave between veins; white submarginal spots small, linear, much shaded with blue; admarginal spots large, pale blue. All the blue markings metallic. The under side does not present any obvious differences from that of *C. kheili*.

The series of discal spots on the fore wing and the large patch on the hind wing distinguish this species from all the allied ones.

Hab. Gambaga, northern territories of the Gold Coast, one male captured August 28th, 1898, by Major Northcott, to whom I have the pleasure of dedicating this fine species.

2. CHARAXES MADENSIS, sp. nov.

♀. Allied to *C. mars*, the female of which is figured by Oberthür in Bull. Soc. Ent. France, p. 194, f. 12 (1897); but differs in the white band of the blackish brown fore wing being wider and standing farther from cell; the inner edge of this band is deeply concave at the lower median vein; there is no separate post-discal series of spots on the upper side of the fore wing. On the hind wing, above, the white band is more sharply defined, much narrower, and all white; the blackish brown outer area is very much broader, the posterior patches at least four times the width of those of female *mars*, not separated from one another. On the under side the white scaling on the fore wing is anteriorly more extended than in the female of *mars*; the median black bars are more distal, the discal ones much feebler; the black submarginal spots of the hind wing are large and stand about 4 mm. from the edge of the wing. Length of fore wing 60 mm.

Hab. Mt. Mada, Buru, 3000 ft., August, 1898 (Dumas).

EMYDIA CRIBRUM: A REMINISCENCE.

BY G. B. CORBIN.

FROM my earliest collecting days *Emydia cribrum* has been a favourite species with me, but for several years past a limited power of locomotion has entirely prevented my visiting its particular haunts. When we consider the somewhat frequent, extensive, and all-consuming fires that periodically sweep over one or more of its favourite habitats, and this coupled with the greed of some collectors, it seems almost a marvel that the species has so far "held its own" in the comparatively limited area in which it occurs.

My first acquaintance with the species was in my schooling days—in 1860 or 1861, I believe—when I accompanied the Rev. Joseph Greene to the then famed "Parley Heath," where the insect was first discovered by Mr. Dale, and I recollect we took two or three specimens. Since then, I think I may safely say I have visited all the heaths for miles around, and some seasons have seen *E. cribrum* literally swarming in certain spots, and on particular evenings, for, although most collectors take it in the daytime, yet its natural time of flight is at dusk, or rather twilight, both morning and evening, and in the peculiarity of its abundance on particular occasions it displays a very marked characteristic of other Lithosiidæ; for who that has collected in the New Forest does not remember how *Gnophria rubricollis* sometimes swarmed on the tree-tops in the warm sunshine; or of an evening, in the riding of the same wood, *Lithosia griseola* var. *stramineola* was equally common; and formerly, but, alas! not

now, how *Gnophria quadra* answered to the call of the beating-stick as it was applied to the branches of the trees?

I have many times found the ova of *E. cribrum*, and on several occasions have "put them down" in likely looking spots in the Forest, especially in the northern parts around Godshill, &c., in the hope that my old friend the late Rev. H. G. W. Aubrey may have had the privilege and pleasure of establishing a colony of the insect near his residence; but I have known of no instance where the insect has been taken west of the Avon, and my endeavours to introduce it to the locality seem to have utterly failed. This statement, however, requires qualification, for in the current 'Entomologist' (*ante*, p. 150) my friend Mr. J. H. Fowler records finding a full-grown larva at some particular spot *in the Forest*; and I can confirm his statement, as I saw the larva, and, having compared it with preserved specimens which both of us possess in our cabinets, I think there can be no doubt about its identity. It is to me a most interesting "find," as I have collected so many times in different parts of the Forest, but never came across a specimen of the insect there in any stage.

In the interesting article from the pen of Mr. Banks (Entom. xxxii. 101-103) there is certainly a mistake in supposing that *E. cribrum* has not been bred from British larvæ. Mr. Fowler's two articles (Entom. 1892, p. 269, and 1894, p. 307) are sufficiently explicit, and must have been overlooked.* As to the "life-history" of this particular species, surely it has been fully described in some of the older entomological journals. I have sent away some hundreds of the ova to different friends and correspondents, and amongst others I may name the late Rev. J. Hellins, of Exeter, and Mr. W. Buckler, of Emsworth—an artist of no mean merit—who I am almost sure reared the insect more than once; and if the larva is figured in his work on larvæ—which, I believe, is now being published by the Ray Society—it would be interesting to know if it was from some of the ova or larvæ I sent him. I reared the insect myself in 1864. At that time the entomological portion of a little unpretending publication named 'Young England' was conducted by the late Mr. Howard Vaughan, who asked me to send him a note on *E. cribrum*, and in response I sent him a short article, in which I briefly described what I then knew of the species; and I make the following extracts from it:—

"The eggs are deposited round the stems of the common heather in the neatest possible manner, and when first laid they are of a bright golden colour, and in this respect may be mistaken for a yellow species of lichen which often grows around the stems of that plant; the eggs do not retain their yellow hue

* *Vide* p. 185.—ED.

very long, but change to a purplish grey before they are hatched, which occurs in about a month or six weeks; and when the larvæ just emerge they are very small, black, and hairy; they then feed, but do not increase in size so rapidly as some other larvæ, and require to be safely secured or they will make their escape. . . . When more than half-grown they hibernate for the winter amongst their food, feeding again and completing their metamorphosis in the following spring. . . . The larvæ which I found in the spring were black, studded with tubercles, bearing short tufts of black bristly hairs, and a dirty white stripe down the back. Other specimens have been reared in which the colour of the body has been blackish red, and a dingy pink, and one of which had the pale stripe down the back of a slight greenish tint. . . . The larvæ, when full-grown, change to pupæ in an upright position in the midst of a tuft of their food (*Aira cæspitosa*). . . . The moth emerges in June and July, but Mr. Dale writes me, 'I have taken the female of *cribrum* as late as August.' . . . As regards the insects themselves, they usually fly in the evening, but may sometimes be 'put up' in the day. When settled they are scarcely visible at a little distance, from their slender form when at rest, as the wings are wrapped more closely around the body than any other Lithosiid with which I am acquainted; also, when taken in the net, they fall to the bottom, feigning death. They never fly very high—usually about two or three feet from the ground—and their flight is generally very easy, rising and falling in undulations very similar to the Phryganidæ. This peculiarity of the insect while on the wing renders it well known to those who have had the pleasure of taking it. . . . When struck at with the net, and missed, they either fly off at increased speed, or else fall down amongst the tangled heather-stems, being then most difficult to find, as they contract their legs, fold their wings closely, wrap their antennæ beneath them, and slide about in such a manner that to capture them is almost an impossibility; but should success attend the efforts made in such a case, the insect is found scarcely worth the trouble of setting, from the mutilation its wings have sustained."

It has been supposed that *E. cribrum* is double-brooded, but all my experience points in the opposite direction. I have taken it as early as May 23rd, and an occasional female as late as the first week in August; but its time of appearance in any given year depends upon whether the season is forward or backward. I believe there is a development of a succession of broods, and that members of the same family are developed all about the same time. Sometimes of an evening you find the insect commonly over a particular area, and the next time you visit the spot it is scarcely to be seen, but you get it at some distance equally abundant; whereas in a week hence the first locality is

the most productive. The mere fact of the eggs being laid in June, and remaining in the same state for a month or more, would be a factor against a second brood, even in an exceptionally warm season, and a moth taken at the end of July may, I think, be safely called a late specimen of the only brood produced in one season.

It must be remembered that these observations were made many years ago, but in principle they agree very closely with Mr. Fowler's more recent remarks, from the fact that both are taken directly from nature.

On one occasion I recollect having a female of the species emerge, and thought I would try "sembling," and with this idea put her in a willow chip-box, which I placed in my coat-pocket, and, having arrived upon the heaths, forgot all about the box and its contents until the unusual abundance of the moths brought to my recollection the imprisoned lady love; no less than three males were in my pocket, and several others were underneath my coat in various directions. I placed the box on a low furze-bush, and netted thirty males in a less number of minutes; and I may say, without the least exaggeration, I could have taken several hundreds if I had wished to do so. The next evening I tried the same experiment on the same ground, but the attractive charm had then vanished; but I am quite sure that very few people, even entomologists, could have believed in the extreme abundance of the insect on such an occasion as the previous evening unless they had seen it. My experience points to one strange peculiarity about the species, *viz.* that although the ova are usually, if not invariably, laid on the heather, the larvæ will seldom take to it as a food *in confinement*; but, as Mr. Fowler remarks, his were reared upon common groundsel, and those who have found the larvæ know very well that they are sometimes to be taken where the heather is very sparse, although most of the works where the larva is described give heather as the food-plant.

In penning these remarks it brings to one's mind and memory how many honoured names have passed away within a comparatively few years, and leaves a regret that some of the kindness and geniality of their lives seems to have died with them, as far as entomology is concerned. An interesting and somewhat conspicuous figure in my recollection of *E. cribrum* is poor old Charles Turner, "the beetle man," whom I often met in my rambles of an evening, generally returning from his toilsome day's work upon the heaths, usually with a leafy branch of some sort in his hand to drive the tormenting flies from his sunburnt face, whilst he held a conversation with "the missus," who trudged along the dusty road some paces behind her spouse. Doubtless some of the present readers of the 'Entomologist' may recollect a few pleasant days or hours spent in pursuit of

E. cribrum, but few will have realized more pleasure, or had greater facilities for its capture, than I have had in the past.

Ringwood : June 7th, 1899.

PHYSIOLOGICAL EXPERIMENTS UPON *DYTICUS*
MARGINALIS, LINN.

BY HENRI GADEAU DE KERVILLE.*

Dyticus marginalis lends itself very well to physiological experiments, as it is very hardy and endures captivity excellently. For nourishment, small pieces of meat of some kind are sufficient. Its gluttony is such that not only does it devour those of its kind who have expired, but even attacks—at least in captivity—those in whom a little life yet remains. I have observed that it gnaws the posterior extremity of the elytra first of all, then the integument of the postero-inferior part of the abdomen, to eat the contents.

I have remarked, as has also our learned colleague Dr. Maurice Régimbart,† that a male of *D. marginalis* can fecundate two or three females in a relatively fairly short time; in one of my experiments a male fecundated three females in less than three weeks.

Desirous of ascertaining whether the males, possessed by an imperious sexual desire, would copulate with a dead female of their species—a fact observed in other insects—I left dead females with very vigorous males (a couple in each bowl) for some weeks without observing, on the part of the last, any amorous propensity; these males manifested upon them their voracity, however, to a slight degree. I killed the females a short time before the experiments by means of alcohol or chloroform, and left them for half an hour beneath a stream of running water to rid them of any odour from the destroying liquid. I also kept males only for some time in small basins, to see if they would attempt copulation; I have not observed even an attempt at pæderasty.

It is, however, the action produced upon *Dyticus* by cold, heat, deprivation of atmospheric air, by chloride of sodium and of magnesium, that I have particularly studied. A number of more or less analogous experiments have already been made by eminent physiologists, among them Paul Bert, Léon Frédéricq,

* 1897, Bull. Soc. Ent. France, pp. 91-7 (translated by G. W. Kirkaldy).

These experiments were made upon fifty male and female individuals of *Dyticus marginalis*, L., which were obtained for me by my friend Mr. Paul Noel, the zealous director of the "Laboratoire régional d'Entomologie agricole" of Rouen.

† Ann. Soc. Ent. France, 1877, p. 268.

Félix Plateau, Paul Reguard, Charles Richet, Henry de Varigny, Emile Yung, &c. I ought to add that all my experiments have been conducted with healthy males and females of *Dyticus marginalis*, and I have registered the temperature of the water with a Centigrade thermometer.

Dyticus marginalis possesses great vital endurance, and, in making experiments upon it, it is very important not to allow oneself to be deceived by its apparent death. In fact, I have had occasion to observe several times in the course of my experiments that individuals which appeared dead, and for several days manifested their existence only under the influence of mechanical stimuli, were able nevertheless to return to life.

Action of cold.—Everyone knows that the ponds and ditches of northern countries which *Dyticus marginalis* inhabits are covered, during the cold season, with a mantle of ice more or less thick, which remains sometimes for weeks without melting, though without at all occasioning the death of the Dytici. Do these insects, despite the lowering of the temperature, retain their normal activity, and consequently respire as actively; or, on the other hand, does the cold lessen their activity to a greater or less degree, as in the majority of insects, which then consume much less oxygen?

The fact that the Dytici which live in water of which the temperature is only 3° or 4° are quite as lively as if it was at its habitual temperature of the warm season—a fact which I have observed several times—leads one to think that at the temperature of melting ice the activity of these insects remains identically, or almost identically, the same. I wished to have the experimental proof of this. I therefore placed the Dytici in a large glass bowl, which I filled entirely with pieces of ice, and placed in a situation where the temperature was low, so that the ice melted slowly. Four days after there was still a small fragment of ice in the bowl, which proves that the temperature of the water had remained very near freezing-point. During these four days my insects showed themselves quite as active as at the mean temperature of the water in which they live. I obtained the same result by placing other examples of *D. marginalis* in a bowl filled with water which I surrounded completely with bits of ice, and left outside for two days during the cold. The congelation of almost the whole surface proved to me that the water in which my insects were swimming was at a temperature sensibly equal to 0°.

To sum up, the temperature of melting ice does not render *Dyticus* at all torpid, and consequently, when the surface of the water where they live is not completely frozen, these Coleoptera consume the usual quantity of oxygen.

Action of want of atmospheric air.—What happens when the surface of the pond is frozen over its whole extent, so that the

Dytici cannot come there to seek a fresh provision of atmospheric air? Must we admit that they have the faculty of living and of moving during very long periods, while consuming only the provision of air that they have stored up? A number of terrestrial insects, it is true, resist asphyxia for some time when they are kept submerged under water. They consume the air stored up in their tracheæ, and, as they are then more or less torpid, their respiration is less active, and, correspondingly, their provision of air is exhausted more slowly. But, to be exact, this resistance lasts for a few days at the most, and there are many ponds and ditches containing Dytici where the surface remains entirely frozen over for weeks. I was anxious to experiment upon the resistance of *D. marginalis* against asphyxia. I therefore disposed, at different times, some male and female Dytici in such a manner that they could swim freely, but, by means of a wire-grating, were always submerged. My experiments show that in general—there are, of course, very numerous, but more or less insignificant individual variations—the Dytici which cannot come to the surface to renew their store of air are, at the end of one to three days, more or less torpid, move slowly, sometimes even appear dead, and, after a duration of two to five days (according to the endurance of individuals), they have very generally ceased to live. Eight days are, I believe, the maximum of the duration of resistance of *D. marginalis* against asphyxia.

I observed that if the elytra and wings of *Dyticus* are removed, or if only the posterior half of the elytra and wings are cut away, the insect ascending freely to the surface of the water, it usually dies at the end of one to three days, for in this condition the air penetrates only very insufficiently, or even not at all, into the tracheæ. On the other hand, the duration of resistance against the want of oxygen is prolonged when one removes from each individual the elytron and wing on one side only. In fact, the insect, on returning to the surface, stores up a provision of air under the remaining wing and elytron; but this is done only with difficulty, and the respiration operates more or less badly, and always so inefficiently that death ensues at the end of a few days.

One can, I believe, deduce from these experiments that in the ponds and ditches in which the surface is completely frozen the Dytici habitually preserve their normal activity, and that they find the atmospheric air indispensable to their respiration—under the mantle of ice, under the leaves, amid the branches of plants, under stones at the margins of streams, &c. One may suppose also that many individuals lessen their activity in consequence of an insufficient quantity of oxygen for their respiration; but I am convinced that if they were completely deprived of atmospheric air, all the Dytici in a pond or ditch would, at the end of eight days, entirely cease to live.

Action of heat.—In the study of this action upon *Dyticus marginalis*, the experiments must be separated into two groups: those in which the temperature has been increased or lowered gradually, and those in which the Dytici have been plunged suddenly from cold water into hot water, or *vice versa*.

From repeated experiments I have assured myself that by gently increasing the temperature of the water in which the Dytici are found one can bring it to temperatures of 30°–35° without the insects appearing greatly inconvenienced. To afford a basis of calculation, I will take the duration of about an hour to make water of 5° pass to a temperature of 30° to 35°. Up to 30° the Dytici always retain their usual activity. It is from 30°–35° that they begin to suffer more or less strongly from the temperature of the water: some swim more rapidly than ordinarily; others try to leave the medium in which they are placed; others become more or less motionless. Be that as it may, I have kept Dytici in water whose temperature was maintained at 35° for more than two hours; and I do not doubt that, without serious inconvenience to my insects, it would have been possible for me to prolong the experiment for hours more, perhaps even for days, with individuals of strong resisting powers. From 35°–40° the Dytici perish at the end of an obviously variable time. At 40° they succumb usually at the end of about four to ten minutes. At 50° their death ensues between one and three minutes, and above 50° they always die very rapidly. If, after having gradually increased the temperature of the water up to a maximum of 40°, one then lowers it little by little to near its original temperature, the Dytici endure the experiment perfectly.

If, instead of working by a progressive elevation and lowering of the temperature, one suddenly plunges into water registering 30°–35° C. some Dytici which were in water at about 5°, these insects, as I have observed, always swim more or less rapidly for several seconds, after which they become motionless at the end of one or two minutes at the most, then appear dead; but little by little they return to life, and regain all their activity at these temperatures, which are very high for these insects.

If the Dytici be plunged suddenly into water at 40°, 50°, or upwards, the same phenomena are produced; but it is very evident that the rapidity of immobility and death is in direct proportion to the elevation of the temperature. According to my experiments, the Dytici that one passes without transition, from water at about 5° to water at 40° or 50°, are quite dead after remaining ten minutes in water at 40°, and five minutes in water at 50°.

If, instead of passing the Dytici at once from cold water to hot, one suddenly plunges into cold water, say, at 5°, Dytici accustomed to water possessing a temperature of 30° to 35°, in which

they were very active, one observes precisely the same effects as in the sudden passage from cold to hot water. These insects usually swim for a few seconds, after which they become motionless and appear dead; then little by little they stir all their legs, and finally recover their normal activity in this water at 5°.

To be precise, my experiments upon the action of heat on *Dyticus marginalis* show that temperatures of water very near 40° are those in which this coleopteron can live only for a more or less short time, and also that the immobility of the Dytici, suddenly very active, is manifested in the same manner in the sudden passage from cold to hot water, or *vice versa*.

Action of chloride of sodium.—The endurance of *Dyticus marginalis* in saline water is very great. In fact, I have kept in 1000 grammes of water containing 50 grammes of sodic chloride—that is to say, 5 per cent.—some Dytici which died only seventeen days after, others having succumbed after a shorter lapse of time. Now, 5 per cent. is twice the quantity of marine salt contained in the water of the temperate parts, at least, of the Atlantic Ocean. Moreover, the Dytici were dead only at the end of nine days in water containing 10 per cent. of sodic chloride. It should be added that during the first third of the duration of these experiments my Dytici appeared very little incommoded by the surrounding medium.

I observed that in water containing 5 per cent. of chloride of sodium, Crested and Palmated Tritons, both species adult and very vigorous, were dead at the end of four hours, and that, in water containing 10 per cent. of it, they succumbed in less than an hour, the Crested Tritons dying much less rapidly than the Palmated Tritons, which are smaller.

Action of chloride of magnesium.—I wished also to note the injurious action upon *Dyticus* of this salt, which in a general manner comes immediately after sodic chloride, in point of view of quantity, in the composition of the water of the seas of our planet.

The experiments which I have made to this end permit me to say that the resistance of *Dyticus marginalis* to the action of magnesian chloride is sensibly the same as its resistance to sodic chloride.

In water containing 5 per cent. of magnesian chloride, some individuals perished only at the end of nineteen days, and in water containing 10 per cent. of it the Dytici died only after living nine days. I ought to add that other individuals succumbed there in a much shorter time.

Some very vigorous adult Palmated Tritons were quite dead at the end of an hour in water containing 5 per cent. of magnesian chloride, and, what goes without saying, more rapidly still in water containing 10 per cent.

In my opinion the great endurance of *Dyticus marginalis* in

water containing very large quantities of chloride of sodium or of magnesium, in which it is placed without any transition—an endurance due without doubt largely to its protective integuments—permits of the supposition that one would be able, working gradually, to keep it living continually in brackish water when it is adult. Perhaps one would even arrive, in habituating them progressively during a series of generations, at the point of making it accomplish therein the entire cycle of its existence? This opinion finds great support in the fact that a closely allied species, *D. circumflexus*, F., normally inhabits both fresh and brackish water.

Finally, I much wish that entomologists would make similar experiments upon *Dyticus marginalis*, to see if their results agree entirely with mine, and upon other aquatic insects with trachean respiration, for such experiments, made with precision, are useful for the knowledge of the biology of the insects.

BERGSTRESSER ON THE CLOUDED YELLOWS.*

THE "goats-clover butterfly," or "orange-yellow hay butterfly," *Papilio hyale*, L., is a light concolorous Danaid. The name "goats-clover butterfly" (geisstaudenfalter) is made use of by the Viennese entomologists, because the Austrian goats-clover (geisklee) or trefoil forms the food-plant of the caterpillar. This caterpillar may be classified amongst the side-striped larvæ (seitenstreif-raupen), of which the above mentioned "Christ's thorn butterfly" (kreuzdornfalter), *Papilio rhamnii*, L., is an example. On account of its colour it is compared to the orange, and is called in France the "hay butterfly," because it makes its first appearance in the hay season towards the end of summer.

Our illustration (Plate II. figs. 3 and 4) shows the upper and under side of the female. As this butterfly would often be confused with the next following, *P. palæno*, L., Herr Esper gives an accurate description of it. The ground colour is orange-yellow in the upper wings. These are also, in the middle towards the anterior edge, marked with a black spot. On the outer edge it has a broad blackish brown border, with detached bright yellow spots. The fringe is always rose-coloured. In the smaller reddish yellow ground of the lower wings a beautiful orange-yellow spot stands well out. The border is also dark here, as in the upper wings, and likewise distinguished by bright yellow spots; but it is not quite so broad, and does not extend so far towards the end. On the inner edge the wings are bright yellow, and along the margin greenish. The body is coloured greenish

* Translated from Bergstrasser's 'Nomenclatur,' 1779, by Mrs. Brown, Rosefield, Elgin.

grey, but on the flat under-portion bright yellow. The neck, head, and antennæ are beautiful rosy red. In the male the bright yellow spots in the border are wanting, and the fore wings are more rounded. Then in the female the tip runs out into a somewhat lengthened projection.

This insect lives in warm countries, such as the Fatherland. It is not found in Sweden and Denmark, but appears in Africa and America. It is caught towards the end of summer, and often even far into harvest, in our fields and meadows on the late flowers, by which it is nourished, and also in the open and higher situated regions, although it does not reach these so frequently as the following one.

The history of this butterfly yet requires many additions before its egg, caterpillar, and chrysalis, with all the facts pertaining to them, are fully described.

The "crown-vetch butterfly," or "sulphur-yellow hay butterfly," *Papilio palæno*, L., is likewise a light concolorous Danaid. The systematical mistakes which have hitherto been made regarding this butterfly have already been clearly brought out by Herr Esper. It is called the "crown-vetch butterfly" (*kronwickenfalter*), because its caterpillar is fed on the variegated crown-vetch, the *Coronilla varia* of Linné, as the Viennese entomologists specify. It also seeks its nourishment from the *Pteris aquilina*, as Linné ascertained; so the butterfly might still have been named from the eagle-herb (common bracken) without the crown-vetch. It is called "hay butterfly," because it is found in this country in great numbers in June and July. In September it still flies in woods, over heaths, and meadows.

It may be distinguished from the former butterfly by placing the two in apposition, as the coloration of both is different. Of the caterpillar there is no drawing at present. The leading entomologists reckon it amongst the side-striped larvæ.

In the female the colours are paler, and the male is somewhat smaller. It is thus difficult to distinguish them from each other, especially as the ground colour and the bordering of the wings are sometimes lighter or darker without distinction of sex.

NOMENCLATURE OF LEPIDOPTERA.

IN a bulky volume, entitled 'Proceedings of the Fourth International Congress of Zoology,' recently published, there are among the papers one or two relating to Entomology, and two appendices. One of these latter deals with the subject of nomenclature of Lepidoptera, and presents the opinions of several eminent lepidopterists upon some very difficult matters chiefly in connection with the law of priority.

Sir George Hampson, who originated the correspondence, propounded the following set of questions:—

1. Whether the tenth or twelfth edition of Linnæus shall be taken as the basis of zoological nomenclature?
2. Is it necessary to add any other pre-Linnæan authors' names to the list of those whose works were accepted by the Committee of the British Association?
3. Are the genera of Hübner's *Tentamen* to be accepted or not? If accepted, what date is to be assigned to them?
4. Are the genera of Hübner's *Zuträge* to be accepted or not?
5. Are the genera of Hübner's *Verzeichniss* to be accepted or not? If accepted, what date is to be assigned to them?
6. Whether the terminations *iida*, *iina*, or *iada*, *iana* are to be employed?
7. By what process is the type of a heterotypical genus to be ascertained?
 - a. What is the type of *Phalana*, L.?
 - b. What is the type of *Tortrix*, L.?
 - c. What is the type of *Tinea*, L.?
 - d. What is the type of *Alucita*, L.?

Show how the result is arrived at in each instance, and discuss the value of the names *Phalana*, L., and *Tortrix*, L., giving the reasons for your conclusions, and stating on what published or unpublished rules you rely.

There are three other questions; but, as these arise out of those referred to above, there is no occasion to repeat them here.

There is no doubt that these enquiries are of considerable importance, and there is equally no doubt that they, together with the replies thereto, will have a world-wide circulation through the medium in which they appear. It has occurred to us, however, that the area of publicity might be extended by reprinting in this Journal the opinions of some of the entomologists consulted, particularly so far as concerns questions 1, 3, 4, and 5.

1. REPLIES IN FAVOUR OF THE TENTH EDITION OF LINNÆUS (date 1758).

Lord Walsingham writes:—

“The tenth edition, 1758, should be adopted. The British Association Committee, in § 1, established the law of priority; and in § 2 they wrote:—

‘The binomial nomenclature having originated with Linnæus, the law of priority in respect of that nomenclature is not to extend to the writings of antecedent authors.’

“Strickland's rules were drawn up in 1842, and adopted by the British Association at Birmingham, 1865 (*vide* Selater, pp. iii and 23). In the original draft no edition of Linnæus was selected (Strickland having left a blank space for the insertion of the edition to be

adopted); the twelfth edition was inserted by the Manchester Committee in 1842 (*vide* Sclater, p. 24). 'This was not done as being the first in which the binomial nomenclature had been used, as it commenced with the tenth; but as being the last and most complete of Linnæus's works, and containing many species the tenth did not.'

"The Committee having admitted that the binomial nomenclature originated with Linnæus in the tenth edition, 1758, and having laid down the principle of priority from *the inception of the binomial nomenclature*, illogically stultify § 1 and § 2 by adopting the twelfth edition, 1766-68. In this they cannot be followed; their action was inconsistent with the principles they advocated."

Mr. W. F. Kirby writes:—

"I hold that the tenth edition of Linnæus should be accepted, for the following reasons:—

- (a) The binomial nomenclature was fully established in it.
- (b) The binomial nomenclature was accepted and employed by many eminent writers between 1758 and 1767.
- (c) The twelfth edition was not a new work, and made no new departure. It is only a revised and large edition of the tenth.
- (d) Linnæus's own species, described in the twelfth edition, cannot be properly elucidated without reference to works of his own, and of other writers, published between 1758 and 1767.
- (e) The number of alterations in nomenclature necessitated by going back to 1758 will not be so great as to produce serious inconvenience."

Prof. Fernald (U.S. America) writes:—

"I am positively in favour of regarding the tenth edition of Linnæus as the basis of zoological nomenclature, for the reason that in this edition of the 'Systema Naturæ' the author has not only given us a distinct idea of the binomial system of nomenclature, but has also consistently used it; so that, if the latter editions of his work had never appeared, there is no question in my mind but that the system would have been adopted by later writers, just as was done by Scopoli and Artedi. All agree that Linnæus conceived this binomial idea, and that later writers perceiving its decided advantages adopted it. If it is claimed that it was not presented clearly enough in the tenth edition, and for this reason the twelfth edition should be taken as the starting-point, but that the works of Scopoli and Artedi using this system clearly should be recognised, why then do not those who argue in favour of the twelfth edition propose to have it start from 1763, the date of Scopoli's 'Entomologia Carniolica'?"

Prof. Smith (U.S. America) writes:—

"Logically the tenth edition of the 'Systema Naturæ' should be taken as the starting-point. In this work the binomial system is consistently applied to all classes of organisms, and may be said to have its real beginning.

"The question is not a new one in the United States, and the almost universal tendency is to make the tenth edition the starting-

point. Canon xiii. of the 'Code of Nomenclature' of the American Ornithologists' Union covers this point, and there the reasons for its adoption are given at length. They seem convincing to me, and this code is generally adopted by our entomologists. I have adhered to this in my 'Catalogue of the Noctuidæ of Temperate North America,' and in all my monographic papers."

Four other gentlemen, *viz.* Aurevillius (C.), Grote (A. R.), Snellin (P. C. T.), and Staudinger (O.), intimated that they preferred to adopt the tenth edition, and, with certain reservations, Dr. Scudder concurred in Lord Walsingham's remarks; Sir George F. Hampson and Mr. Meyrick at first inclined to the twelfth edition, but finally they agreed to accept the tenth. It would seem then that all the entomologists to whom this question was submitted have pronounced in favour of the tenth edition of the 'Systema Naturæ' as a starting-point.

(To be continued.)

NOTES AND OBSERVATIONS.

EMYDIA CRIBRUM IN THE NEW FOREST.—The larva which I mentioned in last month's issue of the 'Entomologist' was that of *E. cribrum* all right; I have already taken over fifty of the perfect insects, and there are still many left upon the wing in the New Forest. The series caught are very much whiter than those I get from Verwood; some are almost white, and none approach the dark forms obtained in the other district. I think this interesting, as it seems to me to be indigenous to the locality, and not an introduction. I should like to know whether anyone has ever taken this species in the New Forest proper before.—J. H. FOWLER; Ringwood, June, 1899.

EMYDIA CRIBRUM.—Mr. J. H. Fowler's remarks on this species (*ante*, p. 150) have greatly interested me, and he is quite right in supposing that when writing my notes (*ante*, pp. 101-3) I overlooked his observations recorded in *Entom.* xxvii. 307-8, which I much regret having done. I am extremely pleased to hear that he has discovered a locality for the species actually *in* the New Forest. This interesting fact does not of course affect my previous statement, based on information given me by the Rev. O. P. Cambridge and corroborated by Mr. George Gulliver (both of whom knew Mr. Bond intimately, and used frequently to accompany him in his expeditions in search of *E. cribrum*), that the late Mr. Frederick Bond, on whose authority the published locality for the insect was given as the "New Forest," used this rather misleading term to denote the locality near Ringwood where he always worked for it, no one in his time knowing of its existence in the New Forest proper. To this day the resident collectors in the New Forest take all their specimens of *E. cribrum* near Ringwood, and to the best of my belief no one but Mr. Fowler has ever met with it within the limits of the Forest itself.—EUSTACE R. BANKES; The Rectory, Corfe Castle, June 19th, 1899.

LOCUST EXTERMINATION. — The following account of the successful use of Locust Disease Fungus is published in 'The Agricultural Journal' (xiv. p. 460), which is issued by the Department of Agriculture, Cape of Good Hope. Writing from Trapper Valley on March 18th, 1899, Mr. J. H. Benn says:—

“ Since returning to this district I have infected nearly 250 separate swarms of locusts. On most farms there are numbers of distinct swarms, that is, batches which have sprung up from various egg-centres, and until the flying stage is reached they do not seem to amalgamate into very large swarms, nor do they travel very far, as there is plenty of food for them in this stage. The locusts on which I am working are about two to three months old, but in many places they are still hatching, so that all ages are to be met with. Probably the majority of locusts now in voetganger stage started hatching in January, and will pass into the flying stage in about two months' time. Unfortunately the weather has been so dry that on a number of farms I have required to infest the locusts more than once, but whenever there has been any moisture either in the evening or early morning the results have been most satisfactory. The method that I have adopted is to put the fungus, which has grown on the sugar and water, into a shallow dish, place this in the middle of a swarm of voetgangers, and with the aid of one or two boys drive the locusts in the direction of the dish. Very soon hundreds have passed through the infected material, and those that have been unable to get out I carefully remove and place on some green stuff, mealie tops, etc., at the same time sprinkling some of the solution over the green food. If the weather is favourable, the locusts start dying on the fourth, fifth, or sixth day, but the length of time that elapses before the fungus begins to take effect depends entirely on the amount of moisture in the atmosphere. In some swarms that I have been able to watch personally the fungus has not started to kill till the eighth day, and in one remarkable case at Bathurst I put a boy on to watch where the locusts went. They travelled about 300 yards from the place that I infected, but did not start dying until the tenth day, and on the fourteenth day the flowers of the mealies, amongst which the locusts were, became simply black with the dead voetgangers. They always seem to make for the highest point when they are dying; in this case they were in such numbers that many of the flower-stalks were broken by their weight.”

We understand that supplies of the Locust Disease Fungus may be obtained from the Director of the Bacteriological Institute, Graham's Town, at a cost of sixpence per tube by all residents in the colony who may require it. Outside the colony applicants will be required to pay extra postage.

RESTING POSITION OF *HESPERIA TAGES*.—Sixteen years ago I figured and described in the 'Entomologist' the moth (*Noctua*)-like resemblance assumed by this butterfly while at rest. A further note on the subject may be worth recording as an example of the power of mimicry and discrimination which this species undoubtedly possesses to a very acute degree for the purpose of protective resemblance. On May 30th last, between 5.45 and 6 p.m., my wife and I found fourteen specimens of

H. tages which had just settled down for the night upon dead flower-heads of knapweed on part of a bank for a distance of about 150 yards; nine were found within exactly ninety yards, and on one dead plant there were three individuals; but the particular point of interest is that all fourteen specimens were settled in exactly the same position, *i.e.* with their backs to the sun, which was shining brightly, heads uppermost, and wings folded down, wrapping over the dead, chequered, brown, weather-worn flower-heads, which form a very remarkable similarity to the butterflies; a fact which I do not think it is too much to say the insects appear to be fully aware of, as we frequently touched and attempted to dislodge them, which merely had the effect of making them settle down all the closer. We were unable to find any at rest on any other plant, although we carefully searched the mixed vegetation growing on the bank.—F. W. FROHAWK; June, 1899.

CAPTURES AND FIELD REPORTS.

COLLECTING AT BETTWS-Y-COED, NORTH WALES.—During a few days' stay here at the beginning of this month (June), I found Lepidoptera very plentiful. Among Noctuæ, at sugar, the commonest were *Grammesia trigrammica*, *Acronycta runicis*, *Thyatira batis*, *Gonoptera libatrix*, *Phlogophora meticulosa*, and *Triphana promuba*. I also took *Euplexia lucipara*, *Xylophasia rurea*, *Noctua plecta*, *Agrotis exclamationis*, *Aplecta prasina*, *Hadena thalassina*, *Cucullia umbratica*, *Odontopera bidentata*, *Abraxas ulmata*, *Melanthia albicillata*, *Larentia viridaria*, *Melanippe montanata*. A lady gave me a perfect specimen of *Amphidasys betularia* var. *double-dayaria*, which she found lying dead on a mountain path. I also saw *Macroglossa stellatarum* at rhododendron blossom. *Pieris brassicæ* was out in numbers.—F. D. BLAND; June 19th, 1899.

EXTRAORDINARY ABUNDANCE OF MACROGLOSSA STELLATARUM.—From June 4th, up to the time of writing, *Macroglossa stellatarum* has been observed here in the utmost profusion, attracted principally to the blossoms of lilac and wallflower; as many as six have been noticed hovering over a lilac tree at one time, and, judging from the reports which reach me from all parts of the town, there must be many hundreds of the insect on the wing. *M. stellatarum* is an insect which is seen occasionally, most seasons, in this locality: but why it should have been almost entirely absent in 1898, and one of our commonest moths in 1899, is a problem which it would be very instructive to have explained.—JAMES C. HAGGART; 58, St. Andrew Street, Galashiels, June 11th, 1899.

VARIETY OF EUCHELIA JACOBÆÆ.—On the 19th inst. my son, Arthur Basset Hearle, captured in an old garden at Brockhurst Cottage, near Gosport, a female specimen of *E. jacobææ* in which the crimson colour was replaced by bright yellow. This I believe to be most unusual. The insect is a little smaller than the ordinary type.—PARKINS HEARLE, Lieut.-Colonel; 12, Foster Road, Alverstoke, June 21st.

DEILEPHILA LIVORNICA IN THE ISLE OF MAN.—A specimen of *D. livornica* was taken by me on Douglas Head on May 23rd last, as it was hovering over the flowers of *Selene maritima*. It is in splendid condition

and measures three inches from tip to tip. Another example was taken by Mr. William Garrett, of Douglas, on the 12th, in the same locality. The weather has been bad here, and I have not been able to collect as I had wished to have done.—THOMAS CRENNEL; 6, St. George's Terrace, Douglas, Isle of Man.

VANESSA CARDUI IN 1899.—On May 28th I saw a specimen of *V. cardui* at the Black Pond, Esher, and I think that I have seen another since, but the second example was on the wing.—W. J. LUCAS; Kingston-on-Thames. *V. cardui* was common in the Broads district near Lowestoft early in June, but the specimens taken were in poor condition.—J. PREST; Broad Street, Teddington.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—June 7th, 1899.—Mr. G. H. Verrall, President, in the chair. Mr. Edgar Greenwood, of Frith Knowl, Elstree, Herts, was elected a Fellow of the Society. Mr. J. J. Walker exhibited, on behalf of Mr. G. F. Mathew, R.N., a number of interesting Lepidoptera, chiefly from the Mediterranean region, and including amongst others the following:—Examples of *Thais polyxena*, Schiff., var. *ochracea*, Staud., having an unusually deep and rich colour, bred from larvæ found at Platea, Greece; male and female of *Thestor ballus*, Hb., from Alexandria, taken on 23rd Jan., 1898, the male remarkable in being largely marked with orange on the upper side of the front wings; unusually large specimens of *Lycæna baton*, Berg., from Vigo, N. Spain; and a singular aberration, from Corfu, of *Melitæa didyma*, Ochs., with central band of black spots very strongly marked on both wings, the other spots being obsolete and the ground colour pale fulvous. Colonel Yerbury exhibited the pupa-case of a Hymenopterous insect which appeared to be parasitic in the weevil—*Barynotus mærens*, Fab. Dr. Chapman showed a large Ant-Lion-larva from Cannes, probably that of *Acanthaclisis occitania*; it was one of those that do not make pitfalls. Mr. E. E. Green exhibited a teratomorphic specimen of a zygænid moth, *Chalcosia venosa*, Walk., which he had found at rest on a leaf, at Udagama, Ceylon, in October 1898. In this specimen four wings were present on the left side, the hindmost being almost as fully developed as the normal hind wing on the right side, while the other three appeared to be attached to the meso-thorax. He also showed larvæ and pupæ of insects in air-tight glass tubes in which a little cotton wool, sprinkled with formalin, had been placed. The specimens, which had been thus preserved for nearly two years, had lost little of their original colour or brilliancy. Mr. Gahan exhibited pupa-cases of a Longicorn beetle, *Plocederus obesus*, Gah., which were remarkable in being composed almost wholly of carbonate of lime. It was not known how the pupa-cases were fabricated, but presumably the larvæ must possess special lime-secreting glands. Mr. R. Mc Lachlan, F.R.S., read a paper on "A second Asiatic species of *Corydalis*," and exhibited the male type of the species described, which he proposed to name *Corydalis orientalis*. He said the first Asiatic

species of *Corydalis* was described and figured by Prof. Wood-Mason in 1884, the genus up to that time having been considered to be peculiarly American. Mr. H. J. Elwes, F.R.S., communicated a paper "On the Lepidoptera of the Altai Mountains"; and the Rev. A. E. Eaton a paper entitled "An Annotated List of the *Ephemerida* of New Zealand."—J. J. WALKER and C. J. GAHAN, *Hon. Secs.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*April 27th*, 1899.—Mr. A. Harrison, F.L.S., President, in the chair. Mr. Smith, of Tresco Road, Peckham, was elected a member. Mr. Drury, F.R.H.S., presented to the Society's collections a large number of the species of the smaller Lepidoptera. Mr. Ashdown exhibited several specimens of the earwig, *Forficula auricularia*, showing considerable variation in the shape and size of the forceps. Mr. Burr said that the example with unusually small forceps was a very rare aberration. Mr. Harrison, photographs of *Morpho epistrophis* taken at short intervals after emergence until the wings were fully expanded. Mr. Edwards, a male and four forms of the female of the polymorphic *Papilio memnon*, a very fine specimen of *P. segonaæ*, with the closely allied species *P. ulysses*. Dr. Chapman, several species of Psychids and their cases, *Lycæna orion*, *Setina aurata*, with strong black markings, *Gnophos variegata*, *Aicialia marginepunctaria*, &c., taken the first week in April at Locarno, N. Italy. Mr. Enoch, a specimen of the locust, *Acridium tartaricum* (*egypticum*), taken March 10th, 1898, at Wembley Park. Mr. Malcolm Burr read a paper entitled, "Orthoptera, with special reference to British species." In a chatty manner he discussed the bibliography of the group, and remarked on the present backward state of our knowledge of it. He referred to the present workers and the work they were doing. The various sections and genera in the group were distinguished at some length and where possible examples were given from the English fauna. After giving many interesting personal observations made in various parts of Europe, he pointed out particularly the directions in which members could aid in the fuller investigation of this neglected order.

May 11th.—The President in the chair. Mr. J. A. Harrison, of Forest Gate, was elected a member. Mr. Turner exhibited a small printing apparatus, which he had received from Mr. King, of Glasgow, and which was admirably sufficient to print all ordinary locality labels. Mr. Edwards, a number of pupæ of *Hepialus lupulinus* from Blackheath. Mr. West, specimens of the aquatic Hemipteron, *Plæa minutissima*, from Blackheath. Mr. Tutt exhibited a number of lantern slides to illustrate the subject of "Mimicry" which he discussed from various points of view. Among the subjects illustrated and discussed were the European *Mantis religiosa*, *Euchloë cardamines*, *Amphidasys betularia*, *Kallima inachis*, *Limnas chrysippus*, and its mimic *Hypolimnas bolina*, a *Heliconius* and its Pierid mimic, *Papilio merope* and its polymorphic females which mimic forms of *Danaïs*, &c.

May 25th.—The President in the chair. Mr. Ashdown exhibited specimens of the two sexes of the Coleopteron, *Osphya bipunctata*, taken in May in Huntingdonshire, together with the two forms of the male. Mr. West, a specimen of the rare Hemipteron, *Drymus pilicornis*, obtained from moss at Box Hill. Mr. Edwards exhibited a considerable

number of species of *Cicadidæ*, chiefly from Borneo and India, and read notes on the group.

June 8th.—Mr. J. W. Tutt, F.E.S., Vice-President, in the chair. Mr. Adkin exhibited a series of *Boarmia cinctaria* from the New Forest, showing an unusual range of variation for that district. Mr. Main, a number of large and brilliant species of Coleoptera from the West Coast of Africa, including the remarkable *Rhina amphicollis*, which has the beak much produced beyond the insertion of the antennæ and covered with bristles. Mr. Sich, living specimens of *Ephestia elutella*, bred from maltins in Hammersmith. Also ova of *Hepialus lupulinus*, and gave details as to the changes of colour after deposition. They were exhibited under the microscope. Mr. Dennis, ova of *Gonepteryx rhamni* under the microscope. Mr. Edwards, a specimen of the hive-bee pest *Galleria mellonella*, and remarked on the damage so caused to beekeepers. Mr. Clark, ova of the freshwater fish parasite, *Argulus foliaceus*, and gave details as to its occurrence, the deposition of the ova, their changes in colour, and the manner of copulation. Mr. Adkin read a report of the field meeting held at Chatham on May 27th, under the guidance of Mr. Walker, R.N., F.E.S., and he also gave an account of the annual congress of the South-East Union of Scientific Societies, on the council of which he had been elected.—Hr. J. TURNER, *Hon. Rep. Sec.*

NORTH LONDON NATURAL HISTORY SOCIETY.—The annual Whitsuntide excursion to the New Forest took place as usual, the dates this year being May 19th to 22nd. On the whole, the outing was extremely enjoyable, and, although the season was decidedly backward, collecting was by no means bad; it would have been materially improved, however, had the weather been more sunny. As it was, butterflies were very scarce. The following are the principal captures. Larvæ:—*Zephyrus quercus*, *Pecilocampa populi*, *Eriogaster lanestris* (very young), *Bombix neustria*, *Nola cucullatella*, *Catocala promissa*, *Amphidasys strataria*, *Metrocampa margaritaria*, *Cleora glabraria*, *C. liehenaria*, *Pseudoterpa pruinata*, &c. Imagines:—Several *Eugonia polychloros* were seen, and also one *Callophrys rubi*. Amongst the captures were *Nisoniades tages*, *Syrichthus malvæ*, *Nemoria viridata* (one), *Tephrosia punctularia*, *Bapta binaculata*, *Cyclophora* (*Zonosoma*) *punctaria*, *Odontopera bidentata*, *Panagra petraria*, *Macaria liturata*, *Spilosoma mendica*, *Cilix glaucata*, and *Phytometra viridaria*. A few *Brenthis euphrosyne* were also taken, and *Gonepteryx rhamni* was in evidence as usual.—LOUIS B. PROUT, *Hon. Sec.*

CARLISLE ENTOMOLOGICAL SOCIETY.—May 4th, 1899.—Mr. James Murray in the chair. Mr. Wilkinson exhibited the following Micro-Lepidoptera from the Carlisle district:—*Nepticula salicis*, *N. aneofasciata*, *N. argentipedella*, *Coleophora limosipenella*, *Argyresthia ephippella*, *Ornix guttea*, *Gracillaria straminella*; and *Phlæodes crenana* from Threlkeld, near Keswick. Mr. Day, a number of Coleoptera, including a specimen of the rare beetle *Lebia crux-minor*, taken near Carlisle; also *Bradycellus placidus*, *B. similis*, *Agabus chalconotus*, *A. sturmi*, *Acilius sulcatus*, and *Staphylinus erythropterus*. Mr. James Murray, *Stomis punicatus* and *Megacronus cingulatus*, from the district.

