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EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.
W. LUCAS DISTANT, F.E.S., &c.
EDWARD A. FITCH, F.L.S., F.E.S.
F. W. FROHAWK, F.E.S.
MARTIN JACOBY, F.E.S.
W. F. KIRBY, F.L.S., F.E.S.
G. W. KIRKALDY, F.E.S.
W. J. LUCAS, B.A., F.E.S.
Dr. D. SHARP, F.R.S., F.E.S., &c.
G. H. VERRALL, F.E.S.

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

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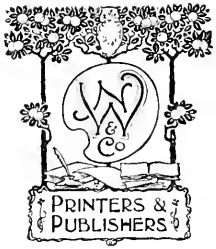
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SPECIAL INDEX.

New Genera and Species are marked with an asterisk.

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DIPTERA.

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NEUROPTERA.

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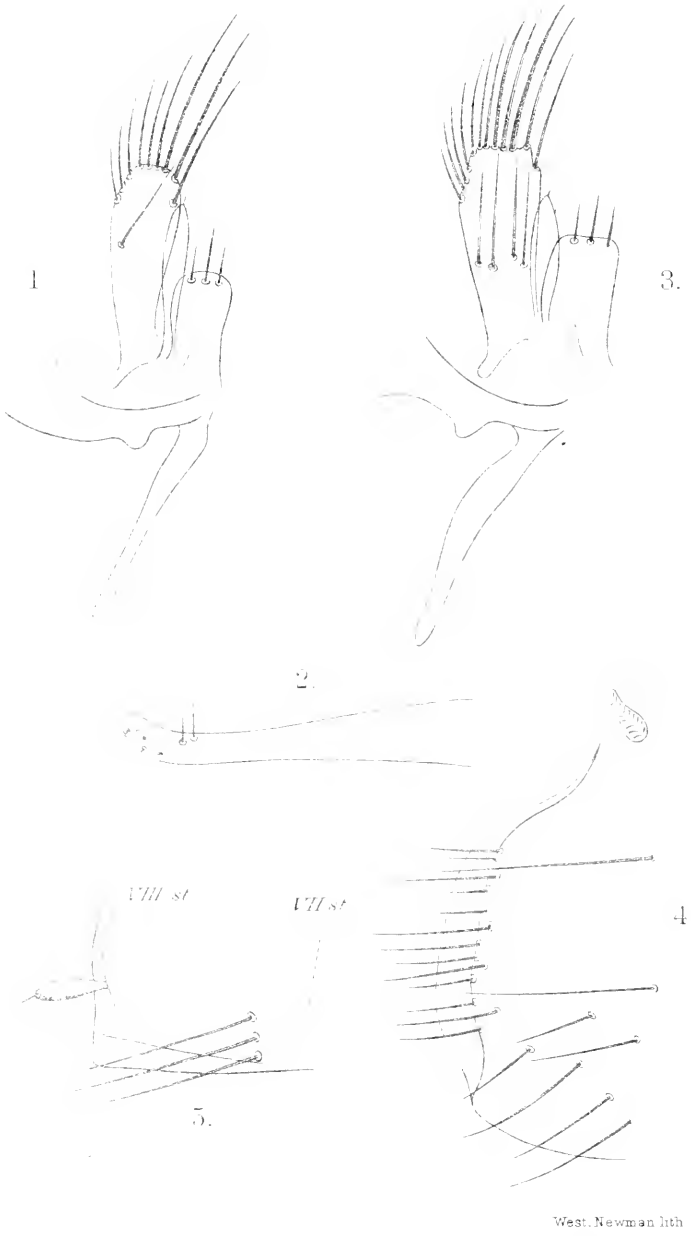

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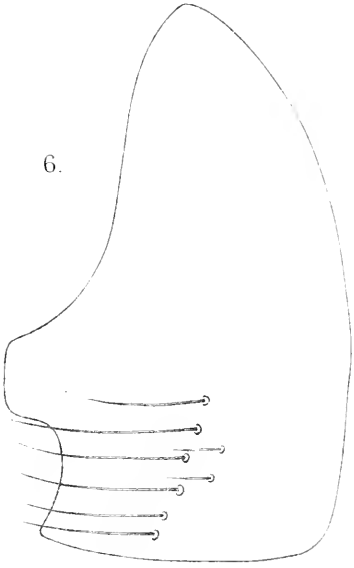
New Siphonaptera from Egypt.



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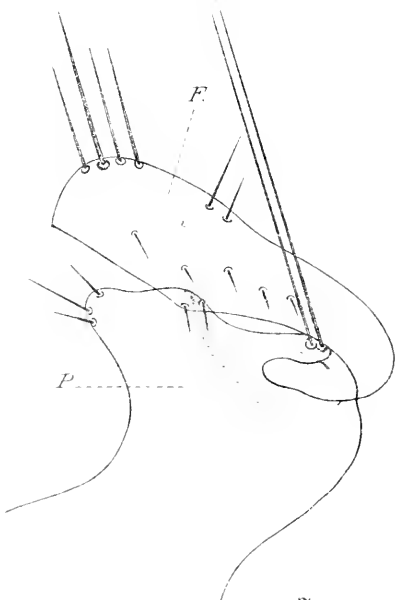

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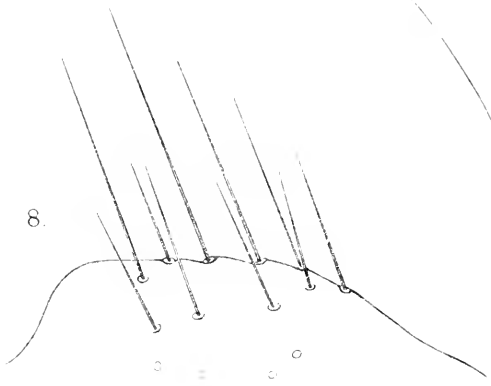

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West, Newman lith

New Siphonaptera from Egypt.

THE ENTOMOLOGIST

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NEW SPECIES OF SIPHONAPTERA FROM EGYPT.

BY THE HON. N. C. ROTHSCHILD, M.A., F.L.S.

(PLATES I. & II.).

THE four new species described in the present article were collected by the Hon. Francis R. Henley and myself on our joint expedition to the Natron Valley.*

1. PULEX MYCERINI, n. sp. (Plate I., figs. 1, 3, 4.)

The head is similar in shape to that of *P. cheopis*, and bears on its hinder portion a row of short hairs along the antennal groove. Above this row, situated in the middle, there is one long bristle. The row of bristles standing before the apical edge of the head is incomplete, the lowest bristle, which is very long, being separated from the one above it by a large interspace. Between this long bristle and the row of short hairs there is one short bristle. The mesothoracic epimerum bears three bristles, one below the middle near the suture which separates the epimerum from the episternum, the second near the upper hinder corner, and the third close to the stigma. The metathoracic epimerum bears one bristle beneath the stigma, and in addition a proximal row of three or four, and an apical row of three bristles. The three thoracical tergites and the second to seventh abdominal ones bear each a single row of bristles, while the first abdominal tergite bears a few hairs in the middle, as is the case in the allied species. In the male the first abdominal sternite bears one hair on each side, the second to the sixth two, and the seventh two or three. In the female the first abdominal sternite bears one hair on each side, the second to sixth three, and the seventh four. The hind coxa bears two bristles at the hinder edge near the apex. The hind femur is not angulate beneath; it bears on the inner side a row of from five to seven bristles, and on the outer side ventrally near the apex two bristles. In one of

* For further reference to this Expedition, and the hosts from which these specimens were collected, *cf.* Nov. Zool. vol. x. pp. 279–285 (1903).