June 1st.—Mr. James Murray in the chair. Mr. G. B. Routledge showed *Bembidium monticola* and *Hydroporus davisii*, from Gelt River. Mr. J. Murray, species of *Bembidia*, including *B. atro-caruleum*, *B. decorum*, *B. monticola*, *B. punctulatum*, *Tachypus flavipes*, *Stenus guttula*, *Tachyusa flavitarsis*, *Helophorus granularis*—all from the river Irthing. Mr. F. H. Day, *Bradycellus cognatus*, *Pterostichus vitreus*, *P. ethiops*, *Cymindis vaporariorum*, *Helophorus arvernicus*, *Calathus micropterus*, from Castle Carrock Fell; *Bembidium stomoides*, *B. paludosum*, from Gelt; *Phytodecta olivacea* var. *nigricans*, which is a rare variety. Mr. Wilkinson, *Tephrosia crepuscularia* (*biundularia*), *Hypsipetes ruberata*, *Lobophora carpinata*, *Bupalus piniaria*, from Carlisle. Members reported Lepidoptera to have been scarce this spring.—G. B. ROUTLEDGE.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—May 15th, 1899.—Mr. G. T. Bethune-Baker, President, in the chair. Mr. A. H. Martineau showed a few insects taken at St. David's, S. Wales, on April 22nd, this year. He found there a very large colony of *Anthophora picipes*, accompanied with great numbers of *Melecta armata*. They were in a most inaccessible spot, burrowing in a bank of drift, and although they were in thousands he was only able to secure two or three males of each. He also showed *Ammophila hirsuta* and *Nomada succincta* from the same district. Mr. J. T. Fountain showed a boxful of Lepidoptera, all taken this year, including male specimens of *Saturnia pavonia*, taken at Sutton on April 30th, by sembling; *Selenia illuminaria*, from Acocks Green; a lot of Tæniocampæ, including *Pachnobia rubricosa*, from Marston Green; *Anticlea badiata*, from Knowle and Marston Green; and *Anisopteryx ascularia*, from Moor Green. Mr. G. T. Bethune-Baker, two drawers full of Palæarctic Melanargias and Erebias.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

The Butterfly Book: a Popular Guide to a Knowledge of the Butterflies of North America. By W. J. HOLLAND, Ph.D., D.D., LL.D., &c. Size 10 × 7 inches. Pp. i-xx, 1-382. Plates, coloured, 48. New York: Doubleday & McClure Co. 1899.

THIS book is, so far as we know, the first attempt that has been made to bring together in a convenient form, and present in a more or less popular style, the information that is possessed in reference to the various species of butterflies occurring in North America. The author has acquired all the types of W. H. Edwards and Theodore L. Mead, and has had the use of the types of species recently described by Dr. Henry Skinner. His collection, which is claimed to be the most complete of the diurnal Lepidoptera of North America extant, has been utilised as the basis of the hundreds of figures which are given on the forty-eight excellent coloured plates. These figures are photographed directly from the specimens themselves, the colouring being reproduced with remarkable accuracy. With the exception of a few obscure or unimportant species, all the butterflies recorded on the American continent from the Gulf of Mexico to the Arctic Circle are delineated by the new photographic process. One hundred and fifty species are

here figured in colour for the first time. This fact alone adds considerable scientific importance to the book, especially as all these figures are taken from the type-specimens. The neuriation of each genus is also illustrated by at least one figure, and altogether there are one hundred and eighty five cuts in the text.

The introductory chapters deal with the life-history and anatomy of butterflies; capture, preparation, &c., of specimens; classification; previous works. All these subjects are treated in a clear and concise manner.

With this volume for a guide, the merest tyro should experience no difficulty in identifying his captures in North American Rhopalocera, and there is no doubt that the book will be the means of largely increasing the number of "butterfly-hunters" in the United States and Canada. The student of European Lepidoptera will also find the book of value. As already stated, the plates are excellent, and we may add that the letterpress printing and general get-up are in every way worthy of them.

We are pleased to learn that the author contemplates the publication of a companion volume on the Moths.

Note.—With regard to colour-photography and its application to the illustration of books on Entomology, we may mention that the art seems to be pretty well understood in this country. We recently received from a firm in London some samples of this kind of work, and among them was a plate of exotic butterflies. The specimens, which had evidently been selected to give a wide range of colour, were all most faithfully reproduced, and we understand that this result was attained with three printings only.

The Larvæ Collector's Guide and Calendar, giving the Times of the Appearance of the Macro-Lepidoptera in all their stages.

IN this handy little volume of ninety pages, which is published by Messrs. Davis of Dartford, we have useful information concerning the field-work of the lepidopterist. There are also notes on rearing Lepidoptera, on the general management of larvæ, and on preserving larvæ.

Macro-Lepidoptera of North Staffordshire and Cannock Chase. Compiled by the Rev. T. W. DALTRY, M.A., F.L.S., &c.; and revised (1898) by JOHN R. B. MASEFIELD, M.A. 8vo, pp. 29. Stafford: J. & C. Mort. 1898.

THIS list, which is reprinted from the 'Transactions' of the North Staffordshire Field Club, is on the same model as that published in 1875, when 378 species were enumerated. The total now reaches 503, including Pyralidæ and Crambidæ.

Report of the Entomological Department of the New Jersey Agricultural College Experiment Station. By JOHN B. SMITH, Sc.D. Pp. 373-467. Illustrated. Trenton, N.J.: The John L. Murphy Publishing Co. 1898.

Cornell University Agricultural Experiment Station, Entom. Div., Bull. 157. The Grape-Vine Tea-Beetle. By M. V. HINGERLAND. Pp. 213. Illustrated. Ithaca, N.Y. 1898.

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[No. 435.

NOTES ON AQUATIC RHYNCHOTA.—No. 3.

BY G. W. KIRKALDY.

1. *Corixa melanogaster*, n. sp.

Belongs to subgenus *Basileocorixa*, Kirkaldy; allied to *C. selecta*, Fieber.

Pronotum, clavus, and corium feebly rastrate. Pronotum with obtuse lateral angles, membrane not distinctly separated from corium. Intermediate tibiæ one-fourth longer than tarsi, which are one-seventh longer than the claws; metaxyphus long, isosceles triangular, subacute.

♂. Frontal fovea suboval, rather shallow, extending to about one-third of the length of the eyes (as seen below). two small foveæ posterior to the base. Anterior tibiæ somewhat dilated apically, pale long, narrow, cultrate (length four times as great as width at base), with about thirty-six small rounded blunt teeth extending from base to apex. Strigil rather large, almost square, about eight rows of teeth (the five basal, regular and parallel; the three apical, somewhat broken). Length 8 mill., breadth 3 mill.

Costa Rica, Alajueta (coll. Montandon).

Dark olive-brown. Pronotum with 11-12 rather irregular yellow lines; yellow lines dilated and entire at base of clavus, undulated and interrupted at apex; undulated and subentire at base of corium; abbreviated and contortuplicated on membrane and apex of corium. Corium not divided by regular longitudinal dark lines. Meta-notum bluish black. Dorsum of abdomen black, segments 2 and 3 more or less reddish, connexivum and apex of last segment pale. Apical segment of posterior tarsi blackish. Venter entirely black, except the exterior lateral margins of pleura, legs, apex of metaxyphus, &c.

This species, of which I have only seen the male sex, is separable from all the other Americans of the "*selecta*" group known to me, by the form of the palæ.

2. *Corixa denseconscripta*, Breddin. Novo Friburgo (coll. Montandon).

3. *C. kollarii* (Fieber). Guadelupe (coll. Montandon).

4. *C. hyalinipennis* (Fabricius). *Sigara hyalinipennis*, Fabricius, cannot (if the male example from Java in Dr. Montandon's collection belong, as I believe, to this species) be referred to the genus *Cymatia*, Douglas and Scott, and is therefore only remotely allied to *C. bondsdorffii* (C. R. Sahlberg) and *C. coleoprata* (Fabricius). It belongs to the genus *Corixa*, Geoffroy, and may for the present be referred to the subgenus *Agraptocorixa*, Kirkaldy, although I have not been able to find a strigil in the male. I have not erected a new subgenus for it, as I have seen only one example, which may not after all really be referable to the species of Fabricius.

To the characters of *Agraptocorixa* (1898, Ann. Mus. Genov. (2), xix. p. 144) should be added:—"Palæ subcultrate, armed with at least one row of denticles on the concave side. Strigil present." *C. hyalinipennis* has the frons (male) lightly impressed, not at all excavated.

5. *Anisops naïas*, n. sp.

♀. Vertical margin (vertex) two and a half times as wide as synthipsis, lateral margins of notokephalon slightly-curvedly diverging. Scutellum one-fourth longer than pronotum. Pronotum obsoletely punctured, scutellum smooth, elytra punctured. Anterior tibiæ flattened, much dilated laterally, curved outwards, as long as tarsi and claws together; first tarsal segment one-half longer than second, which is twice as long as (each of) the stout digitiform claws. Tarsi somewhat incrassate, the second segment stouter at the apex than at the base. Intermediate tibiæ similar to the anterior, one-fourth longer than tarsi and claws together; first tarsal segment one-half longer than second, which is twice as long as the falciform claws. Length 7 mill., width 1.7 mill.

Chile, Viña del Mar (Perth Museum and my collection).

Luteo-stramineous. Abdomen blackish. Claws tipped with black.

Very different from any other American species. Allied, though much slenderer, to *A. wakefieldi*, F. B. W. White, from New Zealand.

The two individuals bore the manuscript label "*Notonecta hyalinipennis*."

Acanthia reuteriella, n. sp.

Belongs to typical subgenus, and would be included in section "ee" in Stål's catalogue of exotic species.

Superficially punctured. Rostrum reaching beyond intermediate coxæ to base of mesosternum. Third and fourth segments of antennæ pilose, with long sparse bristly hairs also; fourth segment a little swollen. Second segment twice as long as the first, one-half longer than the third; third and fourth equal. Posterior tibiæ nearly three

times as long as tarsi, first tarsal segment one-fifth longer than second, which is twice as long as the large falciform claws. Length $4\frac{1}{2}$ mill., width 1.9 mill.

Australia, Albany (Perth Museum, Scotland, and my collection).

Black, opaque; with golden pubescence, abundant on pronotum and scutellum, more sparingly on head and elytra. Eyes and ocelli yellowish. Two basal segments of antennæ obscure yellow (black underneath the first, except at apex), two apical black, with golden pile. Rostrum obscure brown. Elytra: a luteous spot close to the internal suture of the clavus; two elongate flavescient spots on the exterior margin, and three or four smaller spots on the disk, of the corium. Membrane transparent flavescient, except a black blotch at the base near the exterior margin, and another towards the apex; nervures brownish with obscure centres. Legs yellowish; coxæ, femora ventrally (except the basal half of the posterior pair), tibial and tarsal spines, anterior tibiæ narrowly at base and apex, black. A faint brownish smudge dorsally, in the middle, on the anterior tibiæ. Ventral surface black, apical margin of sterna and abdominal segments very narrowly (sixth segment very broadly) yellowish.

I dedicate this handsome little species to Dr. O. M. Reuter, who has made such a laborious study of the difficult palæarctic species. I believe that *Acanthia* will be found to inhabit the tropics much more commonly than has hitherto been supposed.

The ninth "Band" of Hahn and Herrich-Schäffer's 'Wanzenartigen Insecten' is dated 1853 on the title-page, and this date has been generally accepted by modern authors. The greater part, however, was apparently published at least one year earlier, and I have reason for supposing that each "Band" may have been published in several separate "Hefts." I call attention to the matter here, as possibly someone may still be in possession of the original covers.

On pp. 47-8, Schäffer, in dealing with the genus *Corixa*, says that he has only just seen Fieber's synopsis of the European species (Bulletin Soc. Imp. Naturalistes de Moscou, p. 505) published in 1848, and, as his coloured plates were finished long before, he has not altered his manuscript.

Now, it is almost incredible that an entomologist, student of the Rhynchota from 1829 at least, and therefore presumably in communication with other rhynchotists, should—writing in 1853—be only just aware of an important work published in 1848, and apparently quite ignorant of Fieber's three still more important papers published in 1851 in the 'Abhandlung Böhm. Gesell. Wissensch.'

Dallas, in the second part of his 'List of Hemiptera in the British Museum,' dated 1852, quotes the ninth Band of 'Die Wanzenartigen Insecten' as 1850 for some pages (*i. c.* 232, 237,

&c.), and 1851 for others (*i. e.* 246, 257, &c.); while in several instances he quotes two dates, *i. e.* (on p. 427) "Metapodius, *H. Sch. Wanz.* ix. 239 (1850), and 257 (1851); *Spin. Tav. Sin. Hem.* 42 (1850)," thus incidentally asserting that part at least of this ninth Band was published before Spinola's work.

According to Dallas, p. 240 was the last page published in 1850, p. 241 commencing 1851; and, as a matter of fact, the ninth Band is divided into "hefts" of forty-eight pages each, p. 240 thus completing the fifth "heft." Were these issued in separate, dated covers? In the only copy I have seen these, if at one time present, are not now preserved. The following details may also be noted:—

1. Schäffer dates his preface from Regensburg, Jan. 1852.

2. The preface (by J. E. Gray)—presumably written after the completion of Dallas's manuscript—is dated June 6th, 1852.

3. The usually accepted date of the eighth Band is 1848; Dallas, in part i. of the 'List,' quotes some early pages as 1845, later ones as 1846.

COLLECTING IN THE FENS, 1899.

BY F. M. B. CARR.

UNFORTUNATELY, when my father and I arranged to pay a visit to Wicken some months ago, we forgot the enemy of entomologists, the moon. Curiously enough, however, nearly every evening was so cloudy that it made but little difference, and we really had darker and more favourable nights than the collectors of the week before, but the wind was generally north-east or south-east.

On Saturday, June 17th, a baking hot day, we arrived at Soham station about five p.m., having previously been half choked with dust, and nicely-cooked in a railway-carriage containing ten people. Mr. W. O. Bullman, of Wicken, with whom we stayed, met us at the station, and during the drive to Wicken informed us that *Hydrilla palustris* had failed to put in an appearance this year, whereat we were somewhat disappointed, as I at least had had foolish day-dreams with regard to this insect.

What with the drive, the country air, and a most excellent tea (Mrs. Bullman's teas always are excellent), we felt quite ready for the fray, and after seeing Mr. Solomon Bailey we proceeded with him to the fen about nine p.m.

The night was moonlight and rather cold, with an east wind; just about as unpromising as it could be! Of course under these circumstances nothing much could be expected.

Dusking produced single specimens of *Earias chlorana*, *Miana arcuosa*, and *Meliana flammea*. *Herminia cribralis*, *Hepialus*

humuli, and *H. lupulinus* were abundant, together with an occasional specimen of *Coremia unidentaria* (? *ferrugata*).

Light was, of course, bad, but we took single specimens of *Spilosoma urticae*, *Macrogaster arundinis*, male, and *Hadena pisi*. *Spilosoma menthastri*, *Meliana flammea*, and *Herminia cribralis* also turned up.

Treacle was, however, a great attraction, and the following were seen:—*Leucania pallens*, *L. comma*, *Meliana flammea*, *Noctua rubi*, *N. festiva*, *Grammesia trilinea*, *Apamea gemina*, *A. basilinea*, *A. unanimitis*, *Hadena oleracea*, *H. pisi*, *H. dentina*, *Agrotis exclamationis*, *A. corticea*, and *Mtana strigilis*.

The next day (June 18th) turned out beautifully fine and warm, and we felt very much excited at the idea of seeing *Papilio machaon* on the wing, never having done any fen collecting before. We were not in the fen many minutes before we saw a specimen of the beautiful "swallow-tail," which I succeeded in netting. We soon found that there were lots of them about, but, owing to their strong flight, a stiff breeze, and a baking sun, not to mention the rushes, we contented ourselves with a few good specimens, as there were plenty of ova and young larvæ with their white saddles about. A nearly full-grown larva of *Lasio-campa quercifolia* was taken on buckthorn. Larvæ of *Arctia caia* and *Liparis auriflua* were very plentiful. By the bye, I never want to see the latter again, as I have a most frightful time of it whenever I touch anything it has been in contact with, whereas it does not affect my father in the least. A specimen of *Vanessa atalanta*, and, at the entrance to the fen, several *Hesperia sylvanus*, were about the only other things noticed.

In the evening a larva of *Odonestis potatoaria* was taken, and three specimens of *Bombyx rubi* were seen on the wing about eight p.m. The wind had shifted round to the west and was rather strong. The sky was cloudy, and a few drops of rain fell at first, but later on the drops became a steady shower. It was rather damp (rain generally is), but this was our best night at light, though that is not saying much. However, I suppose twelve *Macrogaster arundinis* (males) would be considered pretty good, at any rate Mr. Bailey seemed to think it was, but there was little else—*Meliana flammea*, *Cabera pusaria*, *Coremia unidentaria* (? *ferrugata*), and single specimens of *Hadena pisi* and *Ptilodontis palpina*. *Spilosoma menthastri* and *Nascia ciliaris* were both abundant, and, however bad the night, the latter scarcely ever failed to put in an appearance, running up the sheet and looking so much more brilliant by the strong lamp light than on the setting-board. Treacle was more crowded than on the previous night, the additional species being a splendid specimen of *Charocampa elpenor* and a *Phlogophora meticulosa*.

There were always plenty of things at treacle, and the following are additions to those already mentioned:—*Triphæna*

pronuba, *Noctua plecta*, *N. c-nigrum* (two), *N. augur* (one), *Leucania obsoleta* (two; Bailey says this is a very rare insect in the fen), *L. pudorina* (abundant), *Hadena adusta* (one), *H. suasa* (a few), *H. thalassina* (one or two), *Aplecta advena* (two), *Agrotis segetum* (one or two), *Miana fasciuncula* (very abundant and varying from red to putty-coloured), *Xylophasia polyodon*, *X. lithocylea*, *X. sublustris* (a few), *Rusina tenebrosa*, *Acronycta psi* (? *tridens*), *Gonoptera libatrix* (in fine condition some of them), *Herminia cribralis*, and *Nascia ciliatis*.

Besides those already referred to as occurring at light, the following appeared:—One more *Spilosoma urticae*, two more *Ptilodontis palpina*, *Earias chlorana* (occasionally), five more *Macrogaster arundinis* (males), *Epione apiciaria* (one), *Acidalia rubricata* (one), *Rumia crategata*, *Cabera pusaria*, *Melanippe unifasciata*, *Lomaspilis marginata*, *Phibalapteryx lignata* (a few), *Eupithecia centaureata*, one *Collix sparsata*, *Miana strigilis*, *M. fasciuncula*, *M. arcuosa* (three), several more *Meliana flammea*, *Leucania pudorina*, *Rusina tenebrosa*, *Apamea gemina*, *A. basilinea*, *Noctua rubi*, *N. plecta*, *Agrotis exclamationis*, *A. corticca*, *Hadena oleracea*, *H. dentina*, *Xylophasia sublustris* (one), *Plusia festuce* (a perfect specimen), and one *Hydrelia unca*.

Micros were more numerous, but, unfortunately, I can only give attention to the macros at present.

The following were taken on the wing in the evening:—A few *Earias chlorana* and *Phibalapteryx lignata*, and single specimens of *Spilosoma urticae*, *Notodonta ziczac*, *Timandra amataria*, and *Collix sparsata*.

Day work had to take rather a back seat, as I found quite enough setting to do. However, we generally spent a few hours in the fen, and also had days at Chippenham and Tuddenham.

Larvæ were fairly plentiful:—A few full-grown larvæ and cocoons of *Odonestis potatoaria*, two larvæ of *Lasiocampa quercifolia*; whilst searching buckthorn and willow sticks for the latter I found eighteen larvæ of *Lithosia griseola*. A good many larvæ of *Bombyx neustria* were found, but *Arctia caia* and *Liparis auriflua* were the most abundant. Fourteen *Leucoma salicis* were taken from willow, but they all occurred on bushes in a very limited area and seemed to be local. A batch of small larvæ of *Saturnia carpini* was found on low buckthorns, but I understand their favourite food in the fen is meadow-sweet. By searching dwarf willows about a dozen *Clostera reclusa* were picked up, and a single egg of *Dicranura vinula* was found on willow. Two full-grown larvæ of *Geometra papilionaria* were taken from birch, but they promptly paid me out for taking them by developing a fine lot of ichneumons.

My father beat three larvæ of *Scotosia dubitata* from buckthorn, all of which have emerged safely and are perfect specimens. *Teniocampa gracilis* (abundant on meadow-sweet),

Papilio machaon and *Gonepteryx rhamni* complete the Wicken larvæ.

Imagines were scarce, and the following were the only ones noticed during the daytime:—*Papilio machaon*, *Gonepteryx rhamni* (a battered male), the common Pierids, *Euchloë cardamines* (one male in the "drove"), one *Vanessa atalanta*, *Cænonympha pamphilus*, *Epinephele ianira*, *Hesperia sylvinus*, *Bombyx rubi* (a few), *Fidonia atomaria* (some nice forms), *Lomaspilis marginata*, and *Camptogramma bilineata*. Six *Hyria auroraria* were walked up June 23rd.

On Wednesday, June 21st, Mr. Bullman drove us to Chippenham and back, where, by kind permission of Mr. Tharp, the owner, we had a day's collecting. I think Chippenham looks one of the best places round about, and Mr. W. J. Cross, of Ely, whom we met there, thinks "tons" of it. *Bankia argentula* was very much in evidence and we soon caught enough of them. By beating, seven specimens of *Erastria fuscula* came out, and other imagines seen were *Strenia clathrata*, *Fidonia atomaria*, *Euclidia glyphica*, *E. mi*, and *Phytometra ænea*. *Plusia orichalcea* larvæ had all disappeared; they had been well worked. Larvæ of *Tæniocampa gracilis* were abundant, as at Wicken, and about two dozen larvæ of *Cucullia verbasci* were taken from figwort; only about eight have pupated successfully. On the way home a big batch of *Vanessa urticaæ* were seen.

Tuddenham is unfortunately most strictly preserved now for game, and all the collectors who paid this hunting-ground a visit had been turned off, Bailey included. We were, however, most anxious to take *Agrophila sulphuralis*, and accordingly went over June 24th. We succeeded, after most tiring work on a very dull day, in walking up ten *A. sulphuralis*, nine of which were good specimens, and six *Acidalia rubricata*, and just met the keepers when we had finished. About a dozen larvæ of *Scotosia certata* were beaten from barberry, but have not done at all well since, and there are now only about four survivors.

Altogether we were very well satisfied with our first visit to the fen, which was made all the more pleasant by the comfort of Mr. W. O. Bullman's rooms, and we were thoroughly well looked after. Mr. Solomon Bailey did all in his power to make the entomological part of our stay successful, providing us with lamps, sheet, treacle, and last, but by no means least, localities.

I may just mention that a magnificent female *Sphinx ligustri* was given to me by a man in Wicken, who had just taken it on a bush in his garden.

Of insects which we did not take, an occasional *Arctia fuliginosa* and *Viminia venosa* turned up at other sheets, and Mr. Bailey found two female *Macrogaster arundinis* at rest on rushes.

A GUIDE TO THE STUDY OF BRITISH WATERBUGS
(AQUATIC RHYNCHOTA).

BY G. W. KIRKALDY.

(Continued from p. 154.)

Brullé, however, noted* that some individuals of a species of *Gerris* plunged rapidly beneath the surface upon attempted capture.

The foregoing and ensuing experiments and notices were made, as far as possible, on individuals in their natural habitat as well as in confinement, but it is of course exceedingly difficult to make minute observations upon such insects in the open.

The velvet-like pubescence, with which these insects are clothed, has been previously referred to as permitting the insect to respire without inconvenience by forming an air-bubble around it when beneath the surface, and also as preventing the entrance of water, either when submerged or by chance spray, into the trachæal system.

Meinert instances another scarcely less important use, *viz.* : that this air-investment enables the insects, after diving beneath the surface, to commence respiration of the upper air at once, allowing them to come up perfectly dry. In fact, this air bubble serves much the same purpose as the space between the elytra and the dorsal surface of the abdomen in *Dytiscus*, *Ilyocoris*, *Corixa*, &c., and the lateral grooves covered with two fringes of strong hairs on the venter in *Notonecta*. But it is necessary to the effectual working of the pubescence that it should be perfectly clean and free from dirt. I have previously remarked on the incessant care with which the Gerridæ cleanse themselves; and, taking into consideration the longer legs in *Gerris*, the process is very similar to that already described in *Hydroëssa*.

In nature, although *Gerris* is perhaps as common on small ditches and pools as on larger sheets of water, it by no means keeps to the shelter of the shore of the latter, making fairly long excursions out, and therefore does not thrive well, as a rule, in captivity.

When imprisoned in even a fair-sized bowl, they knock their heads and fore legs continually against the sides of the bowl, become enfeebled, subsequently water-logged, sinking at last to the bottom and there perishing.

Gerris is not at all of a timorous nature; with care, one can approach very close to them and observe them superficially without difficulty, and can even with a well-timed, rapid movement catch them with one's fingers. They are not, as a rule, disturbed

* 'Histoire naturelle, Insectes,' vol. ix,

when small pellets of earth are flung at them; and when they do skate away they always return before long to their old position.

The males of *Gerris* are most extraordinarily amorous, remaining coupled to the females for a long time. If one examines them during late spring or early summer, say June or the beginning of July, one finds the majority pairing, nearly all the solitary individuals being nymphs. The male rides upon the female (which is noticeably the larger), sitting somewhat back, the fore legs tightly gripping her around the mesopleura, the fore tarsi converging strongly, being placed along the first abdominal segment of the female, the middle and hind legs being quiescent or moving about aimlessly. The male grips the female so firmly in this position that one must employ some force to tear him away from her, and retains his hold even when the pair are lifted up from the water in the hand, the female meantime leaping, skating, or climbing gaily on, as if she had no such heavy encumbrance embarrassing her.

Meinert* selected a pair of *Gerris canalium*, Duf. (= *aptera*, Schumm., Meinert), and having placed them in a bowl gave them a couple of duckings. They forthwith sank to the bottom, and lay there some time motionless until he teased them, whereupon they mounted perpendicularly to the surface; but, although the male helped in the ascent by swimming with his middle and hind legs, upon this occasion, the female managed only to reach the surface with her head, and the pair sank again to the bottom. After ten minutes had elapsed the female was again teased, and the pair began again to move, swimming under water for some time. Shortly after the insects were taken from the water, and allowed to dry. They were then placed in the bowl again, but the female could not stand up on her legs, and the pair soon sank deeper and deeper in the water, so that only part of the female was above the surface. Hitherto the male had remained practically motionless (except for the few swimming movements previously narrated), firmly affixed to the female; but after he had floated about half an hour in this position, entirely submerged, he became disgusted with his situation, and began to loose his fore legs from their firm grip. Both now sank right down, whereupon the male tore himself loose, and left the female to lie on the bottom below, while he himself mounted up to the surface, and crawled up from the water on a twig, which was placed in it, by means of his fore legs. When he had gained a tolerably lofty place, he began to dry and preen himself as best

* I regret my knowledge of Danish is not so complete as I could wish, and I have had some little difficulty in interpreting several phrases, the learned author employing one or two words, at the meaning of which I have had to guess. I hope, however, that, checked by the few observations I have had the opportunity to make, the account here given will be found substantially correct.

he might. The female meantime remained lying as though dead, on the bottom of the bowl, for a quarter of an hour, and had by this time been almost an hour under water. She then, however, stirred slightly, and appeared to have some life yet remaining.*

The sexes are very easily separable in this genus. The females are nearly all a little more robust, but there are also well-marked external structural characters. In the females the apical margin of the last "abdominal" segment (that is to say, the last segment of the abdomen, with a "connexivum," or more or less flattened lateral piece, often apparently but, not actually, sutured off from the abdomen) is almost straight; while in the males it is usually more or less profoundly emarginate. This emargination varies more or less in form and extent in the different species. Seen from below there are three "genital" segments (that is to say, abdominal segments modified for sexual purposes, apical to the true "abdominal" segments, and not furnished with a connexivum) visible in the males, and only two in the females.

The apical segments of the venter are represented on plate iii.† fig. 15 ♂, fig. 16 ♀, &c.

(α) *Aquarius*, Schell., 1800 = *Hygrotrechus*, Stål, 1868.

There are two British species, generally known as *G. najas* (De Geer) and *G. paludum*, Fabr., the connexival spines in the former not projecting so far as, in the latter projecting as far as, or farther than, the apex of the abdomen. Now, as may be seen at once by anyone who will take the trouble to refer to the original description,† it is the latter that is *najas* of De Geer, *najas* of modern authors being distinctly referred to by the sagacious Swede as being a very similar but distinct species. His description (p. 312, &c.) refers to Pl. 16, fig. 7, which is undoubtedly *paludum*, auctt. He then describes (p. 314) the wingless form, referring to figs. 8 and 9 (certainly *najas*, auctt.), and concludes by saying (p. 319): "Je crois en attendant que les non-ailées, qu'on pourroit distinguer par le nom de *Punaise aquatique très-allongée non-ailée d'un brun noirâtre, à pattes antérieures courtes, sont une espèce particulière.*" In the explanation of the plates the distinction is as strongly drawn (pp. 649-51): "La fig. 7, représente la *Punaise* (nayade) . . ." [certainly *paludum* auctt.] "La fig. 8, est celle d'une *Punaise aquatique*, qui, quoique très semblable à la précédente paroît cependant d'une espèce différente et n'ayant point d'ailes, ni dans l'un ni dans l'autre sexe." "La fig. 9 fait voir en grand la même *Punaise* . . ." Figs. 10 and 11, magnified portions of no. 8 [figs. 8-11 undoubtedly represent *najas* auctt.] Figs. 12-19 do not concern the point at issue. It

* Further biological notices will be found further on, when treating of the earlier stages in the life-history of the Gerridæ.

† De Geer, 1773, 'Mémoires,' iii. pp. 311-22 and 649-51, Pl. 16, figs. 7-19.

is therefore evident that *paludum* auctt. is synonymous with *najas*, De Geer; while *najas* auctt. must take the name of *canalium*, Dufour,* the next name available. The synonymy will be:—

1. CANALIUM, Duf. (type of subgenus).

Cimex lacustris, Sulzer, 1761 — “species allied to *C. najas*,” De Geer (Mém. iii., pl. xvi., figs. 8 and 9), 1773 — *C. najas* var. α *apterus*, Retz., 1783 — *A. paludum*, Schell., 1800 — *G. aptera*, Schumm., 1832 = *G. canalium*, Duf., 1833 — *G. pausarius*, Curt., 1835 = *H. Najas*, Fieb., 1861 = *G. najas* of modern authors.

2. NAJAS (De Geer).

Cimex najas, De Geer, 1773, *l. c.*, pl. xvi. fig. 7 = *C. najas* var. β *alatus*, Retz., 1783 = *G. paludum*, Fabr., 1794, and modern authors.

In *G. canalium* the connexival spines do not project so far as the apex of the abdomen. The apical segments of the venter are represented on plate iii.† fig. 15 ♂, fig. 16 ♀; plate i. fig. 7 represents an antenna; plate i. fig. 11, the sterna.

This species is nearly always apterous, and I have seen it only in this condition. It is sometimes fairly abundant locally, though it can scarcely be considered common. It is well distributed over the southern English counties; but I know of only a single record (Lincolnshire) north of the Thames, and none from Scotland or Ireland.

In *G. najas* (De Geer), Kirk., the connexival spines project so far as, or a little farther than, the apex of the abdomen. It is rather larger than the preceding species, and is nearly always macropterous. I have seen brachypterous, but not apterous, individuals.

Figs. 17 and 18 represent the apical segments of the venter, male and female, respectively.

It is fairly well distributed, though common only locally, perhaps. Cardiff, Cowbridge and Ipswich are the only localities north of the Thames known to me.

(β) *Limnopus*, Stål, 1868.

There is only a single species, *G. rufoscutellatus* (Latr.), which has been recorded from three or four localities only, widely apart, from Pitlochry to Hastings. It has a very wide distribution; the records of “*rufoscutellatus*” from Europe, Siberia, Turkestan, and North America all apparently referring to one species.

* I have grave doubts as to the validity of the name “*najas*” at all, since De Geer, although mistakenly, refers it to the same species as *lacustris*, Linn.

† This plate will be issued with a future number of the ‘Entomologist.’

I have seen only a single example, a male (kindly communicated from the Brussels Museum by the kindness of M. G. Severin), from which the apex of the abdomen (fig. 19) is figured; the corresponding parts of the other sex (fig. 20) are copied from Schummel. It is the *Cimex lacustris* of several early authors, but does not accord with the original description of Linnæus.

(To be continued.)

NOMENCLATURE OF LEPIDOPTERA.

(Concluded from p. 185.)

3. ARE THE GENERA OF HÜBNER'S 'TENTAMEN' TO BE ACCEPTED OR NOT? &c.

Sir George F. Hampson writes:—

“That the genera of Hübner's ‘Tentamen’ be excluded for the following reasons:—

“That it has no possible claims to be considered a scientific work, or more than a tentative list of names.

“That its genera are entirely undefined, and therefore excluded by the British Association rules.

“That there is no evidence it has ever been published, and that if published no even approximate date can be assigned to it. The first mention of the ‘Tentamen’ known to me is by Ochsenheimer in the preface to his volume iv. (writing in 1816). He gives its full title, and says that it was distributed by Hübner, and that he received it long after the publication of his third volume in 1810.

“We know from Geyer's account of Hübner in Thon's ‘Entom. Archiv,’ 1, 2, p. 28, 1827, that Hübner's method was to print off a few sheets of his various works and send them off to his correspondents whenever it suited him, and that his works were never regularly published till Geyer issued them after Hübner's death, so that his statement accords with what we know from other sources, and the passage was thus interpreted by Hagen who assigns to the ‘Tentamen’ the date ‘before 1816, possibly before 1810,’ quoting the passage in Ochsenheimer.

“In the preface to the ‘Verzeichniss,’ dated 1816, Hübner says that he attempted a system of classification ten years before, and immediately made it known. This may refer to the ‘Tentamen,’ but cannot be clearly shown to do so, and in opposition to the theory that the ‘Tentamen’ was distributed in 1806 we have the fact that it includes the Fabrician genus *Glaucoptis*, published in 1807.”

Lord Walsingham writes:—

“The genera of Hübner's ‘Tentamen’ are all recognisable, as the type is cited in each instance; they are more satisfactory than any genera in the Lepidoptera which had preceded them. They were

adopted by Ochsenheimer in 1816 (*vide* 'Schm. Eur.' iv. p. viii), who regretted that he had not been able to employ any of the 'Tentamen' names in his third volume (1810), as at that time he had not seen a copy. Ochsenheimer moreover writes:—'Herr Hübner hat unter dem Titel Tentamen . . . den Entwurf eines Systems der Schmetterlinge auf einem Quartblatte abgedruckt herausgegeben,' &c. This can only mean that the 'Tentamen' was PUBLISHED on a quarto sheet of paper by Hübner.

"Now as to date. Sir G. Hampson, in his opinion, No. 3, seems to doubt that Hübner refers to the 'Tentamen' in the preface to the 'Verzeichniss.' Let Hübner speak for himself ('Verz. bek. Schm.' 3 (1816)):—'Die Grundlage dieses Entwurfes habe ich sogleich, unter dem Titel: *Tentamen determinationis digestionis atque denominationis singularium stirpium Lepidopterorum* bekannt gemacht, damit sie von Verstandigen, bevor ich sie annahme, geprüft und beurtheilt werden mochte.' Compare the words italicised with the title of the 'Tentamen':—'*Tentamen determinationis digestionis atque denominationis singularium stirpium Lepidopterorum*, peritis ad inspiciendum et dijudicandum communicatum, a Jacobo Hübner.'

"The words in italics are absolutely the same as those quoted in the preface to the 'Verzeichniss,' and it is impossible to imagine that they were used in reference to any other work than the 'Tentamen.' This being accepted as a fact, it is not difficult to arrive at the date of publication of the 'Tentamen.' In the preface to the 'Verzeichniss' (p. 3) it is expressly stated that Hübner drew up the 'Tentamen' 'vor zehn Jahren' for his own purposes, and immediately made it known. This preface was written in September, 1816, therefore $1816 - 10 = 1806$ (the approximate date of the 'Tentamen').

"Zeller, writing to W. H. Edwards, June 23rd, 1876, said: 'The 'Tentamen' was printed not in 1806, but in 1805'; but no reasons were given for this emphatic assertion.

"To recapitulate, Ochsenheimer informs us that the 'Tentamen' was published before 1810; Hübner indicates the date of publication as 1806; while Zeller says that it was printed in 1805.

"The fact that *Glaucopsis* for *phegea* is common to the 'Tentamen' and to Fabricius, 1808, proves nothing. Fabricius and Hübner corresponded, and either author may have used the name in MS. before the publication of either work.

"So far I have only dealt with the question of publication and the acceptance of the 'Tentamen' by Ochsenheimer; there now remains the question whether the 'Tentamen' genera can be accepted as valid from the standpoint of a modern zoologist.

"The British Association Committee laid down two essential points as necessary before any zoological term could acquire the right to recognition in the following words (pp. 10, 11): 'Two things are necessary, before a zoological term can acquire any authority, viz. *definition and publication.*'

"It has, I think, been proved that the essentials of publication were complied with, for Sir G. Hampson's contention that Hübner's works were issued at irregular intervals, and were not *published* until they were *published* by Geyer, cannot be taken seriously. All works issued to subscribers have, after a time, a tendency to appear at

irregular intervals. I suppose it will not be doubted that Herrich-Schäffer's work was properly published, but this appeared at all sorts of dates (*vide* H.-S. 'C B. Regensburg,' 1869), and the same remark equally applies to the 'Biologia Centrali-Americana' and all such works." [Sir G. Hampson remarks that each part of these works was issued at a definite date, but that Hübner, according to Geyer's account, kept his type set up, and printed off and issued a few copies whenever there was a demand for them.] "The authors of British Association Code laid down the following rule:—

"§ 12. A name which has never been clearly defined in some published work should be changed for the earliest by which the object shall have been so defined'; and they previously remark: 'Definition properly implies a distinct exposition of essential characters; and in all cases we conceive this to be indispensable, although some authors maintain that a mere enumeration of the component species, or even of a single type, is sufficient to authenticate a genus.'

"No one will be disposed to doubt the necessity for full definition of all genera published *after* the acceptance of the British Association Rules, but it was impossible for authors who lived and died before these rules were made known to act up to them. All *previous* work must be tested by the meaning of the word 'definition.' Definition does not consist of a generic term accompanied by a greater or less number of mere words which are not diagnostic (*e.g.* the majority of Walker's genera in the British Museum Catalogues), but 'definition' means that the genus proposed shall be capable of comprehension. Hübner's works exemplify the two types of genera. In the 'Tentamen' we have genera which are readily understood, for the type is always cited: we turn to Hübner's figure and can understand what species was intended, and for ourselves test whether the genus be valid or not; on the other hand, in the 'Verzeichniss' the generic name is accompanied by what out of courtesy is called a diagnosis: these genera are for the most part composed of incongruous material, and it is impossible to ascertain what was the original type of the genus, but they are accompanied by some 'verbiage,' and if we follow the British Association ruling they must be accepted, whereas from a scientific point of view the 'Tentamen' genera, being monotypical and capable of absolute identification, are much more worthy of recognition. Citation of type is practically equivalent to definition, for anyone can understand what was intended by an author like Hübner, who figured all the species with which he was acquainted. I am therefore disposed to think that Hübner's 'Tentamen' genera comply with the requirements of 'definition,' and as they were 'published' we are bound to accept them.

"The requirements of § 2 of the German Zoological Society, 'Als wissenschaftlicher Name ist nur derjenige zulässig, welcher in Begleitung einer in Worten oder Abbildungen bestehend und nicht misszudeutenden Kennzeichnung durch den Druck veröffentlicht würde,' are complied with, for Hübner's species are figured.

"If the citation of a type subsequently identified with certainty either from specimens or from a recognisable figure is not to secure the acceptance of a genus, the types of many of Felder and Rogenhofer's genera (and equally species) are rendered useless and take no

precedence. The citation of types with generic definition is the exact equivalent of figuring a species and not describing it, and in the latter case this is accepted as 'defining' it."

Prof. J. B. Smith writes :—

"No, the genera of Hübner's 'Tentamen' should not be accepted. The evidence in Hübner's published works serves to indicate that this sheet was prepared somewhere about 1806, and was primarily a scheme for his own guidance—a tentative classification, such as almost every student has at times made in the groups which he was studying. Hübner printed his scheme, and apparently sent out a few copies to correspondents to obtain suggestions or criticisms, or for their information; much as if I should, by means of a hektograph or other mechanical device, multiply some scheme of my own, and should send it about as a suggestion. It might induce some co-worker who found the scheme feasible to adopt parts of it, just as Ochsenheimer did. It is in this light that I think that author's sentence 'daher konnte ich früher nichts davon aufnehmen' should be construed. There is no sufficient proof of 'publication.' Canon xxiv. of the A. O. U. Code, above referred to, reads :—'A *nomen nudum* is to be rejected as having no status in nomenclature.' It is remarked in comment or explanation that 'a name, generic or specific, which has been published without an accompanying diagnosis or reference to an identifiable published figure or plate, or, in case of a generic name, to a recognisably described species, is not entitled to recognition, being merely a name, and therefore having no status in nomenclature.'

"Under a very liberal interpretation of this, and assuming that the 'Tentamen' was really published, the names might stand, because the generic terms are associated with those of known species. But except to one familiar with the associated species no information is conveyed, since no author is cited for the specific name, and no reference is made to any publication where any species is recognisably described. As a whole, it is a bare outline of a scheme of classification, and nothing more: with not a clue to the characters upon which it was based, and not a syllable that would enable a student in Africa not thoroughly familiar with the European fauna to place a solitary specimen. It seems to me hardly possible to recognise 'Tentamen' names."

Prof. C. Aurivillius writes :—

"The names of *stirpes* in Hübner's 'Tentamen' are, as also all other generic names which are not accompanied by a generic description, to be regarded as not published (*nomina nuda*), and must be altogether rejected. I can by no means agree with those authors who regard a genus as established merely by naming a type. A genus is a systematical idea, and can therefore only be established by a description or by figures of the generic characters. If a genus could be established only by naming a type-species, no one would be able to form an idea of the genus without preserving that species. It is easy to understand how disadvantageous this should be for the systematists. Everyone has therefore a right to demand that an established genus shall be accompanied by a description by which he can form an idea of what the author intended with his genus. I am unable to see how

a genus can be said to be 'defined' by a type. For instance, *Papilio*, type *machaon*, means only a genus, which contains the species *machaon*, but leaves quite undecided whether such a genus comprises all organisms, all animals, all insects, all Lepidoptera, all butterflies, all hexapodous butterflies, all *Equites*, or only some greater or smaller part of the *Equites*, and is therefore not at all *defined*, and certainly much less defined than Linné's genus *Papilio*."

Replies to the first section of Question 3 were also received from seven other entomologists. An analysis of the whole number of replies shows that five were in favour of accepting the 'Tentamen' genera, and that six were opposed to their adoption.

With regard to the year in which the 'Tentamen' was published, it appears that Lord Walsingham, Dr. Staudinger, Professors Fernald, Grote, and Smith consider the date to be 1806; whilst Mr. Kirby is of opinion that publication did not take place until some time between the years 1807 and 1816.

The majority of the replies to Question 4 were in favour of accepting the genera of Hübner's 'Zuträge,' the actual numbers being seven for and four against.

5. ARE THE GENERA OF HÜBNER'S 'VERZEICHNISS' TO BE ACCEPTED OR NOT? IF ACCEPTED, WHAT DATE IS TO BE ASSIGNED TO THEM?

The Committee, with one possible dissentient, accepts the 'Verzeichniss' genera, but there is some difference of opinion as to the date of publication. It seems, however, to have been generally recognised by the nine members of the Committee who replied to this part of the question that the work was issued in serial form. Four of these replies set down the date of commencement as 1816, and all agree that the work was concluded by 1826 or 1827. Sir George Hampson is unable to find any evidence of portions of the 'Verzeichniss' having been published prior to the year 1826. He writes:—

"I am of opinion that the date assigned to the 'Verzeichniss' genera should be 1827, when Geyer published the collected work which Hübner had in part or perhaps wholly distributed in sheets at uncertain intervals during his lifetime, but never definitely published. If this date (1827) be assigned to it, the nomenclature based on it would have some possibility of permanence."

The settlement of Question 6 is largely one for philologists to finally decide, and we will dismiss it by simply quoting Lord Walsingham's reply thereto:—

"*iidæ* and *iinæ* are incorrect, and *ianæ* and *ialæ* should be used.

"The Committee of the British Association had no power to promulgate the employment of terms not orthographically written, and there is no evidence that they had such intentions. Whether they had or had not matters little; the question is orthographical, not

zoological, and must be determined by laws of grammatical usage. The terminations *dx* and *næ* must be accepted, but the preceding coincidence of vowels is merely circumstantial, and must be dealt with accordingly."

In the matter of Question 7, the unanimous opinion of the ten entomologists who expressed their views appears to be that—

"1. The type of a genus must be a species originally included in it by the founder.

"2. The type must conform to the original description of the genus (a species excluded by the description cannot be the type.)"

There are other and more complex matters connected with this question, and about these there is far less unanimity. Some other propositions have also been introduced, and it would therefore seem that the question must still continue an open one, except as regards the two propositions quoted above.

NOTES AND OBSERVATIONS.

EMYDIA CRIBRUM IN THE NEW FOREST.—The late Mr. Bond's own words, written in his interleaved copy of Stanton's 'Manual,' are as follows:—"Near Ringwood, in the New Forest, about two miles upon the Poole road, at a place called St. Lawrence, opposite the inn there." If this very definitely described spot is *misleading*, I must apologise to my friend Mr. Eustace Bankes; but, in the absence of personal knowledge of this old locality, I would suggest that two miles along the Poole road from a spot near Ringwood need not necessarily be in the Forest itself. The context of the situation of the public-house would supply the position near enough. There is no doubt that *E. cribrum* is even now spread over miles of country in apparently isolated communities, and there need be no mystery over a fact so well known.—SYDNEY WEBB; 22, Waterloo Crescent, Dover, July 3rd, 1899.

NOTE ON CATACLYSTA LEMNATA.—Some insects seem to have a remarkable power of discovering any little place that will suit them to live in, even though far away from their previous haunts. There is a cemented tank, about six feet by five feet in size, here in the garden, that is covered with duckweed, and there are some *C. lemnata* about it, both male and female. If the surrounding country was full of ditches and ponds and wet places it might be easily accounted for, but there is no stream nearer than a mile, and that is dry half of every year, and is far too swift when it does run for duckweed to grow on it. There are two horse-ponds that catch rain-water within three or four hundred yards, but curiously there is no duckweed growing on either of these. So these moths must have come a long way to find this little tank.—W. M. CHRISTY; Watergate, Emsworth, Hants.

ENTOMOLOGY IN JAPAN.—We have just received No. 5 of the third volume of the 'Insect World': a Monthly Magazine. Edited by Y. Nawa; and published in Gifu, Japan. With the exception of the

words cited above, the journal is printed in Japanese character. The number, which comprises forty pages, has a well-executed plate representing structural details of some species of Hymenoptera; and there are several nice figures in the text.