the females there are two bristles on one and three on the other femur. The hind tibia bears, besides the apical and dorsal paired bristles, only one row of hairs on the outer side, there being no hairs on the inner and ventral surfaces. The long apical bristles of the fore tibia reaches to the apex of the second tarsal segment, or a little beyond it. The fourth segment of the fore tarsus is nearly twice as broad as it is long. The fourth segment of the hind tarsus is short, being only a little longer than it is apically broad. The first hind tarsal segment bears externally on the ventral surface a row of two, three, or four long hairs. The second hind tarsal segment bears at the apex on the outer side (hinder side on slide) two long bristles, of which the longer one reaches to the claw, while the second extends beyond the middle of the fifth segment. The fifth segment of all the tarsi bears on the ventral surface at the apex only two bristles instead of three, the external one being absent, as is the case in several species of this group of *Pulex*. The eighth sternite of the male bears on each side a single bristle beyond the middle, and another close to the apex. The clasper bears (fig. 1) three processes, as shown in the figure. The uppermost is the largest, being widest near the rounded apex. The process bears at the apical edge a number of bristles, of which the second, counted from the ventral side, is the longest. The second process is very slender, while the third is short and broad, being nearly square. The manubrium is very slender. The ninth sternite is elongate (fig. 2), finger-shaped, bearing subdorsally before the apex two hairs placed close together, and several shorter hairs ventrally at and near the apex. The internal plate of the penis is similar to that of *P. nubicus*,* being ventrally at the apex more evenly curved than in the specimen of *P. nubicus*, from which the figure was taken. The penis bears apically a conical structure which is clothed with short hairs. The ninth tergite of the male bears internally above the manubrium a short projection, which is more distinct than in the allied species (*P. nubicus*, *P. pallidus*, &c.). The eighth abdominal tergite of the female does not bear any hairs above the stigma (fig. 4). The apical margin is broad, rounded, and ventrally sinuate. There is a series of seven or eight bristles near the edge, the uppermost standing ventrally of the first apical bristle. This row is continued ventrally by three or four more long bristles, as shown in the figure. On the lateral surface there is one long solitary bristle on a level with the first apical one, and two more bristles further down, the second of these being a little more ventral than the last apical one. The so-called pygidium is a little longer than broad in side view. Length : ♂, 1·5 mm.; ♀, 2·4 mm.

Three males and five females were secured in March, 1903, at Bir Victoria, from *Gerbillus tarabuli*, and one male, at the same locality and at the same time, from *Pachyuromys dupresi natronensis*.

2. Pulex ramesis, n. sp. (Plate I., fig. 2.)

This species is very closely allied to *P. mycerini*, but differs in the sexual apparatus of the male, and in the legs of both the male and

* Ent. Mo. Mag. (2) xiv. p. 84, t. 2, f. 10, 16 (1903).

female. The hind tibia of the present species bears one, two, or three pairs of hairs at the ventral (anterior) edge, besides the ordinary subapical pair of bristles. The fourth segment of the fore tarsus is not as broad as in *mycerini*, being only one-third broader than it is long. The fourth segment of the hind tarsus is decidedly longer than in *mycerini*, being nearly twice as long as it is broad. The second hind tarsal segment is in the present species longer than in *mycerini*, the proportions between the first and second segments being in *mycerini* 29:20, while in the present species they are 28:23. The longest dorsal apical bristle of the first hind tarsal segment does not reach the third segment, and the two long apical dorsal bristles of the second segment are also somewhat shorter than in *mycerini*. In the male the clasper (fig. 3) has three processes as in *mycerini*, but the upper process is larger, being truncate, and bearing a number of rather stout bristles at the apical margin, and a belt of bristles in the middle, as shown in the figure. The conical hairy structure at the end of the penis is much longer than in *mycerini*. The eighth tergite of the female resembles that of *mycerini*. In the type (male) the eighth abdominal sternite bears on each side in the middle several hairs instead of one only. Length: ♂, 1·5 mm.; ♀, 2–2·2 mm.

Four males and four females were secured in March, 1903, at Bir Victoria, from *Pachyuromys dupresi natronensis*, and five females from *Gerbillus tarabuli*.

3. Pulex pyramidis, n. sp.

This species is very closely allied to *P. cleopatræ*. In size it is much larger, and the comb on the hind coxa consists of fourteen spines. The abdominal sternites of the female bear five hairs only, and the long apical bristle of the second segment of the hind tarsus reaches only a little beyond the middle of the fifth segment.

A single female specimen was secured at Bir Victoria on the 9th March, 1903, from *Jaculus jaculus*.

4. Ceratophyllus henleyi,* n. sp. (Plate I., fig. 5; Plate II., figs. 6, 7, 8.)

The head is similar in shape to that of *C. fasciatus*. There is a row of three long bristles in front of the eye, but no long bristles further forward. On the hinder part of the head there are three round pale spots, which are similar to the pale spots situated along the frontal edge of the head, the first being subdorsal, and the other two post-median and lateral. Below the lower spot there is one single long hair, there being no other long hairs on the side on the posterior part of the head, apart from some along the hinder edge. The pronotal comb consists of nineteen or twenty teeth. The mesonotum bears on each side five to seven long thin hair-like spines, which are situated between the row of long bristles and the apex. The epimerum of the mesonotum is provided with a bristle near the anterior ventral corner, another further upwards before the middle, a third on a level

* This species is named in honour of the Hon. Francis R. Henley.

with this near the apex, and two more near the stigma. The metanotum bears two heavy obtuse apical spines on each side. The epimerum of the metathorax bears a vertical row of from two to four hairs near the base, three hairs from the stigma downwards, and one at the apex. The first and second abdominal tergites have one or two, and the third one short stout apical spine. The abdominal tergites bear two rows of hairs, the anterior one being restricted in the male to the dorsal side of the segment. The stigma of the middle segments is somewhat anterior to the first row of hairs. The seventh tergite of the male bears one very long apical bristle. Below this there is a very short but rather stout hair, and above the bristle there is another stout hair, which is not quite so long as the sensory plate (pygidium). In the female the seventh tergite bears two long bristles, and above them a short one. Abdominal sternites two to seven bear on each side in the male two to four hairs, in the female three to five, besides a few very short ones. The hind femur bears on the inner side six or seven hairs. There are also several hairs on the mid femur. The hind tibia is on the outer side furnished with a row of hairs situated near the dorsal bristles, and with a row of four further towards the ventral side. On the ventral edge (anterior in the slide) there are two or three pairs of thin bristles. The longest apical dorsal bristle of the fore tibia reaches nearly to the apex of the second tarsal segment, and the longest ventral spine to the base of the same segment. Both the ventral and dorsal long apical bristle of the second hind tarsal segment reach to the base of the fifth. The fourth segment of the fore tarsus is very short and broad. The eighth abdominal tergite of the male bears between the stigma and the hinder vertical edge a number of long bristles, which are placed as shown in the figure (fig. 8). The eighth sternite of the male (fig. 5) is very small, and has at the apex on each side an elongate process (A), which bears a bristle at the end. The process (P) of the clasper bears three hairs at the top. The finger (F) is (on the anterior side) straight from the apex to near the middle. On the hinder (ventral) side there are four hairs at the apex and two small ones above the middle. The ninth sternite of the male is shaped as in *londiniensis* and *fasciatus*, being ventrally deeply sinuate. Proximally of the sinus there are two rather stout spine-like bristles besides two hairs. The distal portion of the ninth sternite is covered with very short spine-like hairs. The seventh sternite of the female (fig. 6) is ventrally sinuate on each side, the lobe above the sinus being truncate. The eighth tergite of the female bears two long bristles below the stigma, and the process articulated with the anal segment is almost conical in shape, and nearly three times as long as it is broad. Length: ♂, 3·2 mm.; ♀, 2·4 mm.

One male and four females were secured at Bir Victoria in March, 1903, from *Gerbillus tarabuli* and *Pachyuromys dupresi natronensis*.

SOME BEES FROM SAN MIGUEL COUNTY, NEW MEXICO.

By T. D. A. Cockerell.

Sphecodes veganus, n. sp.

♀. Length about 9½ mm.; head, thorax, legs, and antennæ black, the flagellum very faintly brownish apically, spurs rather light ferruginous; abdomen of ordinary form, bright ferruginous or chestnut-red, shining, the fifth segment hairy, black, slightly reddish basally. Mandibles stout, black stained with dark red, with a blunt inner tooth; labrum with a broad low transverse punctate ridge, not at all emarginate; antennæ with fourth joint short, broader than long; flagellum stout; face broad, covered with white hair; clypeus with very large strong punctures, averaging closer together than the diameter of one; front with close strong punctures; mesothorax shining, with strong and rather close punctures (closer than in *S. arvensis*), median and parapsidal grooves distinct; metathorax with the enclosure large, semilunar, distinct, with very strong vermiform longitudinal rugæ, partly connected by small transverse ones; sides of metathorax coarsely rugose; tegulæ large, pale testaceous with a dark spot; wings faintly dusky, stigma and nervures black or almost so; second submarginal cell very narrow; first longer than in *arvensis;* first abdominal segment with very sparse punctures on a shining ground; second and following segments with minute close punctures, except on the apical margins.

Hab. Las Vegas, New Mexico, September. This and the next species are superficially like *S. arvensis*, but are distinguished by many characters. The fine close punctures of the abdomen of *S. veganus* are very distinctive.

Sphecodes pecosensis, n. sp.

♀. Length slightly over 8 mm.; head, thorax, legs, and antennæ black, the flagellum longer than in *S. veganus;* spurs rufo-fuscous; abdomen of ordinary form, shining, bright chestnut-red, the fifth segment only slightly dusky at apex. Mandibles reddish only at tips, with a divergent inner tooth; labrum with a strong transverse ridge, not emarginate; antennæ with the fourth joint somewhat longer than broad, much longer than the third; face broad, rather thinly pubescent; clypeus with extremely large, almost confluent punctures; a raised vertical line between antennæ; front extremely densely punctured; a small transverse ridge behind ocelli; mesothorax with large confluent punctures all over, giving it a very rough (though not dull) appearance; median groove scarcely indicated; scutellum with sparse punctures on a shining ground; enclosure of metathorax semilunar but ill-defined, with very strong straight longitudinal rugæ, as Sichel describes for *S. metathoracicus*, only in our species the metathorax outside of the enclosure is coarsely cancellate; tegulæ with the anterior border hyaline, then a large black spot, and behind that ferruginous; wings dusky; stigma and nervures black or almost; second submarginal cell narrowed above; first and second abdominal segments

with very sparse punctures on a shining ground (closer at sides of second); third and fourth with closer, but by no means dense, punctures. The eyes are narrower than in *S. veganus*.

Hab. Pecos, New Mexico, June 25th, 1903 (*W. P. Cockerell*). The altitude of Pecos is about 6700 ft.

Colletes gilensis, Ckll.

Pecos, Aug. 7th, a female at flowers of *Melilotus alba* (*W. P. Cockerell*). In Europe the same plant is visited by *Colletes fodiens*, as is recorded by Loew.

Halictus ruidosensis, Ckll.

Pecos; two females at flowers of *Castilleia integra*, June 26th (*M. Grabham*). The usual visitor of this plant is *H. ovaliceps*.

Halictus clematisellus, Ckll.

Pecos; both sexes common on *Petalostemon oligophyllus*, Aug. 12th (*W. P. Cockerell*). Previously taken only on *Clematis*.

Andrena mellea, Cresson.

Pecos, rather common; taken in June at flowers of *Fallugia acuminata* (*Fallugia paradoxa* var. *acuminata*, Wooton, Bull. Torrey Bot. Club, 1898, p. 306). At Glorieta (Sta. Fé County) a female was taken in a flower of *Argemone intermedia*, August 23rd.

Andrena prunorum, Ckll.

Pecos; at flowers of *Fallugia*, June 24th (*W. P. Cockerell*).

Perdita affinis, Cresson.

Pecos; both sexes at flowers of *Grindelia inornata*, Aug. 24th (*W. P. Cockerell*). At Glorieta my wife took it on *Chrysopsis villosa*.

Perdita stottleri, Ckll.

♂. About 5 mm. long; similar to *P. townsendi*, but smaller, with the fifth black band on abdomen wanting, or represented by a mere shaded line.

The species was described from a single female taken on *Bigelovia*. It proves to be really a species of *Gutierrezia sarothræ*, which it visits in great numbers at Pecos, New Mexico, during the last half of August. Its rediscovery is due to my wife.

Perdita chrysophila, Ckll.

A male was taken at Pecos, New Mexico, at flowers of *Picradenia floribunda*, Aug. 21st, 1903 (*W. P. Cockerell*). It is a little smaller than the only specimen previously known, and the metallic tints of the head and thorax are dark blue, not at all green.

Melecta interrupta, Cresson.

Pecos; at flowers of *Fallugia*, June 27th (*M. Grabham*).

Anthidium porteræ, Ckll., var. *amabile*, n. var.

♂. Abdomen with the ground colour red instead of black; the yellow markings rather more developed, the abdominal bands very little, some not, interrupted in the middle line. A very beautiful variation, but in no sense a subspecies.

Hab. Pecos, New Mexico, Aug. 29th, 1903.

Megachile emoryi, n. sp.

♀. Length 18 mm.; black, with the pubescence arranged as in *M. latimanus*, but entirely orange; the dorsum of thorax, except at sides, bare, and as closely punctured as is possible throughout. This looks like a gigantic *M. latimanus*, but in addition to its large size it offers the following differences: pubescence more highly coloured; mandibles with the broad cutting edge presenting low crenulations in place of distinct teeth; sides of vertex more closely punctured; eyes in life black, with a broad green central band; tegulæ dark brown, with extremely close but shallow punctures; wings yellowish grey. From *M. sapellonis*, which resembles it in size, *M. emoryi* is easily known by the straight and simple anterior edge of clypeus, orange abdominal hair-bands, and extremely broad basal joint of hind tarsi.

Hab. Pecos, New Mexico, on Kinkale Ranch, Aug. 31st, 1903. It visits the flowers of the larger yellow-rayed Compositæ. Named after Lieut. Emory, who published an early account of the region it inhabits.

Megachile sapellonis, Ckll.

Pecos, Aug. 31st; female. Eyes in life entirely black.

Megachile wootoni, Ckll.

Pecos, Aug. 31st; female. Eyes in life entirely black. The specimen has black hair on vertex and mesothorax, breaking down the distinction between *wootoni* and *calogaster*.

Megachile monardarum, Ckll.

Pecos; male at flowers of *Thelesperma gracile*, Aug. 7th (*W. P. Cockerell*); both sexes, Aug. 31st. This is the American representative of *M. willughbiella*, and in the male I cannot distinguish it from that species (*cf.* 'Psyche,' 1901, p. 283). Mr. Viereck (Tr. Am. Ent. Soc. 1902, p. 48) has declared this species to be identical with *M. vidua*, Smith. This is quite erroneous; *M. vidua* is the American representative of *M. maritima*. *M. monardarum* has the eyes in life entirely black in the female; but sea-green, with the anterior margin broadly, the posterior margin narrowly, and the upper third or fourth, black, in the male.

Megachile latimanus, Say.

Pecos; female at flowers of *Thelesperma gracile*, Aug. 7th (*W. P. Cockerell*). Eyes in life black, with a rather obscure greyish median band.

Megachile sayi, Cresson.

Pecos, Aug. 31st; male. Eyes in life black, the lower half strongly shaded with green.

Megachile cleomis, Ckll.

Pecos, Aug. 31st; three males. Eyes in life green in middle, black at sides. The length of the last antennal joint and of the second submarginal cell are variable, and sometimes the disc of thorax shows much black hair; it is possible that two or three species are included in my present conception of *cleomis*, but at present I cannot satisfactorily separate them.

Melissodes sphæralceæ, Ckll.

Pecos, August; common. Visits flowers of *Sphæralcea fendleri*. My wife has found it nesting in the ground; the entrance of the nest is without any structure such as is built by *Anthophora* and *Diadasia*. In life the eyes of the female are a beautiful grey-blue.

Melissodes obliqua, Say.

Pecos, Aug. 31st; female. Eyes in life very dark purplish, nearly black.

Melissodes pallidicincta, Ckll.

Pecos, June 12th. Dr. M. Grabham took a female of this and one of *Dianthidium parvum* asleep in *Pentstemon* flowers, in rainy weather.

Anthophora cleomis, Ckll.

Pecos, Aug. 31st; female. Eyes in life sea-green, blackish in front and on hind border.

Anthophora montana, Cresson.

Pecos, Aug. 31st; female at flowers of *Salvia lanceolata*. Eyes in life grey-blue, faintly purplish in front and on hind margin.

Bombus iridis, Ckll. and Porter.

Pecos; at flowers of *Fallugia*, June 24th (*W. P. Cockerell*).

Bombus sonorus, Say.

Pecos, Aug. 31st. The specimen has the bright yellow pubescence of *sonorus*, but differs in having the hair on the pleura partly yellow and partly black.

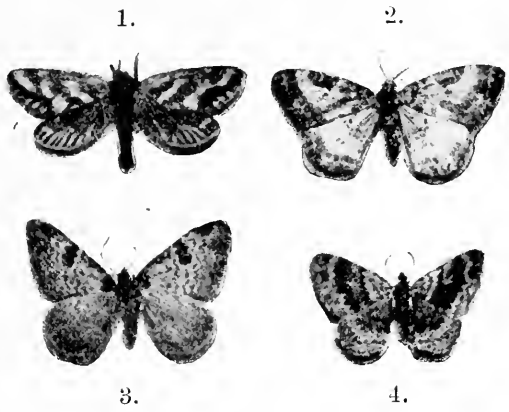
It seems advisable here to make some statement regarding the species of *Oxæa*, *Nomia*, &c., which Mr. Cameron has de-

scribed (Trans. Am. Ent. Soc.), purporting to come from the region about Santa Fé, New Mexico. The character of the species is Mexican, and I am quite confident that the locality assigned is entirely wrong. I wrote Mr. Cameron about it, and he kindly informed me that the material was collected years ago by a person who was known to have visited the Santa Fé region, but who might very well have obtained the insects elsewhere. The collection included some species of *Bombus* which might have come from near Santa Fé.