PRESENTATION TO MISS ORMEROD.—At the annual meeting, on June 25th, of the Société Nationale d'Acclimatation de France, M. Le Myre de Vilers, president, in the chair, the large silver medal of the Society, bearing the portrait of Geoffroy Saint-Hilaire, was decreed to Miss Eleanor A. Ormerod, of St. Albans, England, for her work in Economic, or Applied, Entomology. Miss Ormerod will be heartily congratulated by her numerous agricultural and other friends on the receipt of this distinguished mark of appreciation of her disinterested labours.

ABERRATIONS OF *ZYGÆNA FILIPENDULÆ* AND *Z. TRIFOLIÆ* NEAR RINGWOOD.—It has often been remarked that young collectors are frequently more fortunate in their captures than their older and more experienced brethren, and many of us could verify the statement. Two young friends of mine—brothers—of the name of Bellamy, began collecting Lepidoptera last season, and as they bring most of their captures for my inspection, I have been rather surprised at their success. For instance, last autumn a specimen of *Colias hyale* was taken on the borders of the forest by one of the boys, and, although I had collected over the same ground many hundreds of times, I had but once seen the species alive anywhere in the neighbourhood. During the present season they have met with a yellow variety of *Z. filipendulæ*, and, more remarkable, a black variety of *Z. trifoliæ*. The former specimen is damaged, having lost a portion of the left hind wing, but the example of *trifoliæ* is a perfect gem, having been taken from a grass-stem before its wings were fully developed. From time to time the pages of the 'Entomologist' have been enriched by figures and descriptions of various forms of *trifoliæ*, but I do not recollect seeing such a specimen described as the one now under consideration. The fore wings are, in certain lights, of the usual glossy greenish black colour, but the spots, on close inspection, are conspicuous, appearing to be more thickly scaled and consequently more opaque than the rest of the wings; the borders of the hind wings are of the same greenish hue as the ground of fore wings, whilst that portion of hind wings usually red is of a dull smoky black, with slight indications of a darker central mark on inner margin. The body is black and somewhat "shaggy," and at some distance the whole insect appears to be of a uniform black colour. It is rather small in size, and on being placed side by side with normal *trifoliæ* its antennæ appear to be rather thicker; otherwise this interesting specimen is perfect.—G. B. CORBIN; Ringwood, July 7th, 1899.

[The description of the aberrant *Zygæna* referred to above reminds one of *Z. filipendulæ* var. *chrysanthemi*, Esp. (vide Entom. xxiv. 234), and I consequently wrote to Mr. Corbin asking him if he was quite sure that the specimen had been correctly identified. His reply seems satisfactory upon the point. He was good enough to suggest that if I wished him to do so he would endeavour to obtain the example for examination. This I did not consider necessary, because if Mr. Corbin

is satisfied that the insect is an aberration of *Z. trifolii*, I very much doubt whether I should be able to prove it otherwise. I may add that, so far as I am aware, there is no previous record of a similar aberration of this species.—R. S.]

CAPTURES AND FIELD REPORTS.

MACROGLOSSA STELLATARUM IN THE EDINBURGH DISTRICT.—Mr. Wm. Evans, of Edinburgh, communicates the following note to the 'Annals of Scottish Natural History' (No. 31, p. 184, July, 1899):—"The humming-bird hawk-moth (*Macroglossa stellatarum*) has been more abundant in this neighbourhood this summer than I have ever seen it before. The first I heard of was taken in Peeblesshire on June 1st, and on the 3rd my friend Mr. P. H. Grimshaw captured one at wild garlic (*Allium ursinum*), in Roslin Glen. On the 10th I observed quite a number—certainly not less than fifteen to twenty—on the Fife coast between Burntisland and Kinghorn. Two which I netted were hovering over flowering patches of *Lotus corniculatus* on a sunny bank, but most of them were flying about the cliffs and rocky places where they could not readily be reached. Several times three, and once four, were in view at the same moment. After 4 p.m. they gradually disappeared, the last being seen shortly after six o'clock. The only flowers besides the *Lotus* that I saw them visit here were *Astragalus hypoglottis* and *Salvia verbenaca*. The next example I saw was on the Isle of May, on the 15th. On the 16th I again met with the insect, this time between Longniddry and Aberlady. They were flying about the high roadside wall at intervals for a distance of two miles; and at one place I caught six without moving more than a hundred yards. Altogether, I must have seen quite thirty on this occasion. The same day one was seen at Craiglockhart. In the forenoon of the 19th I noticed three, if not four, on Blackford Hill, and in the afternoon I found numbers careering about the rocks on Arthur's Seat. A similar outburst of this species occurred here thirty years ago (1868-1870)."

Another correspondent to the same journal states that "individuals of this species were attracted in large numbers to a rhododendron when in full bloom," in the Upper Clyde.

UNUSUAL ABUNDANCE OF MACROGLOSSA STELLATARUM.—*M. stellatarum* seems this year to be extremely abundant. I have not previously seen it at Brighton, though it is common at Lewes. It seems to favour one wall very much, and is rarely seen elsewhere. I found one at Fulking, and one on the County Cricket Ground.—ALAN CARDINALL; 18, Cromwell Road, Brighton.

ABUNDANCE OF MELANIPPE FLUCTUATA.—This species, during the four years that I have been living in Upper Tooting, has always been fairly common in gardens, &c. This year it has been in great abundance, especially throughout the month of June. A large amount of variation was also exhibited, both as regards size and tint, as well as in the intensity of the markings.—RICHARD SOUTH; 100, Ritherdon Road, Upper Tooting, S.W.

ANGERONA PRUNARIA AT WANDSWORTH.—A male specimen of the typical form of *A. prunaria* was allured [whence?] by the attraction of electric light, and was captured, at East Hill, Wandsworth, on July 17th last.—H. ARMSTRONG ; 5, Kerrison Road, S.W.

PLUSIA MONETA IN WILTSHIRE.—Though rather late in the day, it may still be of interest to record that, while staying near Pewsey, in Wiltshire, three years ago, I took a specimen of *P. moneta* on the wing, not knowing at the time what it was; it was flying among the flower-beds in the garden, about dusk. I had not the opportunity of identifying the insect until the other day, when I had the privilege of looking through the wonderful collection of Mr. S. J. Capper, of Liverpool, in which I saw a very fine series, besides many other most interesting things. Mr. Capper tells me that at the time I took it the moth was far from common, but that it is appearing more and more each year. I think, however, that it has not before been recorded from Wilts.—J. S. PUCKRIDGE ; The Vicarage, Castlemartin, Pembroke.

[*Plusia moneta* was brought forward as new to the British Fauna in 1890 (*vide* Entom. xxiii. pp. 254, 287, pl. iii. fig. 6).—E.D.]

PLUSIA MONETA IN WEST SUSSEX AND IN KENT.—I found two larvæ of *P. moneta* in the garden here this year, and I also obtained two near Westerham, in Kent. All have pupated, and one imago has emerged.—W. M. CHRISTY ; Watergate, June 21st, 1899.

PLUSIA MONETA IN MIDDLESEX.—On the night of July 15th I netted a specimen of *P. moneta* in our garden; it was hovering over the flowers of *Silene inflata*.—J. F. BIRD ; 162, Dalling Road, Hammersmith, July 17th, 1899.

PLUSIA MONETA IN HERTFORDSHIRE.—On the night of July 18th last, I captured a splendid specimen of *P. moneta* in my light-trap.—PHILIP J. BARRAUD ; Bushey Heath, Herts.

THE YELLOW FORM OF ZYGENA TRIFOLII.—I have only seen three or four yellow specimens of *Z. trifoli* this season.—W. M. CHRISTY ; Watergate, Emsworth, Hants.

SPRING MOTHS AND LARVÆ: CHESTER DISTRICT.—Among the wide grassy lanes branching off the high roads and among the fields, and almost choked in places by thick growths of bramble, dog-rose, and sallow, a friend and I began looking for early moths on the night of March 30th. Many of these green lanes are fast losing their character, if not their very existence—the gipsies, under the paternal hand of the County Council, now know them no more—and there is a clearance going on against bramble, briar, and sallow, much to the disadvantage of local Lepidoptera. Such, at any rate to a great extent, was the case of the particular lane we visited on the date mentioned. Still, there was a good deal of shrubbery left, and we consequently found *Anticlea badiata* fairly plentiful. *A. derivata* did not make its appearance till May 12th. This beautiful moth does not seem to be anywhere common. It is scarce, at any rate, in this district, although its food-plant (dog-rose) flourishes everywhere, and forms the pabulum for *A. badiata* as well. My friend Mr. Thompson, of Chester, took one on the date mentioned; another, June 5th; and I scored

one, May 16th—total, three! Our collecting was done with the aid of lamps, and quite a stock of hibernated larvæ were secured from the willows and blackthorns. Among these were *Triphena fimbria*, *T. orbona*, *T. ianthina*, *Xylophasia polyodon*, and *Noctua augur*. This sort of collecting lasted till the 26th of May, when *A. badiata* fell off, the larvæ disappeared, and there was nothing on the wing but *Rumia crataguta*, *Hypsipetes elutata* (all dark forms), and *Coremia unidentaria*. The type, in which the broad central bar across the upper wings is black, or nearly so, was the commonest form of *C. unidentaria*, but the variety which has the bar, apical blotch, and other marks reddish—sometimes confused with *C. ferrugata*—was also taken. I have never seen the latter species in the district, although it occurs at Birkenhead, Wallasey sandhills, and Puddington (Mr. A. O. Walker's list). *A. badiata* also varied much, especially in depth of tint. Other moths were *Catocampa vetusta* (one, hibernated, taken off willow bloom), *Xylocampa lithorhiza* (one only—another moth seldom seen here), *Tæniocampa gothica*, *T. stabilis*, *T. instabilis*, *T. gracilis*, *Diurnea fagella*, *Hybernia progenitaria*, and *Cidaria silaceata*. The weather was good, on the whole. The nights were often clear and starry, inclined to frost, and with a cold north-east breeze.—J. ARKLE; Chester.

CHÆROCAMPA PORCELLUS.—On June 12th I took a lovely specimen of the above, flying over the flowers of the red campion, in a lane about a mile out of the town; and on the 19th, two more specimens (male and female), within a few yards of the spot where the first was taken. Is not this rather an unusual capture for Warwickshire?—CHAS. BAKER; Long Street, Atherstone, June 26th, 1899.

HALIAS QUERCANA AT DULWICH.—On June 4th I found a larva on a fence bordering Dulwich College. After keeping it for five days it spun a cocoon, and seventeen days later on a specimen of *H. quercana* emerged.—STANLEY A. BLENKARN; Ivyholme, Dulwich Common, S.E.

NOTE ON DIANTHÆCIA CUCUBALI.—On July 24th last I took a specimen of *D. cucubali* at sugar, at Lewes. Is not this unusually late for this species? And is it not also very unusual for it to come to sugar? The specimen was in very fine condition, and evidently only recently emerged.—HUGH J. VINALL; Lewes, July 25th, 1899.

[This species is "double-brooded" on the Continent, and there is no doubt that it is so, occasionally at least, in Britain. The specimens occurring in August and late July are almost certainly derived from the May-June emergence. It has been previously noted as a visitor to sugar.—ED.]

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—June 22nd, 1899.—Mr. J. W. Tutt, F.E.S., Vice-President, in the chair. Mr. Montgomery exhibited larvæ of (1) *Pararge megara*; (2) *Epinephela tithonus*, from ova, showing brown and green forms; and (3) *E. hyperanthus*, from ova, and gave particulars as to their food-plant and their hibernation. He also showed a new arrangement he had made for sending larvæ by post. Mr. Turner, a cluster of large

ova deposited on a spray of heather, closely resembling a head of the dead flowers, and afterwards found to be those of *Bombyx quercus*. Mr. West, a specimen of *Stauropus fagi*, bred from a larva found at West Wickham in 1898. Mr. Adkin, a fine specimen of *Syrichthus malva* var. *taras*, from Milton, Sussex; a cocoon of *Hylophila bicolorana* (*quercana*), and called attention to the special construction which gave it great power of resistance to external pressure; and he mentioned the fact of having seen a specimen of *Hepialus* wallowing in the dust of the road as sparrows do, and flying off when disturbed. Dr. Chapman, specimens of *Fumea intermediella*, bred, and made remarks on the brown and blackish forms; cases of a Psychid from Chili, with a curious internal structure for the support of the pupa; and cases and male examples of *F. crassiorella*, pointing the distinctive features of the species. Mr. Tutt, specimens of *Ephippiphora grandævana* from Hartlepool, with the curious long sand tubes, and described the movements of the pupæ. Mr. F. Noad Clark gave notes on photomicrography as applied to entomology, illustrating his remarks by photographs taken by himself.—HY. J. TURNER, *Hon. Rep. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*June 19th, 1899.*—Mr. P. W. Abbott, Vice-President, in the chair. Mr. R. C. Bradley showed series of *Andrena trimmerana* and *Nomada alternata*, which he had been taking commonly at Moseley; also specimens of *Chortophila buccata*, which he had found newly emerged, drying their wings outside the nests of the *Andrenæ*. Mr. P. W. Abbott, a nice little series of *Sesia sphegiformis*, which he had succeeded in breeding from Wyre Forest. He had caught one or two odd specimens there before, but had not previously found the larvæ. Mr. C. J. Wainwright, a number of Aculeate Hymenoptera, including *Andrena fulvicrus*, *A. thoracica* from Folkestone, *Nomada bifida* from New Forest, and many others.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

CARLISLE ENTOMOLOGICAL SOCIETY.—*July 6th, 1899.*—Mr. James Murray in the chair. Mr. G. Wilkinson exhibited *Stigmonota dorsana*, *Eupæcilia maculosana*, *Dicrorampha saturnana*, *Adela rufimitrella*, from Wreay; *Amphisa prodromana*, from Castlecarrock Fell. *S. dorsana* was the fourth specimen that had been taken. Mr. J. Murray, the following Coleoptera: *Saperda populnea*, which was taken flying round aspen commonly; *Cryptorrhynchus lapathi*, from willow bushes on the banks of the Eden; *Elaphrus riparius*, which is locally common on the Eden; *Harpalus latus* var. *erythrocephalus*, and *Telephorus figuratus*. Mr. F. H. Day, *Bledius spectabilis*; *Telephorus darwinianus*, from Burgh; *Carabus nitens*, from Brackenber Moor in Westmoreland. Mr. G. B. Routledge, *Bradycellus cognatus* and *B. collaris*, from Castlecarrock Fell; *Bembidium schuppeli*, from the banks of the River Irthing, a local northern species, first taken by the late Mr. T. J. Bold in the same district.—G. B. ROUTLEDGE.

RECENT LITERATURE.

Insects, their Structure and Life: a Primer of Entomology. By GEORGE H. CARPENTER, B.Sc.Lond. 8vo, pp. xii, 404, illustrated. London: J. M. Dent & Co. 1899.

THE literature treating of the subject of entomology has become so extensive that it is hardly possible for the average student to keep himself quite posted up to date. A work therefore which, in a comparatively small compass, gives a comprehensive digest of the latest additions to our knowledge should certainly be accepted as a distinct boon.

The author of the volume under notice is to be congratulated on the very able way in which he has dealt with the large amount of material at his command, presenting us with an epitome of the work and teachings of present-day morphologists, biologists, and systematists. The book comprises six chapters, as follows:—1. The Form of Insects; 2. The Life-history of Insects; 3. The Classification of Insects; 4. The Orders of Insects; 5. Insects and their Surroundings; 6. The Pedigree of Insects. There is also a very full bibliography and a convenient index.

The class is divided into fifteen orders, and these are considered as here enumerated:—Collembola, Thysanura, Dermaptera, Orthoptera, Platyptera, Thysanoptera, Hemiptera, Plectoptera, Odonata, Neuroptera, Coleoptera, Trichoptera, Lepidoptera, Diptera, Hymenoptera.

The relationship of the orders is discussed at some length in chapter 6.

In discussing the classification of insects (chapter 3) our author remarks (pp. 157-159), under the sub-heading "The Search for a Natural Classification":—

"It will have been evident to the reader of this chapter that insect classification is a more or less uncertain thing. The limits which mark off species, genera, families, and even orders, from each other depend largely upon the judgment and opinion of the naturalist. Butterflies and moths may be easily enough distinguished from cockroaches, but some of them show a remarkable likeness to caddis flies. This difficulty in classification is just what we should expect, if, as we believe is the case, all insects are really related to each other. We are able to draw hard and fast lines between some groups because in the course of ages they have diverged far from their common stock. But the more nearly related insects are, the more difficult do we find it to make them fit into the divisions that we have made for their reception. Could a naturalist have before him all the insects which live or ever have lived on the earth, his divisions would entirely break down, and his system of species, genera, families, and orders would become lost in a well-nigh indefinable gradation of characters. The object of the classifier is so to arrange the insects which he does know that they may fall into their right positions with regard to those vanished races that must once have formed the connecting links between them. The truly natural classification of insects is that which will place them on their right branches of the great tree of animal life. The labours of the classifier are usually presented in the form of lists or catalogues;

and no linear arrangement—genera, families, orders, following one after the other—can exactly express the true relationships between the groups, which must necessarily show affinities in various directions. But in striving after a natural system, making use in his work of all that he can learn of the inner and outer structure and development of the creatures which he classifies, the systematist is doing his part to read the *history* of insects in the widest sense of the term. And he will, if wise, hold with a light grasp to his systematic divisions, recognising that the increased knowledge which makes the line between two species or two orders appear blurred and uncertain, throws a clearer light on the object of all entomological work, which is to trace the course of evolution in insect life.”

Mr. Carpenter is of opinion that the old style division of the Lepidoptera into Rhopalocera and Heterocera is not scientific, and in this view he is in accord with most recent authors. He, however, also objects to the divisions Jugatæ and Frenatæ, proposed by Comstock; to the Incompletæ and Obtectæ, of Chapman; and to Packard's Haustellata with Laciniata as a sub-order. In rejecting all divisions between the order and the family he is in unison with Hampson. The families adopted are forty-seven in number, and are briefly referred to in the following sequence:—Micropterygidæ, Eriocraniidæ, Hepialidæ, Zygænidæ, Chalcosiidæ, Limacodidæ, Castniidæ, Megalopygidæ, Psychidæ, Heterogynidæ, Cossidæ, Sesiidæ, Tortricidæ, Tineidæ, Pterophoridæ, Orneodidæ, Pyralidæ, Thyrididæ, Drepanulidæ, Callidulidæ, Lasiocampidæ, Lymantriidæ, Hyspidæ, Arctiidæ, Noctuidæ, Argaristidæ, Syntomidæ, Thyatiridæ, Notodontidæ, Sphingidæ, Dioptidæ, Geometridæ, Epiplemidæ, Uraniidæ, Epicopiidæ, Bombycidæ, Eupterotidæ, Ceratocampidæ, Brahmæidæ, Saturniidæ, Hesperiidæ, Lycænidæ, Lemoniidæ, Libytheidæ, Papilionidæ, Pieridæ, Nymphalidæ.

We have great pleasure in bringing this work to the attention of our readers, as we are sure that it will prove to some of them exactly the book they have been anxious to obtain. It is liberally illustrated, well arranged, and printed, and the price is exceedingly low.

The Quince Curculio. By M. V. SLINGERLAND. Bulletin 148. Cornell University Agricultural Experimental Station. Pp. 695-715. Illustrated. Ithaca, N.Y. May, 1898.

U.S. Department of Agriculture, Division of Entomology, Bull. 19. Some Insects Injurious to Garden and Orchard Crops. A series of articles dealing with insects of this class. By F. H. CHITTENDEN. Pp. 100. Illustrated. Washington. 1899.

Contributions toward a Monograph of the Noctuidæ of Boreal America: Revision of the Genus Hydræcia. By JOHN B. SMITH, Sc.D. Pp. 48, 2 plates. Reprint from Transactions, American Entomological Society, xxvi., May, 1899.

The Coccidæ of Kansas. By S. J. HUNTER. Pp. 11, 5 plates. Reprint from Kan. Univ. Quar. viii., April, 1899, series A.

Report on the Work of Exterminating the Gypsy Moth. By C. H. FERNALD and E. H. FORBUSH. Pp. 71, 12 plates. Massachusetts State Board of Agriculture. January, 1899.

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ON THE NOMENCLATURE OF THE RHYNCHOTA.—PART 1.

By G. W. KIRKALDY.

YOUNG entomologists commencing the study of the Rhynchota are doubtless often discouraged, when extending their labours beyond British forms, by the chaotic condition of the nomenclature; although the specific names are fairly well fixed—as much so as one can expect for artificial conceptions—the generic names seem to have no stability, and one has sometimes to spend more time in hunting up references and working through piles of volumes and pamphlets than in actual examination of the insects themselves.

In some orders, where a very similar condition of things prevails, there is good excuse, as, for example, in the Lepidoptera, where the leading authorities are not at all in accord as to whether certain works are to be accepted or not. In the Rhynchota there appears to be (except in a few isolated cases) *no such excuse whatever*. I have carefully examined all the literature of the Heteroptera (of which I am cognisant), up to 1810, and I know of two genera only in which the type cannot be *indubitably* fixed, according to the strict law of priority.

I am aware that with many men it is the custom to sneer at what are termed “antiquarian researches,” but I am convinced that, until the nomenclature of the genera is tolerably well and *safely* fixed, anatomical and biological investigations can only be conducted with an unnecessary amount of extraneous trouble.

O. M. Reuter has already, in a monumental work,* settled definitely a great number of genotypes, and although in a few cases I find his results open to question—and these are when he

* “Revisio synonymica Heteropterorum palæarcticorum, &c.,” in ‘Acta Soc. Sci. Fennicæ,’ 1888, xv. pp. 241-313 and 443-812.

has avoided the strict application of the rule—my researches convince me that his main conclusions are perfectly correct. It would have been unnecessary to make such a remark, were it not that three important works by serious rhynchotists* have been published (subsequent to the 'Revisio'), in which Reuter's results have been almost entirely ignored.

In consulting these works, moreover, I have been unable to appreciate the method by which the names of the families and subfamilies are appropriated; for instance, on p. 45 of Puton's 'Catalogue,' the first tribe of the "Reduvides" is given as "Emesini." Why? Is *Emesa* a more typical genus than *Ploiariola* or *Ploiaria*? It seems to me that the only satisfactory and uniform method—in the present state of our knowledge—is to take the genus founded earliest, and form from that the family, &c., names; *i. e.*, *Ploiaria*, dating from 1786, is the oldest—in its subfamily—and that subfamily should then be known as PLOIARINÆ (or tribe Ploiariini). *Reduvius*, 1775, is the oldest genus in the whole family, so that the latter is, as usually termed, REDUVIIDÆ. On the other hand, *Miris*, 1794,† antedates *Capsus*, 1803, by nine years, and the family should be known as MIRIDÆ.

1. Linnæus founded in the 'Systema Naturæ,' ed. 10, 1758, three heteropterous genera; viz. *Cimex*, *Nepa*, and *Notonecta*. As the types of the two last (*i. e.* *N. cinerea* and *N. glauca*) are not disputed, it is unnecessary to dwell upon them. Eighty-three species are included in *Cimex*, but it was not broken up till Fabricius in 1775, 'Systema Entom.,' removed several species to found *Acanthia* and *Reduvius*.

The type of *Cimex* must be among the Linnean species left therein by Fabricius, and cannot therefore be *C. lectularius*, removed by the latter to *Acanthia*.‡

Reuter has indicated *personatus*, Linn., as the type of *Reduvius*, Fabr. (Lamarek, 1801), and this seems to be generally accepted. He also indicates *zosteræ*, Fabr., and *littoralis*, Linn., as the types of *Acanthia*, Fabr., but as this has been accepted neither by Saunders, Leithierry and Severin, nor Puton, nor yet by Horvath,§ it may be worth while to recapitulate the reasons

* Edward Saunders, 1892, 'Hemipt. Heteropt. British Islands'; Lethierry & Severin, 1893-96, 'Catal. général Hémiptères,' i.-iii.; A. Puton, 1899, 'Catal. Hémiptères paléarct.,' ed. 4.

† "1771," by printer's error in the 'Revisio,' pp. 613 and 764.

‡ This result is unaffected by any subsequent type-fixations or new genera; for example, *C. lectularius* was wrongly fixed by Latreille in 1802 as the type of *Cimex*. Dr. Reuter remarks (p. 268): "Dass Latreille . . . für diese Art den Namen *Cimex* aufnahm, scheint mir nur ein Zeugnis seines guten Tactes zu sein." The learned Doctor is doubtless endowed with a very subtle gift of irony, as I fail to see any display of "tact" in committing an error which has caused nearly a century of nomenclatural confusion, and left the commonest bug without a proper name.

§ 1898, 'A magyar birod állatv. Hemipt.' (1897), p. 43.

for this step. *Acanthia*, Fabr., 1775, contained a heterogeneous assemblage, but it was not till 1797 that Latreille indicated *littoralis* and its congeners as the types of the genus. It is, I think, indisputable that (1) *Acanthia* was not broken up, nor was any type fixed, till 1797; and (2) that Latreille did fix the type. I therefore see no alternative to adopting the name *Acanthia* for *littoralis*, &c., as Reuter has already done in his monograph of the palæarctic species.

For *Cimex lectularius*, Linn., I now propose the generic name **KLINOPHILOS** (with genotype *lectularius*).

From the remnants of *Acanthia* have been formed, up to 1803, *Phymata*, Latr., 1802; *Aradus*, Fabr., 1803, of which Reuter has indicated the types; and *Tingis*, Fabr., 1803, of which Reuter cites "*Acanthia pyri*, Fabr.," as the type. This is, however, incorrect, *T. cardui* (Fabr.) having been indicated by the founder of the genus (p. 125).

2. In 1762 Geoffroy erected two genera—*Naucoris* (type [*cimicoides*, Geoffr. nec Linn.=] *maculata*, Fabr.) and *Corixa* (type [*striata*, Geoffr. nec Linn.=] *geoffroyi*, Leach).^{*} *Sigara*, Fabr. 1775, is synonymous with *Corixa*, Geoffr.

The next publication was Olivier's contribution, in 1789, to the 'Encyclopédie Méthodique,' vol. iv. In this precious volume a "new" genus, *Pentatoma*, was "founded," though very feebly diagnosed, and without mention of species or type.

As the work is, I believe, rare, it may be interesting to some rhynchotists to read the original descriptions:—

"No. 59. *Cimex*, Linn. Geoffr. Fabr. *Acanthia*, Fabr.—Antennes filiformes, composées de quatre articles très distincts. Trompe recourbée sous la poitrine, creusée en gouttière, & contenant trois soies. Trois articles aux tarses. *Corps allongé, rarement ovale, souvent déprimé.*

"No. 60. *Pentatoma Cimex*, Linn. Geoffr. Fabr.—Antennes filiformes, composées de cinq articles cylindriques. Trompe recourbée sous la poitrine, creusée en gouttière, & contenant trois soies. Trois articles aux tarses. *Corps souvent ovale.*"

That is to say, the only workable difference between the two is that *Cimex* has four-segmented antennæ, *Pentatoma* five. Fabricius, in 1794 (Entom. Syst. iv.), splits up *Cimex* into five genera, *Cimex* itself being reserved for the forms now known as "Pentatomidæ" in the widest sense. Now, if *Pentatoma*, Oliv., as *subsequently* fixed by Lamarck in 1801 (note, twelve years after its original proposal), is allowed to be valid, I fail to see how the type of *Cimex* can be fixed. *Pentatoma*, Oliv., 1789, if it has any value at all, is equivalent to the "Pentatomidæ" as a

* I do not know why Reuter places Geoffroy's "Histoire abrégée des Insectes" in the *first* part of his 'Historische Uebersicht,' viz. "Arbeiten, in welchen die binäre Nomenclatur nicht durchgeführt ist"!!

whole (that is, to *Cimex*, Fabr., 1794); but Olivier's definitions of the two genera appear to me utterly worthless. *Pentatoma* was disregarded altogether by Fabricius both in 1794 and 1803, and was considered synonymous with *Cimex* by Latrielle in 1797.

The antennæ in the majority of the "Pentatomidæ" have certainly five segments, but a large proportion have only four, and a few three. Moreover, Olivier's definition of *Cimex* does not accord with that of Fabricius, 1775 (legitimately modified from Linnæus), and does not suffice for the remainder of Fabricius's *Cimex* after the removal of the "Pentatomidæ." Furthermore, there is no indication of types nor mention of species in either. I propose therefore to treat "*Pentatoma*, Olivier," as a *nomen nudum*, and disregard it altogether as a nomenclatural factor at 1789, but hold it in suspense till 1796, when it is ranked as a synonym of *Cimex* by Latrielle.

3. The types of the four genera removed by Fabricius from *Cimex* in 1794 were fixed by the founder as follows:—

213. *Coreus*, type *scapha* (Fabr.).

214. *Lygæus*, type *valgus* (Linn.).

215. *Miris*, type *dolobratus* (Linn.).

216. *Gerris*, type *lacustris* (Linn.).

The first three are not generally accepted.

Coriscus, Schrank, 1796 (type *dauci*), remains unidentified, but the types of the other genera not previously mentioned, erected between 1786 and 1803, are as indicated by Reuter, except that the type of *Cimex* is recorded on p. 301 as "*nigrideus*," whereas it is "*bidens*, Linn."

The following will demonstrate the synonymy I now propose, which is really almost an entire return to the nomenclature adopted by Stål in the opening volumes of the 'Enumeratio':—

1. CIMEX, Linn., 1758. Type, *bidens*, Linn., Fabr., 1803.

2. PENTATOMA, Oliv., 1789. Valueless [ranked as syn. of *Cimex*, 1797.]

3. LYGÆUS, Fabr., 1794 = *Holopterna*, Stål, 1873, and modern authors. Type, *valgus* (Linn.), Fabr.

4. TINGIS, Fabr., 1803 = *Philontochila*, Fieb., and modern authors. Type, *cardui* (Linn.), Fabr.

5. KLINOPHILOS, Kirkaldy, 1899 = *Cimex* of some modern authors = *Acanthia* of others. Type, *lectularius* (Linn.), Kirk.

From this follows the synonymy as below:—

1. CIMICIDÆ = Pentatomidæ, auct.

2. LYGÆIDÆ = Coreidæ, auct.

2a. Lygæinæ = Mictinæ, auct.

2b. Coreinæ = Centroscelinæ, auct.

3. MYODOCHIDÆ = Lygæidæ, auct.

3a. Astacopinæ = Lygæinæ, auct.

- 4.* *MACROCEPHALIDÆ* = *Phymatidæ*, auct.
 5. *MIRIDÆ* = *Capsidæ*, auct.
 6. — ? — = *Cimicidæ*, auct.

I have not thought it necessary to enumerate the changes desirable in a large number of other subfamilies.

THE TYPE OF THE GENUS *HYPOLYCÆNA*.

BY A. G. BUTLER, Ph.D.

IN the 'Wiener Entomologische Monatschrift' for 1860, Felder described a new Lycænid under the name of *Myrina thecloides*, and, in a footnote, he remarked, "This species and its allies, *M. erylus*, Godt., and *M. sipylus*, Feld., differ from the Myrinas in having the second joint of the palpi shorter than the head, the third long, aciculate, arched, the antennæ moderately clubbed."

In the same Journal, two years later, he refers back to this description (to which he adds that the antennæ are clearly but distantly annulated), and he gives to the group the name *Hypolycæna*, adding to it three additional species.

Now it stands to reason that, *M. thecloides* being the only species to which the original description was referred, the fact that no name for the genus was proposed until 1862, cannot prevent *M. thecloides* being its type, and it is manifestly a blunder to recognize any of the three species referred to as "tribus ulterioribus speciebus" as the type of a description written before they were received.

Dr. Scudder was the first to fall into error, when he stated that *H. tharrytas* might be taken as the type; whilst, later, Dr. Moore equally incorrectly indicated *H. tmolus*: the latter is indeed congeneric with *H. thecloides* and with *H. erylus*, although it possesses a far better defined male sexual patch on the primaries than either of them.

Without personal critical comparison of all the structural characters, I am not (at present) prepared to accept all the African forms as belonging to the genus: they may do so.

* *Macrocephalus*, Swederus, 1787, antedates *Phymata*, Latr., 1802.

A CONTRIBUTION TO THE ENTOMOLOGY OF NORTHAMPTONSHIRE.

BY CLAUDE MORLEY, F.E.S., &c.

Is there no one in the whole of broad Northamptonshire who collects Moths and Butterflies? Nay, this cannot be, in view of the existence of the Northampton and of the Peterborough Natural History Societies. Let him arise then and awake to the fact that he can make for himself a name—not a great one, but that of an authority upon a subject within a limited area; and who's is more? There is, says my friend Mr. C. G. Barrett (*Ent. Mo. Mag.* 1897, p. 193), no list of the Lepidoptera of Northants. In these deplorable circumstances, may I be permitted to place a few of my schoolboy reminiscencies upon record? I have never publicly acknowledged my obligations to William T. Hill, of Peterborough, for his good fellowship in the early days of my entomology—the days, as Green says, when everything is rare. Mr. Hill could, doubtless, tell far more of the Lepidoptera of his neighbourhood than I, but unfortunately, as a wag recently remarked, he has “degenerated” from a buggist to an editor, and now, I fear, has deserted his ancient love of things crawling. This being so, I mention, with the keenest appreciation of the paucity of the data and ubiquity of the species enumerated, such as I can recall of those then treasures, as a small and insignificant basis for a county list—a mere twig in that vast forest of insect fauna which must exist, and only needs the working, in so fertile and well-wooded a county. I began to cross the confines of the Science in 1887, and in the Augusts of 1888–92 I noted the following species in the vicinity of Peterborough, with a few additions from Mr. Hill's collection:—

Pieris brassicæ, *vapæ*, and *napi*; *Euchloë cardamines*, common; *Gonepteryx rhamni*, females unusually common at Barnwell Wold and Marholm in August; *Colias edusa* and *C. hyale* both occurred at Helpston Heath during the great 1892 year; *Argynnis paphia* and *adippe*, somewhat common at Helpston Woods; *A. aglaia*, common among very rough grass outside the wood; *A. euphrosyne* and *A. selene* were both taken in the same locality by Mr. Hill; *Vanessa urticae*, *io*, and *atalanta*, common; *V. polychloros* at Barnwell Wold and Peterborough sparingly,—I have found the pupa at Marholm; *V. cardui*, widely distributed and uncommon; *Apatura iris* was said to occur at both Helpston Heath and Barnwell Wold, but I never saw it, nor do I know of authentic records; *Melanargia galatea*, very abundant among long dry grass in a very rough field at Helpston, and I have also seen it at Sutton Heath in 1890; *Pararge egeria* and *megara*, *Epinephele ianira*, *tithonus*, *hyperanthus*, and *Cenonympha pamphilus*, common; *Thecla quereus* and *rubi* both occurred at Helpston Heath; *Polyommatus phlaeus* was common, especially in the fens about Yaxley and Holme, where the specimens were of unusual size and depth of colour; *Lycæna*

agestis and *icarus*, common; *L. corydon*, exceedingly abundant in a disused stone quarry (not on chalk) near Helpston Heath; Mr. Hill took *Nemeobius lucina*, *Thanaos tages*, and a few *Carterocephalus palæmon* at Helpston in 1891; *Hesperia linea* and *sylvanus*, common.

Sphinx ligustri and *Chærocampa elenor*, uncommon; *Smerinthus populi* and *tilia*, common in the larval condition; *S. ocellatus*, scarcer; *Zygæna filipendulæ* and *lonicera*, which were very partial to Scotch thistle heads (*Onopordon*), common at Helpston Heath; *Lithosia lurideola*; *Euchelia jacobææ* was abundant upon the *Senecio* in stone quarries; *Arctia caia*, *Spilosoma lubricipeda*, *S. menthastri*, common; *Hepialus humuli*, *sylvanus*, *lupulinus*, and *hectus* all occurred sparingly at Peterborough; *Zeuzera pyrina*, of which a fine female had been captured at Barnwell Wold; *Porthesia similis*, *Leucoma salicis*, common; *Dasychira pudibunda*, at Borough Farm in the fens; *Orgyia antiqua*, common; *Bombyx neustria* and *Odonestis potatoria*, common at light.

Drepana hamula, flying about oaks at Helpston; *Ulix glaucata*, at light in the houses; *Dicranura vinula* and *Phalera bucephala*, larvæ common; *Pterostoma palpina*, at street lamps, uncommon.

Bryophila perla, *Acronycta tridens*, at light; *A. rumicis*, larvæ at Peterborough in 1890; *Leucania pallens*, *Hydrecia nictitans* and *micæa*, at light; *Axylia putris*, uncommon; *Xylophasia rurea* (one), *lithoxylea*, and *monoglyphica*, common; *Characæa graminis*, common upon flowers of *Senecio jacobæa* at Helpston Heath; *Cerigo matura* (once or twice), *Luperina testacea*, *Mamestra brassica* and *persicaria*, *Apamea didyma*, *Miana furuncula* and *arcuosa* (once), *Caradrina blanda*, all at street lamps; *Agrotis saucia* and *porphyrea*, one each, in street lamps; *A. exclamationis*, *Noctua umbrosa*, *augur*, and *xanthographa*, at light; *Triphæna interjecta*, flying uncommonly among furze bushes (*Ulex*) at Helpston Heath in 1890 and 1891; *T. comes* and *T. pronuba*, at light; *Amphipyra pyramidea*, at Helpston and Peterborough; *A. tragopogonis* and *Mania typica*, on sugar at Waternewton, together with *Dianthæcia cucubali*; *D. carpophaga*, Peterborough; *Polia flavocincta*, *Agriopis aprilina*, *Plusia chrysitis* and *gamma*, at light; *Gonoptera libatrix*, Peterborough; *Euclidia glyphica* was taken by Mr. Hill at Helpston Heath in June, 1891.

Geometræ were not enthralling in those days, and I only noticed *Selenia illunaria*, *Orocallis elinguaris*, *Ennomos tiliaris*, *Boarmia gemmaria*, *Halia rauraria*, *Eupithæcia vulgata*, all common at light; *Strenia clathrata* at Marholm and Helpston Heath; *Fidonia atomaria*, *Abraxas grossulariata*, at Peterborough; *Lomasipilis marginata*, Borough Farm, in fens; *Hypsipetes sordidata*, *Melanippe fluctuata*, *Coremia ferrugata*, *Campptogramma bilineata*, *Cidaria russata*, all common; *C. dotata*, uncommon at Peterborough; *Eubolia mensuraria* and *palumbaria*, in the frequent stone quarries towards Helpston.

Of Micros we knew nothing, but I distinctly remember *Alucita hexadactyle* being unusually frequent in the house.

Of then unworked orders I still possess *Donacia sparganii* from reeds on the bank of the Nen; *Locusta viridissima* from a meadow near Walton Station; *Chrysis ignita* on a stone wall; and *Abia fasciata* on a flower—probably *Heracleum spondylium*—both at Helpston Heath, in August, 1889.

In this connection, I may mention that during a flying visit to Helpston Heath on February 24th, 1896, I noticed many empty cocoons, and obtained one containing a larva of *Sesia apiformis* in aspens at Marholm; and among Coleoptera were:—*Leistis spinibarbis*, hibernating in an old stump; *Oxytelus rugosus*, and *Choleva nigricans*, in *stercore*; *Priobium castaneum*, unusually common in a dead hawthorn stump; and *Erirrhinus vorax*, not rare, beneath aspen bark. The only Diptera seen were *Coecotheca fenestralis*, sitting commonly on the walls of a cave in a stone quarry with a blue Tachinidæ, which Dr. Meade fails to recognise.

Ipswich; August, 1899.

THE ENTOMOLOGICAL CLUB.

(Concluded from p. 164.)

August 15th, 1844.—Trustees' letter of thanks to Club for "interesting and valuable present of insects." Mr. Doubleday instructed to obtain from Mr. Newman and other quarters the remainder of the property of the Club, that it might be brought together under his care: "Resolved, that it was expedient that steps be taken for obtaining from the British Museum those specimens of British and reputed British insects which it has been understood would be given to the Club from among the duplicates there."

September 19th, 1844.—Mr. Doubleday authorised to purchase four to six specimens of *Hipparchia melampus* (*Erebia epiphron* var.), then just recently discovered in Scotland by Mr. Weaver.

October 17th, 1844.—Purchase of an additional cabinet discussed and adjourned to next meeting. (November 21st, 1844.—Cabinet question again adjourned.)

December 19th, 1844.—Unanimously resolved that a new cabinet of twenty drawers be made to match the two at present belonging to the Club.

October 16th, 1845.—New cabinet reported to be nearly completed, and Treasurer authorised to pay for it when received by the Curator. (Paid 1845, see account-book.)

February 19th, 1846.—Plan of arranging the insects belonging to Club discussed. It was finally decided to commence with the Coleoptera, and "to confine them as closely as possible to twenty drawers, and that the arrangement be continued on the same scale, leaving it to be ascertained hereafter whether, at that rate, the whole collection may be arranged in the hundred drawers at present belonging to the Club, or whether more may be required."

May 21st, 1846.—Cabinets, collections, &c., reported to have been removed to the Curator's new residence—8, Spencer Place, Brixton Road.

So far as shown by the minute-book no mention was made of the Club's collection or other property at any meeting between that last referred to and June 15th, 1848, when Mr. Doubleday, as Curator, was authorised to supply a member with ten mahogany boxes belonging to the Club, at the sum of seven shillings apiece.

November 16th, 1848.—It was announced that the insects promised by the British Museum authorities had been received, and were then deposited in the cabinets of the Club.

On the death of Mr. Edward Doubleday in 1849 Mr. Walker was appointed Curator, and the Club's effects were removed to Bedford Square. On January 17th, 1850, the Curator reported that the property of the Club then under his charge consisted of two forty-drawer mahogany cabinets, and one mahogany cabinet of twenty drawers, "but that from the latter one drawer had been removed and was missing; also a number of insects in a deal mahogany cabinet belonging to Mr. Newman; but that no books or boxes of insects had been delivered"; and on May 16th of the same year he submitted the following statement:—"I have nearly finished the arrangement of the Coleoptera, and have placed in the cabinets the Orthoptera, Neuroptera, Hymenoptera, Hemiptera, and that portion of the Diptera which were not previously arranged. I have commenced labelling the Lepidoptera which require partial rearrangement. I have transferred some duplicates and some exotic species from the cabinets to my own boxes, and will give them up as soon as required. In conclusion, I will remark that my correspondence with entomologists will enable me to add to the collection, and would suggest the purchase of 'Curtis's Guide' as a means of ascertaining the number of the species and probably of much increasing them."

According to the report read at a meeting on May 17th, 1851, it would seem that the arrangement of the Diptera had been proceeded with, and that "very many species" had been added to the collection. It was also stated that a copy of 'Curtis's Guide' had been procured, and that most of the species in the possession of the Club had been marked off in it. In October, 1852, Mr. Walker intimated to the Club that as he was removing to Chepstow he was unable to keep the cabinets in Bedford Square, and the matter was then discussed, and its further consideration deferred to the next meeting (November 20th), when it was stated "that Mr. Walker had consented to withdraw his resignation of the Curatorship, and that arrangements were in progress for the location of the cabinets and for making them useful to entomologists generally; the details would be laid before the next meeting."

As mentioned in the previous account of the Club (*Entom.* xxv. p. 6), the collections passed into the custody of Mr. Edward Newman at the end of 1852, and remained under his charge

until the time of his death (1876). They subsequently came under the care of Mr. Lowne, and are still in that gentleman's possession.

It will be seen by the extracts from the minute-book (1841-1851) given above that the exotic portion of the collection was disposed of, so that the cabinets, when deposited with Mr. Newman, contained only British species. The collections were subsequently enriched during the twenty-four years that Mr. Newman was the Curator. Mr. Lowne has now had the charge of the property of the Club for about twenty-three years, but during this period there are few recorded gifts to the Club. The chief *items* are the following:—

November 22nd, 1876.—A copy of Swammerdam's 'Natural History,' which had been presented to Mr. Newman by Mr. Joshua Brown, of Cirencester, was presented to the Entomological Club by Mrs. Newman, and the book was ordered to be placed in the hands of the Curator.

October 26th, 1881.—Mr. Brown presented the Club with a copy of Goedart's 'Entomology,' published in 1635.

It is to be hoped that these collections of British insects may again become available for general study. Almost quite recently there was a report that they were to be deposited with one of the London local societies, and so would be accessible to all entomologists. If this could haply be effected, the arrangement would certainly be quite in accord with the intentions of the original founders of these historic collections.

SOME NEW ENTOMOLOGICAL BOOKS.

Insects. Part II. By DAVID SHARP, M.A., M.B., F.R.S., &c.
8vo. Pp. i-xii, 1-626. Illustrated. London and New York: Macmillan & Co. 1899.

THE present volume is the sixth of the Cambridge Natural History. In our notice of the first part of Dr. Sharp's important work (Entom. xxix. 71), we mentioned that the orders recognised by the author were nine in number. Of these Aptera, Orthoptera, Neuroptera, and a portion of the Hymenoptera were treated in the former volume; the remainder of the Hymenoptera, together with Coleoptera, Lepidoptera, Diptera, Thysanoptera, and Hemiptera are considered in the volume before us. The divisions of Hymenoptera now discussed are the Tubulifera and the Aculeata, these being the second and third series of the suborder Petiolata.

The Coleoptera are divided into six series as follows:—Lamellicornia, Adephaga, Polymorpha, Heteromera, Phytophaga, and

Rhynchophora. With regard to the composition of series 3, Dr. Sharp says:—"We are obliged at present to adopt upwards of eighty families; and we are able to distinguish on positive characters five series. This leaves a large number of forms still unclassified, and these we have here associated with a sixth series, which we have called Coleoptera Polymorpha. This series corresponds with the two series called in books Clavicornia and Serricornia. As it is admitted to be impossible to define these two series, we think it much better to act accordingly, and to establish for the present a great group that can only be characterised by the fact that its members do not belong to any of the other five series. No doubt a larger knowledge of development, coupled with the advance of comparative anatomy, will ultimately bring about a better state of affairs." The Strepsiptera are included provisionally in Coleoptera.

Structure, embryology, metamorphosis, &c., of insects, were fully discussed in a general way in the first five chapters of the previous portion of this work, but these subjects are further entered upon in reference to each order independently. Thus, in his remarks on the external structure of Lepidoptera, Dr. Sharp states with regard to the divisions of the thorax:—"The prothorax is very small, being reduced to a collar, between the head and the alitrunk, of just sufficient size to bear the front pair of legs. Its most remarkable feature is a pair of processes, frequently existing on the upper surface, called 'patagia.' These, in many cases (especially in Noctuidæ), are lobes capable of considerable movement, being attached only by a narrow base. In *Hepialus*, on the contrary, they are not free, but are merely indicated by curved marks on the dorsum. The patagia are styled by many writers 'tegulæ.' They are of some interest in connection with the question of wing-like appendages on the prothorax of Palæozoic insects, and they have been considered by some writers to be the equivalents of true wings. The mesothorax is very large, especially its upper face, the notum, which is more or less convex, and in the higher forms attains a great extension from before backwards. . . . In addition to the front pair of wings the mesothorax bears on its upper surface another pair of appendages, the tegulæ. In the higher forms they are of large size; they are fastened on the front of the mesothorax, and extend backwards over the joint of the wing with the body, being densely covered with scales, so that they are but little conspicuous. These appendages are frequently erroneously called patagia; but have also been called scapulæ, pterygodes, paraptera, and shoulder-tufts or shoulder-lappets."