Colorado Springs, Colorado.

SOME ABERRATIONS OF COMMON MOTHS.

By Francis E. Woodbridge.



1. *Hepialus hectus.*—Male taken at Dunkeld in June, 1900. The markings on the fore wings are rather broader than usual, and there is a row of golden yellow spots along the hind margin between the nervules, increasing in size towards the hinder angle. The hind wings are beautifully dashed with golden yellow along the hind margin between the nervules, with a golden yellow blotch near the apex, and a similarly coloured dot near the costa. The photo shows the markings exactly.

2. *Melanippe rivata.*—Female taken at Uxbridge some years ago. The central band on the fore wings is reduced to a blotch on the costa, and towards the hinder angle there is a dusky cloud extending from the band on the hind marginal area across the usual white stripe towards where the central band should have been. Hind wings normal.

3. *Melanippe fluctuata.*—Female taken at Uxbridge in May, 1903. The blotch near the apex rather more flattened than

usual and somewhat suffused at the edges. The central blotch narrowed to a thin neck on the costa, then widening into a kidney-shaped blotch narrowed in the middle and flattened at the end, somewhat suffused. The wavy lines are somewhat thicker and more distinct than usual. Hind wings rather dark.

4. *Coremia ferrugata.*—Female taken at Throwleigh (Dartmoor) in August, 1901. This specimen, taken at a height of nearly 1,000 feet, shows distinct traces of melanism. The central band of the forewings is blackish, with distinct black edges on either side, rather suffused. The hind wings blackish from the middle to the base, with very few wavy lines. The photo shows the black marking on the hind wings fairly well, and also the black edgings to the central band on the fore wings.

CURRENT NOTES.

By G. W. Kirkaldy.

(Continued from vol. xxxvi. p. 315.)

These notes are intended, not only to afford references to recently published monographs, revisions, &c., but to call attention to stray notices which might otherwise be long overlooked.

Rudolph. I. Geare, 1902: "A list of the Publications of the United States National Museum" (Bul. U.S. Nat. Mus. 51, pp. 1–168 & i–vii). This useful annotated catalogue enumerates 21 annual reports, containing 122 papers, 23 volumes of proceedings (embracing 1240 papers, 50 bulletins, 4 special bulletins), and 50 circulars, the whole comprising (on a rough calculation) 52,000 pages, 3800 plates, and 5700 text-figures, a magnificent result for a quarter of a century.

T. D. A. Cockerell, 1903: "Two Orchids from New Mexico" (Torreya iii., pp. 139–140). The Aphid *Macrosiphum corallorhizæ*, Cockerell, is mentioned as occurring on *Corallorhiza vreelandii*, Rydberg.

T. D. A. Cockerell, 1903: "New Bees from Southern California and other records" (Bul. South. Calif. Ac. Sci. ii., pp. 84–5). Two new species of the bee-genus *Halictus*, and a new, almost black var. of the Cimicid *Murgantia histrionica* are described, with locality notes on some Diptera, Rhynchota, and Crustacea.

E. G. Lodeman, 1902: "The Spraying of Plants" (The Macmillan Co., New York, pp. i–xvii & 1–399, text-figs. 1–92, and frontispiece (portrait of Millardet)). This little work, now reprinted four times, is invaluable to the horticulturist and to everyone interested in economic entomology. The first chapter

deals with the early history of liquid applications; the second to spraying in "foreign countries"; the third to spraying in America; the fourth to materials and formulas; the fifth to machinery, &c.; the sixth to the action of insecticides and fungicides. Part 2 contains specific directions for spraying cultivated plants, and there is an appendix dealing with laws regarding spraying and the metric system.

P. Boname, 1902: "Les Borers de la Canne à Sucre. Insecticides et Fungicides" (Bul. Sta. Agron., Colony of Mauritius, no. 7, pp. 1–28). [Lepidoptera.] A consideration of *Diatræa striatalis* and *D. saccharalis*, their parasites, and remedies against their depredations.

W. E. Britton, 1903: "Second Rep. State Entom." (Rep. Connecticut Agr. Exper. Sta. for 1902, pp. 99–178 & i–x, pls. 1–15, text-figs. 1–19). The greater part of the report is concerned with the San Jose Scale (*Aspidiotus perniciosus*), pp. 114–38; the Apple-tree Tent Caterpillar (*Clisiocampa americana*), pp. 139–48; and the Whitefly (*Aleyrodes vaporariorum?*), pp. 148–63, the notices of the latter being especially useful.

Vernon L. Kellogg, 1903: "The Net-winged Midges (Blepharoceridæ) of North America" (Proc. Calif. Acad. Sci. (3) iii. Zool., pp. 187–232, pls. 18–22). [Diptera.] A valuable contribution to our knowledge of this interesting family, especially in the notices of the immature stages. The author points out that the life-history of no Blepharocerid is fully known, the first eggs of any species being yet to be found; the food-habits of the male are also unknown.

G. Compere, 1903: "In search for Parasites" (Journ. Dept. Agric. Western Australia, viii, pp. 132–45). Report of a tour round the world in search of a parasite of the Fruit-fly (*Ceratitis capitata*) and other insects, and discussion of parasitic insects *v.* spraying.

J. M. Stedman, 1903: "Hessian Fly in Missouri (*Cecidomyia destructor*, Say)" (Bul. Coll. Agric. Univ. Missouri, no. 62, pp. 129–49). [Diptera.]

S. Sawamura, 1902: Investigations on the digestive enzymes of some Lepidoptera (Bul. Coll. Agric. Tokyo Imp. Univ. Japan, iv, pp. 337–47). Though the expanded part of the intestine in Lepidoptera is commonly called the stomach, its physiological function resembles rather that of the intestines of Vertebrata. There is no part of the intestines in Lepidoptera comparable with the stomach of Vertebrata, since no genuine acid gastric juice exists in them.

Arthur M. Lea, 1903: Remedies for Insect and Fungus Pests of the Orchard and Farm (2nd edition). (Dep. Agriculture, Tasmania, pp. 1–54; text-figs.) A popular account of the Orchard and Farm Pests of Tasmania.

W. S. Blatchley, 1903: "The Orthoptera of Indiana" (27th

Ann. Rep. Dept. Geology, Indiana, for 1902, pp. 123–471 ; one coloured plate and many text-figs.). A somewhat popular account of the Orthoptera of Indiana, treated in a very full and clear manner, accompanied by notices of their natural enemies, a bibliography, and analytical keys; the accounts of habits and geographical distribution are very interesting, especially the consideration of the life-zones of the State as exemplified by the distribution of the present order. There is a fine coloured plate of the remarkable pink variety of *Amblycorypha oblongifolia*.

Ed. J. Kyle & Edward C. Green, 1903 : "The Tomato" (Bul. Texas Agric. Exp. Sta. 65, pp. 1–31). The Rhynchoton *Dicyphus saparatus*, Uhler, is noted as a new tomato insect causing serious injury in Texas.

(To be continued.)

NEW CULICIDÆ FROM THE FEDERATED MALAY STATES.

By Fred. V. Theobald, M.A.

A collection of twenty-three specimens of Culicidæ recently sent to me by Dr. Leicester, taken and bred by him in and near Kuala Lumpur, contains ten new species and six new genera. Two other species were sent, namely, *Stegomyia nivea*, Ludlow, and *Myzomyia albirostris*, Theobald, previously known, the former from the Philippine Islands, the latter from Malay.

The descriptions of most of these species have been sent me, drawn up by Dr. Leicester, from fresh specimens, with great care. These descriptions are reproduced here in inverted commas, showing that Dr. Leicester is the describer of the species and not myself, but I have added a few notes on each species. I have proposed six new genera, one named after Dr. Leicester. Most are jungle-living species, and this probably accounts for the novelties in the collection, as the majority of collections so far made have been in and around human habitations. Besides the six new genera, there is a new *Melanoconion*, Theob., three new *Toxorhynchites*, Theob., and a new *Catageiomyia*, Theob. I believe Dr. Leicester has notes on the larvæ of these species to be described elsewhere. I wish it clearly to be understood that the new species, except *Toxorhynchites leicesteri*, *Scutomyia albolineata*, and *Leicesteria longipalpis*, are on the authority of Dr. Leicester. The types are deposited in the British Museum (Nat. Hist.).

ANOPHELINA.

Genus Lophoscelomyia, nov. gen.