Discussing the methods of referring to the wing neuration of Lepidoptera, Dr. Sharp is of opinion "that no system satisfactory from a practical as well as from a theoretical point of view has yet been devised."

In his observations on larva of Lepidoptera, he remarks:—“The front legs are usually called the true legs, the others pro-legs; but this latter designation is a most unfortunate one, the term ‘pro’ being in entomology used to signify anterior. It is, therefore, better to call the three anterior pairs thoracic legs, and the others abdominal feet, distinguishing the hind pair of these latter as claspers. There is, too, an unfortunate discrepancy amongst entomologists in their manner of counting the body-segments; some count the head as the first segment, while others apply this term to the first thoracic segment. The latter is the more correct course, for, as the head is not a single segment, it should not be called such in a terminology that affects to be morphologically exact, not simply descriptive.”

The Lepidoptera are here treated in the usual two divisions, *i. e.*, Rhopalocera and Heterocera. Six families—namely Nymphalidæ (eight subfamilies), Erycinidæ (two subfamilies), Lycaenidæ, Pieridæ, Papilionidæ, and Hesperiidæ—are included in the first division or series; but Dr. Sharp would seem to hold the opinion that the first three families are so closely related that they might be allied in one group.

The Hesperiidæ he considers to be more nearly allied to the Heterocera than to the Papilionidæ; and he states that “when the classification of Lepidoptera is more advanced, so that the various natural groups placed in that suborder are satisfactorily distinguished, it is probable that the Hesperiidæ will be altogether separated from Rhopalocera.” He does not suppose, however, that lepidopterists will be inclined to accept “the family as a suborder equivalent in value to all Heterocera.”

The number of described species of butterflies, Dr. Sharp says, “is probably about 13,000”; and he adds—“but the list is at present far from complete, forms of the largest size and most striking appearance being still occasionally discovered. Forty years ago the number known was not more than one-third or one-fourth of what it is at present; and a crowd of novelties of the less conspicuous kinds is brought to light every year. Hence it is not too much to anticipate that 30,000 or even 40,000 forms may be acquired if entomologists continue to seek them with the enthusiasm and industry that have been manifested of late. On the other hand, the species of Rhopalocera seem to be peculiarly liable to dimorphic, to seasonal, and to local variation; so that it is possible that ultimately the number of true species—that is, forms that do not breed together actually or by means of intermediates, morphological or chronological—may have to be considerably reduced.”

In the matter of classification of the Heterocera, Dr. Sharp’s review of the later systems are very lucidly concise. He remarks:—

“Several attempts have recently been made to form a

rough forecast of the future classification of moths. Professor Comstock, struck by some peculiarities presented by the Hepialidæ, Micropterygidæ (and Erioccephalidæ), recently proposed to separate them from all other Lepidoptera as a sub-order Jugatæ. Comstock's discrimination in making this separation met with general approval. The character on which the group Jugatæ is based is, however, comparatively trivial, and its possession is not sufficient, as pointed out by Packard, to justify the close association of Hepialidæ and Micropterygidæ, which, in certain important respects, are the most dissimilar of moths. The characters possessed by the two families in common may be summarised by saying that the wings and wing-bearing segments remain in a low stage of development. In nearly all other characters the two families are widely different. Packard has therefore, while accepting Comstock's separation of the families in question, proposed a different combination. He considers that Erioccephalidæ should be separated from all others as 'Protolepidoptera' or 'Lepidoptera Laciniata,' while the whole of the other Lepidoptera, comprised under the term 'Lepidoptera Haustellata,' are divided into Palæolepidoptera (consisting only of Micropterygidæ) and Neolepidoptera, comprising all Lepidoptera (inclusive of Hepialidæ) except the Erioccephalidæ and Micropterygidæ. The question is rendered more difficult by the very close relations that exist between Micropterygidæ and a sub-order, Trichoptera, of Neuroptera. Dr. Chapman, by a sketch of the classification of pupæ, and Dyer, by one on larval stages, have made contributions to the subject; but the knowledge of early stages and metamorphosis is so very imperfect, that the last two memoirs can be considered only as preliminary sketches; as indeed seem to have been the wishes of the authors themselves.

"Simultaneously with the works above alluded to, Mr. Meyrick has given a new classification of the order. We allude in other pages to various points in Mr. Meyrick's classification, which is made to appear more revolutionary than it really is, in consequence of the radical changes in nomenclature combined with it.

"As regards the various aggregates of families that are widely known in literature by the names Bombyces, Sphinges, Noctuæ, Geometres, Pyrales, we need only remark that they are still regarded as to some extent natural. Their various limits being the subject of discussion and at present undecided, the groups are made to appear more uncertain than is really the case. The group that has to suffer the greatest change is the old Bombyces. This series comprises the great majority of those moths that have diurnal habits. In it there were also included several groups of moths the larvæ of which feed in trunks of trees or in the stems of plants, such as Cossidæ, that will doubt-

less prove to have but little connection with the forms with which they were formerly associated. These groups with aberrant habits are those that give rise to the greatest difficulties of the taxonomist."

Then follows a consideration in detail of the families, forty-seven in number, commencing with Castaniidæ, and concluding with Micropterygidæ. The arrangement is founded on that of Sir George Hampson in 'Moths of British India.'

The Diptera are divided into five series, and the Aphaniptera are appended as a sub-order. Of Hemiptera Dr. Sharp says that it is probable that about 18,000 species have been described, and that two-thirds of these belong to the Heteroptera. The classification of this order is a modification of that of Schiödté.

As a treatise of the natural history of insects the work will most certainly command a leading position. A great charm about it is, that although a distinctly scientific book, the matters upon which it treats are discussed in a bright and most interesting style, so that it appeals to "the man in the street," as well as to the student and the specialist. The illustrations are numerous and excellent.

New Zealand Moths and Butterflies (Macro-Lepidoptera). By G. V. HUDSON, F.E.S. 4to, pp. i-xix, 1-144. Thirteen coloured plates. London: West, Newman & Co. 1898.

THE particular object of the volume under present notice is to facilitate the work of those who may desire to study the lepidopterous fauna of New Zealand, and we think that it is eminently suitable for that purpose. Collectors who wish to identify and name the moths and butterflies that they capture or rear, will no doubt be easily able to do so with the aid of the well-executed figures, in conjunction with the descriptions. The figures, it may be stated, were drawn by the author himself from the specimens, and their chromo reproduction leaves little to be desired, except that one could have consulted the plates more conveniently if the numbering of the figures had been consecutive.

So far as concerns the arrangement of the work our author seems to have adopted the system of Meyrick. Whether or no he has been well advised in this matter is perhaps of no especial importance, seeing that there are about as many new systems of classification of the Lepidoptera as there are old ones still in use. At any rate Mr. Hudson has done a most useful service to the science of entomology in bringing together in a compact and convenient form the "Macro-Lepidoptera" of the area in question.

The lepidopterous fauna of New Zealand, as it is known to-day, does not appear to be an extensive one. Altogether, two

hundred and forty-three species are referred to by Mr. Hudson, and these are distributed among the families as under :—

CARADRININA, 81.

NOTODONTINA, 136.

PAPILIONINA, 15.

PSYCHINA, 2.

MICROPTERYGINA (part), 9.

The LASIOCAMPINA are not represented, and the PYRALIDINA, TORTRICINA, and TINEINA are not dealt with.

Analyzing the list still further, we find that of Arctiadae there are three species, one of which is the migrant *Utethesia (Deiopeia) pulchella*; of Caradrinidae sixty-eight species are enumerated, and among these are two other migrants, *i. e.* *Agrotis ypsilon (suffusa)* and *Heliothis armigera*. Plusiadae show five species, including *Plusia eriosoma*, Doubl., which is here treated as identical with *Plusia chalcites*, Esp., a South European species. Hydriomenidae (95 species), Sterrhidae (1 species), Monocteniadae (4 species), Orthostixidae (2 species), and Selidosemidae (26 species), comprise the geometrid section of NOTODONTINA, whilst the Sphingidae is only represented by the vagrant *Sphinx convolvuli*, L. (= *Protoparce distans*, Butl.). In PAPILIONINA there are six species of Nymphalidae, including two migratory insects, *Anosia crippus*, Cr. (= *plexippus*, L.), and *Vanessa cardui* (= *kershawii*, McCoy); the Satyridae have four members, and the Lycenidae muster five. There are two species of PSYCHINA and nine of Hepialidae, which family is placed in MICROPTERYGINA.

The species described as new to science, seventeen in number, are as follows :—

Caradrinidae: *Ichneutica dione*, *Melanchra maya*, *M. mercepe*, *M. omicron*, *M. alcyone*, *M. asterope*, *M. octans*, *M. caleno*, and *Agrotis innominata*.

It may be stated that *Melanchra*, Hübn., as employed by Meyrick, embraces all the species usually referred to *Mamestra*. It would appear to be well represented in New Zealand, as upwards of thirty species are placed in the genus.

Hydriomenidae: *Chloroclystis antarctica*, *C. maculata*, *C. rectilineata*, *Xanthorhoe adonis*, and *Notoreas simplex*. As no less than thirty-one species are referred to *Xanthorhoe*, this would also seem to be a strong genus in New Zealand.

Selidosemidae: The new species are *Selidosema humillima*, *Declana hermione*, and *D. griseata*.

One leaves the perusal of this book with the impression that there probably is still much lepidopterous material in New Zealand, belonging even to the groups discussed, awaiting the enterprising collector. Mr. Hudson suggests that he may, at some future time, publish a companion volume on the Micro-Lepidoptera of the country. We hope that the present volume will secure the liberal support that it merits, and so help to

encourage the author to proceed with the contemplated second volume.

A Catalogue of the Lepidoptera of Northumberland, Durham, and Newcastle-upon-Tyne. By JOHN ROBSON, F.E.S. Pt. I. 8vo, pp. i-iv, 1-195. London: Williams and Norgate. May, 1899.

IN the first part of this exceedingly useful Catalogue the Papilionina, Sphingina, Bombycina, and Noctuina are dealt with. It is something more than a mere list of the species of Lepidoptera occurring in the area referred to, as there are notes, sometimes very copious, to each species. Perhaps the more frequent mention of dates might have invested the annotations with additional value.

The classification and nomenclature is that adopted by Barrett in 'Lepidoptera of the British Islands'; but with a view of making the Catalogue practical to those who follow other authorities, references are given to Stainton's 'Manual,' to Newman's 'British Moths,' and to Meyrick's 'Handbook of British Lepidoptera.' So far as the Noctuina are concerned, it would seem that about two-thirds of the whole number of British species are found, or have been recorded as occurring, in the counties named.

We subjoin a few extracts from the Catalogue because they are generally interesting, and they will also serve as examples of the thorough manner in which Mr. Robson has treated his subject:—

EREBIA BLANDINA.—“This interesting species, which had previously only been taken in Scotland, was first recorded as an English insect by Mr. Backhouse, who found it abundantly in Castle Eden Dene. It is still abundant there, and occurs in all open grassy places down almost to the sea level at the mouth of the Dene. Its range extends westward as far as the Dene runs, and I have found it plentiful on the banks of the railway between Thornley and Wellfield stations, and in Edderacres Wood adjoining. The wood extends to the turnpike and beyond, but I never found *blandina* on the west side of the road. This has often struck me as being singular, and also that the butterfly does not occur in any portion of Hesleden Dene, which approaches in one part to within a mile of Castle Eden Dene. It certainly is not because of some peculiar food-plant, for I reared the larva on almost any grass which was easily obtained.” (P. 26).

EUROIS SATURA [HADENA PORPHYREA].—“One of the rarest of the British Nocturæ, not a dozen authentic specimens being known. Mr. Meyrick suggests that it is only an occasional immigrant. It is named in the Twizell list, but it is more than probable that these were but well-marked forms of the next species. In the 'Entomologist' (vol. x. p. 99) is the following:—‘A single specimen in my collection was taken by Mr. John Hancock, while it was at rest on the fencing of

Brandling Place, Newcastle-on-Tyne, in the month of April, 1845. August is stated to be the usual time of appearance of this moth. This exceptional instance has, I believe, never been recorded.—V. R. Perkins, Wootton-under-Edge; January, 1877.' Mr. Barrett (vol. iv. p. 114) speaks of this as 'a supposed capture at Newcastle-upon-Tyne,' and suggests that this also was a variety of *adusta*. Mr. Perkins, however, was a good observer, and not likely to make any record where there was room for doubt. As for the date of capture, Mr. Barrett himself gives June, July, and August for this species, and June, July, and, in forward seasons, the end of May for *adusta*. But all these species are very uncertain, and after an open winter might occur in April. As an illustration I might refer to the dates of Mr. Gardner's captures of *oculta* [June, July, August, September, and October]. Since the above was in type Mr. Perkins has written me to say that he still has the specimen, and that neither he nor the late Mr. Hancock had any doubt but it was correctly named." (P. 124.)

TAPINOSTOLA ELYMI.—"This insect was introduced to the British fauna in 1861, specimens having been taken on the Norfolk coast by the late Mr. Crotch. It was soon turned up on the Yorkshire coast, and I always understood that Mr. Eales was the first to take it in Durham, but Mr. Hedworth says 'Mr. Thomas Richardson, of Mount Pleasant, was the first to discover this species in its present habitat, South Shields.' It was then found at Hartlepool, Dr. Lees being, I believe, the first to take it. Mr. Gardner subsequently found the larva and pupa, and bred the insect. The food-plant, *Elymus arenarius* (sand reed or lyme grass), occurs in patches on the coast, and *elymi* should be looked for wherever it grows. It flies in early dusk, and is very easily distinguished on the wing. Later on it settles on the stems of the food-plant, from which it may be easily boxed. The most productive patches of the plant near Hartlepool are now destroyed, but the larvæ, living inside the stem, are not injured by deposits of smoke, &c., on the leaves." (P. 157.)

CIRRHEDIA XERAMPHELINA.—"A rare species but widely distributed, and will probably be found more plentifully when we know more of its habits. The imago is generally found at rest on the trunk of an ash tree, and the late Mr. T. Meldrum, of Ripon, who was particularly successful in taking it, was of opinion that after emerging from pupa it sat on the trunk till evening, but did not return there after the first flight. Mr. Finlay found imagines on ash trunks in Meldon Park at the end of August and in September, but never commonly." Then follow other localities. (P. 177.)

The work is issued as vol. xii. Part I. of the 'Natural History Transactions of Northumberland, Durham, and Newcastle-upon-Tyne,' and great credit is due to all concerned in its production. We hope that the second part of Mr. Robson's Catalogue will be published at an early date.

NOTES AND OBSERVATIONS.

EMYDIA CRIBRUM *not* TAKEN IN THE NEW FOREST BY MR. F. BOND.—When writing his note (*ante*, p. 209), Mr. Sydney Webb apparently forgot my very definite statement (*ante*, p. 102) that the *exact* spot where the late Mr. F. Bond used to capture *Emydia cribrum* is well known to me, and is *not* within the limits of the New Forest, but about four miles from the western edge of it. The published description of this spot in the 'Manual,' where the words "and in the New Forest" refer to it alone, is therefore inaccurate, and consequently "rather misleading"; and the same is true in a less degree of Mr. Bond's MS. description of it, as quoted by Mr. Webb, because he says "Near Ringwood, in the New Forest . . .," whereas *neither* Ringwood *nor* the spot where he used to take *cribrum* is in the New Forest, and his idea of the extent of the Forest was clearly a little at fault. The place alluded to by Mr. Bond as "St. Lawrence" is generally known as "St. Leonards."—EUSTACE R. BANKES; The Close, Salisbury, August 8th, 1899.

DIANTHECIA CUCUBALI IN JULY.—Referring to the record of *D. cucubali* taken at sugar on July 24th of the present year (*ante*, p. 213), I see no reason why it should not be a late emergence of the first brood, for I have only to-day had a specimen of the closely-allied *D. carpophaga* emerge in my breeding-cage, and six or seven more within the last fortnight; as well as two *D. capsicola*. All these were bred from seed-heads of *Silene inflata* and *Lychnis* collected last autumn. Under ordinary circumstances *D. carpophaga*, *D. cucubali*, and *D. capsicola* are generally to be taken as soon as *Silene inflata* is in flower, about the end of May or beginning of June; but it is evident from my experience this year that *carpophaga* and *capsicola* sometimes emerge later. There is nothing exceptional in the situation of my breeding-cage, which is under a hedge fronting north, but gets plenty of sun in the afternoon.—J. GARDNER; 6, Friar Terrace, Hartlepool, August 4th, 1899.

DIANTHECIA CUCUBALI IN JULY AND AUGUST.—It may be of interest to know that I have taken two *D. cucubali* lately in the house in this road: one on July 25th, and one this morning; the prior one was perfect, but the latter was nipped in the bedroom window. This seems to bear out the fact, stated in your Journal, that the species is double-brooded.—E. SPARKE; 1, Christchurch Villas, Tooting Bee Road, S.W., August 12th, 1899.

CHRYSOPHANUS (POLYOMMATUS) PHLÆAS.—The number of *P. phlæas* which have already put in their appearance during the last few days of this month, suggests another copper season, such as was experienced in 1893. On the afternoon of the 28th I paid a visit to a very limited part of the Sussex Downs, an area of only a few hundred yards in length and about one hundred in width, where I found butterflies very plentiful both as regards numbers and species. On so small a space of ground I noted fourteen species, including *Argynnis aglaia* in plenty, and *Pyramis cardui*. *P. phlæas* was abundant, but unfortunately the one variety which I captured was the only specimen I found to be in

bad condition, it having by some injury lost almost the whole of the right secondary, otherwise it would have been a good insect, being without the usual copper band on the secondaries; two such varieties I took in 1893. I might add that *Pyrameis atalanta* appears unusually abundant already this season; besides the perfect insects, which are now daily emerging, I have found larvæ in various stages on almost every patch of nettles examined.—F. W. FROHAWK; July 31st, 1899.

AMERICAN NOTES.—In the 'Scientific American' (1899, lxxx., pp. 75-6), Prof. L. O. Howard records an Ephydrid (*Psilopa petroles*, Coquillet) as breeding in large numbers in crude petroleum pools in California.

The Diptera certainly do not intend to be left behind in the struggle for existence, as there is scarcely any situation in which they cannot exist. It is well known that their larvæ are not uncommonly found in urine under certain conditions, as also in various parts of the human frame or in that of other animals. I myself have also found the larvæ of *Helophilus* (?) in the sea near Deal, and kept them alive for three days in sea-water.

In the 'Proceedings of the Entomological Society of Washington' (1899, iv., pp. 265-91), Mr. C. L. Marlatt's presidential address will be probably interesting to British entomologists. It is entitled "An Investigation of applied Entomology in the Old World."—G. W. K.

CAPTURES AND FIELD REPORTS.

COLIAS EDUSA IN WILTSHIRE.—On Aug. 14th I saw a male specimen of *C. edusa* in the Stonehenge district.—JOHN HENRY LEECH.

COLIAS EDUSA IN Co. WATERFORD.—On the 10th of this month I saw four specimens of this butterfly, and succeeded in capturing one, a male. On the following day I saw another. The clouded yellow is decidedly rare about here in most seasons, and many years pass without my being able to see a single specimen.—WILLIAM W. FLEMING; Coolfine, Portlaw, Co. Waterford, Aug. 15th, 1899.

COLIAS EDUSA IN Co. CORK.—On Aug. 1st a specimen of *C. edusa* is reported in the 'Field' as having been seen at Glengarriff Harbour, and another at Skibbereen, on Aug. 10th last.—F. W. F.

DEILEPHILA LIVORNICA IN SURREY.—Mr. W. C. Patterson records in the 'Field' of Aug. 19th, the capture of a specimen of this rare moth at Limsfield, during the previous week; it came to light.—F. W. F.

VANESSA ATALANTA IN LONDON.—On Aug. 13th last I was very pleased to notice a beautiful specimen of *V. atalanta* sitting on a white dahlia-flower, in a garden on the Victoria Embankment, near the Temple Station. I may mention that I have seen odd examples from time to time during the month, both at Balham and in Chelsea.—RICHARD SOUTH; 96, Drakefield Road, Upper Tooting, S.W.

ARGYNNIS LATONA IN HAMPSHIRE.—Miss Ethel Urquhart sends the following cutting from 'The Times,' Aug. 17th last:—

"*A Rare Butterfly*.—Mr. William Dale writes from the Hampshire Field Club, Southampton:—"It will interest many of your readers to hear that there was captured in this country on Friday last a specimen of that very rare butterfly, *Argynnis lathonia*, the Queen of Spain fritillary. It was caught by my son on the higher part of the sandy beach at Highcliffe, in Christchurch Bay, at the entrance of the chine. It was in perfect condition, but as it is hardly reckoned a British species the supposition is it came from France, favoured by the exceptionally fine weather and southerly winds.'"

LIMENITIS SIBYLLA IN ESSEX.—On July 21st last, I caught a specimen of *L. sibylla* in Hazeley Hall Wood, where I have collected constantly for the last twenty-five years without previously seeing this butterfly.—E. A. FITCH; Maldon.

EREBIA ÆTHIOPS (BLANDINA) IN THE ISLE OF SKYE.—This butterfly was not uncommon, on the first day of August, on some grassy cliffs on both sides of the Leath Allt, a stream running into the sea on the east coast of Skye, between Staffin and Portrigh (Portree). The specimen that I secured for examination was not at all wild, and was easily caught. I also captured and released, after examination, *Ctenonympha pamphilus*, *Polyommatus icarus*, and *Pieris rapæ*. I also saw, but did not take, a species of *Epinephele*, probably *ianira*. In the Pass of Brander, near Loch Awe, on the mainland, I noticed *Pyrameis (Vanessa) atalanta*.—G. W. KIRKALDY; Wimbledon.

CHRYSOPHANUS (POLYOMMATUS) PHLÆAS VAR. SCHMIDTII.—Mr. Robson mentions in his 'Catalogue of the Lepidoptera of Northumberland, Durham, and Newcastle-upon-Tyne' that Miss Annie Rossie captured two examples of this variety of *C. phlæas* "a little to the north of Newcastle-upon-Tyne in the summer of 1895."

CYANIRIS ARGIOLUS, L., IN LONDON.—On July 29th last I captured three specimens, one male and two females, of this butterfly in the garden here, and saw a fourth. They were flying in the bright sunshine, between two and five o'clock in the afternoon, and were attracted by the privet flowers. They are in good condition, and had doubtless bred in the immediate neighbourhood, probably in this garden, as there are holly-trees and ivy which flowers. I think this occurrence is particularly interesting, as we are within three miles and a-half of Charing Cross; and may add that during a number of years that my father and myself have noticed the butterflies here, we have neither seen nor heard of this species occurring in the neighbourhood.—HAMILTON H. DRUCE; The Beeches, Circus Road, London, N.W.

MACROGLOSSA STELLATARUM ABUNDANT.—*M. stellatarum* is nearly as abundant here as at Brighton (*ante*, p. 211), but always singly. I have not yet noticed this species in pairs here. A jasmine plant growing up the side of the house seems to be especially favoured.—ALAN W. CARDINALL; The Cliffe, Limpley-Stoke, near Bath.

This species seems to swarm here; another batch appears to have just arrived.—E. A. FITCH; Maldon, Aug. 20th, 1899.

SPILOSOMA LUBRICIPEDA IN AUGUST.—On Aug. 8th last I noticed a male specimen of *S. lubricipeda* on the garden fence here, and on the 12th of the month a male example of the same species emerged in an outdoor

breeding-cage, in which I had reared a brood of larvæ derived from ova deposited by a female early last June. The last individual of this brood pupated only about a fortnight ago. Yesterday a specimen of the var. *zantina* emerged in the same cage as that last referred to.—RICHARD SOUTH; 96, Drakefield Road, Upper Tooting, S.W., Aug. 21st, 1899.

COSMIA PYRALINA NEAR MALDON.—I had the pleasure of taking a very fine example of this rare and local species at sugar on a balsam-poplar in my garden here, on July 14th last. Continuous sugaring ever since has not produced another specimen. In 1885 I beat a larva of this species from elm near Brentwood, the imago resulting from which, on July 10th of the same year, I still possess. I fancy there are very few bred *C. pyralina* in existence. The only other time and place I have found this species, during my thirty years' collecting, was at Monk's Wood, Hunts, where, in the early part of August, 1875, my friend Mr. Nelson M. Richardson and myself took twelve or fifteen specimens at sugar. As they were not in the finest condition, I conclude that the species generally emerges about the middle of July.—(Rev.) GILBERT H. RAYNOR; Hazeleigh Rectory, Maldon, Essex, Aug. 16th, 1899.

AGROTIS ASHWORTHII, ACIDALIA CONTIGUARIA, &c., IN NORTH WALES.—During the third week in July I took a few nice *Acidalia contiguaria* near Penmaenmawr, and have now larvæ feeding from eggs deposited. Within five or six inches, too, of a couple of *contiguaria*, I found a small batch of eggs of *Agrotis ashworthii*, from which the larvæ have also hatched out, and appear to be doing well. No other species of rarity were observed. *Agrotis lucerneæ* was not uncommon, flying wildly about stone-heaps on the mountain sides, but, from the nature of the ground, very difficult to catch. Dark *Melanippe galiata* and *Gnophos obscurata* were common, with *Larentia cæsiata*, *Cidaria populata*, *Pseudoterpna cytisaria*, &c. *Acidalia promotata* occurred on the lower rocks.—GEO. T. PORRITT; Crosland Hall, Huddersfield, Aug. 4th, 1899.

ACRONYCTA MEGACEPHALA LARVÆ ABUNDANT.—During the past four weeks I have seen one or more larvæ of *A. megacephala*, almost each day, on the trunks of poplar-trees here and there in the vicinity of King's Road, Chelsea. On Aug. 2nd, however, I was surprised to notice that almost every poplar that I passed, in walking from Battersea Bridge to Fulham Road, had two or three of these larvæ resting on the trunk; in one case I counted ten between the base of the lowest branch and the root of one tree. I should also mention that larvæ of *A. aceris* are more than usually common this year in the same district.—RICHARD SOUTH; 96, Drakefield Road, Upper Tooting, S.W., Aug. 15th, 1899.

EUCOSMIA UNdulata AND DIPTERYGIA SCABRIUSCULA (PINASTRI) IN LONDON.—I was surprised to net a specimen of *E. undulata* in my garden last July; also to take, at sugar, *Dipterygia scabriuscula* amongst the common London insects.—J. A. FINZI; 53, Hamilton Terrace, N.W.

AMPHIDASYS BETULARIA VAR. DOUBLEDAYARIA IN THE LONDON DISTRICT.—I took a specimen of *A. betularia* var. *doubledayaria* in a garden at Dulwich on June 17th last. Unfortunately it had been trodden upon, but the thorax and the wings on the left side were intact.—A. R. KIDNER; 139, Rosendale Road, West Dulwich, S.E.

STAUROPUS FAGI AT WATFORD AND EALING.—On July 6th a fine fresh male specimen of this species flew into my dressing-room, attracted by the

incandescent gas-light. The following night another came to the window, which happened to be shut, and before I could open it the insect flew off; but I had a good view of it before it went. I am not aware that this moth has been taken in this district previously. My friend Mr. Laurence Miles, of Ealing, had one brought to him by a policeman, who took it off one of the electric (arc) lamps there. Not knowing that the insect was a rare one, he took no note of the date.—ARTHUR COTTAM; Eldercroft, Watford, Aug. 7th, 1899.

PLUSIA MONETA IN SURREY.—*P. moneta* seems to have established itself satisfactorily in this neighbourhood. In the early nineties a fair number were taken at sugar by an entomologist who mistook them at the time for *P. festuca*, and only identified them as *P. moneta* last year. In May this year I was fortunate enough to secure four larvæ on the solitary plant of *Aconitum* which my garden possesses. These hatched out successfully in July, and a few days afterwards a fifth insect was taken at a lamp indoors.—G. OGLE; St. John's, Woking.

PLUSIA MONETA AT CAMBRIDGE.—I obtained a fair example of *P. moneta* in the New Court of St. John's College, Cambridge, on July 17th last. The specimen had been caught in a web, but fortunately was still in almost perfect condition.—A. R. KIDNER; 139, Rosendale Road, West Dulwich, S.E.

PLUSIA MONETA IN WILTSHIRE.—In the August number of the 'Entomologist' this species is reported from North Wilts. Two years ago, on July 7th, 1897, a fine specimen of this moth was taken in our garden here, by my mother. We were not sure of the insect at first, but have now clearly identified it as *P. moneta*. I have not seen any other records from Wiltshire.—CECIL M. GUMMER; 2, Swayne's Close, Salisbury.

NOTE ON MECOSTETHUS GROSSUS.—With reference to Mr. Lucas's paper (*ante*, p. 179), *Mecostethus grossus* is at the present date (July 31st) fairly abundant in the New Forest bogs.—HERBERT ASHBY; Pinehurst, Basset, Southampton.

ZYGENA FILIPENDULE VAR. CHRYSANTHEMI.—An example of *chrysanthemi*, the variety of *Z. filipendula* in which the crimson colour of spots and hind wings is replaced by fuliginous or brownish black, was captured on the hills at Fairlight, near Hastings, by Mr. S. Peters, on July 9th, 1898.—H. W. PETERS; 32, Pevensey Road, Eastbourne.

COLLECTING IN GLOUCESTERSHIRE.—I spent part of last month, from the 3rd to the 22nd inclusive, in the secluded village of Utey, on the Cotswolds, where I had the assistance and frequent company of a resident entomologist, Mr. R. W. P. Fitzgerald. Sugaring was fairly good, though no great rarities occurred, the best "take" being several lovely specimens of *Acronycta ligustri*.—(REV.) CHAS. F. THORNEWILL; Calverhall Vicarage, Whitchurch, Salop, Aug. 4th, 1899.

SESIA ICHNEUMONIFORMIS IN GLOUCESTERSHIRE.—On July last 21st I captured a specimen of *S. ichneumoniformis* in an old quarry at the north end of the "Bury Hill."—(REV.) CHAS. F. THORNEWILL; Calverhall Vicarage, Whitchurch, Salop.

HYSIPETES SORDIDATA (= ELUTATA).—Some of the specimens referred to by Mr. Arkle as *H. elutata* (*ante*, p. 219) have been sent to us for examination, and we have no hesitation in saying that they are examples of *H. imphiata*.

PACHYTYLUS MIGRATORIUS IN HAMPSHIRE.—On Aug. 1st I took a specimen of *P. migratorius* near Brockenhurst in the New Forest. It was on the wing at the time.—H. W. SIMMONDS; Sussex View, Cumberland Gardens, Tunbridge Wells, Aug. 17th, 1899.

INCIDENTAL COLLECTING IN THE LAKE DISTRICT.—I went for a fortnight's excursion to the Lake District a short time ago—May 27th to June 10th; but I so far determined not to give much time to collecting that I did not take a net with me. However, I boxed a few things which just happened to come in our way as we walked along. On Muncaster Fell I boxed two of *Thecla rubi* flying over the top of the fell, where dozens could easily have been caught in a short time. We (three of us) could not find any at rest on the stems of the grass, &c., as the sun was setting, like their allies the "blues"; nor could we find them on the rocks or anywhere else. On Burmoor I saw a larva of *Nemeophila plantaginis*, and another on the top of Sty Head Pass; a specimen of *Hadena thalassina* flew to light in my sitting-room at Bowness. In Coleoptera, my nephew called my attention to a beetle, as we were going along Burmoor, near the foot of Scaw Fell, which proved to be *Carabus glabratus*, and the only one we met with. Near there were also a few of *Corymbites cupreus*. At the foot of Kirk Fell I found a good specimen of *Melœ proscarabeus* crawling into its hole in the mountain; and close by I dug out one of *Geotrupes vernalis*. I saw three more, going up Sty Head Pass. *C. cupreus* were very plentiful up this pass, taking short flights in the hot sunshine; there were also a few in Borrowdale and on Helvellyn, very numerous in Grisedale Pass, and some on the top of Kirkstone Pass. The great majority of them were brownish violet in colour. Amongst the hundreds I saw in the district I only noticed four females. On the top of Sty Head Pass *C. arvensis* were plentiful, running over the rocks and wet turf, apparently making much of the few sunny days they get there in a year. On the same spot were also *Byrrhus fasciatus*, *Pterostichus vitreus*, and *Cychrus rostratus*. On Helvellyn were *Nebria brevicollis*, *C. catenulatus* (the latter eating a worm), and a few more of *C. arvensis*. On the top of the mountain I took a red-legged var. of *N. gyllenhali*; and in the shelter on the top I took *Megacronus analis*. In Kirkstone Pass were a few of *Necrophorus mortuorum* under a dead blackbird. *Diacanthus æneus* and *holosericeus* we saw on Orrest Head, Windermere. In Diptera, *Tipula vernalis* and *Bibio lacteipennis* were plentiful on the top of Helvellyn and on the top of Sty Head Pass. In Neuroptera, *Drepanopteryx phalænoides* and *Baetis venosa* I took at Windermere. In a stream there I saw several larvæ about three-quarters of an inch long, very similar to the larvæ of caddis-flies, but, instead of making a case they could take about with them, they generally sheltered themselves under stones; but one made use of some bits of stick and grass-stems that had been washed together. They came out of their shelter by a jerky movement, little by little, first to the right, then to the left, very cautiously, every now and then drawing back into their retreats, but sometimes nearly the full length of them would be out. I could not perceive them to seize anything, either in the way of food or material for case-making. Are there some of the Trichoptera larvæ which have not movable cases?—F. MILTON; 7, Chilton Street, Bethnal Green, E., Aug. 4th, 1899.

COLLECTING ON DARTMOOR.—While staying at Dartmoor, in the earlier part of last June, my sister and I took, among others, the following Lepidoptera. I was only there for four clear days, and did not do much

night-work, but from the insects we took I should think the district would yield very good results if properly worked:—

Rhopalocera: *Euchloë cardamines*, *Leucophasia sinapis*, *Argynnis euphrosyne* (one), *A. selene*, *Vanessa atalanta*, *V. io* and *V. cardui* (hybernated), *Pararge egeria*, *P. megæra*, *Melitæa artemis* (two somewhat worn specimens), *Thecla rubi* and larva of *T. quercus*, *Lycæna argiolus*, *L. alexis*, *Syrichthus malvæ* and variety with confluent spots, *Nisoniades tages*, *Hesperia sylvanus*.

Heterocera: *Smerinthus ocellatus*, *Sphinx ligustri*, *Chærocampa elpenor* (one), and *C. porcellus* (two), *Macroglossa stellatarum*, *Lithosia rubricollis* (one, just emerged from the pupa), *Euthemonia russula*, *Chelonia villica*, *Arctia fuliginosa*, *A. mendica*, *A. menthastri*, *Agrotis exclamationis*, *Mamestra brassicæ*, *Hecatera serena*, *Anarta myrtilli*, *Heliodes arbuti*, *Euclidia glyphica*, *Phytometra ænea*, *Venilia maculata*, *Odontopera bidentata*, *Fidonia atomaria*, *Melanippe montanata*, *Chesias rufata* (very abundant). *Leucophasia sinapis*, though nowhere common, seemed to be pretty widely distributed about the neighbourhood, as we took single specimens in most of the woods we visited. One I found flying with a male *Euchloë cardamines*, the female of which it greatly resembles when on the wing. *Chærocampa elpenor* and *C. porcellus* we took at rhododendrons at dusk. They seemed fairly common, but were hard to capture. *Argynnis selene* and *Thecla rubi* were extremely abundant in the woods, and also on the heaths and hill-sides.—CECIL M. GUMMER; 2, Swayne's Close, Salisbury.

NOTES FROM BATH.—The generally hot, dry season we have experienced has, as usual, been favourable to the production of the Diurni. A special instance of this came under my notice on Monday last, Bank Holiday. Taking a walk in the country near Weston-super-mare, I noticed by the roadsides, at the blossoms of wild mint, knapweed, and bramble, *Epinephela tithonus*, *Pararge megæra*, *Lycæna icarus*, *Vanessa atalanta*, *V. io*, *V. urtica*, frequently, and one male example of *Gonepteryx rhamni*. On crossing a pasture-field with many patches of lucerne, a most lively scene was witnessed. The field, about two acres in extent, seemed, to use a common expression, alive with the small "whites" (*Pieris rapæ*), and flitting with them was *Lycæna icarus*, apparently quite as numerous; it was one constant movement. One female *Colias edusa* I noticed after watching some time. A thunderstorm approaching soon after, how changed the scene! in a few minutes not a single insect could be seen on the wing. I may add to these notes that I have frequently seen *Macroglossa stellatarum* in several parts of the country during the season.—J. B. JEFFERYS; Bath.

LEPIDPTEROUS LARVÆ ON CLEMATIS.—On a fine plant of *C. vitalba* overshadowing a summer-house in the garden here were great numbers of larvæ of *Odontopera bidentata* and *Mamestra persicariæ* in September, 1898. This year, so far, there are no signs of a continued abundance. Surely this is a somewhat unusual food-plant for both species, especially *persicariæ*, which is considered an exclusively low feeder. This latter species occurred in two forms, *i. e.* dark chocolate-brown and an olive, without any intermediate gradations. I bred some numbers of both species; *bidentata* turned out somewhat darker than usual (but probably not due to the food-plant), and *persicariæ* were all very large and clearly-marked specimens.—A. D. IMMS; "Linthurst," Oxford Road, Moseley, Worcestershire, Aug. 14th.

[The larva of *M. persicariæ* has been recorded as feeding on clematis; also on ivy, lilac, raspberry, plum, and poplar. See Entom. xxiii. p. 319.—ED.]

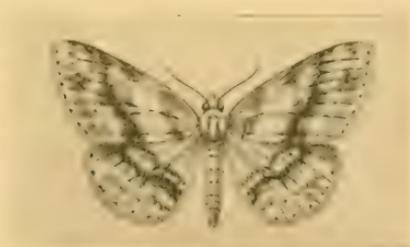
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TEPHROSIA BIUNDULARIA, AB.



THE above illustration represents a very striking aberration of *Tephrosia biundularia*. Mr. William M. Christy, of Watergate, Emsworth, who obtained the specimen, has been good enough to lend the insect for figuring. He writes:—"It was taken in the moth-trap, which is placed in the woods here, sometime between the 1st and 23rd of June, 1891." As the figure gives an excellent idea of the markings of the specimen, it seems only necessary to add that the colour is pale ochreous brown, with a whitish ante-medial band on the fore wings; the basal third of the hind wings is also whitish. The post-medial black line on both wings is unusually well defined, and is shaded with a darker tint of the ground-colour.

ROUND THE CHESTER ELECTRIC LAMPS.

By J. ARKLE.

IF the suburbs of a town, or indeed any part of one, are free from smoke and noisome vapours, and planted with trees and gardens and shrubberies, the entomologist will find moth-hunting by the electric lamps very profitable. On the other hand, if the conditions are unfavourable in the immediate neighbourhood, electric or other lamps do not appear to be worth working; there should be varied, or at any rate existing, vegetation, with the accompanying circumstance of fairly pure air. Let me quote the following illustrations in support of what, I am prepared to admit, may be a rule and not a law. A large electric lamp—high up and very conspicuous—at the Winter Gardens, Morecambe, only attracted, July, 1889, *Acidalia scutulata*, *Xylophasia polyodon*, *Triphæna pronuba*, and *Plusia gamma* (Entom. xxii. 296). The more interesting moths of Heysham Moss, three miles away, did not put in an appearance at all. I have no doubt the results would have been different had there been well-clothed sandhills about. Morecambe, in short, was deficient in the “greenery” conditions, although its air is of the freshest. Again, at Chester, we have now a varied vegetation almost luxuriant. The lime flourishes in our streets and suburbs, and on July 19th the air was laden with the scent of its pendent bunches of yellow blossoms. There are also the poplar, birch, beech, sycamore, and horse-chestnut, together with endless privet and hawthorn, and ornamental willows and sallows. I specially select these trees and shrubs since they account for all, or nearly all, the best moths we take at the electric lamps, and because many of them are either replaced by other species—a mile or so away, and then for a large area—or they are almost non-existent. Thus the lime is replaced by the oak; the birch, beech, and horse-chestnut practically cease; the hawthorn continues; but the willow, poplar, and privet become scarce. The conclusion, therefore, would seem to be this—the life-histories of the extraordinary species we have taken during the past two seasons (Entom. xxxi. 299) at the electric lights are confined to little more than the area actually illuminated by the lamps themselves. The best lamps are those where the vegetation referred to is most profuse. Again, there are species of moths recurring, year after year, only a mile away from the city, which, it would be pretty safe to say, are never attracted. I only know of one puzzling species, *Agrotis porphyrea*, which frequently occurred, fine and fresh, in June and July. I have searched in vain for any food-plant of the insect other than heath, and conclude that this apparent exception to the rule is due to my ignorance of all its pabulum. How species locate

themselves in towns like Chester, where, in times gone by, there was neither the idea nor even the room for tree planting, but where, in modern times, tree-lined streets are looked upon as matters of course, seems, at first sight, a puzzle. But where the carcass is, we are told, there will the eagles be gathered together, and this observation lets in a lot of light upon the situation. Plant the trees, and, other things being equal, the insects will find them.

I now append, up to date, a list of the moths taken this season at our electric lamps. The best species the reader may choose for himself; but I think they will usually be found at the beginning of each monthly list:—

MAY.

Dicranura bifida.—From a commercial point of view, this moth appears to be twice the value of *D. furcula*; and yet it was a common moth up to the end of June, much more so than *D. furcula*. It does not seem to fly much when attracted. It either circles down to the ground about two or three feet from the lamp, or rests upon the adjacent walls, or, more frequently perhaps, high up on the lamp itself. A friend uses, with success, a simple but ingenious instrument fixed to the end of a long stick for bringing such moths off the lamps. Another stick, or pole, of equal length carries a good-sized net for capturing insects on the wing. But all this is hot and laborious work on a warm summer night, especially as most of the insects are of the commonest description, and cannot be determined when on the wing. There is, it is to be confessed, always a good deal of weeding out.

Smerinthus ocellatus.—To see, and to hear, this big, handsome fellow come flopping on the ground from the lamp above is almost startling. I use the word "fellow," for it is a drawback that nearly all the moths that come to the lamps are males. I do not think the proportion of females, mix the species as you like, exceeds five per cent. *S. ocellatus* was very common to the end of June.

Amphidasys betularia.—This species appeared about the end of May, and continued to the end of June as an almost abundant insect. Most were of the black variety (*doubledayaria*); but the type also appeared in proportion to the black form of from one in eight to one in twenty, according to various collectors. I heard of no types last season. What, then, has come over the species here to produce them in this! To my mind it is simply inexplicable; and the best way out of the difficulty, I believe, is to accept the broad fact that, throughout the animal world, including man, there is a tendency to vary, in coloration, from light to dark forms, and that there are some uncommonly good-looking people in all. Such explanatory phrases as "local

environment" fail at Chester, just as they do at other places that could be mentioned. Not only did *A. betularia* occur as extreme forms this season, but a good number of intermediates were taken as well. A few of these are exactly half-way in coloration between the type and var. *doubledayaria*; but the chief colour disturbance is a substitution of white, in the latter, in the costal region of the lower wings. In a few specimens the white basal spot of the upper wings is absent. One of the best intermediate forms I have seen, if not the best, of *A. betularia*, has the following history:—A friend was just about to cover it with his net, as it rested on the ground, when one of the madding crowd picked it up with his finger and thumb and politely presented it, leaving, of course, his monogram upon the insect. Like the preceding species, *A. betularia* seems to be electrified by the lights, wheeling round in small circles, and finally resting upon the ground, where, unlike the others, it usually rests for an indefinite period. Cats are the greatest enemies to moths when on the ground, for they watch for them through all the hours of the night, and devour them greedily. I have often seen as many as three round a lamp, and they were very unwilling to be driven away.

Other moths in May were *D. vinula*, *Spilosoma lubricipeda*, *S. menthastri* (sad nuisances, as they occurred in such numbers), *Habrostola triplasia*, *Hadena oleracea* (another nuisance), *Caradrina blanda*, *Selenia lunaria*, *Odontopera bidentata*, *Melanippe fluctuata*, *Pionea forficalis*, &c.

JUNE.

Acronycta albi.—This moth turned up on the 6th, and occurred commonly until about the 20th. During the night of the 17th I was with a collector who took three. Some of the forms have the upper wings exceptionally dark, almost black, the lower ones appearing in beautiful white contrast, and often margined with a black, suffused border.

A. psi, *A. megacephala*, *A. rumicis*.—Common during the first three weeks; *A. tridens* (?), possibly, and during the same period; but I put a query to it as I am unable to distinguish between this species and *A. psi*. A writer says *A. tridens* has less than six dashes on the costa; and *A. psi* more than six. What the insect would be with six dashes, neither less or more, is not stated. But the "dashes" are so indistinct that I am unable to determine their number on any given specimen; in short, I am about as foggy upon the differentiation of the two species as was the hero in Burns' 'Death and Dr. Hornbook' on the crescent moon:—

"To count her horns wi' a' my power I set mysel',
But whether she had three or four I couldna tell."

A. leporina.—A few specimens were taken.

Smerinthus tilicæ.—The honours of the season fell to a visitor, Mr. Quinton, who captured a specimen of this addition to the district list, at the end of June.

S. ocellatus.—Common during the first three weeks of the month. On the night of the 5th no less than five were on the ground at the same time, and within five or six paces of the same lamp. Three of them were captured, and the remaining two escaped.

S. populi.—I did not observe this species until the 14th. It was often flying round the same lamp in company with *S. ocellatus*. This fact, together with the non-union of two species so like each other in size and general appearance, is, I think, very significant. The same observation applies to other species; for example, *A. badiata* and *A. derivata*.

Chærocampa elpenor.—One taken, June 7th.

Notodonta dictæa.—Fairly common, but they had to be worked for. A collector might, up to the middle of the month, have taken, on an average, one or two per night. Netting would begin, in these long days, at 11.15 p.m. The round of lamps would be worked, and then the return made for moths at rest. This would take up to 2 a.m. or 2.30 next morning, when the great luminary would rise in the east, and the electric lamps would blanch and grow pale before it.

N. dictæoides.—A few, I am told, but very few, were captured.

N. ziczac.—Fairly common.

Dasychira pudibunda.—A few were taken.

D. bifida.—This good and handsome moth was a common visitor.

D. vinula.—Very common.

D. furcula.—Occasional.

Habrostola triplasia.—A fine-looking, dark moth, and fairly plentiful. There was a handsome form with the basal outward-bent line, and the outer-marginal inward-bent line, almost scarlet.