Head with upright forked scales, and some narrow-curved ones; palpi densely scaled in both sexes, most so in the male; thorax with

very long curved hair-like scales. Prothoracic lobes large, with a tuft of black spatulate scales on the anterior face, and with black bristles. Abdomen with hairs only, except the last two segments, which have lanceolate scales. Hind legs with a dense tuft of outstanding scales on the apex of the femora. Wings clothed with broadish blunt lanceolate scales.

This genus approaches *Nyssorhynchus*, Theob., but differs in having long, curved hair-like scales on the thorax instead of narrow-curved and spindle-shaped ones. The dense apical tufts on the hind femora are very marked in both sexes.

So far I have seen no Anopheline approaching it in general appearance. Possibly others will be found in jungle growth.

A single species only is known, and is here described by Dr. Leicester.

The female type is, unfortunately, broken in transit.

LOPHOSCELOMYIA ASIATICA, Leicester, sp. n.

"Hind legs with the femora with a dense apical tuft of long black and white scales. Wings with two yellow costal spots. Tarsi unbanded.

"♀. Head black, frosted, when dry dark brown; the scales are arranged in tufts, and bare places are left between; it is rather lighter along the orbital margins, giving the appearance, under a hand lens, of a narrow white margin to the eyes; on the vertex is a tuft of long, silky hair-like scales, with a double curve on them which project well forwards; behind these are a few white narrow-curved scales placed on either side of a bare black line and extending but a small way back and laterally for a short distance down the orbital margins; behind these are some flat-topped white upright scales which merge behind into a dense mass of black (when dry, brown) upright scales extending laterally over the occiput to just short of the eyes, from which they are separated by a bare space. I can perceive no flat scales anywhere. There are a few black narrow-curved scales succeeding the white along the orbital margin. The eyes are a metallic bronzy-green. Antennæ with the basal joint dusky, its depression brown, some rather broadly spindle-shaped white scales on its inner face; the second joint light brown, some black spindle-shaped scales on its inner face, succeeding joints similar but without scales; all the joints except the basal one covered with short white hair; verticillate hairs pale brown. Palpi equal in length to proboscis; pallid, covered with long black scales, a few pale ones at the junction of the third and fourth joints, and some pallid hairs at the tip (best seen with a hand lens). Proboscis covered with black short scales; labellæ fawn-coloured. Mesonotum with the greater part of the upper surface of a pale fawn colour (in some lights it has a greenish tinge) with a dark brown line in the centre in front; on either side there are two dark brown patches separated by a narrow pale line. Looked at sideways these patches look lighter except for a small round dark spot at the upper part of pale line separating the two patches. In front is a rosette of fairly broad curved scales, white in colour; the rest of the mesonotum is covered with scattered pale golden hair-like curved scales (white in

some lights) and pale golden bristles. Prothoracic lobes elongated forwards but not mamillated; a tuft of black spatulate scales placed on their anterior superior face, and there are also some black bristles. Scutellum with the central part dark brown, black under a hand lens; lateral portions same colour as mesonotum; a few pallid curved hair-like scales are scattered irregularly over it, and the bristles are brown in colour. Metanotum the same colour as the mesothorax, with a dark brown central stripe. Wings with the costa black scaled, except for two yellow scaled spots involving the first longitudinal, and the second spot involves the upper branch of second longitudinal. The first spot is placed rather more than half way from base of the costa, the second just before the apex of the wing. There are two patches of black scales, one at base of second long vein, and the other at base of third and at base of the fourth. There is a light scaled area on the lower branch of second longitudinal. The first sub-marginal cell longer and narrower than the second-posterior cell with its base nearer the base of the wing (cross-veins cannot be made out). All the rest of the veins clothed with black scales. Fringe black except opposite the yellow apical spot, where it is golden yellow. Pleuræ dark brown, marked with pallid lines. Legs with coxæ pallid; fore-legs clothed with black spindle-shaped scales with a purplish hue in some lights; knee-spot pale, and a few pale scales at junction of tibia and metatarsus. Mid-legs the same as the front, except for a conspicuous patch of white scales on the dorsum of the femora just before the apex. Hind-legs have a little before the apex of femora a dense tuft of lanceolate scales which stand out on either sides conspicuously; where this ends the femora become snowy white, and similar long scales, snowy white in colour, project from either side. There is no banding of the tarsi. Fore and mid ungues equal and simple. Abdomen has the dorsum greenish-yellow except segment four, which is dark brown; there are numerous pale golden hairs; on the last two segments there are numerous golden brown and dark brown lanceolate scales. The apices of the segments are slightly darker than the bases.

"♂. Head muddy brown when fresh (dark brown when dry); between the eyes is a triangular space bordered on either margin by white narrow-curved and more to the front by long silky white hair-like scales, which cross and project forwards over the face; behind this space are a number of white spatulate scales standing upright like palisades; the ends are not forked; passing backwards towards the nape and also laterally is a dense tuft of upright scales which become darker and darker the further back they are placed. Antennæ with the basal joint dark brown, succeeding joints dirty white at the base, yellowish at the apex, plumes pale tawny brown. Palpi long, black scales at the base on their outer sides; dark brown scales over the whole of the apparent first joint, except for a ring of pale scales about its middle; a ring of yellowish scales at the junction of the penultimate and antepenultimate joints; upper surface of apical half of penultimate joint scaled with yellowish scales and all the terminal joint except for a patch of black scales near its base. Proboscis uniform. Thorax pale fawn brown; a median dark line and lateral dark brown patches; on the anterior margin is a rosette of long narrow-curved white scales; hair-like golden bristles arranged in

lines are distributed over it; there is a dark spot in front of scutellum. Wings with the costal spots much paler yellow than in the female; the first spot is very long, and commences fully two-thirds from the base of the costa; the second spot is small, and near the apex both involve the costa to first longitudinal, the second involving also the upper branch of second long vein. At the base of the second long vein is a distinct patch of black scales, and a few are scattered along the course of this vein. There is another patch at the base of the third vein, and another near the base of fourth, and a very few along the course of the vein. Besides these and the scaling on the costa and subcosta and first long vein there are no other dark scales on the wing. In the feathering of the hind legs and the markings of the legs generally it resembles the female. Abdomen as in the female."—(Leicester). Length 4 mm., male; 4·3 mm., female.

Observations—This species was taken in Ambang Jungle, six miles from Kuala Lumpur, on the 27th of June. It is a very distinct small Anopheline, the hind femoral tuft alone distinguishing it, and the wings have five noticeable black spots, four prominent and true distinct yellow costal spots. The specimen sent by Dr. Leicester is in the British Museum (Nat. Hist.) Collection (deposited).—F. V. T.

(To be continued.)

NOTES AND OBSERVATIONS.

In a letter from our colleague, Mr. W. G. Kirkaldy—who holds an appointment in the Department of Agriculture and Forestry at Honolulu—he mentions having seen ten species of butterflies, among them being *Pieris rapæ*, *Pyrameis cardui*, *P. atalanta*, *Lampides boeticus*, and *Anosia archippus*. *P. rapæ* has probably been accidentally imported, and two species of Lycænidæ have been introduced for experimental purposes.

Although the insect fauna of the Hawaiian islands has been pretty closely investigated, there still remains considerable scope for further research, especially as regards the important matters of life-histories, distribution, &c.

Cross-pairing of Zygæna trifolii and Z. filipendulæ.—At the end of July last, while investigating the lepidopterous fauna of the Weybridge district, I came upon a colony of *Z. filipendulæ* on some marshy ground. Among the specimens were several fine examples of a form exactly identical with *hippocrepidis*, Steph., which occurs in May and June in meadows at Northwood, and to which reference has previously been made (Entom. xxx. 181). Flying with the *filipendulæ* were a few males of *Z. trifolii*; but still more interesting was the discovery of no less than four crossed pairs of *trifolii* and *filipendulæ*, the males in each case being referable to the first named. Some little

distance farther on the breeding-ground of *trifolii* was found, but no *filipendulæ* were there.

All the available specimens on the *filipendulæ* ground were carefully examined, with the result that a very instructive series was obtained. Besides the *hippocrepidis* there were several examples so very like *trifolii* that one could readily suppose them to be six-spotted specimens of that species; indeed, if they had occurred on the *trifolii* ground such a conclusion would have been very natural; as, however, they were only found in the *filipendulæ* camp, the probability seems to be that they, and perhaps also *hippocrepidis*, are the progeny of cross-pairings.

In the Middlesex locality, where the two species occurred in close proximity in May and June, I often looked for cross pairs on the *trifolii* ground, but without success. The *filipendulæ* colony there was in a less favourable situation for observation, and therefore was not so closely examined; if this could have been done, some instances of crossing might have been detected.

I may mention that only two of the cross-pairs were taken, and one of these was given to Mr. Carr. Each of the females deposited ova, and the larvæ hatched in due course. I believe that every egg in my batch hatched, but, unfortunately, there has been great mortality among the larvæ, so that at the present time there are less than a score remaining. It is to be hoped that Mr. Carr may be able to get his larvæ through to the perfect state, as the result ought to help us to clear up some of the doubt concerning the status of *hippocrepidis*, Steph. So far as one can see at present there does not appear to be any sufficient reason to consider it a species, or even a subspecies.—Richard South.

Xylophasia zollikoferi, Frey., in Britain.—Mr. T. Ashton Lofthouse (Ent. Mo. Mag. (2) xiv. 290, and 'The Naturalist,' no. 563, p. 456) records the capture of a specimen of this species at Linthorpe, Middlesbrough. It was taken at sugar on Sept. 26th last. So far as we know, only two specimens of *X. zollikoferi* have previously been observed in Britain. One of these was taken in October, 1867, by Mr. Harding, of Deal, and the other by Mr. Tait, at Inverurie, in Scotland. The former is in the Doubleday Collection in the Bethnal Green Museum. The species seems to be exceedingly rare in Europe, the occurrence of a third specimen in Britain is therefore of great interest.

Coincidence of Pyrameis cardui and Plusia gamma.—The following extracts from my note-book for 1888, will, I think, be interesting to Mr. H. Rowland-Brown (*ante*, p. 316) and, possibly, to the readers of the 'Entomologist' generally:—

P. cardui. In profusion in the Chester district during the first half of June (Entom. xxi. p. 315). The butterflies were in fine condition. There was a second appearance about the middle of September. Larvæ were abundant on thistles, Heysham Moss (North Lancashire), July 27th (Entom. xxi. p. 317). From these I reared a fine dark series.

P. gamma. "The moth swarmed with us—a curious coincidence to the season's abundance of *P. cardui*" (Entom. xxi. p. 318). Seen

also at Chattenden, Cuxton, Farnborough (Kent) and Westcombe Park (Entom. xxi. p. 187); at Sheffield (Entom. xxi. p. 212); and at Sunnyside, Groombridge, Sussex (Entom. xxi. p. 233). The season was a notoriously wet and dull one, and the temperature low, on the whole—anything but favourable for insect immigration; yet it was not only a *cardui* and *gamma* year, but a *galii* year as well (Entom. xxi. p. 256).

Curiously enough, the season for 1888 was the only one in which I ever remember seeing larvæ and pupæ of *P. gamma*. On rough hilly wastes I found larvæ (many of them) feeding on burdock, and the pupæ spun up, chiefly on thistles, in July and August.—J. Arkle; Dec. 3rd, 1903.

Melitæa didyma ab.—Since writing my note to an illustration of an aberrant *M. didyma* (Entom. xxxvi. 153) I have come across, in the 'Bulletin de la Société Entomologique de France,' for 1900, a plate of aberrations of the same species, one of which is almost identical with that figured by me. These, with a note furnished by M. Charles Oberthür, are exceptionally interesting, inasmuch as he takes the view that such "aberrations are always analogous according to the prevailing scheme of each species, and even of each genus." "The aberrations," he continues, "are not isolated examples, occurring once not to re-occur in like form; they are rather regular variations appearing in certain places where the necessary conditions exist for their development. What these conditions may be appears to be little known. Heat, cold, light, and electricity seem, however, to be the principal causes of aberration in Lepidoptera." And he goes on to cite the curious case of a lilac-winged aberration of *Lycæna bellargus*, taken after a thunderstorm in some numbers, where none of that species differing from the normal colour form had been observed before or after the electrical disturbances of the atmosphere. Incidentally also to the occurrence of *M. didyma* at Bourg-des-Compts in the neighbourhood of Rennes, M. Oberthür says that this without doubt is the furthest western locality for the species in France, and therefore Europe.—H. Rowland-Brown; Oxhey Grove, Harrow Weald, Nov. 25th.

Geometra vernaria.—My experience with regard to the emergence of this species was very similar to that of Mr. Clarke (Entom. xxxvi. 291). The first insects to emerge were all males, the females remaining till last. There was, however, some overlapping, one or two of the latest males emerging about the same time as the first of the females. G. M. Russell; Portchester, Nov. 12th, 1903.

Contribution to the National Collection of British Lepidoptera.—Twelve specimens of *Eupithecia consignata*, by Mrs. Hutchinson, of Leominster, Herefordshire. Ten of the specimens were reared last April, and are the direct descendants of a female example captured in April, 1874.

CAPTURES AND FIELD REPORTS.

Sirex gigas in Wiltshire.—In October last an example of this species was captured at Coulston, near Westbury, Wilts. It was a female, in excellent condition.—J. B. Teend; 1, Grosvenor Square, Southampton, Dec. 13th, 1903.

Autumnal Lepidoptera in Surrey.—This autumn seems to have been particularly favourable for collecting at gas-lamps, and among a host of other things taken by this means since Sept. 1st I may mention:— *Neuronia popularis, Luperina cespitis, Xanthia citrago, X. gilvago, Cirrhœdia xerampelina, Caloeampa vetusta, Ennomos alniaria, E. fuscantaria, Himera pennaria, Eupithecia subfulvata, Triphosa dubitata, Eubolia cervinata.* Sugaring has also produced its insects, though of only the commoner order, the following being taken since Sept. 29th:—*Xylophasia monoglypha* (one on Oct. 13th), *Agrotis suffusa* (two), *Noctua c-nigrum, Mania maura* (one on Sept. 30th), *Orthosia lota, O. pistacina* (abundant), *O. litura, Orrhodia ligula, Scopelosoma satellitia, Xanthia gilvago, X. circellaris* (common), *Miselia oxyacanthæ, Phlogophora meticulosa* (in swarms), *Catocala nupta* (slightly worn), *Hypena rostralis,* and *Pyralis costalis.*—Leslie H. Mosse-Robinson; Wandle Bank, Wallington, Surrey, Oct. 20th, 1903.

Collecting in Devon, Torquay, and Neighbourhood. 1903.—The first three months of 1903 were very mild, which caused the sallows to come into leaf before the catkins had a chance to open. Therefore we did not get many insects at sallow. Larvæ were fairly plentiful during the first quarter of the year. I append a list of the principal captures for the year, taken from my note-book. In January and February larvæ of *Heliophobus hispidus* were fairly plentiful; also a few each of *Leucania putreseens* (full-grown in January), *Rusina tenebrosa, Triphæna ianthina, T. fimbria, Epunda lichenea.* The following moths were taken at sallow, light, &c.:—*Hybernia rupicapraria* (males and females at rest on blackthorn bushes), *H. leucophæaria, H. progemmaria* (males only). In March, imagos of *Selenia illunaria* (first specimen taken March 19th). *Xylocampa lithoriza* and *Tæniocampa gothica* were the only fresh things noticed out.

In April the following moths were noticed, principally at sallow:— *Tæniocampa munda, T. cruda, T. miniosa, T. gracilis, T. stabilis, T. instabilis, T. rubricosa, Hoporina croceago* (one), *Scopelosoma satellitia, Xylina petrificata,* and a few *Trachea piniperda.* In the same month the larvæ of *Arctia fuliginosa, Chelonia villica, Nudaria mundana, Callimorpha dominula,* were noticed among others.

In May, larvæ of *Lithosia caniola, L. complanula, Epunda nigra,* and on heather larvæ of *Agrotis agathina, A. porphyrea, Noctua neglecta,* &c. The moths for the month, noticed, were *Anarta myrtilli* (one) on May 8th, at rest on heather (is not this early for this species ?), *Heliodes arbuti, Gonoptera libatrix, Tephrosia crepuscularia, Nemoria viridata, Asthena candidata, Corycia temerata, Fidonia piniaria, Melanippe procellata, Anticlea badiata, Cidaria russata,* and *Anaitis plagiata.*

June: the following imagos:—*Zygæna loniceræ, Euthemonia russula* (males only), *Chelonia villica, Orgyia pudibunda, Acronycta ligustri, A.*

rumicis, *Axylia putris*, *Dianthœcia carpophaga*, *D. conspersa*, *Mamestra anceps*, *Grammesia trilinea*, *Rusina tenebrosa*, *Euplexia lucipara*, *Hadena thalassina*, *Larentia olivata*, *Emmelesia affinitata*, *Cidaria ribesiaria*, *Phibalapteryx tersata*, *Anticlea rubidata*, among others, were noticed.