Other common moths.—*Phalera bucephala*, *Euchelia jacobææ*, *Grammesia trilinea* (looking in the electric light as if dressed in buff and gold), *Plusia iota*, *P. pulchrina*, *P. chrysitis*, *Xylophasia hepatica*, *X. rurea* with var. *combustata*, *X. polyodon* (with the dark form), *Hadena thalassina*, *Cucullia umbratica*, *Dianthæcia cucubali* (the larvæ have since been abundant in the seed-vessels of white campion), *Axylia putris*, *Leucania impura*, *L. pallens*, *Chortodes arcuosa*, *Apamea basilinea*, *Mamestra brassicæ*, *Miana strigilis* (with var. *æthiops*), *M. fasciuncula*, *Caradrina cubicularis*, *C. blanda*, *A. betularia*, *O. bidentata*, *Cabera pusaria*, *S. lunaria*, *Panagra petraria* (one only, worn), *Abraxas grossulariata*, *Anaitis plagiata* (one), *Pionea forficalis*, *Botys urticalis*, *Aglossa farinalis*, *Hydrocampa nymphæata*, *H. stagnata*. Nuisances: *H. oleracea*,

Spilosoma lubricipeda, *S. menthastri*, *A. exclamationis*, *Rumia eratægata*, *Melanippe fluctuata*, *Melolontha vulgaris* (common cockchafer). This beetle reminds one that there is a tell-tale physiognomy among insects as well as among men, with this difference, that man can, to a great extent, cultivate his facial expression, whilst that of the insect is as fixed, from the first, as its facet-divided eyes. Thus, there is the malignant look of the wasp, the irritable face of the bee, the cold, hard, and repellent face of the aphid, and the utterly mild and inoffensive look of the moth or butterfly. Our cockchafer is a blustering but harmless sort of fellow, and he looks like it. His very obesity commands affection.

JULY.

S. ocellatus, *S. populi*, *N. dictæa*, *N. camelina*, *Lithosia complanula*, *Nola cuculatella*, *Thyatira derasa*, *Noctua c-nigrum*, *Leucoma salicis* (one specimen on the 18th. I laid down, some five hundred yards away from where I made this capture, a lot of eggs from Hoylake moths, years ago. As the species is new to the Chester list, the circumstance just related may account for its appearance), *P. iota*, *P. pulchrina* (again here are two species appearing together, very like each other, and yet keeping themselves distinct), *P. chrysitis*, *P. festuæ* (first brood, and rather worn), *P. gamma*, *Tryphæna pronuba*, *T. orbona*, *X. lithoxylea*, *Mamestra persicariæ*, *M. brassicæ*, *A. putris*, *L. impura*, *L. pallens*, *L. conigera*, *L. lithargyria*, *C. cubicularis*, *H. triplasia*, *Tapinostola fulva*, *Bryophila perla*, *Apamea oculo*, *D. cucubali*, *C. umbratica*, *S. menthastri* (one, a late one), *C. blanda*, *H. oleracea* (getting worn and over), *M. literosa*, *N. rubi*, *A. exclamationis* (also getting over), *A. betularia* (began to thin off by the 5th), *Cidaria fulvata*, *Uropteryx sambucata*, *Boarmia repandata*, *Eupithecia absynthiata*, *Halia wararia*, *Sclenia illunaria* var. *juliana*, *Pelurga comitata*, *M. fluctuata*, *T. amataria* (worn), *Crambus tristellus*, *Hydrocampa nymphæalis*, *Tortrix podana* (with the black form), *Aspis udmanniana*, *Schænobius forficellus*, *Xanthosetia zœgana*. Nuisances: *X. polyodon* (they swarmed, settled on us, and even crawled over us), *Arctia caia*, *L. auriflua*.

AUGUST.

The advent of this month completes a year's observations at our electric lamps. So far—Aug. 18th (the weather "broke" in the middle of the month, as usual)—the present August, in spite of the recent Indian heat, has not been so prolific as last, either in quantity or quality of moths. The following is a representative list:—

N. dictæa.—A collector took four this week, and in fine condition.

N. dromedarius.—Several. I have been very careful about

the identity of this moth, as I have always understood it was a June species.

L. auriflua, *Luperina testacea* (some fine forms with the markings on the upper wings black), *Neuronia popularis*, *A. oculatea*, *N. rubi*, *X. polyodon*, *X. scolopacina* (one, Aug. 3rd, new to Mr. A. O. Walker's list), *L. complanula*, *E. absynthiata*, *Halia vararia*, *Crocallis elinguaris*, *Ennomos tiliaria*, *E. fuscantaria*, *Crambus tristellus*, *Paraponyx stratiotalis*, *T. podana*, *Scoparia angustea*, *Catoptria scopoliiana* (?), *Hyponomeuta padellus* (small ermine, and far too abundant.)

As a rule, the hours were very happy, and there was plenty of interest in observing, all through the night, how well a town can be placed under watch and ward. The only case I know of where anything like obstruction occurred was, years ago, in a lonely suburb, long before the institution of the electric lights. A tramp—the genus is fast disappearing under the new forms of local government—became inspired with the idea that a solitary collector was worth looting. The matter, however, was eventually arranged by the flight of the enemy.

Chester: Aug. 18th, 1899.

DESCRIPTIONS OF NEW SPECIES OF SOUTH AMERICAN PHYTOPHAGOUS COLEOPTERA.

By MARTIN JACOBY, F.E.S.

Lema tenuilimbata, sp. nov.

Below black; head and thorax flavous, the latter impunctate, with a lateral black stripe; elytra closely foveolate punctate, flavous, the lateral margins and the apex more broadly black, interstices costate at the apex, the ninth row of punctures interrupted; legs testaceous, antennæ black. Length, 6 mill.

Head finely rugose between the eyes, pale fulvous, clothed with fine yellowish pubescence; labrum black; antennæ scarcely extending to the middle of the elytra, black, the third joint double the length of the second; thorax not longer than broad, but slightly constricted at the sides, the disc smooth and impunctate, obsoletely transversely depressed near the anterior margin, the basal sulcus deep, the sides with a narrow longitudinal black band; scutellum black at the apex; elytra flattened, pale flavous, the punctures very deep and round, closely placed and transversely connected, the interstices strongly costate at the sides and apex, the latter black, this colour extending in shape of a narrow stripe along the sides upwards to the shoulders, leaving the extreme lateral margin of the ground colour, breast, and abdomen black; legs pale testaceous, the femora with an obsolete piceous stripe above; the tibiæ and tarsi also more or less striped with piceous.

Hab. Callanga, Peru.

I know of no similarly marked species of *Lema* belonging to Lacordaire's second division with interrupted ninth row of punctures. *L. mesoxantha*, Kirsh, from Peru, seems somewhat allied in coloration, but has no lateral stripe, differently coloured antennæ, and many other differences.

Lema circumcincta, sp. nov.

Pale yellow; the head, antennæ (the apical joints excepted), the breast, and the tibiæ and tarsi black; thorax impunctate; elytra finely punctate-striate, yellow, narrowly margined with black. Length, 9 mill.

Head impunctate, black, the supraocular grooves very deep; antennæ long and slender, black, the apical three joints flavous; thorax not longer than broad, moderately constricted at the sides, the angles obtuse, the surface impunctate, pale flavous, the basal sulcus rather shallow; scutellum black; elytra scarcely perceptibly depressed below the base, of a greenish yellow, finely punctate-striate, the punctures dark, the ninth row entire, all the margins narrowly black, the shoulders likewise with a black spot, the anterior half of the epipleuræ yellow, the rest black; below flavous, the breast, the upper portion of the femora, and the tibiæ and tarsi black, third joint of the latter fulvous.

Hab. Cachabé, Ecuador (Rosenberg).

The greenish yellow shining upper surface and the details of the black coloration will separate this species from any of its South American allies; there is also a very small black spot placed on the elytra below the base, but whether this is accidental or not I cannot say, as I have only a single specimen before me.

Lema cærulea-lineata, sp. nov.

Black; the apical joints of the antennæ and the femora flavous; thorax impunctate; elytra closely punctate-striate, flavous, a narrow sutural and marginal stripe, abbreviated before the apex, metallic blue; abdomen flavous. Length, 8 mill.

Head impunctate, black, shining, not constricted behind; the antennæ slender, extending to the middle of the elytra, black, the apical two joints flavous; thorax not longer than broad, moderately constricted at the sides, the surface black, very shining and impunctate, the basal sulcus deep; scutellum black; elytra much wider at the base than the thorax, with a rather shallow depression below the base, flavous, finely punctate-striate, the interstices near the apex costate, a narrow sutural and lateral stripe, the last one surrounding the shoulders, all three abbreviated at the same distance before the apex, metallic dark blue; the breast black; the abdomen and the femora flavous, the latter with a black spot or stripe above; tibiæ and tarsi black.

Hab. Bolivia.

Not unlike *L. boliviana*, but with flavous apical joints of the antennæ. This and the colour of the head and thorax will

separate the species from *L. trilineata*, Lac., and others of the same division; the narrow elytral blue stripes from *L. boliviana*. Four specimens are contained in my collection.

Lema speciosa, sp. nov.

Flavous; the head, antennæ (the apical joints excepted), the anterior and posterior margins of the thorax, and the tibiæ and tarsi black; elytra metallic blue, the lateral margins and the apex more broadly flavous. Length, 7 mill.

Head black, impunctate, very shining; the eyes deeply notched; antennæ black, the apex of the ninth and the apical two joints flavous; thorax not longer than broad, the anterior angles rounded, the surface with a few fine punctures, flavous, the basal sulcus rather shallow, the disc with a narrow anterior and posterior black band, the latter narrower than the anterior band; scutellum black; elytra with a very slight sutural depression below the base, strongly punctured anteriorly, the interstices at the same place slightly transversely convex, the others rather strongly longitudinally costate from the middle downwards, the entire disc metallic dark blue, the lateral margins narrowly and the apex more broadly flavous, the under side and the femora of the latter colour; the tibiæ and tarsi black.

Hab. Peru.

A species allied to *L. limbatipennis*, Jac., *L. flavomarginata*, Clark, and several others; but distinguished from all by the markings of the thorax in connection with the flavous joints of the antennæ and similar coloured under side.

Lema boliviana, sp. nov.

Black; the thorax impunctate, very shining; elytra much wider than the thorax, with basal depression, flavous, closely and strongly punctate-striate; abdomen flavous. Length, 8 mill.

Head black, shining, strongly constricted behind the eyes, the latter deeply notched; clypeus acutely pointed between the antennæ, the latter black, long, extending a little beyond the middle of the elytra, robust, the fourth joint one-half longer than the third, the following joints equal; thorax as broad as long, deeply constricted at the middle, the basal sulcus deep, placed immediately below the middle, the anterior angles rounded, the surface very shining, black, with a slight bluish gloss, entirely impunctate; scutellum black; elytra broad, distinctly depressed below the base, pale flavous, closely and rather strongly punctate-striate, the ninth row entire, the interstices slightly costate near the apex; the breast and legs black; the abdomen flavous.

Hab. Bolivia.

The elytra in this species are broader at the base than in most cases in this genus, making the thorax appear comparatively small. This and the uniformly coloured pale flavous elytra in connection with the black head, antennæ, and legs will help to distinguish the species.

Lamprosp̄ærus amazonicus, sp. nov.

Dark fulvous; the antennæ (the basal joints excepted) and the legs black; thorax extremely finely and sparingly punctured; elytra remotely punctate-striate. Length, 4 mill.

Oblong or subelongate; the head impunctate, fulvous; the clypeus not separated from the face, entirely impunctate, its anterior margin concave at the middle; antennæ extending below the middle of the elytra, black, the lower three joints flavous, third and fourth joints equal, the fifth slightly longer, terminal joints elongate and slightly thickened; thorax transversely convex, twice as broad as long, the sides strongly rounded, with a narrow margin, the anterior angles slightly thickened, the surface with a few extremely minute punctures, only visible under a strong lens, posterior margin scarcely produced at the middle; elytra slightly wider at the base than the thorax, convex, oblong, the shoulders prominent, distinctly but not very regularly punctate-striate, the punctures as well as the rows distantly placed, the suture not preceded by an impressed line, but by a row of closely placed punctures; sides of the elytra strongly deflexed so as not to be visible from above; legs nearly black, the anterior femora more or less fulvous at the base; prosternum oblong, rather broad, slightly narrowed between the coxæ.

Hab. Amazons.

This is another species of far more oblong shape than the typical forms, but agreeing in the main points with *Lamprosp̄ærus*.

Lamprosp̄ærus flaveolus, sp. nov.

Oblong-ovate, flavous; the apical joints of the antennæ black; thorax remotely punctured; elytra with basal depression, strongly punctate-striate, the punctures distantly placed. Length, 4 mill.

More elongate in shape than the typical species of the genus, of entirely flavous colour; the head distinctly but remotely punctured, the vertex with a central longitudinal groove; the clypeus separated from the face by a transverse depression, remotely but strongly punctured; eyes large; the antennæ extending to the middle of the elytra, flavous, the fifth and the following four joints fuscous, the apical two flavous again, third and fourth joints equal; thorax more than twice as broad as long, of equal width, the sides strongly rounded, with a narrow reflexed margin; elytra oblong, depressed below the base, the surface remotely punctate-striate, the punctures distantly placed, a short row of closely placed punctures is placed near the suture at the base, followed by an impressed or punctured groove which accompanies the suture, the apex of the elytra less strongly punctured than the rest of the surface; elytral epipleuræ moderately broad at the base, flat; prosternum subquadrate, longer than broad.

Hab. Amazons.

I have retained the name for this species given to it by the late Ed. Lefèvre, who examined the insect. The latter is by no means a typical representative of the genus, as the general shape is not ovate or rounded, nor is the prosternum broader than long.

(To be continued.)

NOTES AND OBSERVATIONS.

THE ENTOMOLOGY OF NORTHAMPTONSHIRE.—Referring to Mr. Claude Morley's interesting contribution to the Entomology of Northamptonshire in your current issue (*ante*, p. 222), he remarks that "*Apatura iris* was said to occur at both Helpston Heath and Barnwell Wold, but I never saw it, nor do I know of authentic records." I may say that, when collecting Lepidoptera in Barnwell Wold in the year 1875, I took a specimen of *A. iris* there on July 18th; it was the first I had ever taken, and even now, after the long lapse of years, I can recall how delighted I was at my good fortune; the insect, a fine male, is still in my collection. I never succeeded in taking *A. iris* again in Barnwell Wold, but saw it there subsequently on several occasions, and also at Ashton Wold, a few miles away in the same county.

In the years 1872, 1873, and 1875 I made periodical visits to Barnwell Wold, and amongst the butterflies taken, which are not of universal distribution, were—*Thecla pruni*, larvæ in May, on blackthorn, not uncommon. *T. betularia*, larvæ in June, on blackthorn, plentiful. *Nemeobius lucina*, plentiful in one corner of the wold, end of May and beginning of June. *Carterocephalus palæmon (paniscus)*, plentiful, May and June. *Argynnis aglaia*, plentiful on rough fields near the wold, July. *Melanargia galatea* swarmed in July, both in the wold and along the roadsides in the surrounding district. *Vanessa c-album*, the only specimen I have seen alive of this insect I captured in Ashton Wold, Northants, in August, 1872.

My captures of Heterocera were of course numerous, and, as my entomological diary for the years mentioned is still in existence, I should be pleased to give any entomologist who may take in hand a Catalogue of the Lepidoptera of Northamptonshire a full list of the species taken by myself in the county during the period mentioned.

In conclusion, I should like to point out that the name Barnwell Wold is really a misnomer, as there is no wold there. Barnwell Wold is, or was when I knew it, a fair-sized wood with a few rough fields near; the term wold is still used, no doubt from the fact that in olden times there were miles of open wolds (rough uncultivated uplands) in this part of Northants; these have long since disappeared before the march of agriculture, and with them has gone, alas! *Lycæna arion* (once plentiful), *Hesperia comma*, and doubtless many others. "Sic transit."—E. HAROLD CONQUEST; 58, Hatherley Road, Walthamstow, September, 1899.

COLEOPTERA OF REIGATE AND ITS VICINITY. — The Holmesdale Natural History Club, Reigate, have recently published the third part (Staphylinidæ) of the List of Coleoptera of Reigate, compiled by Mr. John Linnell. The first part of this list was issued in 1861, and the second part in 1867. Delay in the production of the present instalment, which—with few exceptions—refers to captures by local collectors between the years 1853 and 1870, is stated to have been due to various causes, but in some measure to the unsettled state of nomenclature and arrangement previous to the publication of Fowler's 'Coleoptera of the British Islands' and 'The Catalogue of British Coleoptera' by Sharp and Fowler. Close on five hundred and fifty

species are enumerated in the list ; of these four hundred and forty-four were taken in the immediate neighbourhood of Reigate or Red Hill, fifty-seven within a radius of from five to six miles, and forty-eight others at places distant from seven to twelve miles from the town.

VANESSA CARDUI. — What has become of *Vanessa cardui*? In my rambles around this neighbourhood in the late spring months of the present year, sundry more or less tattered individuals of this species were occasionally met with, and on June 11th, a warm sunny day, it was flying quite commonly over a rough field not half a mile beyond the continuous streets of houses that, in this quarter, form the outer border of London ; I waited for some little time watching them, and several times saw two or three of them flying together. On comparing notes with my friends, I learned that they, too, had found the species commonly in many parts of the country, and I naturally looked for an abundant autumn emergence. But quite the reverse is the case. During the later half of August and up to the present time I have paid periodical visits to the same field and neighbourhood ; on many of these occasions the days have been delightfully warm and sunny, but not one individual has come under my notice ; and during a stay of some three weeks at Eastbourne, terminating on August 14th, one solitary example was the only representative of the species that I met with. *Vanessa atalanta* was fairly common in spring, and both here and at Eastbourne I found it unusually abundant this autumn. The two species have much in common, and the thought that occurs to one's mind is, what special circumstance could have favoured the propagation of the one without being equally advantageous to the other? I may have been singularly unfortunate in my search for the autumn brood of *cardui* ; if so, perhaps some of our more fortunate country friends, who have better opportunities for observation than we Londoners, will be able to throw a different light on the subject.—ROBERT ADKIN ; Lewisham, Sept. 20th, 1899.

A CORRECTION.—In my paper “On the Nomenclature of the Rhynchota. Part I.” (Entom. 1899, pp. 217–21), I proposed to “treat ‘*Pentatoma*, Olivier,’ as a *nomen nudum*.” After further consideration, it appears to me that this would not be in accordance with the strict law of priority, for a genus once diagnosed—however insufficiently—ought to be treated as valid, if at all possible. The case is certainly a very awkward one, and the only way out of the difficulty seems to be to treat *Pentatoma*, Oliv., 1789, and *Cimex* (Linn., 1758), Fabr., 1794, as genera practically co-extensive but not co-typical. In the synonymy I proposed (p. 220) no. 1, CIMEX, will remain unaltered ; for no. 2 read :

“PENTATOMA, Oliv., 1789. Type, *rufipes*, Linn., Lam., 1801.

At p. 220, line 26, for “*nigrideus*” read “*nigridens*” ; line 36, for “*Philontochila*” read “*Philontocheila*.”—G. W. KIRKALDY ; Sept. 16th.

TRIPHÆNA ORBONA, var.—On July 30th, 1892, I captured, in Cambs, a specimen of *T. orbona* resembling fig. 3 in “Newman.” It was exhibited at the meeting of the South London Entomological Society on October 13th in that year. I have now to record a second example, perfectly fresh, taken this year at sugar in my own garden at Wood-

ford on August 1st. To my mind, the recent acquisition is preferable, inasmuch as the light ground shows up the singular markings in bold relief, which the dark ground of the other fails to do. With me, sugaring answered very well the first ten days of August, but since then the numbers of moths gradually declined, gnats being in the ascendant. Query—Did the gnats help drive them away? Certain it is they have been cruel to the genus *Homo*.—CHARLES OLDHAM; Woodford, Essex, Sept. 13th, 1899.

COLOUR OF THE LARVÆ OF AMPHIDASYS BETULARIA INFLUENCED BY THEIR SURROUNDINGS.—At a recent meeting of the Birmingham Entomological Society Mr. G. H. Kenrick gave an account of an experiment he had tried with larvæ of *Amphidasys betularia*. He had about two dozen larvæ from a pair of black parents; when about a quarter of an inch in length he separated them, putting some into a box lined white, and feeding them on food carefully selected all green; and the others into an ordinary dirty breeding cage, with a liberal allowance of brown twigs in the food. At the end, all in the white box were of the pale green form; in the other box most were dark, one or two very dark, but two also pale; although at the beginning they were all colours and mixed in both boxes; thus showing that uniform pale surroundings had produced all pale larvæ, while variable surroundings had produced a variable lot of larvæ.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

MANTIS KILLING A BIRD. — In the 'Journal of the Bombay Natural History Society,' xii. no. 3 (1899, July), p. 578, is recorded the killing of a bird by a Mantis. The bird (*Archnechthra minima*) was hovering round the branch on which the Mantis (probably a female of *Hierodula bipapilla*) was concealed. Whether through fright or no, the Mantis struck at the bird with its fore legs and scalped it. Considering the comparative sizes of the insect and its victim, there is nothing altogether surprising in the occurrence.—G. W. KIRKALDY.

THE COMMON EARWIG.—Having occasion to refer to Dr. D. Sharp's first volume on Insects, in the Cambridge Natural History (1895), I was surprised to find that at p. 214 he speaks of the idea that earwigs enter the ear as a superstition. That they ever penetrate the brain, as formerly supposed, is highly improbable; but that they occasionally enter the ear there is no manner of doubt; though such occurrences would naturally be much more common in former times than at present, when people lived out of doors, and were much more in the woods and fields than is the case now. A case was related to me some years ago by a relative of my own, respecting a lady who came out of the garden with an earwig in her ear, which caused her great inconvenience till her sister remembered having heard me say that oil poured into the ear would dislodge any insect that happened to get into the ear; and this remedy was successfully applied. Mr. F. Enock also tells me that earwigs have frequently dropped into his ear when he has been beating bushes, and they have crept in, and remained there, till he has pulled them out by the tail. The term "superstition" is often used nowadays only to indicate that some particular fact does not happen to have fallen within the writer's own personal experience.—W. F. KIRBY; Natural History Museum, South Kensington, Sept. 6th, 1899.

CAPTURES AND FIELD REPORTS.

DIANTHECIA LUTEAGO VAR. BARRETTII IN NORTH WALES.—I captured two examples of *D. barrettii* in North Wales last June, about the beginning of the month. In 1897 I took a specimen of this insect in Carnarvonshire (Entom xxx. 222). I may add that *Sesia musciformis* (*philanthiformis*) seemed to be common on the sides of the steep cliffs.—F. C. WOODFORDE; Market Drayton.

PLUSIA MONETA IN SUSSEX.—On the evening of July 17th last I took a beautiful specimen of *P. moneta* at Cuckfield. It came into the sitting-room, attracted by the lamp, and settling on the table I easily secured it. The species has been identified by an authority. I think it may be interesting to mention that I have kept up the brood of *Clostera anachoreta* (with the help of a friend), the ova of which I found at St. Leonards-on-Sea in 1893. The moths of this season are as fine as any I have bred. (Miss) A. D. EDWARDS; 55, Gildredge Road, Eastbourne, Aug. 26th, 1899.

CALLIMORPHA HERA IN DEVONSHIRE.—During a fortnight's stay in South Devon, this month, I obtained several specimens of *C. hera*. I took two specimens of the type in very fair condition, and four specimens of the variety known as *lutescens*, three of which are poor, the fourth being good. With one exception the specimens were taken on the wing, in sunny lanes and paths in woods, or at rest. The exception was one *lutescens*, at ten o'clock one night by lamplight.—G. MOREL-DE-VILLE; Liverpool, Aug. 31st, 1899.

LEPIDOPTEROUS LARVÆ ON CLEMATIS.—With reference to Mr. A. D. Imms's note (*ante*, p. 240), I took a large number of the larvæ of *Mamestra persicaria* on clematis (one of the cultivated species) one year during my residence in Burton-on-Trent, including both the varieties mentioned by your correspondent. And this year I have had three specimens sent to me, which were found feeding on a "cactus-dahlia," showing a special preference for the blossoms.—CHAS. F. THORNEWILL; Calverhall Vicarage, Whitchurch, Salop, Sept. 8th, 1899.

ENNOMOS AUTUMNARIA (ALNIARIA), &c.—At Margate, in September, 1898, I captured a female specimen of this insect on the gas-lamp at my front garden gate, and got a batch of eggs, which I divided between some friends and myself, in order to gain experience. The success of my friends has turned out *nil*. My share was fifty eggs, and in the spring I was alarmed by their shrinking in the middle so much that I concluded they were infertile. But I kept them on, hoping against hope. However, forty larvæ emerged, and I fed them upon poplar, dividing them into three batches. I lost one batch almost entirely—those that emerged last; but the others kept healthy, and eventually twelve to fourteen turned into pupæ. On Aug. 29th a lovely female emerged, and I tried unsuccessfully for a week to attract a "wild" male before killing her. She never seemed to make any attempt at flight. On Sept. 6th and 7th I bred one male and two female specimens. Each female has now deposited a batch of eggs; the male is in a battered state, but the females are still in good condition. To-day I bred a second male, and promptly killed him, to secure at least one good specimen of this sex.

Last Friday (the 8th inst.) my gas-lamp attracted *E. fuscantaria*, male;

and a hundred yards away another gas-lamp had on it a female, so I kept the pair together for twenty-four hours. The female has now deposited her eggs. It is curious that *fuscantaria* eggs are laid in one long row, whilst those of *autumnaria* form a large blotch. I think the former must feed on privet here, as there is little or no ash within a mile.

Macroglossa stellatarum has been common here, and both *Colias edusa* and *C. hyale* are now on the wing. Last Saturday I saw five "clouded yellows" in a patch of lucerne close by, but, having a full series and a due care for my neighbour's property, I did not catch one. I have seen perhaps a score in all, so I am hopeful that next season we may have a "clouded yellow" year.—T. P. BARRETT; 3, St. John's Villas, Margate, Sept. 11th.

COLIAS HYALE IN KENT.—Three specimens of *C. hyale* are reported in 'The Field' of Sept. 9th, having been captured on Aug. 28th, in Kent; one on the Island of Sheppey, by Mr. E. A. Cockayne, and two near Southfleet, by Mr. H. Huggins, jun.

COLIAS HYALE IN NORFOLK.—Mr. O. E. Harries also records in 'The Field' the capture of *C. hyale* near Hunstanton, on Aug. 29th.—F. W. F.

COLIAS EDUSA IN DEVON AND CORNWALL.—Several captures of *C. edusa* have been made during the past few weeks in the south-western counties, principally in those above mentioned.—F. W. F.; Sept. 18th, 1899.

CHRYSOPHANUS (POLYOMMATUS) PHLEAS VAR. SCHMIDTII.—On Aug. 23rd last my wife captured an example of the var. *schmidtii* at Barlaston Downs, Staffordshire. It is a male with rather enlarged black markings, and the basal half of the primaries are beautifully opalescent. I may add that the capture of the specimen is rather remarkable, as the particular object of my wife's visit to Barlaston that day was attained, she having expressed a hope of taking a white var. of *C. phleas*.—W. F. FROHAWK; Sept. 1st, 1899.

MACROGLOSSA STELLATARUM IN LONDON SUBURBS.—A friend of mine informed me that he had seen a specimen of this species in his garden at Chelsea early this year, and another collector observed one hovering over *Phlox* in a garden at Herne Hill on Aug. 20th.—F. M. B. CARR; 46, Handen Road, Lee, S.E.

MACROGLOSSA STELLATARUM IN EVIDENCE.—As *M. stellatarum* appears to be here, there, and everywhere this season, perhaps an account of its having been mobbed by sparrows may be of interest to readers of the 'Entomologist.' My sister (writing from the Isle of Ely on Aug. 24th) says:—"Our risible faculties have been greatly excited several days in watching the movements of the humming-bird *Sphinx*, as it flitted from flower to flower, with about a dozen old sparrows all the while giving it chase, flying at it, surrounding it, and rushing after it in the most amusing manner. Sometimes there are two or three of them together on the front beds of geraniums, but the cheeky sparrows won't let them have any peace."—CHAS. OLDHAM; Woodford, Essex, Sept. 13th, 1899.

ACHERONTIA ATROPOS IN SUFFOLK AND SOMERSET.—A full-fed larva of *A. atropos* was found on Aug. 22nd, at Chilton, one of the parishes adjoining this place.—EDWARD RANSOM; Sudbury, Suffolk, Sept. 12th, 1899.

A pupa of this fine moth was sent me from Suffolk at the end of July

last, and a fine larva was brought me from a potato field near this town early in August. Both have emerged perfect specimens.—(Rev.) A. P. WALLER; Bridgwater, Somerset.

ACHERONTIA ATROPOS IN SHROPSHIRE.—At the end of last month I obtained a fine larva of *A. atropos*; this is now in pupa. It was found feeding on potato leaves in a neighbouring village.—CHAS. F. THORNEWILL; Calverhall Vicarage, Whitchurch, Salop, Sept. 8th, 1899.

ACHERONTIA ATROPOS IN THE SUBURBS OF LONDON.—On Monday, Sept. 11th last, a friend of mine, who lives at Thornton Heath, brought me a nearly full-grown larva of *A. atropos*, which he had found in his garden on a cabbage. I knew he was growing some potatoes in the garden, and went to examine the plants on the next evening. I found one or two rows taken up, and the dry stalks lying about. Cabbages were grown between, and the larva had probably strayed on to these when it found its food-plant drying up. On examining the remaining plants, I was delighted to find three more very large larvæ of *A. atropos*. Two of the four have gone to earth since, and the others will follow in a day or two. I have never heard of larvæ of this species in the immediate neighbourhood of London, and though I have had larvæ on several occasions from the South of England, I have not previously seen such large ones as these, which measure nearly five inches in length.—O. LINDEMANN; 16, Chestnut Road, West Norwood, S. E.

ACHERONTIA ATROPOS IN CHESHIRE.—A fine specimen was taken near Chester about the middle of May last.—J. ARKLE; Chester.

ABUNDANCE OF VANESSA ATALANTA IN ESSEX.—*V. atalanta* seems to be extremely abundant here. I have never before seen them in such numbers.—ALAN W. CARDINALL; Manor House, Tendring, near Colchester, Essex, Sept. 6th, 1899.

VANESSA ATALANTA IN LONDON.—I saw a single specimen outside Liverpool Street Station on Aug. 31st.—ALAN W. CARDINALL.

VANESSA ATALANTA AND CYNTHIA CARDUI AT LEE.—The former insect has been seen abundantly even here at Lee, visiting the dry treacle patches in the garden. *Cynthia cardui* has also been seen or taken on several occasions. I certainly had not seen a specimen at Lee for several years.—F. M. B. CARR.

VANESSA ANTIOPA IN YORKSHIRE.—A specimen of *V. antiopa* was seen on Oliver's Mount on the 10th inst.—J. H. ROWNTREE; Scarborough, Sept. 15th, 1899.

NOTES ON VANESSA ATALANTA.—*V. atalanta* has been unusually abundant this season in the Epping Forest district. As early as 8 a.m. on the 8th inst., while taking my accustomed morning's stroll through the Forest, *en route* for Snaresbrook Station, my attention was drawn to several specimens of this brilliant butterfly. The centre of attraction appeared to be a small birch (*B. alba*), the trunk of which was almost alive with wasps. While I watched, nearly a score of *V. atalanta* were endeavouring to alight on any portion of the trunk unoccupied by the wasps. As soon as one succeeded it was immediately attacked and driven off, to return again undaunted in a few seconds. Although the butterflies must have been repeatedly stung, they did not appear to suffer much inconvenience.

Attempting to approach closer to the tree, I provoked hostilities on the part of the wasps, and was compelled to beat a hasty retreat. What I wished to ascertain was the nature of the attraction, which I feel convinced was not sugar, as I could see no trace of that substance on the tree. This tree would have been one of the last I should have selected for sugaring, there being many others in the immediate neighbourhood admirably adapted for that purpose. Unfortunately, I was not able to continue my investigations further, as the call of the great City close by could not be disregarded.—ERNEST CORNELL; 6, Vernon Road, Leytonstone, E.

[Probably the bark of trunk had been injured in some way, and the butterflies were attracted by the exuding sap.—ED.]

VANESSA ATALANTA.—I have never known *V. atalanta* to be so abundant during the last thirty years as it is this season. It appears equally numerous over the greater part of the country. I have found it the commonest species of butterfly, excepting *Pieris brassicæ* and *P. rapæ*, in Staffordshire, Essex, and Sussex; and I hear of its abundance in Yorkshire and other counties. In consequence of the present dry state of the country, this beautiful insect is a common object in crowded streets and thoroughfares, floating over and resting on the freshly watered roadways in such numbers as to attract the attention of the usually unobserving public. I think there can be but little doubt that there are two if not more broods of this species during the season. The hibernated specimens deposit eggs in May and June, which produce imagines at the end of July and August, these early examples being undoubtedly the parents of those that emerge in September (and perhaps October); otherwise, how are the small larvæ which occur during September to be accounted for, as they are certainly not the offspring of the hibernated butterflies? And, further, I think I have made notes (not now at hand) of finding larvæ in October. Therefore it is highly probable that a succession of broods takes place from July till late autumn.—F. W. FROHAWK; September, 1899.

ABRAXAS (ZERENE) ULMATA AT BRIGHTON.—I captured one specimen on a wall, hardly three hundred yards from the town, in July last.—ALAN W. CARDINALL.

NONAGRIA SPARGANII AND XANTHIA OCELLARIS IN SUFFOLK.—Though rather late, it may be of interest to record the occurrence of these two species in the above county. In September, 1893, whilst sugaring near Woodbridge, I took an insect which I was unable to identify, and I placed it with *X. gilvago* and *X. ferruginea*, supposing it must be a variety of one or other of these two moths. I now find it to be undoubtedly *X. ocellaris*. It agrees entirely with the description given in Barrett's new work, having the white dot at the base of the reniform stigma, and the more sharply angulated fore wings, which at once separate it from *X. gilvago* or *X. ferruginea*. *N. sparganii* I took in July, 1897. Whilst searching the stems of *Typha latifolia*, I turned out a green caterpillar, which subsequently pupated, and the imago emerged in the following August. Not knowing any other green caterpillar to inhabit the stems of *T. latifolia* except *N. canna*, I confused it with this latter moth. It proves, however, to be *N. sparganii*, which species, I believe, has not hitherto been recorded from Suffolk. I have shown both these moths to Mr. Arthur Cottam, of Watford, who very kindly helped me in their identification.—(Rev.) A. P. WALLER; St. May Street, Bridgwater, Somerset.

CADDIS-FLIES AT SUGAR.—Amongst many other unsolicited guests at sugar, at Hurst Hill, in the New Forest, last August, were two specimens of *Glyptotaelius pellucidus*—a female on Aug. 4th, and a male on Aug. 15th.—W. J. LUCAS; 12, Caversham Road, Kingston-on-Thames, Sept. 14th.

EROMENE OCELLEA IN HAMPSHIRE.—On Feb. 21st last I took a specimen of this insect in the New Forest.—HERBERT ASHBY; Pinehurst, Basset, Southampton, Aug. 30th, 1899.

[See Entom. xxiii. p. 300, pl. iv. fig. 11.—ED.]

ACRONYCTA ACERIS.—I can fully endorse Mr. South's note on the unusual abundance of this species in the London district this autumn (*ante*, p. 237). On some trees in a road near my house I have occasionally found some few larvæ in former years as they descended from the upper branches to undergo pupation, but I have never before seen them in anything approaching the numbers that they were in during the middle of August last. Not only were they crawling on the trunks of the trees, but on the ground and on adjacent fences. I noticed that many of these larvæ, after crawling some distance, would settle down on a stave of the fence or some similar position and rest there, sometimes for three or four days, during which time they turned much darker in colour, and eventually died without having made any attempt at forming a cocoon. Of several that I brought home a large proportion behaved in a similar manner, forsaking the food given them, and, after wandering about the cage for some time, settling down on the pieces of cork-bark offered them for the purposes of pupation, and remaining there until they died. I have so far been unable to discover any parasite, nor can I assign any cause of death. The healthy larvæ, on becoming full fed, at once get in among the pieces of cork and there form their cocoons.—ROBT. ADKIN; Lewisham, September, 1899.

UNUSUAL VISITORS TO SUGAR.—I was much surprised, on Aug. 9th, to take several *Drepana cultraria* (*unquicula*) at sugar. I may mention that Geometers also came freely to sugar on that night, among which were *Zonosoma omicronaria*, *Phibalapteryx vitalbata*, *Camptogramma bilineata*, *Melanippe fluctuata*, &c. I have never seen them like it, before or since.—W. E. BUTLER; Hayling House, Reading, Sept. 3rd, 1899.

LONDON LEPIDOPTERA.—A correspondent, writing from The Avenue, Brondesbury, but who has omitted to give his name, remarks:—"With reference to the Editor's note (p. 235), I may mention that *V. atalanta* is common here. *V. cardui* was seen in the grounds of St. Paul's School last term. *Macroglossa stellatarum* frequents Hyde Park, and I saw it here twice on Sept. 1st, and once on Sept. 2nd."

LARVÆ AT CHISWICK.—I have much pleasure in recording the following list of larvæ taken at Chiswick this season; and having regard to the fact that they were all taken within the parish, which is very restricted, I consider it a very good one. I have not included some of the commonest species. *Smerinthus ocellatus*, *S. populi*, *S. tiliæ*, *Sphinx ligustri*, *Chorocampa elpenor*, *C. porcellus*, *Macroglossa stellatarum* (in abundance), *Sesia tipuliformis*, *Cossus ligniperda*, *Zeuzera pyrina* (*asculi*), *Nota cuculatella*, *Liparis salicis*, *Crocallis elinguaris*, *Uropteryx sambucaria*, *Amphidasys betularia*, *Acidalia incanaria*, *Eupithecia subnotata*, *Melanippe ocellata*, *Pelurga comitata*, *Dicranura vinula*, *D. bifida*, *Notodonta dictæa*, *Pterostoma palpina*, *Acronycta aceris*, *A. megecephala*, *Diantheccia capsicola*, *D.*

cucubali, *Hadena pisi* (again in great numbers), *H. trifolii* (*chenopodii*), *Habrostola triplasia*, *Euplexia lucipara*, *Triphæna comes* (*orbona*), and *Catocala nupta*. In addition, on the Surrey shore, *Notodonta ziczac* and *Gonoptera libatrix* have occurred.

Although working Chiswick for many years, I have not observed *Charocampa porcellus*, *Macroglossa stellatarum*, or *Pterostoma palpina*, and it is quite ten years since I had the pleasure of taking the larva of *Sphinx ligustri* in this neighbourhood; in fact, I considered it extinct in the parish.—ALFRED T. MITCHELL; 5, Clayton Terrace, Gunnersbury, Sept. 18th, 1899.

LEPIDOPTERA ATTRACTED BY ELECTRIC LIGHT AT SHEPHERD'S BUSH.—Among the species either taken or observed during a few visits, at end of June and beginning of July, to the lamps, were the following:—*Smerinthus ocellatus*, *S. populi*, *Sphinx ligustri*, *Zeuzera pyrina* (*asculi*), *Cossus ligniperda*, *Spilosoma lubricipeda*, *S. menthastri*, *Liparis auriflua*, *L. salicis*, *Uropteryx sambucaria*, *Rumia luteolata* (*cratægata*), *Amphidasys betularia*, *Abraxas ulmata*, *Cidaria associata* (*dotata*), *Halia wavsaria*, *Dicranura vinula*, *Acronycta aceris*, *A. megacephala*, *A. psi*, *Agrotis exclamationis* (in enormous numbers), *Axylia putris*, *Xylophasia lithoxylea*, *Hadena pisi*, and *H. trifolii* (*chenopodii*) (commonly). As evidence of the extraordinary power of attraction, I can say without exaggeration that around some of the arc-lamps a hundred specimens could be seen at once; and on one night, just before a thunderstorm, the sight was a most bewildering and beautiful one. The immense number of insects circling wildly in the zone of light had a most weird effect, and reminded me strongly of a pyrotechnic display. The hind wings of *Agrotis exclamationis* shone like silver, while other species appeared to be bright gold. In five nights this effect was only observed once, and it attracted the attention of numbers of people not interested at all in entomology. Regarding the capture of *Abraxas ulmata*, which is a rather large and very light female, I should like to mention that it was taken, in company with a number of *A. grossulariata*, flying round *Euonymus*. There is a good deal of wych elm about two miles distant, but I do not remember to have seen this species included in the Middlesex list, so that I was quite astonished on proving its identity.—ALFRED T. MITCHELL; 5, Clayton Terrace, Gunnersbury, W.

A DAY AT OXSHOTT, SURREY.—I managed to get a whole day's collecting at Oxshott, with Mr. J. Wilson, of Lee, and my father, on July 20th last, and was very pleased with the results. Both the country and the insects reminded me strongly of the New Forest. There were two large school-treats on, but these did not trouble us much, except when a small crowd followed us in the fond hope that we were "catching rabbits." Up to about one o'clock, when we had lunch, we did not experience particularly good luck; but afterwards we did much better; and if we had not wasted a good lot of time in the evening over treacle, which produced nothing, we should undoubtedly have taken a good many more things, as insects were abundant flying over the heath.

By beating we obtained five examples of *Calligenia miniata*, three *Lithosia complana*, one *L. helveola*, one *L. mesomella*, eight *Platypteryx falcula*, four *P. lacertula*, a few *Liparis auriflua*, several *Metrocampa margaritaria*, four *Ellopiæ fasciaria* (*prosapiaria*), one female specimen of *Geometra papilionaria* (worn; I obtained a few eggs), *Hemithea thymiaria*, *Macaria liturata* (getting worn), *Fidonia pinaria* (several, females only), *Acidalia emarginata* (very abundant), *Cabera pusaria*, *Lomasipilis marginata*,

Hyppipetes elutata, *Boarmia rhomboidaria*, *Melanthia albicillata* (one worn specimen). On the heaths, *Fidonia atomaria*, *Pachygnemina hippocastanaria*, *Pseudoterpna cytisaria*, *Agrotis porphyrea*, and *Anarta myrtilli* were taken; *Gnophos obscurata* was fairly plentiful. Single specimens of *Cidaria immanata* (? *russata*), *C. fulvata*, and *C. pyrallata* were also seen.

Among butterflies, *Lycæna ægon* swarmed on the heaths; and a perfect specimen of *L. argiolus* (second brood) was obtained. *Epinephele ianira* was, of course, common; and *E. tithonus* was just coming out. *Polyommatus phlæas* was in beautiful condition; and *Hesperia sylvanus* and *H. linea* were plentiful.

Larvæ of *Macaria liturata* (?) and *Fidonia piniaria* (?) were taken from the pines; also two *Panolis piniperda*. Two larvæ of *Notodonta chaonia* and one of *Lophopteryx camelina* were beaten; and a few larvæ of *Clostera reclusa* were found on dwarf sallow.

On our way to the station in the evening two *Lithosia complana*, several *Gnophos obscurata* and *Pachygnemina hippocastanaria*, one *Apamea didyma* (*oculea*), and a few *Agrotis porphyrea* were netted flying over the heath; and a great many more things were seen. In the station a specimen of *Acidalia imitaria* finished the day's takings.

A Correction.—In my few notes (*ante*, pp. 196–199), I see I wrote *Melanippe unifasciata* instead of *M. subtristata* [p. 198, line 15].—F. M. B. CARR; 46, Handen Road, Lee, S.E.

COLLECTING AT SWANAGE, DORSET.—Rhopalocera were exceptionally common this year; twenty-nine species were taken during a stay from Aug. 1st to Sept. 11th. *Pieris brassicæ*, *P. rapæ*, and *P. napi* were all common; six *Colias edusa* seen, and three taken. Two specimens of *Gonopteryx rhamni*. All the Fritillaries captured were more or less worn; one *Argynnis paphia*, four *A. aglaia*, and one *A. adippe*. Of the Vanessas, *Vanessa atalanta* was the only species at all common, though *V. urticæ* and *Pyrameis cardui* were found. *Melanargia galatea* was fairly common on the Undercliff and Downs. *Epinephele ianira*, *E. tithonus*, *Satyrus semele*, *Cænonympha pamphilus*, and *Pararge megera* were all common; *P. egeria* could only be found in one wood. Six *Thecla quercus* were captured flying round ash and oak trees. *Polyommatus phlæas*, *Lycæna agestis*, *L. icarus*, and *L. argiolus* were common; *L. minima*, a few worn specimens; *L. bellargus* and *L. corydon* were abundant on the downs; *L. ægon* on Studland Heath. Three specimens of *Hesperia thaumas*. *H. actæon* was found fairly plentiful on the cliffs.

Of the Heterocera, *Macroglossa stellatarum* was by far the commonest; one could be seen at almost every fuchsia or geranium bed, and I counted eight at once on a small patch of vetch. Among other moths taken were the following:—*Euchelia jacobææ* (the caterpillars of which were common on ragwort; one imago seen); *Dasychira pudibunda* (one larva taken), *Lasiocampa quercus*, *Odonestis potatoaria*, *Cerura vinula* (one larva), *Bryophila perla*, *Acronycta megacephala* (larva), *Aporophyla australis* (at sugar), *Cerigo matura*, *Agrotis saucia*, *A. nigricans*, *Triphæna fimbria*, *Scoliopteryx libatrix*, *Acontia luctuosa*, *Metrocampa margaritaria*, *Crocallis elinguaris*, *Gnophos obscurata*, *Hemitea strigata*, *Acidalia scutulata*, *Aspilates ochrearia*, *Anaitis plagiata*. *Asilus crabroniformis* was common on heaths.—S. W. KEMP; 80, Oxford Gardens, Notting Hill, W.

ERRATA.—P. 238, line 23 from bottom, for “*ante*, p. 179,” read “*ante*, p. 169”; line 3 from bottom, for “*ante*, p. 219,” read “*ante*, p. 213.”

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*July 13th, 1899.*—Mr. J. W. Tutt, F.E.S., Vice-President, in the chair. Messrs. J. R. Picken, of Brixton; A. A. Buckstone, of South Norwood Park; S. W. Gadge, of Brixton; and G. W. Tombs, of Dalston, were elected members. Mr. Lucas exhibited a finely-marked specimen of *Libellula quadrimaculata* var. *prænubila*, taken at the Black Pond, Esher. Mr. R. Adkin, bred specimens of *Pachnobia hyperborea* from Rannoch. Mr. Turner, the following species and varieties of dragonflies, taken during the field meeting at Byfleet on June 10th:—*Pyrhosoma nymphula* (*minium*), with *P. tenellum* for comparison; *Enallagma cyathigerum*, with a variety having the longitudinal portion of the black mark on the basal segment wanting; *Ischnura elegans* and a red-bodied female variety; *Agrion puella*; *A. pulchellum*; *Erythramma najas*; *Brachytron pratense*; and *Calopteryx splendens*. He also showed a male *Anax imperator* (*formosus*), and both sexes of the very local *Orthetrum cancellatum*, from Woolmer Forest. Mr. Lucas read a report of the field meeting held at Byfleet on June 10th. Mr. Adkin read a report of the field meeting held at Chalfont Road on July 1st. Mr. Carrington gave a very interesting account of a recent visit he had made to Bradwell-juxta-mare, a village on the Blackwater near Southminster.