July was the best month during the season: *Agrotis lucernea*, *Leucania putrescens*, *Agrotis corticea*, *Thyatira batis*, *Gonophora derasa*, *Agrotis lunigera*, *Dysthymia luctuosa*, *Plusia festucæ*, *Apamea gemina*, *Caradrina blanda* occurred, among other commoner things.

August produced *Lithosia caniola*; only five were taken this year. Five journeys were made to Dawlish for *Callimorpha hera*; this month only nine specimens were taken; this species also appears to be getting scarce. At sugar, a few such things as *Luperina testacea*, *Agrotis saucia*, and a few *Triphœna interjecta* were the best insects taken.

September and October produced a few each of *Epunda nigra*, *Heliophobus hispidus*, *Hadena protea*, *Xylina petrificata*, *Polia flavicincta*, *Anchocelis rufina*, *Noctua glareosa*, *Anchocelis lunosa*, *Cerastis vaccinii*, *C. ligula* (*spadicea*), *Scopelosoma satellitia*, *Xanthia citrago*, *X. cerago*, *X. silago*, *X. aurago*, *X. ferruginea*, and *Stilbia anomala*; among Geometers, *Scotosia dubitata* and *Cidaria miata*.

November, up to the second week, produced nothing fresh in the way of moths; a few larvæ of *Heliophobus hispidus*, *Leucania putrescens*, and *Xylophasia hepatica* were the principal species.

The season, as a whole, has been a very poor one; we have had very little sunshine, so have not done much with the butterflies. One example of *Colias edusa* was taken at Dawlish, and one at Torquay in August; these were the only specimens seen by us during the season. We had one *Sphinx convolvuli* brought to us; it had been found at rest on a stable door on Sept. 1st, and one *Acherontia atropos*, which was picked up on the road, dead, on Oct. 15th; these latter were very fair specimens.—S. & J. Walker; Torquay, S. Devon.

The Dragonflies of Epping Forest in 1903.—Our season began on the 1st June with the taking of *Pyrrhosoma nymphula* and *Agrion puella*; then followed *Ischnura elegans* on 21st June. No fresh species fell to our net until 9th August, when we took *Sympetrum striolatum*, immature, and a single specimen of *S. sanguineum*. We did not again meet with the last-named dragonfly during the season, and we commented upon its apparent absence in 1902 in our report for that year ('Entomologist,' Feb., 1903). On Aug. 16th we took, near Chingford, for the first time in Epping Forest, a specimen (female) of *Calopteryx splendens*; the late period of this capture will be noticed. On the same date we collected *Æschna cyanea* and *Æ. grandis* for the first time this season. Both species became unusually abundant; in a single morning (Sept. 1st) we took *Æ. cyanea* no fewer than seven times (six males, one female). Upon several occasions, early in September, we were much interested in watching *Æ. grandis* ovipositing in a pond near Chingford. The females of this species receive no assistance from the males in the important function of oviposition; they rest upon rushes and other plants growing in a suitable situation, and thrust the abdomen deep into the water. On Sept. 13th we took a specimen while thus employed, when we found that the last five segments (numbers 6 to 10) were wet from immersion in the water. In

the beginning of September we made several visits to some ponds near Loughton, and on the 3rd of that month we took there a series of *Lestes sponsa*. At the same ponds, on the same day, we found *Enallagma cyathigerum* plentiful; in our report for 1902 we remarked upon the apparent scarcity of this species in the forest, but perhaps it would be more correct to describe the insect as being very local rather than scarce. We continued to collect the undermentioned species until the date noted against each:—*A. puella*, Sept. 1st; *I. elegans*, Sept. 4th; *E. cyathigerum*, Sept. 4th; *Æ. grandis*, Sept. 13th; *Æ. cyanea*, Sept. 20th; *S. striolatum*, Sept. 20th.—F. W. & H. Campion; Walthamstow, Essex, Nov. 6th, 1903.

Notes on some Lepidoptera reared during 1903.—I was much interested with Mr. F. A. Oldaker's notes on Lepidoptera bred during the past season, and can sympathize with him in the ill-luck which he experienced with some of the species. I thought that a few remarks with regard to those which I attempted to breed might not be without interest.

In February and March I obtained a number of common species, such as *Triphæna pronuba* and *Phlogophora meticulosa*, together with a few *Triphæna fimbria*, by searching in the garden after dark with a lantern. To save trouble, I kept these under glass in the kitchen, to induce them to feed up quickly and pupate before the usual time. This plan was very successful, and nearly all produced fine imagines in due course. Later on, by beating birch, crab-apple, &c., in this district, I took numbers of larvæ of *Hybernia defoliaria H. aurantiaria*, and *Nola cucullatella*, all of which I was successful in bringing through to the perfect state. The *H. defoliaria* are nearly all of a very dark form. From aspen I obtained a few larvæ of *Tethea subtusa*, a species which I had not previously found here. Unfortunately only one pupated successfully, but this produced a lovely specimen, which emerged on the 9th July. I completely failed with *Smerinthus ocellatus*, of which I had about one hundred ova from a New Forest female (laid May 29th, 30th, and 31st). The larvæ began hatching on June 11th, but nearly all died when quite young; a few only grew to about half size, when they also died off.

Of *Nyssia hispidaria* I had about twenty ova sent me, which began hatching April 14th. The larvæ did very well till full grown, when they died off in the most disappointing way, one by one. I was more successful with *Demas coryli*, and have now some pupæ resulting from about fifty ova laid at the beginning of June. These hatched between June 6th and 15th, and fed up well on oak.

Another species with which I was unsuccessful was *Endromis versicolor*. The larvæ hatched from May 2nd onwards, and although I provided them with fresh birch I could not induce them to even commence feeding, and all died in a few days.

When in the New Forest, at Whitsuntide, I obtained a very worn female of *Tephrosia consortaria*, which on June 1st and 2nd laid a number of ova in a chip-box, placing them quite out of sight between two layers of the wood. The egg is bright green when laid, oblong in shape, with rounded ends, and the surface minutely pitted. These hatched in due course, but in my subsequent absence from home were

overlooked and consequently perished. During the same visit to the New Forest I found about fifty larvæ of *Tæniocampa miniosa*, about half an inch long. These fed up remarkably well, and I have now about four dozen healthy pupæ.

In April, when at Wimborne, Dorset, I found larvæ of *Xylopoda fabriciana*, commonly in rolled-up nettle leaves. This little larva spins a whitish opaque tough cocoon in the rolled-up leaf. The pupa is light brown at first, turning darker before emergence, about 6 mm. long, and very active. The first moth emerged on May 8th.

With regard to Mr. Oldaker's remarks on *Euchelia jacobææ* I may mention that I found larvæ very commonly on ragwort near Orford, Suffolk, at the end of July and beginning of August. Those which I took pupated about Aug. 8th, but there were many small ones left which could not have gone down until a fortnight or so later.

Having a few pupæ of *Dasychira pudibunda* in the spring, and wishing to breed the species, I attempted to obtain eggs, but for some unaccountable reason I was unable to obtain a single pairing. The females laid a number of ova, but these were, of course, all infertile. The dates of emergence of the specimens are somewhat interesting, all the females emerging before any of the males, *viz.*:—May 1st, one female; 2nd, one female; 4th, one female; 10th, two females; 11th, one female; 12th, one male; 15th one male.—Philip J. Barraud; Bushey Heath, Herts, Dec. 5th, 1903.