July 27th.—Mr. F. Noad Clark in the chair. Mr. Fremlin exhibited a store-box of insects he had taken during a holiday at Stornoway, Isle of Lewis, and gave a full account of the neighbourhood from a natural-history point of view. Among the exhibits *Melanippe montanata* and *Camptogramma bilineata* were much varied. Mr. West, a specimen of the snake-fly (*Rhaphidium*) and the Homoptera *Pediopsis fuscineris*, and *Cixius cunicularis* with var. *dionysii*, all from West Wickham. Mr. Clark, a photomicrograph of the egg of *Eubolia cervinata*.

August 10th.—Mr. T. W. Hall, F.E.S., in the chair. Mr. Malcolm Burr exhibited a large number of species of the orthopterous family Eumastacidae, which he was monographing, and contributed notes on their distribution, with detail drawings by Mr. E. H. T. Schuster, of Oxford. He also showed the specimens of Orthoptera which had been brought from Socotra by Mr. Ogilvie Grant, as a portion of the result of the recent expedition. Mr. Sauzé, a considerable number of insects of all orders, taken in Hampshire and Dorset during his recent holiday there.

August 24th.—Mr. Robert Adkin, F.E.S., in the chair. Mr. Edwards exhibited a number of insects of various orders from Borneo and India, including the large bee *Xylocopa latipes* (of which the male has paddle-shaped fore legs), the enormous digging wasp, *Triscotia procera*, the giant ant, *Camponotus gigas*, and several remarkable species of Pompilidae, together with a large immature *Tarantula*, specimens of the crab spiders, *Gasteracantha*, and the rare allied genus to the scorpions, *Thelyphonus*. Mr. West exhibited three species of Hemiptera—*Oncotylus viridiflavus*, found on *Centaurea* at Wisley; *Tricopsylla walkeri*, found on buckthorn at Box Hill; and *Terenthia lata*, obtained by sweeping at

Reigate. Mr. Patteson reported that a specimen of *Deilephila livornica* had been taken at Limpsfield at light. Mr. Adkin exhibited a series of *Acidalia aversata*, bred from ova laid by a female captured at Lewisham. The whole brood were dull non-banded forms like the female parent, and very distinct from the ordinary light form.—HY. J. TURNER, *Hon. Rep. Sec.*

CARLISLE ENTOMOLOGICAL SOCIETY.—*August 3rd, 1899.*—Mr. J. Murray in the chair. Mr. Murray exhibited the following Coleoptera:—*Halysia 16-guttata*, from Orton near Carlisle; *Lathrimæum unicolor*, from Whitehaven; and a specimen of the rare *Carabus glabratus*, which was found under a stone on Castlearrock Fell. Mr. F. H. Day also showed a large number of Coleoptera:—*Bembidium femoratum*, from the banks of the River Eden, near Little Salkeld; *Oretochilus villosus*, under stones on the River Irthing; *Cryptohypnus dermestoides*, Irthing; also *Hypera trilineata*, *Barynotus schouherri*, and *Tropiphorus mercurialis*, taken from among hay. Mr. J. Wilkinson exhibited a very variable series of *Epinephele (Enodia) hyperanthus*, taken at Orton. The specimens taken in Cumberland differ from those taken in the South of England by the colour of the wings on the under side being paler and sometimes with a yellowish tinge. Several of the specimens had no rings on the under side, and only minute white spots.—G. B. ROUTLEDGE.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*August 21st, 1899.*—Mr. G. H. Kenrick in the chair. Mr. Kenrick showed a drawer of Pierines from Thibet and other parts of Asia. It included several species showing a gradual transition from *Pieris* to *Aporia crataegi*, this being particularly marked in *Pieris deota*. He also showed *Agrotis ashworthii*, bred from one of the only two larvæ he had been able to find at Llangollen—the other being ichneumoned; also a specimen of *Acronyeta menyanthidis* from Edgbaston, which appears to be the first specimen known in the Birmingham district. Mr. R. C. Bradley exhibited a specimen of *Acronyeta alni*, bred from mountain ash at Sutton. Mr. H. Willoughby Ellis said he had a larva sent to him this week from Bransgrove, where it was found on maple. Mr. Ellis showed the following Coleoptera:—*Scolytus destructor* and *S. multistriatus*; the latter was found in some logs near Kingswood, and is a species which has not been known in the Midlands before; as however the logs had apparently been brought to the place where they were found, they had probably brought the *Scolytus* with them from some other district. He also showed *Epyrea deleta* from Knowle, and a fine variable series of *Strangalia armata* from Haywood, Warwickshire, all taken this year. Mr. J. W. Moore, insects from the Cambridgeshire Fens: *Leucania straminea*, four bred examples, which he said were the first specimens of the species which anyone had bred; *Leucania obsoleta* (four specimens); a short series of *Senta ulvæ*, and one *Moma orion* (bred), all in grand condition. Mr. C. J. Wainwright, a fine long series of *Anthrax paniscus*, taken in Cornwall this summer. He said that at first he had found them confined to one spot of hot protected sand near the beach at St. Ives, where they settled either on the hot sand itself or on blossoms of *Daucus carota*; before he left Cornwall, however, he had found them much more scattered at St. Ives, occurring especially on *Angelica sylvestris*; and also as far as

the Land's End on one side and on the high road not far from Camborne on the other. He also showed continental *Anthrax fenestrata*, *A. maura*, *A. morio*, and *Lomatia lateralis*, for comparison. Mr. G. H. Kenrick communicated the results of an experiment he had made in the treatment of the larvæ of *Amphidasys betularia* (see p. 253).—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

THE Direction of the Vienna Museum has lately published two most important monographs upon Rhynchota, and the authors have earned the gratitude of their fellow-students by this highly meritorious work, which, indeed, was only to be expected from entomologists of their reputation.

ANTON HANDLIRSCH: *Monographie der Phymatiden*. (Annalen, K.K. Naturh. Hofmuseums,* 1897, xii., pp. 127-230. Plates iv.-ix.; and thirty-five figures in text.)

L. MELICHAR: *Monographie der Ricaniiden*. (*L. c.*, xiii., 1898, pp. 197-359. Plates ix.-xiv.; and a figure in text.)

Though neither the Phymatidæ nor the Ricaniidæ occur in the British Islands, they would probably be represented among the first consignments of Rhynchota received from correspondents abroad.

The Phymatidæ (Macrocephalidæ according to strict priority) have usually been regarded as allied to the Tingitidæ and Aradidæ; but Professor Handlirsch confirms Schiödte's opinion that they are more closely allied to the Reduviidæ. Nine genera, comprising seventy-three species, are recorded. These are well distributed, Phymatidæ being found almost all over the world, with the exception of the Australian, Ethiopian, and North Palæarctic regions. The anterior legs are carci-niform, the femora being enormously incrassate, and in a great many species the connexivum is enormously angularly-dilated, the pronotum being also often angularly produced laterally, so that a somewhat grotesque appearance is presented.

Dr. Melichar's monograph is, in a sense, even more valuable, since there is no recent general Catalogue of Homoptera. The Ricaniidæ, of which thirty-one genera and two hundred and sixteen species are described, are almost entirely tropical, their headquarters being situated in Ceylon and in the Malayan Archipelago.

Considering the enormous number of lepidopterists, it is remarkable that there are so few students of the Auchenorrhynchous Homoptera, a suborder which furnishes us with species so greatly resembling some of those of the more admired order, that they would be located in the latter by an untrained eye.

The value of both works is immensely enhanced by the full analytical tables, generic and specific, and by the numerous plates and woodcuts.—G. W. K.

* Received in this country in 1898 and 1899 respectively. It should also be noted that the "new species" described in the latter were diagnosed previously in the 'Verhandl. zool. bot. Ver. Wien.,' although there is no allusion to this in the monograph itself.

The Micro-Lepidoptera of Guernsey. By W. A. LUFF. 8vo, pp. 11. A reprint of a paper read before the Guernsey Society of Natural History, and published in its 'Transactions' for the year 1898.

Two hundred and eighteen species, including five Deltoids and *Aventia flexula*, are recorded as occurring in Guernsey; three of these—*Tortrix pronubana*, Hübn.; *Adela violella*, Tr.; *Funea* (?) *lapidicella*, Zell.—are noted as not found in Britain. The general arrangement of the list is on the lines of that of the 'Entomologist Synonymic List,' but *Helias chlorana* is placed with the Tortrices.

Mr. Luff remarks that most of the species referred to were captured in the perfect state, and it would seem that very few of them have been obtained in their earlier stages. Possibly when more attention is directed to the collecting of larvæ of "Micros," a number of additions will be made to the list, and at the same time some of those species now only represented by one example or perhaps a couple of specimens will turn up more plentifully.

We heartily congratulate Mr. Luff on the production of this list, which has evidently been compiled with care. All the species have been examined by high authorities, and the identifications may therefore be taken as correct, a matter, we may add, of the utmost importance in all local lists.

OBITUARY.

WE regret to announce that Mr. SAMUEL STEVENS, of "Loanda," Beulah Hill, Upper Norwood, died on August 29th. He was born on March 11th, 1817, and was therefore in his eighty-third year.

Mr. Stevens joined his brother in business at Covent Garden about 1840, but withdrew again in 1848, when he established a Natural History Agency at 24, Bloomsbury Street. At that time Messrs. Wallace and Bates were about to start for the Amazon, and he undertook to act as their agent in the distribution of the natural history specimens that they obtained. On the death of his brother, in 1859, Mr. Stevens took charge of the auction business in King Street on behalf of the widow, and continued to conduct it until his nephews took over the management. During that time he still carried on the Bloomsbury agency, but in 1867 he sold the business to Mr. Higgins, and thenceforth devoted himself almost entirely to his favourite pursuits, which were, insect collecting, fishing, and water-colour painting, in which art he was an adept. From his early youth he had been an ardent entomologist, but he had always a strong penchant for the practical side of the subject. As a collector of Coleoptera and Lepidoptera he was most successful, and many of the rarer species in each order were captured by him. There are many notes from his pen scattered through the various entomological journals, but he did not estimate his own knowledge and ability at their true value, and consequently he did not contribute very largely to entomological literature. He was a Fellow of the Linnean and Entomological Societies of London; his election into the latter dates as far back as 1837. He was also a member of the Entomological Club from the year 1852. We understand that his collections will be disposed of either as they stand or by auction.

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THE SPECIES OF THE BEE-GENUS *DIEUNOMIA*.

By T. D. A. COCKERELL, N. M. Agr. Exp. Sta.

THE generic name *Eunomia*, Cresson, being preoccupied, was changed to *Dieunomia* in Entom. xxxii. 14. Taschenberg considered it to be *Cyathocera*, Smith; but that is in reality a synonym of *Steganomus*. Ashmead, on the other hand, has recently identified *Eunomia* with *Monia*, Westwood; but that cannot well be correct, as *Monia* has simple hind legs (Westwood knew the male), and is stated to have "lingua apice lato bifido," and "palpi labiales minuti." When recently at the Academy of Natural Sciences in Philadelphia, I saw the three described species in the Cresson collection, and made the following table for their separation:—

Wings uniformly fuliginous	<i>heteropoda</i> , Say.
Wings yellowish, hind margin broadly smoky. (♀.)	
Tegulae piceous; pubescence of thorax very dark	
seal brown	<i>marginipennis</i> , Cresson.
Tegulae light fulvous; pubescence of thorax	
fulvous	<i>apacha</i> , Cresson.

To these may now be added the following new species:—

Dieunomia xerophila, n. sp.

Eunomia heteropoda, Ckll. (not Say), Bull. Sci. Lab. Denison Univ. xi. (1898), p. 50.

♂. Length about 20 mm.; black, with very short pale yellowish grey pubescence, very dense on the mesothorax, scutellum, and post-scutellum. Head seen from in front almost circular; middle ocellus larger than the lateral ones; vertex flattened, shining, with scattered deep punctures; face and clypeus densely punctured; middle of face very hairy; first joint of labial palpi as long as the other three together; antennae long, black, flagellum crenulated above, the last joint dilated and flattened; tegulae testaceous; wings dark yellowish,

apical margin broadly smoky, nervures and stigma dark ferruginous; legs black with brownish grey pubescence, small joints of anterior and middle tarsi dark ferruginous; middle femora greatly swollen, with a keel beneath, which is broadly notched in the middle; middle tibiæ with a low keel beneath, which is curved at its end and terminates in a pointed projection; basal joint of middle tarsi broad and flattened in front; hind femora swollen at the end; hind tibia flattened into an immense triangular body, which viewed from behind is broadly bifid beneath; hind tarsi with the basal joint slender, longer than the others put together; base of metathorax coarsely roughened; abdomen closely punctured, unicolorous, pruinose with short pubescence, which on the hind margins of the segments forms pale bands; third ventral segment elevated at the lower lateral corners, and produced into a spine, from which projects a tuft of hairs; fourth ventral segment with a sublateral nodule on each side.

♀. Similar to the ♂; pubescence of mesothorax, scutellum, and postscutellum extremely dense (except when worn), and ochreous in colour; legs not deformed as in the ♂, pubescence on hind legs quite fuscous, basal joint of hind tarsi broad, with dark ferruginous pubescence beneath; antennæ short, ordinary; hair of ventral surface of abdomen long and warm brown.

Hab. Mesilla Park, New Mexico, Sept. 17th, in a sandy place, ♂ ♀ (*Ckll.*); Aztec, N.M., at flowers of *Verbesina encelioides*, Sept. 19th, ♀ (*C. E. Mead*). A larger insect than *D. apache*. The middle tibia has a spur in both sexes.

Dieunomia mesillæ, n. sp.

♂. Length about 15 mm.; black, differing from *D. xerophila* as follows:—Size smaller; face covered with dense white hair; vertex closely punctured, except on each side of the ocelli; apical joint of flagellum not so broadened, its end truncate; metathorax, except the narrow basal enclosure, very hairy; wings yellowish hyaline, apical margins strongly smoky; legs black, tarsi ferruginous; middle femora fairly swollen, concave, not keeled, beneath; basal joint of middle tarsus ending in a long, narrow, truncate projection; hind femora greatly swollen, triangular in lateral view, the summit of the triangle forming a thick conical eminence, the whole covered with erect grey hair; hind tibiæ with a large, oblique, flattened, quadrangular process of an orange fulvous colour; first three segments of abdomen strongly depressed basally; hair-bands of abdomen very distinct; lateral inferior corners of ventral segments simple. There is no spur on the middle tibia, whereas *D. xerophila* has a single well-developed spur.

Hab. Mesilla, N.M., July 5th, 1898 (*C. M. Barber*). This insect is widely separated from *D. xerophila* by the shorter antennæ, much less dilated at the tip; and also by the absence of the spur on middle tibia, and general structure of the legs.

NOTE.—*Panurginus albitarsis* subsp. *fortior*, *Ckll.*, Entom. May, 1899, p. 129, should stand as *P. innuptus* var. *fortior*. It differs from the typical form in the maxillary palpi, but is hardly separable as a race.

Mesilla Park, New Mexico, U.S.A.: Sept. 26th, 1899.

NOTES FROM RINGWOOD AND DISTRICT.

BY J. HY. FOWLER.

THE earlier months of the season were very unfavourable to collecting. We had several hard frosts in May and early June, which caused insects to be scarce. Spring moths scarcely appeared at all; larva beating was useless, and has been so for two or three years. Matters began to improve about June. I collected some larvæ of *Callimorpha dominula*, and bred a few good varieties of the species. Two of these are yellow; one orange, quite intermediate between the latter form and the type; two nice ones, hind wings suffused with black, the scarlet being almost invisible; several with the pale spots yellow; and one with the hind wings almost entirely scarlet.

April 3rd. *Xylocampa areola* upon fir trees. 6th. *Cymatophora ridens* and *Earias chlorana* bred; the latter freely, several emerged quite up to June. These might be regarded as a second brood; the same remark applies to late specimens of *Emydia cribrum*. Some pupæ seem to lie over for a time, and in this connection I may mention that I have a pupa of *Vanessa atalanta*, which I have no doubt is a specimen of the usual June brood. Oct. 7th is late for pupa; still, I have known them even later than this. I bred a few *E. chlorana* quite golden green; they were killed by my fingers, so were not discoloured in any way by the cyanide bottle. 16th. *Vanessa io*, *V. urticae*, *Gonepteryx rhamni*, *Pieris brassicæ*, and *P. napi* were all to be seen in my garden. 17th. *Satyrus egeria*, scarce; *Eupithecia pulchellata*, bred. 27th. *Boarmia cinctaria* out; I have taken many good forms this season. One male is unicolorous grey; another example of the same sex has all the markings a rich brown, the only one of this form I have ever seen; several specimens are white-banded, others nearly white. This species was abundant and continued out up to June. I have seen as many as eleven on one tree. May 5th. *Lycæna argiolus*, very scarce and late. 6th. Netted several moths over honesty flowers, very similar to *Cucullia umbratica*, but not so large. One is almost entirely black. 9th. *Pachynemias hippocastanaria*, which is usually common, was very scarce. 22nd. *Anthocharis cardamines*, a few; I have not seen a dozen specimens of this species for the last two seasons. 30th. Took cases of *Psyche villosella*, *Fumea roboricollis*, and *Talæporia pseudo-bombycella*; also the first example of *Emydia cribrum*. June 1st. *E. cribrum* well out; also *Scodionia belgiaria*. 3rd. *Corycia tenerata*; *Lithosia aureola* very common, but difficult to net; a fine female *Eurymene dolabraria*; several larvæ of *Nola strigula*; *Thecla quercus* and *Phorodesma bajularia*. 5th. One *Boarmia cinctaria* seen; several *Epione advenaria*; *Macroglossa stellatarum* seen. 6th. From this date I netted a

good number of *Emydia cribrum* in the New Forest locality; as before noted, they were very much lighter than those taken at Verwood. One female is almost white, the two longitudinal lines are very indistinct, and upon the whole they are all smaller as well. To anyone who is acquainted with the exact spots or localities where this species is found, the opinions of those who have never seen or taken it upon the wing are amusing. A few facts, which would appear to be well known about it, I certainly should like to be enlightened upon (the remarks by Mr. Banks are quite correct), but when I saw St. Lawrence mentioned in connection with *E. cribrum*, I certainly thought we had an Isle of Wight locality for the species. I may mention that the "public-house" at St. Leonards has been converted into a private one for years past. If old collectors remember the "*cribrum* heath" opposite this same house, they will be pleased to hear that I recently took over forty fine specimens there. The heather has grown again, but, heath fires having been so frequent, it is necessary to obtain permission to collect from the Earl of Malmesbury.

It is extraordinary that its habitat in the New Forest was not discovered before. I took it upon a stretch of heath quite two miles long, and think it may extend farther, for this heath was formerly certainly connected with that of St. Leonards and Verwood, say *via* Holmsley, Avon Tyrrell, and on to Hurn, which is close to St. Leonards. At the present day, however, the valley of the Avon, with its river, water-meadows, and higher cultivated lands, effectually divide the two localities. Formerly the heath lands and forest was continuous beyond the western boundary of the Avon, so in the olden days there may have been many good spots for *E. cribrum* upon heaths which have since been broken up and cultivated. The New Forest locality is over two hundred feet higher than the others.

June 6th. Two male *Psyche villosella* bred; larva of *Orgyia fascelina* taken; also two male specimens of *P. villosella* upon the wing. 9th. *Nemoria viridata* very common at dusk; also *Scodiona belgiaria*. 13th. Found a dead but fine female *Bombyx trifolii*; a few larvæ of this species were also taken in the spring. 13th. *Emydia cribrum*, a batch of ova laid; changed to purple by the 17th, and larva emerged on 27th, thus proving this species to remain just fourteen days in the egg stage. 14th. *Phibalapteryx lignata*, common in meadows. 15th. One *Anthocharis cardamines*; *Lithosia mesomella*, common upon the wing at dusk; *Lobophora sexalata* flying by day. 19th. *Hadena dentina* at rest on palings. 23rd. Larvæ of *Thecla betulæ* very scarce; one *E. chlorana*. 24th. Larvæ of *Dicranura vinula* abundant. July 3rd. *Nudaria senex* amongst rushes; *Liparis salicis*, larvæ, pupæ, and imagos all found together upon osiers. 4th. Two *Boarmia roboraria*; larvæ of *Vanessa io* and *V. atalanta* abun-

dant. 6th. *Hepialus humuli*, common; also *Iodis vernaria*; a fine female *Zeuzera æsculi* was brought to me alive; *Zygæna trifolii*, scarce. 7th. Took many pupæ and larvæ of *Nonagria typhæ* from bullrush stems, and bred over a hundred. I kept the stems stuck in wet earth, the exit being exposed, and frequently drenched them with water.

In 1897 I took a few *Caradrina ambigua*, over forty in 1898, and about a dozen this year; the majority on clematis flowers in September, but several were netted as they flew over the heaths.

On the sea-coast I found a nice colony of *Lycæna minima* (*alsus*). They were very large examples. *N. typhæ* pupæ were also plentiful. *Aspilates citraria* was rather scarce. *Acidalia emutaria*, common.

My best captures for the season were fine varieties of *Lycæna corydon*. I obtained about two dozen. Several males are lighter blue than the type; the black borders are absent, but replaced by a row of pure white square spots upon all the wings; those of inferiors are centred with black. Others have the dark borders with large white spaces upon them intervened with black lines. Two females are marked in a similar manner, and appear totally different from the type. I have taken many examples approaching this form both at Dover and near Blandford, but they cannot be compared to the above. Several females have the usual blue markings, and are ringed upon all the wings in the nervular spaces. Streaked varieties were fairly common, also males with orange spots upon upper hind wings.

Two good varieties of *Melanargia galatea* were also taken. These have much more black colour than is usual, and approach var. *procida*; they are a pair. Other specimens taken are very yellow, and one is brownish.

The second brood of *Lycæna argiolus* was abundant. I found five pupæ spun up on dead holly leaves lying upon the ground.

A good many *Colias edusa* have been seen down by the coast. Four specimens also occurred here, but the large New Forest butterflies have been very scarce again this year. *Vanessa polychloros* was common in the larval stage, but not one imago was seen. What becomes of them? Larvæ of *V. cardui* were fairly common. I bred about two dozen. Upon a small isolated heath in the forest I netted three varieties of *Satyrus ianira*. Two are females, and have nearly the whole of the fore wings orange, with a similar coloured blotch upon the hind wings. One is a male, with large, very brilliant spaces upon fore wings. In each case the eye-spots are small. They were the only specimens of the species I could find there.

Ringwood: October 7th, 1899.

DESCRIPTIONS OF NEW SPECIES OF SOUTH AMERICAN
PHYTOPHAGOUS COLEOPTERA.

BY MARTIN JACOBY, F.E.S.

(Concluded from p. 250.)

Nodonota venezuelensis, sp. nov.

♀. Dark æneous; the antennæ, tibiæ, and tarsi more or less fulvous; thorax finely punctured, the sides closely aciculate-punctate; elytra very finely geminate punctate-striate, with basal depression, the sides with three or four more or less interrupted costæ.

Var. Antennæ and legs dark æneous. Length, 3-3½ mill.

Head strongly and remotely punctured; the clypeus distinctly separated, punctured like the head; antennæ short and robust, the terminal joint strongly thickened, the apex of each stained with fuscous; thorax twice as broad as long, narrowed in front, the sides rounded, oblique, the surface closely and finely punctured at the sides, less closely at the disc, the interstices extremely finely granulate and sparingly impressed with minute punctures; scutellum impunctate; elytra distinctly transversely depressed below the base, the latter rather strongly punctured in double rows, the posterior portion very finely and more remotely punctate, the shoulders in shape of an elongate tubercle, followed by another rounded one before the depression, the sides below the latter with four or five costæ, which do not extend much below the middle, and are sometimes interrupted into several elongate tubercles, the apex of each elytron rather pointed.

Hab. Venezuela.

I only know the female of this species, which seems closely allied to *N. singularis*, Lefèv., likewise from Venezuela; but this author describes his species as having the head alutaceous and finely and remotely punctured, and the elytra as punctured in rows, and says nothing about a geminate punctuation; nor does he describe any costæ at the sides, but elongate tubercles instead. The antennæ in the present insect are moreover without single erect hairs at each joint, as Lefèvre describes *N. singularis*. *N. costipennis*, Lefèv., differs in the scarcely perceptibly punctured thorax, and other details.

Nodonota boliviana, sp. nov.

♂. Black; head and thorax distinctly but not closely punctured; elytra rather irregularly punctured in rows, the latter partly geminate, distinct to the apex.

♀. Elytra very finely punctured, with a single small tubercle at the sides. Length, 3-3½ mill.

Head very sparingly and finely punctured, sometimes with a metallic gloss, the epistome somewhat obsoletely separated from the face by oblique grooves; the antennæ black, the lower five joints fulvous, the basal joint stained with black above; thorax twice as

broad as long, rather strongly narrowed in front, the sides rounded, the angles acute, the surface finely but not closely punctured, the sides more closely punctate, impunctate near the margins; elytra not depressed below the base, finely punctate-striate in irregular double rows, which become single towards the apex, where the punctures are much finer and the interstices slightly convex, at the sides the latter are much more strongly costate in some specimens than in others; below and the legs black, with a more or less æneous gloss.

Hab. Bolivia.

I cannot identify this species with *N. atra*, Har., the only one with which it may be confounded. *N. atra* has evidently been described from female specimens only, having an elytral tubercle; the size is larger, the punctuation of the thorax is described as being more remote at the sides than at the middle, the exact opposite being the case in *N. boliviana*. The elytra, according to Harold, are very obsoletely punctate-striate at the base, but distinctly so near the apex; in the present species this is again exactly reversed. There are nearly a dozen specimens before me which, although varying slightly in the strength of the punctuation, agree in every other way; amongst them is only a single female specimen which has the elytral punctuation much finer, and a single tubercle of very small size placed at the sides below the shoulders.

Nodonota fastitida, sp. nov.

Dark blue or violet; the labrum, palpi, antennæ, and the tibiæ and tarsi more or less fulvous; thorax extremely finely and closely punctured; elytra strongly and rather closely punctate-striate, feebly impressed below the base. Length, $2\frac{1}{2}$ mill.

Head very finely and sparingly punctured, shining, the clypeus more strongly punctured, separated from the face; labrum and antennæ fulvous, the apical joints of the latter rather darker; thorax twice as broad as long, the sides rather strongly rounded at the middle, obliquely narrowed anteriorly, with a narrow reflexed margin, the anterior angles acute but not dentiform, the surface extremely finely and closely punctured throughout; elytra subcylindrical, feebly transversely depressed below the base, the punctuation comparatively strong and arranged in single rather closely approached rows, the punctures themselves, however, distantly placed, the interstices flat throughout; below and the legs greenish, the tarsi more or less fulvous.

Hab. Peru.

Of this species two specimens are contained in my collection, one of them named as above by Lefèvre, but evidently never described; whether the two specimens are, however, specifically identical, I am doubtful, as one of them is more remotely and strongly punctured on the thorax, and has the tibiæ of fulvous colour, and the upper side violaceous. Other differences I am unable to find.

Nodonota cæruleata, sp. nov.

Metallic dark blue; basal joints of the antennæ obscure fulvous; thorax very closely and finely punctured, the sides aciculate-punctate; elytra without depression, very finely punctured in irregular rows, the interstices flat. Length, 3 mill.

♂. Head minutely granulate, distinctly punctured between the eyes, very sparingly so at the vertex and clypeus, the latter separated from the face; the labrum and the terminal joint of the palpi piceous; antennæ black, the lower five joints fulvous, the basal joint black above; thorax twice as broad as long, the sides nearly straight and obliquely narrowed towards the apex, the anterior angles dentiform, the surface subopaque, crowded with small punctures which are not larger at the sides than at the middle, and rather evenly distributed; scutellum impunctate; elytra subcylindrical, with an extremely feeble depression below the base, punctured in irregular rows, which become more remote and rather feeble below the middle, the suture accompanied by an impressed line at its apical portion, the sides likewise with the punctured rows more distinct close to the margins; below and the legs blackish green, the tarsi black and strongly dilated at the anterior legs.

Hab. Terezopolis.

This species, of which I only know the male sex, seems closely allied to *N. venustula*, Lefèv., but the labrum and palpi in that insect are described as fulvous, the sides of the thorax as rounded, and the punctuation of the elytra stronger at the sides and apex than at the base; none of these conditions agree with the species before me.

Nodonota subænea, sp. nov.

♂. Blackish æneous below, above dark æneous or cupreous; the basal five joints of the antennæ fulvous; thorax finely but not very closely punctured; elytra very finely and subremotely punctate-striate, with a basal depression, the interstices scarcely raised.

♀. Elytra with one small tubercle before and two others below the depression. Length, 5 mill.

Head rather strongly and closely punctured, especially so between the eyes; the clypeus still more coarsely punctate, not separated from the face; labrum black, basal joints of the palpi fulvous; antennæ black, the lower five joints fulvous, the basal joint black above, the sixth joint as long as the third one, this very slightly longer than the second joint, terminal joint thick and elongate; thorax scarcely twice as broad as long, narrowed in front, the sides evenly rounded, the angles acutely produced, the disc finely and rather distantly, the sides more closely punctured; elytra convex, pointed at the apex, very finely punctured in irregular rows, distinct to the apex, the interstices at that place and at the sides very slightly raised, the shoulders prominent, the base with a short transverse depression; below and the legs very dark æneous; tarsi bluish.

Hab. Colombia.

Larger than any of the Colombian species described by Lefèvre in the Münch. Mittheilg. from the same locality; the basal joint of the antennæ black above, and the elytral punctuation very fine. *N. pustulata*, Har., of which the female has been described only, has four tubercles below the shoulders of the elytra, and the sides of the thorax are impunctate; *N. bogotana*, Har., has strongly punctured elytra, and the apex of the tibiæ and the tarsi fulvous. I possess two males and one female specimen of the species described here.

Syphaxia maculata, sp. nov. (Galerucinae).

Robust, elongate and parallel, fulvous; antennæ black, the apical joints fulvous; thorax transverse, sulcate, finely pubescent, with two black spots; elytra greenish, opaque, finely rugose, each elytron with eight fulvous spots. Length, 13 mill.

Of broad subcylindrical shape; the head fulvous, broad, very finely rugose between the eyes, the latter rather small, oblong, entire, frontal elevations only indicated; antennæ stout, not extending to the middle of the elytra, black, the apical three joints fulvous, third joint the longest, the following joints gradually shortened; thorax three times broader than long, the anterior margin strongly concave, the sides rounded and widened at the middle, the angles not produced, the surface deeply sulcate at the sides and longitudinally so at the middle, the impressions very finely pubescent, the base with two obscure blackish spots, rest of the surface not perceptibly punctured; scutellum broad, fulvous, its apex broadly rounded; elytra convex, wider at the base than the thorax, very finely rugose and punctured, opaque and pubescent, greenish, with eight fulvous spots placed as follows: one at the base, two before the middle, slightly oblique, one of narrow and elongate shape below the shoulders, three placed triangularly below the middle, and one at the extreme apex of each elytron; below and the legs fulvous, impunctate and scarcely pubescent; legs very robust, the tibiæ longitudinally sulcate, the first joint of the posterior tarsi very slightly longer than the second; claws simple, thickened at the base; prosternum invisible between the coxæ, the anterior coxal cavities open.

Hab. Calanga, Peru.

Syphaxia is the only genus in which this handsome species, of which a single specimen is contained in my collection, can be placed; the shape of the antennæ, that of the thorax, and the less dilated elytra does not entirely agree with the typical form, which, however, in themselves would not be sufficient to separate the genus. On the other hand, the general structural characters, and of all, the simple claws, robust legs, and open coxal cavities agree with *Syphaxia*. The specimen before me is probably a female, the last abdominal segment being deeply triangularly emarginate at the apex.

NOTES AND OBSERVATIONS.

MORTALITY OF THE LARVÆ OF *ACRONYCTA ACERIS*. — Having read Mr. Adkin's note (*ante*, p. 258) relative to the enormous mortality of *A. aceris* larvæ this season, and having had a very large number of them both taken wild and bred from ova, I can say that I have had the same result with both. During the months of July, August, and September I have taken from fences, trees, and crawling on the ground no less than sixty-seven specimens of this beautiful larva, and the localities I have taken them from are Putney, Barnes, Acton, and Chiswick. In spite of all, I have never at one time had twelve larvæ feeding, and the net result has been about thirteen cocoons, and seven of those when opened, instead of containing pupæ, I found enclosed either ichneumous or dried-up larvæ. All those taken wild were apparently healthy, and looked full-fed and about to pupate, but at least fifty of them made no attempt to do so, nor would they eat either sycamore, horse-chestnut, or maple; they simply turned a nasty dull pink colour and dried up. With regard to those reared from ova I experienced the same results, and the few correspondents I sent some to in the North of England and Scotland have all written and informed me that they have done no good with them, so I take it that the disease must have been contracted from the ova. I found that most of those that I reared from ova did well until the last skin, when they died off in the same manner as those taken wild. It may not be out of place here just to give my experience of those bred from ova. I put a female in an ordinary chip-box on Friday, July 7th, and fed her till the Sunday, when she commenced laying her eggs on that night, and continued doing so by night only on Monday, Tuesday, and Wednesday; and, although she laid no more, she fed and lived for over a week afterwards, as I did not turn her out until the first lot of larvæ emerged, and she was then just alive. One thing I particularly noticed and was surprised to see, and that was, that although in some instances the ova deposited touched each other, in no case did they overlap as I have seen them illustrated; also that the young larva on first emerging in nearly every instance made its first meal off the shell of the egg. I think this may account for the eggs not being found on the leaves where the young larvæ are found in a state of nature. I have carefully looked on sycamore and horse-chestnut and found the young larvæ, but never empty ova, and, as they are white after the larva has emerged, they would be conspicuous, and could not be easily overlooked; also, in spite of the larvæ having been so common this year, I never saw more than one on a leaf. I may also mention that I have experienced disease of a similar character in another of this same family, *Acronycta psi*, but not to the same extent. I shall be glad to hear from anyone else who has bred *A. aceris* from ova, if he has done better with them or experienced the same result as myself. I have also heard that this larva has been found in Scotland this year; surely this must be a mistake. — G. F. LEIGH; 391, High Road, Chiswick, W.

LARVÆ OF *ACRONYCTA ACERIS*.—I notice in the 'Entomologist' (*ante*, p. 258) a note by Mr. Adkin *re* larvæ of *Acronycta aceris*. I too have

taken a good number at Dulwich and Croydon, and have had the same experience with regard to a number shrinking and drying. I think this is due to constipation, owing to the dry state of the food-plant caused by the very hot weather; I had the same thing occur with larvæ of *Arctia caia* earlier in the year.—C. W. COLTHURP; East Dulwich.

LEPIDOPTERA FROM CHINA. — I have only recently seen Mr. Kirby's article (*ante*, p. 31), but I think a few further notes may be of interest.

Crebeta deidamia, Eversm.—March 28th should of course be May 28th, as we only took over Wei-hai-wei on May 25th. This butterfly occurs during May and again in August, and I have taken it both at Wei-hai-wei and Chifu; it has a special liking for steep hillsides strewn with fragments of rock.

Cænonympha amaryllis, Cram.—Common during the first half of June, and occurs again in August, but more sparingly.

Chrysophanus turcicus, Gerh. = *phleas*, L. et auct. — The spring specimens are quite typical, but summer and autumn examples are darker, and fall under the head of var. *eleus*, Fabr. They are not, however, nearly so dark as some of the Japanese summer brood.

Pieris daplidice, L.—Common at Wei-hai-wei and Chifu in May and August, and especially fond of patches of dry sand near the beach.

Macroglossa stellatarum, L. — Common at Wei-hai-wei and Chifu almost all the year round; I have taken it from April to October.

Zygana (Syntomis) phegea, L.—Occurs during the first three weeks of June. It was abundant in 1898, but this year I only noticed a few. These Wei-hai-wei specimens are peculiar as wanting the characteristic white tip to the antennæ, and so fall under ab. *nigricornis*; this form therefore occurs here, not as an occasional aberration, but as a permanent local race.

On p. 31, line 9 from top, for Len-kung-tan, read Leu-kung-tao (or -tau). — T. B. FLETCHER; H.M.S. 'Centurion,' China Station, September 6th, 1899.

FORFICULA LESNEI. — With Mr. W. J. Ashdown, the discoverer of *F. lesnei* in the neighbourhood of Leatherhead, I visited two of its haunts about a week ago. Beating bushes in the hedgerows produced it in considerable numbers; in fact, it was obtained much more commonly than its congener *F. auricularia*, as many as three or four being more than once found in the umbrella at the same time. It is easily distinguished at sight from the commoner species by its much smaller size, its rich sienna-red colouring, and in the male by the shape and colour of the forceps, which look conspicuously pale. Of course, closer examination reveals the fact that there are no wings in either sex. Males occurred rather more commonly than the females, which latter appear to hibernate, for Mr. Ashdown says that he takes this sex only in the spring. Notices was taken of the trees of which the hedges consisted, from which *F. lesnei* were beaten. The following at least were amongst them:—Bramble, hazel, wayfaring-tree, dogwood, blackthorn, whitethorn, elder, ivy, rose, oak, maple, and spindle-tree. The list is long enough, but probably no significance is to be attached to it, as no doubt the earwigs used the bushes simply for shelter or were searching on them for food. *F. lesnei* will eat fruit, and Mr.

Ashdown fed some on rice; probably also they will eat animal matter, and will turn out to be omnivorous like *F. auricularia*.—W. J. LUCAS; 12, Caversham Road, Kingston-on-Thames, Oct. 14th, 1899.

CAPTURES AND FIELD REPORTS.

COLLECTING AT HAILSHAM, SUSSEX, AND AT EASTBOURNE.—Arrived at Hailsham on Aug. 5th, 1899 (2½ hours late, thanks to the L. B. & S. C. R.). We were too late for anything but supper, especially as we were greeted with a heavy thunderstorm. After supper, however, the weather cleared, and about 9.30 p.m. we took a turn round the town. *Bombyx neustria* was fairly plentiful at the gas-lamps, and a nice specimen of *Notodonta ziczac* was taken. The next day showed us pretty much what we had to expect from day-work, which was very slow. Beating produced scarcely anything but *Abraxa grossulariata*, *Asthena candidata*, and some of the Ephyras. The first named absolutely swarmed at night in the hedges, and, though a very common moth, I never remember to have seen it in such enormous numbers before; however, they did not yield any varieties.

Ordinary butterflies were abundant. *Gonepteryx rhamni* was seen occasionally. The three common Pierids were indeed plentiful, but the commonest butterfly was undoubtedly *Epinephele tithonus*, except on the downs, where *Lycana corydon* was, as usual, an easy first in point of numbers. *Epinephele ianira*, *Lycana icarus*, *Hesperia linea*, *Polyommatus phloas*, and *Canyonympha pamphilus* were all very common. A few worn specimens of *Argynnis paphia* were met with in Abbot's Wood, and *A. aglaia* was plentiful on "The Hide" outside the wood, and was also seen on the downs near Jevington; but all the specimens were reduced to shreds. *Pararge megæra* struck me as not being quite so abundant as usual in this part of Sussex, and the same applies to *Satyrus semele* on the downs. *Vanessa atalanta* was plentiful, and on a poplar tree near Polegate Station, which was riddled with larvæ of *Cossus ligniperda*, my father saw six specimens at once. One beautiful specimen of *V. (Cynthia) cardui* was taken, and *V. urticae* was only represented by one specimen. *Thecla quercus* seems to be pretty generally distributed all round Hailsham, but was getting worn. *Lycana argiolus* was in fair numbers, especially on the outskirts of Abbot's Wood; but this insect always seems to be difficult to obtain in really first-rate condition. One specimen only of *Hesperia sylvanus* was seen. I was informed by a well-known Eastbourne naturalist that *Apatura iris* and *Limenitis sybilla* had been taken during the previous week in Abbot's Wood.

Turning to the moths, *Lithosia griseola* seems to be very generally distributed and common, and at Wannock, on Aug. 7th, one or two came down to nearly every blow of the beating-stick. The variety *stramineola* does not seem to occur here, but it may be of interest to mention that I bred one from eighteen larvæ taken at Wicken in June this year. *Lithosia lurideola* was far less common, only one being beaten. The following were also beaten:—*Liparis auriflua*, *Drepana falcataria* (three), *D. lacertinaria* (two), *Selenia illunaria*, *S. tetralunaria*, *Ephyra omicronaria*, *E. trilinearia* (one), *E. porata*, *E. punctaria*, and *E. pendularia* (the last three being fairly common), *Ligdia adustata* (three), *Timandra amataria*, *Acidalia*

emarginata (one), *Epione apicaria*, *Rumia cratagata*, *Eubolia mensuraria* (abundant), *Hypsipetes elutata*, *Cidaria testata*, *Cosmia affinis* (one), *C. trapezina*, *Apamea didyma*, and *Triphæna ianthina*.

Aspilates citraria was walked up in several fields and on the downs, but nineteen out of every twenty must have been males. From one female I obtained a nice lot of ova; the young larvæ hatched on Aug. 20th, and are now feeding well on clover.

Catocala nupta, *Bryophila perla*, and *Cerigo matura* were seen at rest. *Eubolia bipunctata* was fairly common on the downs, also empty cocoons of a *Zygæna*, but no moths.

The 10th August was spent at Eastbourne. After a delightful dip, on a broiling hot day, in the briny, we proceeded to scale the inevitable Beachy Head *viâ* the undercliff, which usually teams with butterflies. On the way along the sea-front we found *Macroglossa stellatarum* in some abundance, but mostly in poor condition.

Arrived on the downs, we found *Lycæna corydon* in its usual profusion, but *L. bellargus* was only just coming out, and we had to content ourselves with two fine males. While securing a specimen of *L. corydon* I found a full-grown larva of *Charocampa porcellus* on yellow bedstraw. A few *Aspilates citraria* and one *Melanippe galiata* were about the only other insects. Another specimen of *M. stellatarum* was seen in the restaurant at the top of the Head.

We returned to Hailsham in time to treacle. As at the fens in June, treacling was the most satisfactory mode of collecting, over sixty species being noticed during the week. The two best nights were the 10th and 12th, when moths positively swarmed. On the first date there were forty-three species, and on the second forty-four. The following were noticed at treacle:—Three worn *Lithosia complana* (from one female I obtained ova, which have since hatched), *Lithosia griseola*, *Epione apicaria*, *Boarmia rhomboidaria*, *Acidalia emarginata* (one), *A. aversata*, *A. bisetata*, *Asthena candidata*, *Cabera pusaria*, *Hypsipetes elutata*, *Camptogramma bilineata*, *Cidaria testata*, *Ephyra omicronaria*, *E. punctaria*, *E. porata*, *E. pendularia*, *Coremia propugnata*, *Ligdia adustata*, *Lomaspilis marginata*, *Cynatophora duplaris* (two very bad specimens), *Acronycta ligustri* (a perfect specimen), *Leucania pallens*, *Miana literosa*, *M. furuncula*, *Xylophasia polyodon*, *Agrotis suffusa*, *A. puta*, *A. exclamationis* (one), *A. segetum* (one), *Noctua baia* (very common), *N. xanthographa*, *N. umbrosa* (one), *N. dahlia* (one), *N. rubi*, *N. triangulum* (a worn example), *N. c-nigrum* (two), *N. plecta* (several), *Hadena oleracea*, *H. thalassina* (a fine example), *Apamea didyma* (very abundant), *A. ophiogramma*, *Triphæna fimbria*, *T. ianthina* (abundant), *T. interjecta*, *T. pronuba*, *T. orbona* (abundant), *Cosmia trapezina*, *C. affinis*, *Mamestra brassicæ*, *M. anceps* (?), *Cerigo matura* (cytherea), *Hydræcia nictitans* (some with red discoidal spots), *H. micæa*, *Caradrina cubicularis*, *C. blanda* (?), *Amphipyra pyramidea* (two), *A. tragopogonis*, *Gonoptera libatrix*, *Phlogophora meticulosa*, *Mania maura*, and *Catocala nupta*.

I think light would have paid well, too, had we been able to work it properly. As it was, the following were noticed:—*Bombyx neustria*, *Liparis auriflua*, *Lithosia griseola*, *Ptilodontis palpina* (one), *Crocallis elinguaris*, *Pseudoterpna cytisaria* (one lovely coloured specimen; I do not remember taking one in good condition so late as Aug. 8th before), *Boarmia rhomboidaria*, *Aspilates citraria*, *Cabera pusaria*, *Hydræcia micæa*, *Lupe-rina testacea*, *Xylophasia polyodon*, and *Apamea didyma*.

Lophopteryx camelina, *Calligenia miniata*, *Lithosia griseola*, *Cilix spinula*, *Epione apiciaria*, *Halia vauaria*, &c., were taken on the wing in the evening, and in the underground passage at Polegate Station we found, among other things, a good female of *Bombyx quercus*, which I kept for eggs, and a good specimen of *Dianthæcia cucubali*.

Larvæ were distinctly scarce, the following being the only species noticed:—*Smerinthus ocellatus* (on sallow), *Cherocampa porcellus* (one), *Dasychira pubibunda* (small), *Orygia antiqua*, *Pygæra bucephala* (very tiny), *Hylophila prasinana*, *Acronycta megacephala*, *Euclidia glyphica*, *Ligdia adustata*, and a few other geometers.

An evening in the marshes was only noticeable for the quantities of common insects at bramble-blossom, *Lithosia lurideola* (two), *L. griseola*, and *Triphæna interjecta* (one) being the best of the rabble. I was rather struck, when treacling on Aug. 11th, to find thirteen specimens of *Asthena candidata* on the trunk of a tree which had not been treaced since Aug. 6th. I put some more treacle on, and the tree presented a very curious appearance a little later on—the *A. candidata* had returned, and there were also two lovely specimens of *Catocala nupta*, several smaller Noctuæ, and one *Epione apiciaria*. There were scarcely any *Asthena candidata* at the other trees.

We returned home, after a very pleasant holiday, on Aug. 13th.

Having occasion to visit Eastbourne on Aug. 26th and 27th, I was only able to do about an hour's collecting. About the only change on the downs worthy of notice was the substitution of *Lycæna bellargus* for *L. corydon*. A nice specimen of *Vanessa cardui* was seen, and among other insects observed were *Satyrus semele*, *Pararge megæra*, *V. urtica*, *V. atalanta*, *Macroglossa stellatarum*, *Aspilates citraria*, *Melanippe galiata*, *M. fluctuata*, *Acidalia marginepunctata*, *Luperina testacea*, *Plusia gamma*, and *Bryophila perla*.—F. M. B. CARR; 46, Handen Road, Lee, S.E.

COLLECTING AT FOLKESTONE.—While staying at Folkestone for a fortnight in July, I managed to take a few very good insects, including *Melanargia galatea*, *Lycæna alsus*, *Sesia ichneumoniformis*, *Trochilium crabroniformis* (*bembeciformis*), *Leucoma salicis*, *Porthesia chrysorrhæa* (seven males), *Notodonta dictæa* (one male), *Bryophila glandifera* (very variable), *B. perla* (dark vars.), *Xylophasia sublustris*, *Caradrina alsines*, *C. blanda*, *Aspilates gilvaria*, *Angerona prunaria*, *Hemithea strigata*, *Acidalia ornata*, *Melanthia procellata*, *Phibalapteryx tersata*, &c.—W. E. BUTLER; Hayling House, Reading, August, 1899.

COLLECTING IN KENT.—On Aug. 29th I paid a visit to Bowley Mill, near Charing, Kent. Butterflies seemed scarce: *Epinephele ianira*, *Vanessa urtica*, *V. atalanta*, *Pieris brassicæ*, *P. rapæ*, *P. napi*, *Pararge megæra*, *Lycæna icarus*, *Cænonympha pamphilus*, and *Polyommatus phleas* were on the wing; but sugar was very productive for the common species; *Leucania pallens*, *Hydræcia nictitans*, and *Noctua xanthographa* simply swarmed; I could have taken five or six hundred if I had wished to. *Noctua rubi*, *Amphipyra tragopogonis*, and *Phlogophora meticulosa* occurred more sparingly; while I took single specimens of *Agrotis suffusa*, *Hadena oleracca*, *Heliophobus popularis*, and *Triphæna orbona*. The Geometers were represented by a single species, *Coremia propugnata*, which was tolerably common.—S. A. BLENKARN; Clifton House, $\frac{1}{2}$ East Dulwich Road, S.E., Oct. 9th, 1899.

COLLECTING IN THE MAIDSTONE DISTRICT.—I spent from the second week in August to the last week in September at my home near Maidstone, but did not give very much time to collecting. *Macroglossa stellatarum* was very common indeed. A bed of verbenas in our garden seemed a special attraction for them; there were often as many as six or seven hovering over the blossoms at the same time. Among other species that I took were *Crocallis elinguaris*, *Plusia iota*, *Gonoptera libatrix*, *Mania maura*, and *Catocala nupta*. The larvæ of *Charocampa elenor* were fairly abundant along the banks of streams and ditches. The larvæ of *Sphinx ligustri* were conspicuous on the privet hedges, but not in such abundance as last autumn. At the entrance of one of the hop-gardens I came across a half-grown larva of *Cossus lignipeda* burrowing its way into the earth, and a few yards away on one of the hop-poles was a freshly emerged *Triphæna fimbria*. On Sept. 25th I had brought me a fair specimen of *Acherontia atropos*, which was found in one of the potato fields.—W. GANDY; Beech View, Reigate, Surrey, Oct. 12th, 1899.

COLLECTING IN NORFOLK.—Not having noticed lately in your journal any account of captures in Norfolk, I thought a list of a few insects obtained near Norwich during August and September might be acceptable. The following were taken at sugar:—*Catocala nupta* (abundant and fine), *Agrotis suffusa* (common), and *A. saucia* (one specimen), *Noctua c-nigrum* and *N. xanthographa* (both species abundant and varied), *Triphæna pronuba* (abundant), *Amphipyra pyramidea*, *Xylophasia polyodon*, *Hadena adusta*, *Dianthæcia cucubali* (one specimen taken in the middle of August, surely rather late), and *Phlogophora meticulosa* (very abundant all through September, and practically the only insect seen at sugar during that month). *Macroglossa stellatarum* was very common on geranium beds, also *Vanessa atalanta*, which I frequently saw on the tree-trunks which I had sugared. The following larvæ were also taken:—*Cerura vinula*, *Acronycta aceris*, *Sphinx ligustri*, *Smerinthus ocellatus*, *S. populi*, *S. tilie*, *Arctia caia*, *A. lubricipeda*, *Pygæa bucephala*, *Acronycta tridens* and *A. psi*.—W. T. HARRIS; 17, Micheldever Road, Lee, S.E.

LEPIDOPTERA IN MORAY.—The past season has been highly favourable to these insects. Two species, ordinarily of occasional occurrence in Moray, have been unusually abundant—*Pyrameis atalanta* and *Lycæna phlæas*. Several larvæ of *Manduca (Acherontia) atropos* have been found, and imagines of *Phlegethontius (Sphinx) convolvuli*, and *Macroglossa stellatarum* have been captured.—HENRY H. BROWN; Rosefield, Elgin.

APORIA CRATÆGI.—I have again the pleasure to record the capture of this insect, although I took but eight specimens. Several other collectors have taken them, but not in any numbers, and they certainly seem to be getting scarcer year by year. The first time I took *A. cratægi* was in 1896, so they appear to be holding their own; but this, coupled with the sheltered position of the locality, may be on account of the exceptionally mild winters which we have experienced of late. Anyhow, the species should hold out for some years yet, as it certainly has not been over-collected—at least, not by me.—H. DOUGLAS STOCKWELL; 2, Albert Road, Dover, Oct. 19th, 1899.

COLIAS EDUSA IN SUSSEX.—I captured a female specimen of *C. edusa* on the 19th inst., at Slindon, near Arundel, Sussex, the only one I have

seen this summer.—LEWIS S. GILES; 1, London Road, Norbury, S.W., Sept. 22nd, 1899.

COLIAS EDUSA AT CHICHESTER.—One or two specimens of this butterfly were seen at Chichester in August.—JOSEPH ANDERSON.

COLIAS EDUSA IN SOUTH DEVON.—I took a male specimen of *C. edusa* on Sept. 25th last, between Uffculme and Blackborough, about seventeen or eighteen miles inland from Sidmouth. The example was in perfectly fresh condition, and appeared to be recently emerged. The sun was obscured at the time, and the insect was flying in a very half-hearted manner, so that I had time to fix up my net for its capture.—H. W. BARKER; Halberton, near Tiverton, Devon.

COLIAS EDUSA AND *C. HYALE* AT DOVER.—Of the former species I took a poor male on Aug. 22nd, and saw another, but had no chance to net it. These are the only live specimens I have seen this year. *C. hyale* has been more in evidence; three were taken and three more seen by a friend of mine in a lucerne field near Walmer on Aug. 28th. I took one on Sept. 6th, in the same field, which was probably one of those my friend failed to capture, as it was rather worn, and had almost got to the end of its rope; but for all that it wanted a deal of catching.—H. DOUGLAS STOCKWELL; 2, Albert Road, Dover, Oct. 19th, 1899.

COLIAS EDUSA AND *C. HYALE* AT ERITH.—I have seen two or three *C. edusa*, and have heard of a few others that were observed in this district last August, but am told that those taken were not in good condition, appearing either to have travelled far or been out a long time. I noticed a fine male *C. hyale* here on 6th ult., and one of my sons saw two or three others a day or two afterwards, one of which he netted, but it also was much the worse for wear.—E. SABINE; October, 1899.

VANESSA ATALANTA, &c.—I have found *V. atalanta* very plentiful in Kent, Surrey, Sussex, and Hampshire, and saw a large number at ivy blossom on a railway bank near Ramsgate, and had a similar experience to Mr. Cornell (*ante*, p. 256) at Malden, Surrey, where I saw a number flying round and settling on the trunk of a beech-tree which was swarming with wasps. I noticed that the tree was nearly leafless, and looked as though it were dying. The *atalanta* were so busily engaged that I was able to pick one off with my fingers in brilliant sunshine. Of *V. cardui* I saw a fair number on Sept. 5th, but *V. io* I have not seen in either of the four counties named, but heard of its being taken near Margate.—C. W. COLTRUP; East Dulwich.

VANESSA ATALANTA PLENTIFUL IN THE ROTHERHAM DISTRICT.—All through September *V. atalanta* has been quite a common insect. Several could be counted at the same time. A few days in the middle of the month a pear-tree in the gardens here, having a few pears on it pecked by the birds, was quite an attraction, in fact, quite a pretty sight with the butterflies, dozens at a time, flying and sitting about the tree. The lanes and fields had not been forsaken, for up to Oct. 6th and 7th *V. atalanta* was to be seen in them also.—W. BROOKS; Grange Hall, Rotherham, Oct. 9th, 1899.

VANESSA ATALANTA AND VAR. AT ERITH.—This has certainly been an *atalanta* year. From the end of July till within the past day or two the species has been very much in evidence here in all stages, imagines, larvæ

of all ages, and pupæ being readily obtainable at one and the same time, and in almost any numbers too, especially larvæ. But there has been little or no variation in the perfect insect, as far as my own experience goes. Out of some six hundred that I have already bred, I have met with hardly anything worth recording; and yet, wonderful to relate, a friend, till lately a resident here, Mr. B. P. Kemp, obtained a grand var. from one of (only) three larvæ that he had casually found in this neighbourhood! It much resembles that figured in Entom., August, 1878, but the bands on hind wings are without spots, and it has a small *white* spot on the black discs of said wings. The under side is really magnificent. Through the kindness of my friend I am enabled to add this beautiful specimen to my series. I have still quite a number of pupæ and some larvæ, and doubtless, if weather is at all favourable, more will be readily obtainable. I observe that Mr. Frohawk, in his note (*ante*, p. 257) states that he found the larvæ in October. I have taken them in November (see Entom. xxvi. 16). I would only add that some of our more immediate neighbours, who are aware that I am an entomologist, have lately been loud in their praises of the numbers of very beautiful butterflies they have seen in their gardens this autumn, and have been unable to account for their great abundance, until informed that they had mostly been captured or bred, and, after examination, released by myself. Some of our friends were greatly surprised and interested on seeing the various stages of the breeding process in my cages.—E. SABINE; Oct. 2nd, 1899.

VANESSA C-ALBUM.—This species appears to me to be getting scarcer every season where it formerly was plentiful; in the hop-grounds in this locality I have visited several large plantations within the last week with small results. I attribute the scarcity to the different washes, &c., used for cleansing the plant during the period of growth.—W. EDWARDS; Malvern.

LYCÆNA BÆTICA AT WINCHESTER AND DEAL.—Mr. H. W. Shepherd-Walwyn, of Bidborough, Tunbridge Wells, reports the capture of a specimen of this species at Winchester, on Sept. 1st, this year. Mr. James H. Parry, of St. Augustine's College, Canterbury, informs us that he has taken one at Deal on the 16th of the same month. Curiously, each of these specimens was sitting on a window.

LYCÆNA ARGIOLUS AT ERITH.—In common justice to this delicate little species, I think I ought to record its great abundance here this season. Both broods were exceedingly numerous, even in our garden, several being on the wing at the same time, to my mind adding much to its charm, especially in the earlier part of the summer. I have heard, too, that it was exceedingly plentiful at Bexley Heath and other places round about the neighbourhood.—E. SABINE; October, 1899.

ACHERONTIA ATROPOS IN BUCKS.—A friend of mine caught one specimen at Marlow in August. It fell from the top of the door of a room in a friend's house, and he immediately caught it.—ALAN W. CARDINAL; 18, Cromwell Road, Hove, Oct. 1st.

ACHERONTIA ATROPOS IN DEVONSHIRE, &c.—Two specimens have been sent me by correspondents during the last week—one from Turnchapel, near Plymouth; another—a grand moth, five inches from tip to tip—from Bishopsteignton. Further captures are reported from Braunton, by a correspondent who has taken four. One was also taken at Lostwithiel

(Cornwall); it was brought into the house by a cat.—C. W. BRACKEN; 15, Lipson Avenue, Plymouth.

ACHERONTIA ATROPOS IN HAMPSHIRE.—Four pupæ of *A. atropos* were brought to me about the middle of September. They were all found in this neighbourhood. One was dead when it came into my hands; the others were placed in a greenhouse, where they were subjected to considerable heat, and the imagos emerged between Sept. 21st and the beginning of October.—WILLIAM M. CHRISTY; Watergate, Emsworth, Hants.

ACHERONTIA ATROPOS IN KENT.—I had a full-fed larva brought to me during the first week in August. It was taken in a potato-field on the outskirts of the town, and at once pupated. The imago emerged on Sept. 17th, having been only about a month in the pupal stage. The pupa was, of course, forced, and this was done by its being placed in a box on a shelf over a gas-stove. Several more larvæ have been found in this neighbourhood, and also at Deal, and I heard of an imago being taken here in the town the early part of the present month.—H. DOUGLAS STOCKWELL; 2, Albert Road, Dover, Oct. 19th, 1899.

ACHERONTIA ATROPOS IN LINCOLNSHIRE.—The fine dry summer of 1899 appears to have been favourable to the larvæ of *A. atropos*, for on Sept. 3rd and 5th consignments of a dozen fine pupæ reached me. On Sept. 25th one imago emerged, and on the 26th another fine example was added, and on the 28th a third was noticed trying to extricate itself from the pupa-case, but, doubtless owing to a slight injury to pupa, this one proved to be a cripple. On Oct. 4th two dozen more pupæ were safely received, thus clearly showing that the species must have been fairly common on the potatoes in the Long Sutton district.—W. BROOKS; Grange Hall, Rotherham, Oct. 9th, 1899.

ACHERONTIA ATROPOS IN SUSSEX.—On June 20th a specimen of *A. atropos*, caught by a labourer, was brought to me at Chichester. He had kept it a week in a bottle, the result being that the condition was not all that could be desired. Another moth was taken on Sept. 19th, an extremely fine female, in fine order. Several larvæ and pupæ were found in this neighbourhood.—JOSEPH ANDERSON.

This species seems to be fairly plentiful at Slindon, as I received both larvæ and pupæ from that district.—LEWIS S. GILES; 1, London Road, Norbury, Sept. 22nd, 1899.

ACHERONTIA ATROPOS IN WORCESTERSHIRE.—I have had seven larvæ and two pupæ of *A. atropos* brought to me at Malvern. All were found in gardens, among potatoes. I have also heard of several others being obtained in this neighbourhood.—W. EDWARDS; Malvern.

SPHINX CONVULVULI AT DOVER.—A nice specimen was taken last month by a local collector in the Connaught Park here, and I had one brought to me the early part of this month, but it was in bad condition and of no use. When over at Deal, on the 1st inst., I picked one up in the road, which some one had evidently stamped upon, as the poor thing was crushed, and this was also of no good.—H. DOUGLAS STOCKWELL; 2, Albert Road, Dover, Oct. 19th, 1899.

SPHINX CONVULVULI AT MALVERN.—One example was captured in a dining-room here, and another as it was flying over *Nicotiana affinis*. A third specimen was seen, but not secured.—W. EDWARDS; Malvern.

SPHINX CONVOLVULI AT BRIDGWATER.—A fine male was taken in my son's garden at Bridgwater, by his wife, on Sept. 11th; it was flying over the *Nicotiana*.—ARTHUR COTTAM; Eldercroft, Watford.

SIREX JUVENCUS IN MORAY.—A female of this hymenopteron was taken on Sept. 13th last, by a workman employed near the harbour at Hopeman, on the Moray Firth. No large woods are near the village. The finder thought it came from the direction of a foreign vessel in the harbour.—HENRY H. BROWN; Rosefield, Elgin.

MACROGLOSSA STELLATARUM IN THE CITY.—While passing down Gresham Street to-day (1.40) I noticed a small specimen of *M. stellatarum* settled on the window of a warehouse.—S. A. BLENKARN; Clifton House, East Dulwich Road, S.E., October 11th, 1899.

MACROGLOSSA STELLATARUM AT EASTBOURNE AND RAMSGATE.—This species was very plentiful at Eastbourne and Ramsgate in fields of lucerne, and I took one at rest on a clothes-post against a wall at the former place. It was hanging on the clothes-line which was round the post, and looked exactly like a knot till I examined it closely. It was evidently freshly emerged, as I succeeded in taking it home in a small pill-box, where it remained quite motionless after the first movement when I transferred it. I should like to know if any of your correspondents have taken it in a similar position. I also saw a specimen of the same species hovering over flowers in my garden at East Dulwich on the 30th ult.—C. W. COLTRUP; East Dulwich.

MACROGLOSSA STELLATARUM AT LUDDENDEN FOOT.—On September 28th I caught a good specimen of *M. stellatarum* in our house, and one or two others have been seen in the garden. In the 'Halifax Naturalist' for this month there is an account of two being captured at Elland. These, I believe, are the first records for this district.—ARTHUR ROBERTSHAW; Ellenroyde Hall, Luddenden Foot.

MACROGLOSSA STELLATARUM AT ERITH.—This species has been very numerous here this autumn, and from what I can gather the same state of things has obtained pretty generally round and about the district.—E. SABINE; Erith, Oct., 1899.

MACROGLOSSA STELLATARUM AT HASLEMERE.—The humming-bird hawk-moth has been frequently seen in the garden this summer. The flowers generally seem to attract it, perhaps lavender especially. This morning, at half-past seven, one was seen at the petunias; weather dull and gloomy, with soaking dew.—T. P. NEWMAN; Hazelhurst, Haslemere, Oct. 23rd, 1899.

MACROGLOSSA STELLATARUM AT MALVERN.—*M. stellatarum* has been very abundant in this neighbourhood, flying over the scarlet geranium, and still fresh specimens may be seen. I took one on September 22nd, apparently just emerged.—W. EDWARDS; Malvern.

NOTES FROM BUCKS.—My brother and myself were fortunate in obtaining three larvæ of *Stauropus fagi* in a small wood near here. The first was beaten from oak on Sept. 9th, and pupated on the 13th; whilst of the other two, beaten from oak and beech, one spun up on the 21st, and the second is still feeding. *Macroglossa stellatarum* has been unusually abundant here during the season. This district appears to be a good one for

Lepidoptera, and would doubtless be still better if there were more oaks in the neighbourhood; as it is, every wood is largely composed of beech.—
ERNEST PEACHELL; High Wycombe, Bucks, Sept. 22nd, 1899.

ARCTIA CAIA CATERPILLAR ATTACKED BY A SPIDER.—At Chichester, on May 11th, I found a fairly large caterpillar of the above species under a coping (where it had evidently gone to change its coat) having a regular it and making sundry darts at it. I succeeded in extricating the caterpillar, fight with a small spider, which was busily engaged winding its thread round which had evidently not been entangled long enough to be hurt, as it afterwards fed up and came out a perfect specimen. I communicate this, as I do not know whether it is known that caterpillars of this size are attacked by small spiders.—C. W. COLTHRUP; 127, Barry Road, East Dulwich, S. E., Oct. 10th, 1899.

SMERINTHUS TILIE ABERRATION.—A specimen of *S. tilia*, which I obtained from the larva this spring, differs from others on account of the absence of any markings on the fore wings, and it has only very slight markings on the hind wings. I obtained the larva last autumn, crawling down an elm tree at Hammersmith, and soon after I got it, it changed into the pupa state, and the moth came out in May last.—A. T. BETTERIDGE; London and County Bank, Watford, Sept. 21st, 1899.

A SECOND BROOD OF SMERINTHUS POPULI.—A friend of mine, L. F. Cathcart, had some ova of *S. populi* given him in May or thereabouts, and was successful in rearing them to the pupa. In August he was surprised to find that five had emerged.—ALAN W. CARDINALL; 18, Cromwell Road, Hove, Brighton.

CUCULLIA CHAMOMILLE AT CHICHESTER.—A number of larvæ of *C. chamomilla* were found feeding on *Anthemis tinctoria* in her garden at Ryman's Tower, Apuldrum, by my friend Mrs. Fogden, who gave them to me.—JOSEPH ANDERSON.

TRIPHENA SUBSEQUA AT MALVERN.—I have the pleasure of recording the capture of *T. subsequa* by self and friends in this neighbourhood. I have collected in this locality for many years, but have not previously met with this species. Five examples were take at sugar.—W. EDWARDS; Malvern.

CHRYSOPHANUS (POLYOMMATUS) PHLŒAS AT ERITH.—This pretty little species has been unusually abundant about here this autumn, and during the past month my son has captured quite a number of varieties; in fact, I have never obtained so many in any one season, not excepting the great "copper" year of 1893. They embrace a gold-coloured female; a grey and straw coloured male, having one side paler than the other, all the wings being very shining and somewhat iridescent; several with portions of one or more of the wings bleached; some four or five with elongated wedge-shaped spots, approaching streaks; a few with the hind wings more or less suffused with copper; two or three coppery in place of blue spots; and seven or eight minus the red band on hind wings, but having from one to five red pencil-like streaks in place thereof. One or two also are "odd-sided," the spots or markings being quite different on either primary. I am afraid this unsettled weather will put a stop to further collecting. Last season I took perfectly fresh specimens of this species up to the 13th of this month.—E. SABINE; Oct. 2nd, 1899.

CHRYSOPHANUS PHLÆAS AB. SCHMIDTII, GERH., AT NORWOOD.—On Sept. 24th I captured the above in a field adjoining this house. It is a fine specimen, and I shall be pleased to show it to any reader who cares to see it.—ALFRED E. HARLEY-MASON; Thornlaw House, West Norwood, S.E., Oct. 13th, 1899.

ABUNDANCE OF THE LARVÆ OF ORGYIA ANTIQUA.—The limes in St. James's Park seem this season to have suffered severely in consequence of the large number of larvæ of *O. antiqua*. One tree in particular, near the Suspension Bridge, between Birdcage Walk and the Mall, had, when I passed it on July 31st, all its lower branches stripped. Attached to these branches, which were then putting forth new leaves, there were hundreds of cocoons well packed with ova.—F. G. WHITTLE; 3, Marine Avenue, Southend, Aug. 13th, 1899.

ERRATA.—P. 251, line 17 from top, for *T. betularia* read *T. betula*; line 13 from bottom, G. (not E.) HAROLD CONQUEST.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*October 4th, 1899.*—Mr. G. H. Verrall, Vice-President, in the chair. The President announced the death, at the advanced age of eighty-six years, of Mr. Hippolyte Lucas, an Honorary Fellow of the Society. He gave a brief account of the career, and eulogised the work, of the distinguished French entomologist. He also announced the death of Mr. Samuel Stevens, and, in reference thereto, said the Society had to deplore the loss of one of its oldest and most highly esteemed Fellows. Mr. Stevens was formerly for many years Treasurer, and had also been a Vice-President; and during the whole period of his long connection with the Society had always shown the greatest interest in its welfare. That this interest had up to the last continued unabated was manifested by the terms of his will, in which he had made a bequest to the Society. Mr. J. J. Walker exhibited, on behalf of Mr. E. G. Bayford, a specimen of *Galerita bicolor*, Drury, a North American beetle of the family Carabidæ, said to have been taken many years ago at Doncaster; also a remarkable variety of *Vanessa urtica*, L. (*ichnusoides*, De Selys), captured in the Isle of Sheppey on August 28th, 1899. Mr. B. A. Bower showed dark aberrations of *Boarmia rhomboidaria*, Hb., in which the normal colour of the fore wings is replaced by dark brown, causing the fuscous markings to stand out very prominently. The President exhibited a specimen of the "Spanish-fly," *Lytta vesicatoria*, taken last June near Newmarket. He remarked that this handsome beetle was now becoming very rare in England. Mr. Colbran J. Wainwright, a number of dipterous insects, including a long series of *Anthrax paniscus*, Rossi, taken in Cornwall at the end of July and beginning of August; a series of *Eumerus ornatus*, Mg., from Herefordshire, and *E. lunulatus*, Mg., from Cornwall; and a specimen of *Mallota cristaloides*, Læw., taken near Hereford last July. Mr. H. J. Donisthorpe, specimens of *Dytiscus dimidiatus*, Berg., and *D. circumcinctus*, Ahr., taken last August in Wicken Fen; also eight specimens of *Athous rhombeus*, Oliv., including one of the black aberration, which were taken last

June in the New Forest. The Rev. F. D. Morice, three female specimens of *Exoneura libanensis*, Friese, taken at Brumana on Mount Lebanon near Beirut; and, for comparison with them, he showed two specimens of *Ceratina cucurbitina*, Rossi, from Switzerland. He commented upon the remarkable distribution of the genus *Exoneura*, Smith, this genus having been hitherto recorded only from Australia. Mr. G. J. Arrow read a paper "On Sexual Dimorphism in the Rutelid genus *Parastasia*." Mr. W. L. Distant contributed "Descriptions of four new species of Cicadidæ." Mr. Claude Fuller, a paper "On some Species of Western Australian Coccidæ."—J. J. WALKER and C. J. GAHAN, *Hon. Secs.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*September 14th, 1899.*—Mr. J. W. Tutt, F.E.S., Vice-President, in the chair. Mr. Colthrup, of Barry Road, East Dulwich, was elected a member. Mr. Montgomery exhibited two bred series of *Spilosoma mendica*, in one of which black longitudinal lines were well developed in both sexes. Mr. Colthrup, series of *Bryophila perla*, including fine yellow forms; and a series of *B. muralis (glandifera)*, including several very pale specimens, both being from Eastbourne; together with a variety of *Spilosoma menthastri*, having a black border round all the wings. Mr. Buckstone, two males in copulation with one female at the same time, of a species of *Telephorus*; a very blue female of *Polyommatus corydon*, taken at Riddlesdown some years ago; and an example of *Chrysophanus phleas* var. *schmidtii*, taken at Beckenham in 1886. Mr. Edwards, a long bred series of *Bombyx castrensis* from near Rochester, together with preserved larvæ, ova, and pupæ. The males showed great variation. Dr. Chapman, a sample of the species of Lepidoptera taken in August at Arolla, S. Switzerland, some 7000 feet above sea-level, including *Cupido minima*, *Erebia glacialis*, *E. mnestra*, *E. epiphron*, *E. gorge*, *Setina aurita*, &c. Mr. Adkin, large series of an *Acronycta* taken at sugar in Abbott's Wood; together with bred series of *A. psi* and *A. tridens* for comparison. Dr. Chapman could give no special character for distinguishing the two species, but considered that by the general facies the majority of the specimens were *A. tridens*. Mr. Tutt, a few bred specimens of *Porthesia chrysoorrhæa*, showing traces of the black dot at the anal angle of the fore wings, the characteristic mark of *P. similis (auriflua)*; also a pair of *Lampides betica*, taken at Fontainebleau, and referred to the abundance of the species in Europe during the present season.

September 28th.—Mr. A. Harrison, F.L.S., F.E.S., President, in the chair. Mr. Dennis exhibited photographs to show the resting positions of *Mamestra persicariæ* and *Cherocampa elpenor*. Mr. Jäger, his more important captures in S. Devon this year, including *Caradrina ambigua*, *Lithosia caniola*, *Leucania albipuncta*, and *Synia musculosa*. Mr. Harrison, long and fine varied series of *Agrotis vestigialis (calligera)* and *A. tritici*, taken this year at Wallasey. Mr. R. Adkin, specimens of the Lepidoptera taken at Wisley during the Society's field meeting in July. Mr. Edwards, a pupa of *Deilephila euphorbiæ*, which had changed in a frail cocoon made in a glass-topped box. Dr. Chapman recorded an emergence of the species after eighteen days in the pupa stage. Mr. Turner, a bred series of *Cabera pusaria*, showing extreme variation in the transverse

lines; and a fine female variety of *Bombyx quercus* var. *callunæ*, with the basal area suffused with the male coloration, and the submarginal area semidiaphanous. It was from Carlisle. Mr. Gadge, a *Bombyx neustria* with three perfect wings, and no trace of the left fore wing. Mr. Colthrup, a larva of *Odonestis potatoaria*, only about half-grown, taken in May; together with an example of *B. quercus* var. *callunæ*, in which the transverse line of the fore wing was almost straight. Mr. Lucas, series of the rare dragonfly *Sympetrum flaveolum*, and contributed notes on its occurrence. They were from Ockham Common. Mr. McArthur, specimens of *Dianthecia carpophaga*, bred, from near Brighton, including some beautiful forms with snowy patches. Mr. Tutt, a postal-box of Heterocera he had just received from Natal, collected by Mr. Cheeseman. Mr. Harrison, specimens of the so-called jumping beans, which were seeds of a species of *Euphorbia*, tenanted by larvæ of *Carpocapsa saltitans*. The report of the Wisley field meeting was communicated by Mr. Ashdown.

October 12th.—Mr. A. Harrison, F.L.S., F.E.S., President, in the chair. Mr. F. Bennoch-Carr and Mr. F. M. Bennoch-Carr, of Handen Road, Lee, were elected members. Mr. Fremlin exhibited extremely interesting and varied series of Lepidoptera captured at Stornoway, including *Melanippe montanata*, *Camptogramma bilineata*, and *Eupithecia* ? sp. Mr. Montgomery, a series of *Epinephela hyperanthus*, reared from ova deposited on July 21st, 1898, and read notes on the appearance, hibernation and the variation of the species in its different stages. Mr. Adkin, two specimens of *Syrichthys malva* var. *taras*, taken in the neighbourhood of Abbott's Wood, with the type and intermediates. A discussion ensued as to its regular occurrence in certain localities. Mr. A. Russell, a mass of cocoons of *Eriogaster lanestrus*, including composite cocoons and a portion of the larval nest, from Polegate; also a bunch of cocoons of *Saturnia pavonia* from Fleet, with a separate cocoon containing pupa; and pupa and imago of a species of Diptera. Dr. Chapman, larvæ of *Leioptilus lienigianus* in the spun-up leaves of wormwood, preparing for hibernation. Mr. Kaye, bred and captured specimens of *Pseudoterma pruinata* from Byfleet.—HY. J. TURNER, *Hon. Report Sec.*

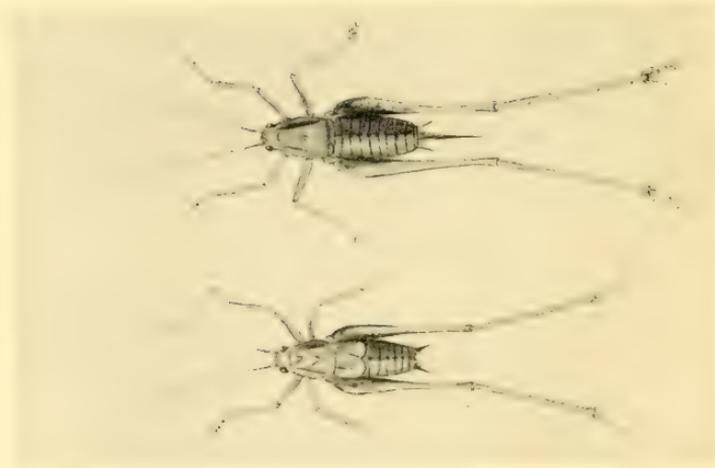
CARLISLE ENTOMOLOGICAL SOCIETY.—September 7th, 1899.—Mr. James Murray in the chair. Mr. J. Wilkinson exhibited *Nomophila noctuella*, which had been very abundant at Silloth; pale varieties of *Polyommatus phleas*, also from the same place; and larvæ of *Notodonta dromedarius*, beaten from birch, from Salkeld, near Lazonby. Mr. G. B. Routledge showed a larva of *Acherontia atropos* from the village of Castlecarrock; about a dozen others had also been found feeding on privet. Mr. J. Murray, the following Coleoptera:—*Polydrusus undatus* from Wreay, *Anthicus scoticus* from Allonby, *Rhynchites minutus* and *Rhinomaces attelaboides* from Orton, *Dichrotrichus pubescens* and *Apion ononis* from Silloth. Mr. F. H. Day also showed Coleoptera:—*Agabus femoralis*, *Calathus fuscus*, *Thyamis jacobææ*, from Silloth; *Megarthus affinis*, *Philonthus puella*, out of fungus at Orton; *Cassida hemisphærica* swept from bilberry at Orton; also the large sawfly, *Sirex gigas*, from Carlisle, and ichneumon *Pimpla manifestator* from Orton.—G. B. ROUTLEDGE.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—September 18th, 1899.—Mr. G. T. Bethune-Baker, President, in the chair. Mr. G. W. Wynn showed *Notodonta trepida*, *Dicranura bifida*, and *Cymatophora or*, bred from larvæ taken at Wyre Forest last year; also a pair of *Endromis versicolor* bred from ova found in Wyre Forest in May last year; and *Xylophasia sublustris*, taken in Hampton-in-Arden last June. Mr. J. T. Fountain, a series of *Procris statives* from Umberslade, Warwickshire, where he found a colony restricted to one corner only of a field. Mr. R. C. Bradley, a number of Thibetan Lepidoptera, obtained by a sportsman who was not an entomologist, and sent to Prof. Bridge. They were chiefly Geometers, in bad condition. It was remarked that in general facies they bore a strong resemblance to a similar lot of British Geometers, many of them being evidently closely allied to British species and perhaps identical. Mr. C. J. Wainwright, a few rare Diptera:—*Mallota cristaloïdes*, one specimen from Herefordshire. He said that this species was not known as British until in July 1884 Mr. F. C. Adams obtained a specimen in the New Forest. Since then Mr. Adams has taken other specimens, all however in the New Forest, and it has not been known from any other locality until this specimen was obtained in Herefordshire in July last. He also showed series of *Eumerus lunulatus* from St. Ives, Cornwall (July 26th to Aug. 7th, 1899), *E. ornatus* from Herefordshire (July 8th to 11th, 1899), and a specimen of *E. tarsalis* from the Meuse Valley, Belgium, which he said closely resembled the third British species *sabulonum*. Mr. G. H. Kenrick, four drawers containing the genus *Callidryas* from his collection, and gave an account of the genus. He said that they were amongst the insects which migrate. He came across a swarm of one species himself on the borders of the Transvaal a few years ago. They formed a stream about a mile wide, and were slowly moving on, those in the rear flying forward to the front, and that being continued. He said that they were a difficult genus to collect owing to their speed of flight: it was almost impossible to follow them, and the only way to get them was to find the flowers they frequented and wait for them. Mr. G. T. Bethune-Baker showed two drawers of Erebiæ containing some very interesting species, chiefly European, but a few being from the Pamirs and other parts of Asia; amongst other interesting species were *Sibo* from the Pamirs, *E. jordana* from Turkestan, *E. tian-shanica* from Tianshan, and *E. calmucca* also from Tianshan Mountains. Mr. R. G. B. Chase, series of *Catocala promissa*, *C. sponsa*, *Triphana fimbria*, *Amphipyra pyramidea*, &c., taken at sugar in the New Forest in the second week in August last. Also a series of *Ithocera rhamni* taken on heather in the New Forest at the same time; they were all in beautiful condition, but undersized. The largest seemed below the average in expanse, the smallest measured only fifty-two millimeters across from tip to tip. It was thought probable that it was owing to the dry weather and the consequent scarcity of fresh food.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

OBITUARY.—We regret to hear of the death of Dr. ALEXANDER WALLACE, of Colchester. A further notice will appear in our December issue.



2. *Niphidium dorsale*, Fabr. (nat. size.)



1. *Thamnortizon cinereus*, Linn. (nat. size.)

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ORTHOPTERA IN 1899.

By W. J. LUCAS, B.A., F.E.S.

(PLATE III.)

THOUGH the British Orthoptera number but some forty-two, yet they are so varied in form and habits, and several species are so numerous in individuals, that every naturalist must make the acquaintance of some, either at home or in his collecting excursions. Consequently a few notes on certain of the more interesting that have been met with during the past twelve months cannot be out of place now that we are nearing the close of the year—season we must not say, since some of the Orthoptera are always with us year in and year out.

Forficula lesnei has already been noticed (*ante*, pp. 16, 20, 275).

It may not be welcome news that a new locality for *Periplaneta australasie* has to be announced, but the fact remains that a couple were forwarded alive in February last from an orchid-house at Camberwell. This cockroach is no doubt increasing in frequency in Britain. Luckily it is rather a handsome species, and, moreover, seems to prefer warm conservatories to dwelling houses. In Kew Gardens, on Oct. 28th, a male was taken off a flower-pot standing in the *Victoria regia* tank, with the yellow markings on the pronotum reduced to a thin distal line and a basal three-pointed spot not very bright in colour.

Ectobia panzeri was taken in a new locality, amongst the sand-hills in the neighbourhood of Studland, in Dorset. The spot was quite close to the shore, a habitat which the insect evidently likes. It is plentiful, however, in the New Forest some miles from the coast. *Ectobia lapponica* was secured by sweeping in the forest at the beginning of June.

Numerous were the unsolicited visitors to the lepidopterists' treacle at the beginning of August in the New Forest, both at

Hurst Hill and at Ramnor enclosure, and amongst them occurred three of the Orthoptera. The commonest, of course, was *Forficula auricularia*; but *Meconema varium*, the silent grasshopper (!) of the oak and other forest trees, pale green in colour and most delicate in structure, was quite common too. With these were taken several females of the large brown grasshopper (*Thamnotrizon cinereus* (Plate III. fig. 1)). Ungainly creatures they look, with short stout body and hind legs, and antennæ of inordinate length. Of wings they are practically destitute, for the tiny scales possessed by the male, and still smaller points on the thorax of the female, can be of no use to them in their progress amongst the herbage and bushes. Though not often seen, they are fairly common insects in the southern part of England.

Another grasshopper, with long hind legs and antennæ, and abbreviated wings, met with on Esher Common, at Woking, and in the New Forest, was *Platypleis brachyptera*. It may generally be found hopping about on heather in rather damp situations. In some specimens the elytra are to a great extent bright green, in others grey, not an unusual form of variation with this division of the Orthoptera.

Though my note on *Mecostethus grossus* (*ante*, p. 169, and Plate II.) has not so far elicited the record of any new localities, yet it should be stated that I took it plentifully in the New Forest during the first half of August, and at three fresh bogs, making seven in all (some of them several miles apart) which have been recorded for it in the New Forest. But few females were secured. *M. grossus* varies considerably in size, and to some extent in colour, one female being very bright, with rosy dorsal surface of thorax. When handled this insect emits a dark brown-green liquid from its mouth.

But perhaps this year the most interesting species taken was *Xiphidium dorsale*. Though it does not seem to have been often noticed in this country, it probably is not uncommon; and, in order that those interested in the British Orthoptera may be assisted in making a search for it next year, a life-sized figure (Plate III. fig. 2) accompanies this note.

In size the female is about 19 mm. long, exclusive of the ovipositor, which reaches about 8 mm.; the male is smaller. In colour both sexes are delicate pale emerald-green, with a broad crimson-brown dorsal stripe along the whole length of the body—head, thorax, and abdomen. The vertex is produced as a sharp projection between the antennæ, which are very long and slender. The elytra are shorter than the abdomen, nearly hyaline, with reddish brown veins; the wings are very tiny. The ovipositor is shorter than the abdomen, rather slender, turned up slightly at the tip, but not greatly so. The cerci of the male are conical and pointed, with a distinct internal tooth.

Perhaps the most noticeable features of the insect are its rounded form and slender structure. In consequence of the latter it dries very badly, and loses its delicate colours. The abdomen should be carefully emptied of its contents, and loosely filled with cotton wool to preserve the shape.

In consequence of possessing such tiny wings *X. dorsale* cannot fly, but it hops very actively from blade to blade of the tussocks of long grass amongst which it lives, and, as it clings very tightly to them, it is not easy to secure the insect by sweeping. Perhaps the hands are the best implements with which to effect its capture, as they are certainly the readiest. If thoroughly disturbed it goes down towards the roots of the grass, and there cannot be found. When captured *X. dorsale* sometimes emits a dark purple-brown liquid from the mouth. It seems to like tussocks of a tall, soft, pale green grass, and perhaps prefers wet spots, though its habitat is not restricted to them.

Few localities have been recorded for this interesting grasshopper. Eland Shaw gives two—Herne Bay (E. Saunders) and Deal (G. T. Porritt). Mr. Porritt has also taken it at Chippenham Fen. I have myself taken a few in a very restricted spot in the New Forest (9th Aug. 1898, 12th Aug. 1899), somewhat larger numbers quite close to the coast near Christchurch, in Hampshire (Aug. 16th, 1899), and one amongst the sand-hills near Studland, in Dorset (Sept. 4th, 1899). In addition, Pagham Marsh, in Sussex, and near London, are mentioned by Burr as localities in his 'British Orthoptera.' *X. dorsale* is the only British representative of the genus.

THE LYCÆNID GENUS AZANUS OF MOORE.

By A. G. BUTLER, Ph.D.

IN Marshall and De Nicéville's 'Butterflies of India' three species of *Azanus* are recognised—*A. ubaldus* (the type of the genus), *A. uranus*, and *A. gamra*.

In Aurivillius's 'Rhopalocera Æthiopica' the genus is regarded as a mere section of *Cupido*, although admitted to be "a very natural and easily recognisable group." Six species are recognised as belonging to it—*C. sigillatus*, *C. moriqua*, *C. mirza*, *C. jesous*, *C. ubaldus*, and *C. zena*.

As a matter of fact, I find the synonymy in the latter work cannot be followed, because, in the first place, *C. sigillatus* (the first species) is a synonym of *C. moriqua*; whereas *C. natalensis* is a perfectly distinct species.

In the second place, I cannot see how *C. mirza*, which is described as having the wings and fringes unicolorous and violet,

can be regarded as identical with a species (apparently nearly as large again as itself), with lilac wings, brown marginal line, brownish white-tipped fringe, and three additional spots in the circle round the discoidal spot on the under surface of the secondaries. *C. jesus* (of which *C. gamra* and *C. agave* are doubtless synonyms) is also doubtless the same as *C. crameri*. *C. ubaldus* is correctly regarded by De Nicéville as the female of *C. zena*, and has nothing whatever to do with *C. crameri*, as Mr. Trimen believed.

The genus therefore will stand as follows:—

AZANUS, Moore.

Eyes clothed with fine short hair; first subcostal branch forming a mere short frenum, which unites the costal and subcostal veins; secondaries without tails; palpi long, porrected; antennæ moderately clubbed.

Section 1.—Front wings without thickened scaling.

1. *Azanus moriqua*, Wallgr.

Syn. *Lampides sigillata*, Butler.

Lycæna benigna, Moeschl.

Eastern Africa from Abyssinia to Zululand.

2. *Azanus mirza*, Plötz.

Cameroons.

3. *Azanus occidentalis*, Butler.

Western Africa only.

4. *Azanus jesus*, Guérin.

Syn. *Lycæna gamra*, Lederer.

Lampides agave, Walker.

Azanus crameri, Moore.

Natal to Upper Egypt; Aden, through Syria, Persia, and India, southwards to Ceylon.

5. *Azanus asialis*, De Nicéville.

Sumatra.

6. *Azanus natalensis*, Trimen.

Natal, north-eastwards through Nyasa to Wadelai. This is the largest and most conspicuous species in the genus, and differs markedly in the pattern on the under surface of the secondaries of both sexes, and in the amount of white on the upper surface of the female.

Section 2.—Front wings crossed by a thickened belt of colour in the males.

7. *Azanus uranus*, Butler.

North-western and North-eastern India, southward to Madras; also said to occur in Biluchistan.

8. *Azanus ubaldus*, Cramer.

Syn. *Papilio artemides*, Stoll.

Lycæna zena, Moore.

L. macalenga, Trimen.

L. thebana, Staud.

Natal, north-eastward to Somali and the Arusa Galla country; Arabia; North-west India, southward to the Deccan; Ceylon.

Allied to the above is a Burmese insect which appears to me to be distinct; but, as we at present only possess one male obtained at Tilin Yaw by the late Capt. Watson, I think it better to wait for further material before doing anything with it.

ON NEW SPILOSOMA HYBRIDS.

By ARISTIDES V. CARADJA.*

[AFTER introductory remarks upon the scientific importance of hybridising experiments, the following new forms are described.]

Spilosoma hybr. *seileri*, Car. (pl. vi. figs. 1-6), is the offspring of *S. luctuosa*, H.-G., ♂, and *S. sordida*, Hb., ♀. The crossing was successful in five cases, but from each of the broods the larvæ hatched in quite different numerical proportions; while two broods yielded only three apiece, and the third seven, the remaining two produced forty-eight and seventy-one vigorous caterpillars, from which, however, there were reared up, excluding a number of cripples, only fifteen perfectly formed male and twenty-seven female imagines, of which six males and ten females had to be sacrificed to later experiments. At the same time I was successful with the opposite combination, viz. *sordida* ♂ and *luctuosa* ♀; but from the numerous eggs laid only small larvæ incapable of development hatched out.

A short description of *seileri* is necessary despite the figures. As regards the pattern and proportions of the wings, it is exactly intermediate between its parents. The ground colouring of the wings and other parts is grey-brown, darker than in *luctuosa*. The yellowish covering of scales always plentifully present in the last named appears but scantily in individual male and female examples along the anterior and exterior margins of the fore wings. The pair figured in Nos. 1 and 5 has the densest covering of yellow scales, and hence appears the lightest; the male figured between them, at No. 3, is the darkest specimen of the whole brood, but is nevertheless still lighter than my *sordida*, males,

* 'Iris,' 1898, pp. 392-7, plate vi. (Translated by G. W. KIRKALDY.) See also Entom. 1899, pp. 106-8.

from the Wallis canton. Fig. 6 represents a light yellowish-grey coloured male quite divergent from both parents.

If the females of *seileri* are somewhat more thinly covered with scales than the corresponding sex of *luctuosa*, they certainly have not nearly such transparent wings. The females figured at Nos. 2, 4, and 5 are altogether different from their appearance on the plate, as the spots and stripes are really almost as clearly recognisable as in the male figured at No. 1. In the whole arrangement of the wing-patterns *seileri* inclines more to *sordida*, except that all the spots and stripes are much more sharply marked, pretty nearly as in *luctuosa*. On the fore wings there are three rows of spots, proceeding from the costa at equal distances, parallel to one another, and not notably sinuately diverging, as is the case in *luctuosa*; a fourth shorter row of spots arises at the apex itself, and runs obliquely towards the outer of the three parallel rows of spots. Along the outer margin are also five more or less recognisable black spots.

The hind wings appear darker than the fore wings, and bear (as well as the distinct spot on the cell) black longitudinal stripes, which commence at the base of the wing, and end at the seven dark spots situated before the margin; the latter are placed as in *luctuosa*. On the under side of the fore wings the dark markings extend into the inner margin; on the hind wings all the spots and stripes are marked still more sharply than on the upper side. The under side of the body and the legs are light grey, the tibiæ yellowish, but not reddish yellow as in *luctuosa*.

The other examples of *seileri* vary among themselves pretty strongly, apparently, in colouring, thickness of scale-covering, and distinctness of markings; some individuals lean towards *luctuosa*, the majority more to *sordida*.

The males and females of *seileri* were quite capable of reproduction in their pairing with one another. From five copulations, all of which were fertile, one hundred and eighty eggs apiece were produced on an average; from every one of these nine hundred eggs there hatched out a sprightly caterpillar! Reciprocal crossing between *seileri* ♀ on the one side, and *sordida* ♂ or *luctuosa* ♂ on the other, also produced, in each single case, approximately normally fruitful broods, for there were scarcely 17 per cent. of the numerous eggs sterile. On the other hand, the crossings between *seileri* ♂ and *sordida* ♀ or *luctuosa* ♀ (alas! successful in two cases only) were but incompletely fruitful, for the thirteen larvæ hatched out of four broods broke down before the first skin change.

Lastly, a pairing was accomplished between *seileri* ♀ and *mendica* var. *rustica*, Hb., ♂. The result was akin to that which I have recorded from the combination of *sordida* ♀ or *luctuosa* ♀ and *rustica* ♂. The eggs were only very slightly fruitful, and,

from the few that hatched only a single one managed to struggle on to pupation.

Although a pure hybrid, *seileri* has, as regards its powers of reproduction and crossing, almost the value of a species.

From these data one may conclude that both progenitors of *seileri* (viz. *sordida* and *luctuosa*), although so different superficially, are yet in reality very closely related, and must have branched off into two species themselves since a relatively short enough period. It is also likely that *sordida* is the more recent form, and that the sexual dimorphism in this species has arisen quite lately; the male *seileri* figured on fig. 6 appears to offer a very interesting illustration of a return to the earlier prevalent colouring of *sordida* ♂.

Spirosoma hybr. *beata*, Car. (pl. vi. figs. 7-9), is from a crossing between *mendica* var. *rustica* ♂ and *sordida* ♀. I described it in 'Iris,' x. p. 371.

In *beata*, *rustica*-blood prevails over that of *sordida* in the proportion of 3:1. The following markings, characteristic of *sordida*, have, however, been transmitted, viz. the somewhat elongate form of the wings, the faint yellowish grey (not milk-white) ground colour of the wings, even in the female, the tendency to a row of spots commencing at the apex, the black-spotted fringe of the fore wings, and—in the female—the noticeably dark more or less strongly impressed longitudinal stripes on the hind wings. The capital figures render a more extended description superfluous. Further crossings of this hybrid could not be effected. Upon the hybrid itself one should consult the 'Iris,' x. p. 372.

Spirosoma hybr. *hilaris*, Car. (pl. vi. figs. 10-11), has for father the hybrid *inversa*, Car.,* for mother the hybrid *viertli*, and is therefore the result of a cross between the ♂ of a race-mixing of the second order with the ♀ of a genuine bastard. As is evident from the faithful figure, the parentage of *sordida* is not very noticeable (except perhaps in the stronger spotting of the wings in the ♂); while, on the contrary, the influence of *standfussi*, in the strong darkening of *hilaris* ♂, is unmistakable. The colouring of the latter is the same as that of the lightest *standfussi* females; the ♀ resembles the *inversa* ♀ figured, only the black spots on the margin of the hind wings are much clearer marked.

This extraordinary mixture was very successful in different combinations, and rendered startling results. In the in-and-in breeding each crossing was fruitful, and almost the same in the crossing with var. *rustica* ♂.

A crossing of the hybrid ♀ with *sordida* ♂ produced eggs of which about 75 per cent. were fruitful, but of the converse only

* Hybrid *inversa* originated from *standfussi* ♀ and var. *rustica* ♂.

16 per cent. A crossing with *luctuosa* ♀ resulted in some weakly larvæ, the converse being unfruitful.

Spilosoma hybr. *inversa*, Car., was the name I gave originally to a very rare black-and-white spotted ♂ var. of *standfussi*. Last year, however, such quantities of an insect, named *inversa* by me, the offspring of *standfussi* ♀ and *rustica* ♂, came into the market, that at present no large collection can be without it. The name *inversa* may therefore lapse for the rare form of *standfussi*, and stand for the offspring of *standfussi* ♀ and *rustica* ♂; a pair of this hybrid are shown at figs. 12 and 13.

The forms figured at 14 and 15 are from a combination of *mendica* ♂ and *inversa* ♀. This new mixture is very similar in colour to the dark form of *standfussi* which I named var. *mus.*, and I have been able to cross it further successfully with *rustica* and *inversa*.

A GUIDE TO THE STUDY OF BRITISH WATERBUGS (AQUATIC RHYNCHOTA).

BY G. W. KIRKALDY.

(Continued from p. 204.)

(γ) *Gerris*, Fabr. (restricted).

= *Limnotrechus*, Stål, 1868.

In this section, the typical one of the genus, there are seven British species (one of which is, so far as our islands are concerned, restricted to Scotland), separable by the accompanying table:—

- | | |
|---|-----------------------------|
| 1. Intermediate tibiæ not more than $2\frac{1}{3}$ times (rarely more than twice) as long as the tarsi;* posterior lobe ("disk") of pronotum nearly always more or less rufescent | 2 |
| — Intermediate tibiæ rarely (if ever) less than three times as long as the tarsi; posterior lobe of pronotum not rufescent | 4 |
| 2. Abdomen longitudinally channelled beneath; submarginal flavescent line of pronotum continued on the anterior lobe | 4. (?) <i>asper</i> , Fieb. |
| — Abdomen longitudinally keeled beneath; submarginal flavescent line not continued on anterior lobe of pronotum | 3 |
| 3. Robust; very wide across intermediate coxæ; abdomen shallowly depressed on each side of central keel | 5. <i>costæ</i> , Schöff. |

* The intermediate legs are so long that the difference between " $2\frac{1}{3}$ " and "3 times" is easily recognisable.

- Less robust; narrower across intermediate coxæ; abdomen not depressed on each side of central keel 6. *thoracicus*, Schumm.
- 4. ♂. Sixth abdominal segment armed beneath with two strong teeth; ♀ seventh abdominal segment (first "genital") transverse, impressed beneath at base 10. *odontogaster*, Zett.
- ♂ without the teeth; ♀ seventh abdominal segment not transverse 5
- 5. First segment of posterior tarsi more than twice as long as second; base of pronotum more angular, posterior lobe strongly keeled; species 8–13 mm. long 6
- First segment less than twice as long as the second; base of pronotum less angular, posterior lobe more feebly keeled; species 6½–7½ mm. long. 9. *argentatus*, Schumm.
- 6. Large species, 12–13 mm. long. Large yellow tubercle on metasternum; anterior femora black above; mesopleura very wide; submarginal flavescent line on pronotum not continued on to anterior lobe 7. *gibbifer*, Schumm.
- Smaller, 8–10 mm.; no metasternal tubercle (or, if present, small and black); anterior femora pale, with two black lines; mesopleura narrower; submarginal line continued on to anterior lobe 8. *lacustris* (Linn.)

4. *G. asper* (Fieb.) ?.

= *G. thoracicus*, Flor (nec Schumm.) ?.

= *G. lateralis*, Schumm. ?.

I have not been able, up to the present, to settle the synonymy of this species. *G. asper* (Fieb.) and *G. lateralis*, Schumm., whether synonymous themselves or not, are readily separable from *G. thoracicus* and *G. costæ* by the fact that in the first two the venter is channelled (*canaliculate*), in the last two keeled (*carinate*). Of the European species with carinate venter, I seem to have two in my collection.

No. 1 represented by a single male from Pitlochry. To this species are referable three apterous females from Mr. Saunders's collection (one now in mine!). I have not seen specimens from any other country than Scotland, the records being from Pitlochry, Loch Galby, and Forres.*

No. 2 represented by a winged female from Hungary, given me by Dr. Horváth. I have seen specimens of this from Gibraltar.

* I know the country around Forres fairly well, and I much doubt that this species was really taken there. I expect Norman included in the term "Forres" individuals taken as far afield as Granttown and other likelier places.

No. 1 seems to be a slenderer species than No. 2, and the first antennal segment much shorter in proportion to the head. The male genital segments seem different, and there are one or two minor differences. I cannot see anything in the description of *lateralis*, Schumm., really discordant with *asper*, Fieb.; but, as I do not know which of the two forms above mentioned (if, indeed, they are distinct specifically) is the true *asper* of Fieber (or the true *lateralis* of Schummel), I have left the matter in suspense until I can obtain more material. My impression is that there are two species:—

1. *G. lateralis*, Schumm., inhabiting Continental Europe (more or less locally), = *G. asper* (Fieb.) (and *G. lateralis* (Fieb.)?).

2. *Gerris*, sp. n., inhabiting subalpine Scotland very locally and rarely, = *G. asper*, Douglas, Scott, and Saunders.

Fig. 21 represents the sixth abdominal segment (from beneath), &c., of my male from Pitlochry.

5. *G. thoracicus*, Schummel.

= *G. plebejus*, Horváth.

A very common species all over England, and probably over the Scottish Lowlands. I have one or two specimens from near Inverness, but it is quite absent from the Highlands proper (being replaced by *G. costæ*), and is rare in Northern Europe. I have never seen an individual in which the rufescent (or flavescent) colour on the posterior lobe of the pronotum was not distinctly apparent.

Fig. 22 represents the apical parts of the abdomen in the male; fig. 23 those in the female (beneath).

6. *G. costæ* (Schäff.).

= *G. rufoscutellatus*, Costa (nec Latreille).

= *G. lateralis*, Puton (nec Schummel).

Very closely allied to *G. thoracicus*. Its distribution is remarkable. It is not uncommon over the greater part of Central and Southern Europe, but has not (to my knowledge) been found yet in Scandinavia. In the British Isles, on the contrary, it is a subalpine species. It has been recorded from—ENGLAND, Buxton; NORTH WALES; IRELAND, Donegal and Armagh; but apparently only sparingly. In the Highlands of Scotland it is by far the commonest species; I have taken it from near Callander (in Perthshire) to Inverness, and from Loch Callater (near Braemar) to the Isle of Skye, and it has been noted also from Isle of Harris and the Orkneys. Up to this year I had taken only the melanic form, but this year, in Skye, I found colour varieties very commonly. The most extreme were—(α) bluish black (the “rufescence” on the posterior lobe

“black”)! (β) reddish brown on posterior lobe of pronotum, elytra, &c.; so ruddy, in fact, that I was deceived for a few moments into thinking I had obtained a supply of *G. asper*.

The characters, therefore, given by Saunders do not altogether hold good, *i. e.* “antennæ ferruginous . . . elytra black . . . legs ferruginous,” &c.; the venter also is often flavous, the pale colour narrowing towards the base.

Fig. 24 represents the (male) apical parts of the abdomen (beneath).

N.B.—This species is not, as stated in the third and fourth editions of Puton’s *Catal. Hém. paléarct.*, *G. lateralis*, Schummel, that species having (as remarked previously) a canaliculate venter.

7. *G. gibbifer*, Schumm.

Common and well distributed in the South of England, but not recorded from Scotland and Ireland.

Fig. 25 represents the apical segments (male).

8. *G. lacustris* (Linn.) Stål.

= *variabilis*, Curtis.

The type of the genus, fixed by Fabricius, 1794. Distributed apparently well over the United Kingdom, but I have few precise localities. It has a great range over Europe, and I have examined a specimen from Japan which I cannot separate from the ordinary British individuals. The apical segments in the male are little different from those in *G. gibbifer*; fig. 26 represents those of the female.

The type of the species does not appear to be extant. The original description of *Cimex lacustris*, Linn., in *Syst. Nat.* ed. x. p. 450 (1758) is very indefinite, but excludes *rufoscutellatus*, *thoracicus*, *asper*, and *costæ*.* Poda (1761, *Mus. Ins. Græc.* p. 60) refers to Ray’s figure (an atrocity, but it cannot well refer to anything but *lacustris* or *argentatus*). Reuter (1888, *Act. Soc. Sci. Fennic.* xv. p. 364 [sep.]) confidently refers Poda’s description (as also that of Scopoli, *Ent. Carn.* 1763, p. 136) to *lacustris*, but I must confess I can see absolutely nothing distinctive about it. Houttuyn’s description (1765) I have not seen, but, as Reuter refers it to *rufoscutellatus*, it need not be considered. In fact, all the descriptions up to that of Fabricius, 1794 (not the same species as that described by the latter author in 1775), are either antagonistic to the original description, or do not elucidate it; so that it may be considered as definitely fixed by Fabricius, 1794. This is fortunate, as this is the same interpretation as

* Linné’s references to other authors, *i. e.* Ray, Bradley, &c., imply these species; but Linné says “*supra nigra*” without qualification.

that held by practically all authors since the middle of this century.*

9. *G. argentatus*, Schummel.

= *apicalis*, Curtis.

Very closely allied to *lacustris*. It is not common, but is probably sometimes passed by as the latter species. It is widely distributed over England, and recorded from Scotland and Ireland. The apical segments of the abdomen are not greatly different from those of *lacustris*.

10. *G. odontogaster* (Zett.).

Easily recognisable by the two strong ventral teeth in the male, and the transverse seventh segment in the female (figs. 27 and 28).

Generally distributed, though not common.

METAMORPHOSES, &c.

Little detailed information has been published on the metamorphoses of the Gerridæ. Dufour† states that the eggs are deposited one after another, but not touching nor crowded together, in a kind of mucilage fixed upon the leaves of immersed plants. They are elongate, cylindroid, not truncate at either of the extremities. Instead of opening by the unglueing and downfall of a regular operculum—as in the majority of land-bugs—their anterior third splits longitudinally, and by this rent the young nymph leaves. This occurs usually about May or June. The nymphs may be at once separated, at any stage, from the apterous imagines by the frailer frame, shorter abdomen, and by the unisegmentate anterior tarsi. They keep more to the shelter of the banks of the stream or of aquatic plants. The nymphs change into imagines usually about the beginning of August, though—as in most aquatic insects—these periods will bear a very liberal interpretation. Like the imagines, they feed on minute dead or dying flies, &c., that have fallen into the water, and are sprawling helpless on the surface.

* I have dealt with the synonymy of *lacustris* in this manner because Reuter cites the modern acceptation, indorsed by him, as an exception to his rule.

† 1833, Mém. div. savans Acad. Sci. France, iv. p. 347.

THE LATEST ARRANGEMENT OF BRITISH PYRALIDÆ.

THE concluding part of Sir George F. Hampson's Classification of the Pyralidæ was published in February last, and we are now able to see what position the British species, referable to the family, are assigned in a system based on the neuration and other structural characters of the imago.

The six parts into which this Revision has been divided were issued as under :—

SCHÆNOBIINÆ and CRAMBINÆ (Proc. Zool. Soc. Lond. Dec. 1895).

EPIPASCHIINÆ, ENDOTRICHINÆ, and PYRALINÆ (Trans. Ent. Soc. Lond. Dec. 1896).

CHRYSAUGINÆ (P. Z. S. L. June, 1897).

HYDROCAMPINÆ and SCOPARIANÆ (T. E. S. L. July, 1897).

PYRAUSTINÆ, pt. i. (P. Z. S. L. Nov. 1898).

PYRAUSTINÆ, pt. ii. (P. Z. S. L. Feb. 1899).

SCHÆNOBIINÆ.

There are twenty-five genera in this subfamily, the majority of which contain species belonging to Oriental and Neotropical regions only. The genera represented in Europe are *Scirpohaga*, Treits., the type of which is *prelata*, Scop. (not British); *Schænobius*, Dup., *gigantellus*, Schiff. (type), and *forficellus*, Thunb.; *Donacaula*, Meyr., founded for the reception of *mucronella*, Schiff. (*Schænobius mucronellus*); and *Acentropus*, Curt., in which there are but three species, including *nivcus*, Olivier, the type.

CRAMBINÆ.

Thirty-one genera are comprised in this subfamily, and of these *Crambus*, Fabr. (No. 6), appears to be the largest and most extensively distributed. There are over two hundred species included in the genus, and the sequence of the species occurring in Britain is as follows :—

- 9. *C. paludellus*, Hübn.
- 33. *C. fascelinellus*, Hübn.
- 51. *C. inquinatellus*, Schiff.
- 58. *C. geniculeus*, Haw.
- 59. *C. contaminellus*, Hübn.
- 60. *C. sabinellus*, Tutt.
- 65. *C. tristellus*, Fabr.
- 66. *C. selasellus*, Hübn.
- 70. *C. perlellus*, Scop. (*warringtonellus*, Zell., is not mentioned).
- 74. *C. latistrius*, Haw.
- 104. *C. furcatellus*, Zett.

105. *C. margaritellus*, Hübn.
 109. *C. pinellus*, Linn.
 111. *C. myellus*, Hübn.
 119. *C. verellus*, Zinck.
 120. *C. falsellus*, Schiff.
 139. *C. chrysonuchellus*, Scop.
 140. *C. craterellus*, Scop.
 142. *C. hortuellus*, Hübn.
 149. *C. culmellus*, Linn.
 150. *C. dumetellus*, Hübn.
 152. *C. pratellus*, Linn.
 157. *C. sylvellus*, Hübn.
 158. *C. ericellus*, Hübn.
 (Type) 159. *C. pascuellus*, Linn.
 160. *C. uliginosellus*, Zell.
 161. *C. hamellus*, Thunb.

The above, with one or two trifling exceptions, is an exact reversal of Meyrick's arrangement of the British species of *Crambus*. The latter author, however, retains *Calamotropha*, Zell., for *paludella*, Hübn., but Hampson merges Zeller's genus in *Crambus*, Fabr.

Platytes, Guen. (No. 8) has thirty-eight species referred to it. The type of this genus is *P. cerusella*, Schiff., which holds the thirty-fourth place in the list; whilst the thirty-eighth species is *P. alpinella*, Hübn., generally included in *Crambus*.

The type of the genus *Eromene*, Hübn., is the European *E. bella*, Hübn., and *E. ocella*, Haw., is the eighth species enumerated.

The sixteenth genus is *Chilo*, Zinck., with *C. phragmitellus*, Hübn., as the type, and twenty-six other species included therein.

ENDOTRICHINÆ.

Endotricha, Zell., is No. 2 of the twenty-two genera in this subfamily, and *E. flammealis*, Schiff., is placed seventh of the thirty-three species in the genus. The type is not indicated.

PYRALINÆ.

In this subfamily there are forty-eight genera; the fifth is *Aglossa*, Latr., with six species, including *A. pinguidis*, Linn. (type), and *A. cuprealis*, Hübn. "*Pyralis*" *costalis*, Fabr., is placed, with three other species, in *Hypsopygia*, Hübn. (No. 6). *Pyralis*, Linn. (No. 7), has nineteen species, *P. farinalis*, Linn. (type), being sixth, and *P. lienigialis*, Zell., eighth. *Herculia*, Walk. (No. 16), is a more extensive genus, as it embraces some thirty-eight species, of which *H. (Pyralis) glaucinalis*, Linn., is No. 4. The forty-sixth genus in Pyralinæ is *Cledeobia*, Steph., with twelve species, of which *C. angustalis*, Schiff., ranks tenth, and is also the type.

The Chrysauginæ are entirely exotic, and the Hydrocampinæ and the Scoparianæ have been previously referred to (Entom. xxx. pp. 242, 244).

PYRAUSTINÆ.

A large subfamily, containing over one hundred and sixty genera, among which the British species are distributed as follows:—

25. *Agrotera*, Schrank. (16 species.)

11. *A. nemoralis*, Scop. Distribution: Europe; Japan; China.

70. *Sylepta*, Hübn. (122 species.)

77. *S. (Botys) ruralis*, Scop.=*verticalis*, Schiff.

74. *Glyphodes*, Guen. (142 species.)

64. *G. unionalis*, Hübn. Distribution: South Europe; Ethiopian and Oriental regions to Australia.

99. *Evergestis*, Hübn. (17 species.)

11. *E. (Orobena) extimalis*, Scop. Distribution: United States America; Europe.

12. *E. (O.) straminealis*, Hübn. Distribution: United States America; Europe.

110. *Nomophila*, Hübn. (2 species.)

(Type) 110. *N. noctuella*, Schiff. Distribution: Universal.

114. *Phlyctænodes*. (61 species.)

1. *P. (Spilodes) palealis*, Schiff. Distribution: Europe; Madeira; North Africa; Japan.

7. *P. (S.) verticalis*, Linn.=*cinctalis*, Tr. Distribution: Europe; Japan; Afghanistan; North-west Himalayas.

36. *P. (S.) sticticalis*, Linn. Distribution: Europe; Beloochistan.

116. *Diasemia*, Guen. (10 species.)

(Type) 1. *D. literata*, Scop. Distribution: Europe; Japan; India; Ceylon.

2. *D. ramburialis*, Dup. Distribution: Universal.

129. *Mecyna*, Guen. (8 species.)

(Type) 2. *M. gilvata*, Fabr.=*polygonalis*, Hübn. Distribution: Southern and Eastern Europe; Madeira; Syria; Abyssinia; Aden; India; Ceylon.

137. *Cynæda*, Hübn. (2 species.)

(Type) *C. (Odontia) dentalis*, Schiff. Distribution: Europe; Western Asia.

146. *Pionea*, Guen. (129 species.)

12. *P. (Botys) pandalis*, Hübn. Distribution: Europe; Japan.
24. *P. (Scopula) ferrugalis*, Hübn. Distribution: Europe; Western Asia; Madeira; Western and Southern Africa; Japan; Afghanistan; India; Ceylon; Burma.
47. *P. (Ebulea) crocealis*, Hübn. Distribution: Europe; Western Asia.
48. *P. (Scopula) lutealis*, Hübn.
52. *P. (Ebulea) stachydalis*, Zinck.
55. *P. (E.) verbascalis*, Schiff. Distribution: Europe; Western Asia; Japan; India; Ceylon.
- (Type) 87. *P. forficalis*, Linn. Distribution: Europe; Central Asia; Japan; Himalayas.
115. *P. (Scopula) decrepidalis*, H.-S.
121. *P. (S.) olivalis*, Schiff. Distribution: Europe; Armenia.

149. *Pyrausta*, Schrank. (220 species.)

7. *P. (Nascia) cilialis*, Hübn. Distribution: Europe; Amurland.
22. *P. (Botys) fuscalis*, Schiff.
23. *P. (B.) terrealis*, Tr. Distribution: United States America; Europe; Afghanistan.
25. *P. (Ebulea) sambucalis*, Schiff.
45. *P. (Botys) repandalis*, Schiff.
57. *P. (B.) flavalis*, Schiff.
85. *P. (B.) nubialis*, Hübn. Distribution: Europe; Western Asia; Himalayas; Assam.
101. *P. (B.) asinalis*, Hübn.
125. *P. (Scopula) alpinalis*, Schiff.
161. *P. (Herbula) cespitalis*, Schiff. Distribution: Palearctic region; Northern India; Burma.
166. *P. (Rhodaria) sanguinalis*, Linn. Distribution: Europe; Western Asia; Siberia; North-west Himalayas.
189. *P. (Pyrausta) purpuralis*, Linn. (including *P. ostrinalis*).
190. *P. (P.) aurata*, Scop. Distribution: Europe; Syria; Persia; Afghanistan.
208. *P. (Ennychia) nigrata*, Scop.
- (Type) 209. *P. (E.) cingulata*, Linn.
220. *P. (E.) octomaculata*, Linn. Distribution: Europe; Western Asia.

The Phycidæ (Phycitinæ) and Galleridæ (Gallerianæ) were revised by the late Mons. E. L. Ragonot, and these families, or subfamilies as they are now classed, will be referred to on a future occasion.

NOTES AND OBSERVATIONS.

INSTINCT IN CHRYSALIS OF PARARGE MÆRA.*—On the 19th May last, in the afternoon, I collected twenty-one chrysalids of *P. mæra* from a wall near Moulins (Allier), and placed them in my caterpillar box. To minimise the inevitable shocks of transport, I covered them with a handful of fresh leaves, and carried the box as nearly as possible in one position. On my return, after a slow walk of about an hour, the box was placed on a table, and left unopened till eight o'clock the next morning. On removing the leaves, I observed that of the twenty-one chrysalids only eight were isolated; the thirteen others were associated, each one joined at the apex of the abdomen, forming four groups: two groups of two, one of three, and one of six; the last appearing like a six-rayed star. It seems indubitable that a state of repose is the natural condition of the evolutive life of a chrysalis, and we ought not to be surprised at seeing the blind power of instinct attempting to re-establish equilibrium when accidentally disturbed.

FURTHER NOTES ON THE ACCIDENTS CAUSED BY BEE-STINGS.†—(1) A man, thirty-five years old—stung by bees—was obliged to lie down for a whole day with fever (temperature, $38\cdot4^{\circ}$ C.=about 101° F.), loss of appetite and sleep. (2) A man, aged twenty-five—fell into a quasi-coma, and for a time lost memory. (3) Thirty-two years old—fever ($40\cdot1^{\circ}$ C.=about 104° F.), lasting twenty-four hours. (4) Twenty-nine years old—fever ($39\cdot2^{\circ}$ C.=about $102\frac{1}{2}^{\circ}$ F.), loss of appetite, nausea, diarrhœa, slightly delirious. (5) Twenty-seven years old—fever ($38\cdot7^{\circ}$ C.=about 101° F.), vomiting, loss of appetite, excessive excitement, nightmare. The venom presumably acts principally upon the nervous centres, owing to a special toxin, the existence of which is indubitable, and which is effective according to the constitution of the subject. In some neuropaths the stings cause transitory fears, which compel them to avoid bee-hives. A young man, of twenty-seven, confessed to me, some time after his restoration to health, that he dared not pass in front of a bee-hive now, and at the idea of visiting one he shivered and turned pale. I have seen him since, and he has been obliged to get rid of his hives, as he could not overcome the involuntary fear which mastered him at the sight of a bee. I propose to call this phenomenon "Aphobia." To conclude, the following are the morbid symptoms ensuing on bee-stings: fever (often violent), inflammation of the injured part, itching, vomiting, delirium, nightmare, &c.; and, in some cases, aphobia.

WANTED.—*Authentic* records of GERRIDE from localities outside the London district, especially the common species, viz.: *Hydrometra stagnorum*, *Gerris gibbifer*, &c. These are wanted for an early number of the 'Entomologist.'—G. W. KIRKALDY; St. Abbs, Wimbledon, Surrey.

* G. de Roëquigny Adanson, in Bull. Soc. Ent. France, 1899. (Translated by G. W. Kirkaldy.)

† E. Spalikowski, in 'Le Naturaliste,' 1899, p. 85. (Translated by G. W. Kirkaldy.)

ANERASTIA LOTELLA, *Hb.*, AND CRAMBUS LATISTRIUS, *Hw.*, ETC., IN THE WEST OF SCOTLAND.—When collecting on the Ayrshire sand-hills near Irvine on July 8th, I obtained a fine specimen of *A. lotella*, *Hb.* This species, so far as I can make out, has never been recorded further north than Yorkshire. And, again, from almost the same locality on August 12th I secured a dozen specimens of *C. latistrius*, *Haw.* Meyrick in his Handbook gives the distribution of *C. latistrius* as Britain to Perth; it has not, however, been recorded from the Clydesdale district, or, in fact, the whole of the West of Scotland. The sandy coast of Ayrshire has apparently been but very poorly worked of recent years, and I am of the opinion that many species, not only among the Crambites, but in all the other groups and orders, would be turned up if a little more attention was given to that locality. It is also interesting to note that on the same day in which I took *A. lotella* I also added the bee *Colletes montanus*, *Mor.*, to the British list of Aculeate Hymenoptera. Mr. E. Saunders, who kindly identified the species, has described it in the present number of the *Ent. Mo. Mag.*—AND. ADIE DALGLISH; 21, Princes Street, Pollokshields, Glasgow, Nov. 9th, 1899.

NOTE ON LOZOPERA BEATRICELLA.—The larva is similar in colour to that of *L. dilucidana* and also to that of *L. francilliana*. It is dirty white; head shining and black, with two small dots at the back of the head, also a small dot at the extreme end of the last segment. The time for the imago would be the last week in June and the first week in July. My first specimen emerged on June 23rd. In its natural state it flies very late, from about half-past seven or eight until dark, and flies very steady. There is no doubt that *L. beatricella* is a very local species, otherwise it would have been brought to light before, as it feeds on the same plant as *L. dilucidana*—*Pastinaca sativa* (the wild parsnip). As there is a striking difference between the two species, *L. beatricella* would have been easily detected if it had been bred by anyone.—W. PURDEY.

[*Lozopera beatricella* was described by Lord Walsingham last year. See *Ent. Mo. Mag.* (2) ix. 75.—ED.]

SMERINTHUS POPULI DOUBLE-BROODED.—I have for the last three years been able to obtain two distinct broods of *Smerinthus populi*. I have found ova at the end of May, and again at the end of July. This year I found a full-grown larva which pupated on July 26th. The imago appeared about August 28th, and laid a large number of eggs.—J. L. SAXBY; Larkfield, Kent.

HUMMING SOUND OF MACROGLOSSA STELLATARUM.—It may be from want of observation, but until this summer I was not aware that any sound was produced by *Macroglossa stellatarum*. One day, whilst attending to the plants in a little conservatory, my attention was attracted by a loud humming noise, considerably louder than that of a humble-bee, and, seeking to ascertain the cause, I found that it emanated from one of these moths, which had flown in, and which on rapidly vibrating wings and with outstretched proboscis was hovering over the flowers. I have never heard the sound out of doors, and it would be interesting to me to have the experience of others.—JOSEPH ANDERSON; Chichester.

SETTING RELAXED LEPIDOPTERA.—Being busy during the summer months, I have to set most of my insects during the autumn and winter, after having duly *relaxed* them. I am told in one of the text-books that *relaxed* insects are liable to “spring,” and that it is advisable to *touch* the wings at the base with cement to *prevent* this. As my house is a new one, and therefore probably still somewhat damp, I procured a bottle of cement (from Watkins and Doncaster) with which to operate. The first thing I found was that the cement was much too thick, and that “*touching*” the base of the wings meant bringing away some of the legs, and in the more delicate insects possibly a wing. On advice I added vinegar (acetic acid) to the cement, and made it more workable. I first of all set the insects, leaving them on the boards some three weeks or more, then took them off, applied some of the cement, and strapped them down again for a night or two, or possibly a week. I am pretty expert with my fingers, and pride myself on my setting, especially on the arrangement of the antennæ. Most of my insects came off the boards looking as well as most people would desire. I then put my insects into a store-box, and wrap up in brown paper and place on top of kitchen dresser. To-day I took down some of the boxes and opened them. To my intense disgust, many of the insects looked as if they would fly out of the box, with their wings up, and their antennæ all awry! Of course they cannot be re-set. The cement seems to do more harm than good. I shall be glad if anyone will advise me what to do.—A. H. RYDON; “Awbrook,” Lindfield, Sussex, Oct. 28th, 1899.

CAPTURES AND FIELD REPORTS.

NOTES ON LEPIDOPTERA FROM THE CHESTER DISTRICT.—*V. atalanta* was unusually common in August and September. A specimen was taken at night at a Chester electric lamp. So abundant were the larvæ that I might almost say they were to be found on every clump of nettles. Small larvæ were feeding up when the butterfly was on the wing in August—surely a second brood! I do not think I ever saw so many butterflies on a given day as I did, on Aug. 10th, in the Shotwick district, at the base of the Wirral peninsula, between the estuaries of the Dee and Mersey. The landscape was fairly enlivened by them—no less than eleven species: *Pieris brassicæ*, *P. rapæ*, *P. napi*, *Vanessa urticæ*, *V. io*, *V. atalanta*, *Pararge megæra*, *Epinephele ianira*, *E. tithonus* (the latter abundant and variable), *Folygonmatus phlæas*, and *Lycana icarus (alevis)*. In this district we came upon a marsh dried up by the excessive heat and drought, and covered with a tall and luxuriant growth of vegetation. Here we could have taken any number of the plume, (*Eidematophorus lithodactylus*, a new record, I believe, for the district list. On low young willows and poplars we found, throughout the Sealand and Shotwick neighbourhoods, from Aug. 2nd to Aug. 10th, lepidopterous eggs quite new to us. They were almost if not quite the size of the egg of *Dicranura vinula*. In every case they were attached to the under side of the leaf, sometimes singly and sometimes in batches of from two to six. They were whitish, with a pale brown apical

ring, in the centre of which was a small blotch of the same tint. There was also a pale brown circular spot on one side of each egg. The eggs were rather flattish and oval. Hatching began on Aug. 10th, and all the larvæ died by the 18th. I do not think they ate anything of the willow or poplar given to them. Here is a description taken with the aid of a strong lens:—About half an inch long. Head large, shining and black. The *general* aspect of the caterpillar is black, and rather thinly covered with greyish hairs. Each segment, dorsally, is bluish, except 3 and 4. Legs black; claspers greyish. On segment 2, on each side, is a rounded black tubercle, each tubercle emitting a tuft of black, *longer* hairs pointing forwards. Each segment is slightly raised dorsally; the 12th more so, in fact, it has a black hump. On segments 3 and 4, which are velvety black, is a large oval pale yellow spot, covering almost all the dorsal area of the two segments. Along the remaining nine segments, dorsally, stretches a line of prominent orange heart-shaped spots, each containing a small black dot. The spaces between these orange spots are whitish yellow. There is a less distinct paler orange line on each side, just above the legs and claspers, containing the black spiracles. I shall be pleased if someone will say what these caterpillars probably were. Personally, I think they might be *Dasychira fascelina* or *Orygia gonostigma*. In North Wales, among the flowers and grasses of the carboniferous limestone, I netted, July 31st, some *L. astrarche* (*agestis*) with black discoidal spots *on all the wings*, each spot being surrounded by a white circumscription. The spots and white circumscriptions are most prominent on the upper wings. All the wings are well margined with large bright red spots, forming almost continuous bands. In the Delamere Forest district I was very pleased, on July 21st, to meet with two colonies of *L. ægon*.—J. ARKLE; Chester.

PLUSIA MONETA AT CHICHESTER.—A specimen of *P. moneta* was taken here by a lad, from a street gas-lamp, one evening in June last.—JOSEPH ANDERSON; Chichester.

SPHINGES AT RINGWOOD.—I saw a specimen of *Acherontia atropos* that had been bred here; *Sphinx convolvuli*, three examples only were seen; *Macroglossa stellatarum*, extremely abundant; larvæ of *S. ligustri*, scarce; a few larvæ of *Smerinthus ocellatus*, *S. populi* and *S. tiliæ* also, and two *Charocampa elpenor* were taken. All the above species occur here in more or less abundance every season.—J. HY. FOWLER; Ringwood.

NOTE ON LIGDIA ADUSTATA.—I was rather surprised on opening one of my boxes to-day (Nov. 6th) to find that a fine specimen of the above had emerged. The box is kept in a cold room facing north, which is not artificially heated. I took larvæ in the middle of July, at Bexley and in August at Polegate and Hailsham, this year. I append a few dates of the capture of this species by me, which may perhaps be of interest:—1896, April 9th, 10th and 12th, Dartford Heath. 1897, June 5th to 7th, Wrotham, abundant. 1898, May 30th, Chelsfield; June 5th, Bexley; July 2nd, West Wickham. 1899, May 21st, Ranmore, Surrey; July 9th, Ranmore, Surrey; July 16th, Bexley (and larvæ); Aug. 7th, Polegate (and larvæ); Aug. 10th, Hailsham (at treacle); Nov. 6th (bred). So that I have taken the moth in April, May, June, July, and August, and bred it in November.—F. M. B. CARR; 46, Handen Road, Lee, S.E.

ACHERONTIA ATROPOS IN KENT.—Seeing that there are several notes on *A. atropos* in this month's 'Entomologist,' I thought that perhaps the

following notes from Kent might be of some use. On Aug. 25th I went to a friend's house at Hothfield, near Ashford, and in his potato-fields succeeded in digging up three pupæ. Since then nearly twenty more have been taken. I was not aware that *A. atropos* occurred in such numbers as this. An imago emerged from one of the three pupæ about Sept. 8th; the other two have died.—S. A. BLENKARN; 8, Wood Street, Cheapside, London, Nov. 10th, 1899.

COLIAS EDUSA AND *C. HYALE* IN 1899.—To the *Colias* records this year I can add one male *C. edusa*, near Shorncliffe Camp, on Aug. 26th last, and three *C. hyale* at the same place, on the same day. All were taken in lucerne fields. I also took one more *C. hyale* on Aug. 28th, in the same locality. — H. AINSLIE HILL; 9, Addison Mansions, Kensington, W., Nov. 7th, 1899.

SESIA MUSCIFORMIS AT SWANAGE: A CORRECTION.—In a former note (Entom. xxx. p. 111) I stated that I had taken *Sesia musciformis* at Swanage. This should have been *S. ichneumoniformis*; the former species I have never obtained there.—J. HY. FOWLER; Ringwood.

HESPERIA PANISCUS AT SWANAGE: A CORRECTION.—I cannot verify this record (Entom. xxx. p. 111), as I did not see the specimen at the time. Would the gentleman who informed me of its capture at Swanage come forward and clear up the matter? I fancy he told me that he resided in the neighbourhood of Bournemouth.—J. HY. FOWLER; Ringwood.

LEPIDOPTERA AT SWANAGE.—Whilst staying at Swanage in September, *Macroglossa stellatarum* came to a flower of scabious in my wife's dress, remaining some time, whilst it tried every little floret for honey, and even returned a second time. During my visit I saw one *Colias edusa* on the cliffs, and a male *Lycena adonis*.—JOHN R. B. MAREFIELD; Rosehill, Cheadle, Staffordshire.

DRAGONFLIES IN THE CHESTER DISTRICT.—*Æschna grandis* has been as common and as bold as ever, especially in August. I could have taken many, but netted only one, which seemed to challenge my net by repeatedly coming well within reach. *Æ. juncea* seemed again to be scarce, probably through the shallow pools and marshes being dried up in the almost tropical sun. I saw the species only in North Wales. On July 21st I went to Oakmere to get some *Leucorrhinia dubia* for a correspondent, and my surprise was great to find the dragonfly entirely over; so were *Libellula quadrimaculata* and *Pyrrhosoma minimum*. This was exceptionally early, and doubtless owing to the exceptionally hot summer. *Lestes sponsa*, however, was abundant; so were *Agriion puella*, *Enallagma cyathigerum*, and *Sympetrum scoticum*. *Ischnura elegans*, a beautiful graceful little dragonfly in black and blue, appeared in unusual numbers, as a second brood, on Aug. 4th. In North Wales, up to the end of September, I repeatedly saw a dragonfly like *Orthetrum carulescens*, only larger perhaps, flying singly among the oak tops, but, of course, far beyond reach.—J. ARKLE; Chester.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—November 1st, 1899.—Mr. G. H. Verrall, President, in the chair. Mr. Arthur M. Lea, of Hobart, Tasmania; and Mr. Charles P. Loundsbury, B.Sc., of Cape Town, were elected Fellows of the Society. Mr. J. J. Walker exhibited two living specimens of *Bostrychus cornutus*, Fab., obtained from a wooden stool which was brought from Zanzibar. Mr. C. O. Waterhouse showed a living example of *Macha hecate*, Chev., a West African species of Longicornia. On behalf of Mr. W. Purley, of Folkestone, Mr. C. G. Barrett exhibited the following species of Lepidoptera:—*Stigmonota trauniana*, one specimen, with the costa less spotted than usual; *Lozopera beutricella*, six examples, together with the pupa-skins protruding from a stem of *Pastinaca sativa*; *Peronea cristana*, two examples of a very fine variety; *Cledeobia angustalis*, two deeply coloured examples; *Crambus inquinatellus* var.; *Eudorea dubitalis* var. *ingratella*, two examples; and *Eudroticha flammealis*, four examples of a dark variety. Mr. McLachlan showed four examples of *Deilephila lineata*, taken by Mr. E. W. Hainworth at Victor, Colorado, at an elevation of 9000 feet, on July 23rd, 1899; also an ash-twigg which had been girdled by hornets, the observation of this curious fact having been made by Mr. W. C. Boyd, of Cheshunt, from whom he received the twig. Dr. T. A. Chapman exhibited specimens of *Erebia flavofasciata*, taken at Campolunga at an elevation of 7000 feet. He stated that the species occurred only in those places where there was an outcrop of dolomitic strata belonging to the crystalline schists, and was not to be met with elsewhere at that elevation, nor was it to be found in association with the same strata at lower levels. Mr. H. J. Elwes exhibited, and gave a brief account of, a collection of Lepidoptera made by Mrs. Nicholl and himself in a part of Bulgaria, that country which had not previously been visited by entomologists. *Lycana eroides*, *L. anteros*, *L. zephyrus*, *Melitæa cynthia*, *Erebia gorge*, and a species which he believed to be *Cænonympha typhon*, were a few of several interesting forms to which he directed attention.—J. J. WALKER and C. J. GAHAN, *Hon. Secs.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—October 26th, 1899.—Mr. A. Harrison, F.L.S., President, in the chair. Mr. Tomlinson, Kingston-on-Thames, was elected a member. Mr. South exhibited, on behalf of Mr. Fowler, of Ringwood, the following varieties of *Lycana corydon*: (1) A specimen with a shining spot on each fore wing; (2) a series with the usual black hind marginal borders replaced by white quadrate spots; (3) a male with traces of orange lunules on the upper surface of the hind wings. He also exhibited a long series of *Emydia cribrum*, showing extensive variation. Mr. Harrison, a series of *Grammesia trigrammica*, including several dark varieties, approaching var. *bilinea*, from Delamere Forest. Mr. F. M. B. Carr, (1) *Dryas paphia* from the New Forest, a very fine banded *valesina* form, taken in July, 1898; (2) a dark form of the same species. Mr. Barrett, a bred series of *Cidaria truncata (russata)*, laid by a female captured at West Wickham on June 10th. All were smoky, approaching var. *perfuscata*. Mr. Merrin communicated a paper entitled "Colour in

Nature." Mr. Claude Morley, F.E.S., communicated a paper entitled "Insects and the Balance of Nature: Elementary Notes on Ichneumons."—HY. J. TURNER, *Hon. Report Sec.*

LIANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—*October 9th, 1899.*—Mr. Charles Dalmer was elected a member of the Society. Mr. Pierce read a letter from Mr. J. Williams, of Vyrnwy, on the enormous number of a Dipteron which, during the past summer, infested the lake and its neighbourhood. The President's exhibit included fine melanic forms of *Hemerophila abruptaria* and *Camptogramma bilineata*. Mr. Burgess-Sopp, *Acanthocinus ædilis*, taken at Cardiff; *Phytosus nigri-ventris*, new to the British list, taken at Hoylake; and *P. balticus* for comparison. He also briefly noted the history of *P. nigri-ventris* as a recorded British species. Mr. Crabtree exhibited and remarked upon a series of *Triphænas*, including Scotch extreme forms of *T. orbona*; also a drawer of the genus *Tæniocampa*, including the var. *gothicina* of *T. gothica*. Mr. Day showed rarities captured in the Fen and Broad districts; and a fine lot of bred insects. Mr. Tait exhibited his Monkswood captures, and gave his experiences with *Thecla pruni* and *Apatura iris*; also a description of the district. Chief among Mr. Price's exhibits were *Erebia medea*, *Agrotis tritici*, *Heliothis marginata*, and *Rhodaria sanguinalis*. Mr. Thompson exhibited *Pericallia syringaria*; and long series of Moss captures. Mr. Pierce read a note on *Thera variata* and *T. obeliscata*, and exhibited specimens. Mr. F. Birch showed *Donacia cinerea* from Hatch Mere, and remarked upon its habits and the difficulty of collecting it. Dr. Cotton showed series of *Carsia imbutata*, *Notodonta dictæoides*, and *Celæna haworthii* from Simonswood Moss. The Rev. R. Freeman exhibited an interesting case of Norfolk insects, including the beautiful *Hylophila bicolorana* (*guercana*). Mr. Tipping, series of *Erebia medea* and *Melanthia rubiginata*. Dr. Chaster, *Pyropterus affinis* from Killarney; and other Coleoptera from Southport. Dr. Cotton said that *Acherontia atropos* had been fairly common about St. Helen's this autumn.—FREDK. BIRCH, *Hon. Sec.*

KENDAL ENTOMOLOGICAL SOCIETY.—*October 9th, 1899.*—The President in the chair. In some opening remarks he recorded the attractiveness of sugar in the earlier part of the season, many long series of good insects having been taken up till August, but having failed to be of any use since then. As in other places, *Vanessa atalanta* and *Macroglossa stellatarum* had been exceptionally abundant. Exhibits:—Messrs. Holmes, fine series of *Thyatira batis*, *Diantheecia carpophaga*, *Gonoptera libatrix*, *Xylophasia subulstris*, and *Acronycta menyanthidis*, a specimen of *Agrotis præcox* (an unusual inland capture), and two fine varieties—var. *schmidti* of *Chrysophanus* (*Polyommatus*) *phleas*, and a specimen of *Gonepteryx rhamni* with an additional orange spot on each fore wing near the outer margin. Mr. Littlewood, var. of *Noctua festiva* and black form of *Boarmia repandata*. Also fine series of *Triphæna fimbria*, *Arctia plantaginis* and *Satyrus semele* (all bred). Rev. A. M. Moss, a drawer of *Geometræ*, dark northern forms of *A. runcicis*, series of *A. menyanthidis* and *Epinephele hyperanthus*, from Carlisle; also a score of newly preserved larvæ. He also reported having failed to capture a specimen of *Sphinx convolvuli* flying around tobacco plants

(*Nicotiana affinis*) on Sept. 6th near Bowness. Larvæ of *Cucullia asteris* had almost all pupated by that date, but larvæ of *Drepana falcata* and *D. laertula* had been very abundant throughout September. Messrs. Duncan, Watson, and Wilkes also made interesting exhibits.—A. M. Moss, *Hon. Sec.*

OBITUARY.

DR. ALEXANDER WALLACE died on October 1st, at his residence, St. John's Terrace, Colchester, aged seventy years. He was born in Guilford Street, Russell Square, London, and was educated at Winchester and Trinity College, Oxford, where he graduated M.A. Having passed through St. Bartholomew's Hospital with distinction and taken the M.D. degree, he held several appointments in London, and subsequently removed to Colchester, where for a period of about thirty years he practised as a consulting physician.

Dr. Wallace was at one time an ardent collector of British Lepidoptera, and was one of the first, if not actually the first, to take British examples of *Catephia alchymista*, *Micra parva*, *Nola centonalis*, *Caradrina exigua*, and some other rare species; and there are many notes from his pen in the older entomological magazines. He was a member of the Entomological Society of London for some twenty years, dating from 1858, and it is in the 'Transactions' of that Society that the most important of his papers on sericulture, a subject which greatly interested him, and upon which he was an authority, are published. In the 'Entomologist's Annual' for 1869 there is a lengthy article by him on the rise and progress of silkworm culture (other than *Bombyx mori*) in Europe, with especial reference to the British introduction and acclimatization of the then new silk-producing species.

OUR INDEX.

IN view of the requirements of students of the present day, it seems desirable that reference to the contents of entomological periodicals should be made as convenient as possible. The index of the volume of the 'Entomologist' for 1899 has therefore been prepared on a model different to that of any previous volume of this Journal. Instead of indexing the less common species only, as has been the custom in the past, we have now registered every species alluded to in our pages for the year, the species being entered alphabetically under proper headings.

We take this opportunity of expressing our grateful thanks to Messrs. Kirkaldy and Lucas for assisting us in this matter. The former has been good enough to undertake the Diptera, Hymenoptera, and Rhynchota; whilst the latter has kindly attended to the Neuroptera and Orthoptera.

It is to be hoped that the new departure will prove useful to our readers.

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OF
GENERAL ENTOMOLOGY.

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