Field-work in 1903.—A record of my work with the net during the past season may not prove uninteresting. On the whole, the weather has been peculiarly depressing, and many of the days on which I had hoped to get plenty of insects were totally unsuited; for, even if there was no rain actually falling, the wind was blowing, and the temperature was too low to tempt any insects out into the open. My collecting times were, with a few exceptions, Wednesday and Saturday afternoons. On Feb. 8th I noticed *Vanessa urticæ* out, and at intervals during March it appeared in my garden on days warmer than usual. It was not till April 20th that I observed *Gonepteryx rhamni*, and one of the features of this season, as far as my observation goes, has been the rarity of this species. *Pieris brassicæ* and *P. rapæ* were first seen on May 4th, but no *P. napi* till May 30th. *Euchloë cardamines* was as abundant as ever near Ranmore Common from May 21st onwards; and on the same date *Pararge egeria* was observed in a copse in fair numbers, and the first specimens of *Nemeobius lucina* were noticed. This species was very abundant later on, and the searching for ova on the cowslip leaves yielded good results on several days when little else was to be done. *Bapta temerata* and *Abraxas adustata* were beaten from the bushes on May 21st, and a beautifully marked specimen of *Lomaspilis marginata* on May 23rd. *Hesperia malvæ* and *Callophrys rubi* were first observed on the same date, as well as *Eupithecia satyrata*, which I obtained then for the first time, near Ranmore. *H. malvæ* was one of the species particularly plentiful this year. *Argynnis euphrosyne* appeared on May 27th, as well as *Euclidia glyphica* and *E. mi*, and on May 30th *Phytometra ænea* and *Panagra petraria* turned up, as well as *Thanaos tages*. On June 1st, which I spent on Ranmore and the neighbourhood, we got *Bupalus piniaria*, *Cidaria*

suffumata, *Strenia clathrata*, *Zonosoma linearia*, as well as a number of larvæ of *Zephyrus quercus* from the oaks. On June 3rd *Lycæna adonis* was first seen, but this species was difficult to get in good condition, owing to the rain and wind. *L. alexis* was first noticed on the same day also, as well as *Acontia luctuosa*, which was taken in some numbers during the next ten days. On June 4th *Acidalia ornata* was taken, but few of this species were observed. June 12th was a blank, except for a few *Asthena candidata*, and on June 17th nothing new turned up except *Melanippe unangulata*. On June 22nd we took *Lycæna alsus* for the first and only time this year, and then only three or four specimens. But *Augiades sylvanus*, seen first on the same day, was more plentiful than usual, and an interesting variety of *Camptogramma bilineata*, with dark bands, was taken. On June 24th *Melanthia ocellata* and *Larentia viridaria* were beaten out, and a female *Lycæna agestis* deposited about fifty ova in a pill-box. These duly hatched on June 29th, but all died off before the first moult. On July 4th *Cidaria fulvata* was plentiful and in fine condition, and on July 8th a good number of *Aphantopus hyperanthus* were netted, only to be released again, when it had been found that they were normal. On July 11th very little was about, but diligent work among long grass produced a good series of *Endrosa irrorella*, and a fair number of pupæ of *Zygæna filipendulæ* were noticed at the same time. July 22nd saw the advent of *Adopæa thaumas* in fair numbers, and a few males of *Augiades comma* were taken, the first female being seen on July 25th, on which date *Eubolia bipunctaria* was noticed. The above notes refer almost exclusively to work on and near Ranmore, but on July 30th I migrated to the neighbourhood of Bognor, which I found singularly unproductive in the daytime, of course owing to the atrocious weather. A walk from Bognor to Arundel on Aug. 7th produced one *Argynnis adippe*, but nothing else except *Pieris brassicæ*, *P. rapæ*, *P. napi*, *Epinephele jurtina*, *E. tithonus*, *Lycæna alexis*, *Adopæa thaumas*, and *Plusia gamma*. On Aug. 10th *Vanessa atalanta* was observed, and *V. io* on the 12th, as well as *Acidalia marginepunctata*. *Polyommatus phlæas* was the only insect to be seen on Aug. 18th, but on the 19th *Timandra amataria*, *Hypsipetes sordidata*, and other geometers were obtained by beating the hedges by the roadside. On Aug. 29th *Cilix glaucata* was taken in the same manner. On Sept. 1st a fine female variety of *Epinephele jurtina*, with white patches on the two upper wings, was netted; and on Sept. 5th, when I had returned to Dorking, two belated females of *Lycæna corydon* were seen. Single specimens of *Vanessa atalanta* were noticed at different times during this month, and several worn specimens of *V. cardui*.

Such is my record for the year, and I think the most noteworthy feature is the entire absence of *Cyaniris argiolus*, which is usually plentiful here. No specimens of *Vanessa polychloros*, *Colias edusa*, or *C. hyale* were seen, and very few *Gonepteryx rhamni*.

A curious circumstance that happened is perhaps worthy of note. One of my boys put a setting-board, containing four specimens of *Vanessa atalanta*, into a cupboard, and on looking at it the next morning he found that the insects had entirely disappeared. Subsequent events, in which a penny trap figured successfully, revealed the fact that mice were the culprits. We found a few fragments of wings

scattered about the cupboard, but the mice had eaten or removed every vestige besides, leaving nothing whatever but the pins and paper on the setting-board. — F. A. Oldaker ; Parsonage House, Dorking, Nov. 26th, 1903.

Notes from the North-west. — The season for 1903 will probably be remembered for some time, and all over the country, for its climatic eccentricities — eccentricities even for British weather. Generally speaking, the summer may be described as one of the coldest and wettest, if not the coldest and wettest, on record. Nothing unusual, here in Cheshire, marked the weather of January, except that it was often springlike ; and February was so genial, that I do not remember ever seeing such a fine display of spring flowers. Hawthorns, lilacs, and laburnums were green with foliage. April 10th (Good Friday) was generally voted a perfect day ; white and pink lilacs were in bloom ; there was even a rhododendron ; and I gathered a bit of white hawthorn-blossom from a hedge. Then came a frost—"a killing frost" —and all these too-innocent flowers were covered with snow on Easter Monday. April continued cold and wet, with frequent frosts, almost to its close. May came in upon us with sharp thunderstorms, but redeemed its character somewhat after the middle of the month, so that Whit Monday (the 31st) was positively warm, sunny, and cloudless. Everybody expects fine weather in "the flowery month of June," and, I should say, on the whole, it is the pleasantest British month of the year. But people took to overcoats on the 14th, and there was such a frost on Midsummer-day that most of the brackens and birches in Delamere Forest became as brown as in December. There were some warm, sunny days at the end of the month, as usual ; but there was, altogether, more rainfall than we liked. July was a cold, wet, windy month, taken on the whole. The following is from my note-book for the 6th :—"I do not remember such a low July temperature as to-day's ; and I certainly never set *ashworthii*, *davus*, *myrtilli*, and *nebulosa* in such a low temperature. The wind whistles as in stormy October." The same cold, wet, and windy character applied to August, and was continued, more or less, through September, with the addition of two degrees of frost on Sept. 14th. October was a month of almost constant rain. November assumed its accustomed character—plenty of moisture, either in a state of fog or rain—together with the usual mild few days about the middle of the month, when *Himera pennaria*, *Hybernia defoliaria* (with an occasional *H. aurantiaria*), *Cheimatobia brumata*, *Asteroscopus sphinx* (*cassinea*), and *Pœcilocampa populi* faithfully and annually make their appearance at the street-lamps.

Under such unfavourable weather conditions it is not surprising that insects have either been scarce or have come and gone unobserved. The following are some of the species which, in my experience, seem to deserve special mention. I saw few butterflies. There were some of the three commonest "whites," a few *Vanessa urticæ*, but, apparently, no *V. io* or *V. atalanta*. *Thecla rubi* was a common butterfly among heath and birch in Delamere Forest, June 6th. *Cœnonympha typhon* (*davus*) had not appeared in its accustomed haunts by June 27th, but was in plenty on July 4th. Unfortunately, on that date, the specimens were nearly all badly chipped, although fresh, owing to the boisterous

weather. On July 11th the butterfly was not so numerous, but it was in good condition. *Lycæna ægon* and *Epinephele ianira* were numerous and fresh on that date in the Forest district; and I should not forget to say I had glimpses of *E. tithonus* in the Shotwick neighbourhood on July 31st. On the Crosby sandhills, near Liverpool, August 4th, *Satyrus semele* was common. The coloration of the specimens struck me as being unusually rich, but perhaps this was owing to their undoubted freshness. Another thing I could not help noticing about these Crosby *S. semele* was the fact that they were not nearly so skittish and difficult to capture as are specimens of the same species on the rock-faces of North Wales and North Lancashire. I found *Leucoma salicis* on these sandhills as well, on the same date.

Among moths I saw *Lobophora carpinata* (*lobulata*) in Delamere Forest from April 15th to April 25th, at rest on palings and tree-trunks, where it posed in flat contradiction to the doctrine of protective resemblance. *Tephrosia biundularia* I first saw on April 25th, and the species continued out until June 6th, when the specimens were getting decidedly shabby; I got a fine ashy-grey female with blackish wing-suffusions and bands on May 16th. From this interesting female I have now a large progeny lying over the winter in the pupal state. *Panagra petraria* seems to be a local moth in Delamere Forest; it was plentiful, though worn, on one particular bracken-covered spot, June 6th. *Eubolia plumbaria* (*palumbaria*) was fresh and abundant on Hatchmere Heath on the same day, and I took a fine series of both sexes to renew. Among the birches in the Forest *Acidalia remutaria* and *Cidaria corylata* were also fresh, and plentiful enough. A nice *A. straminata* var. *circellata* has already been recorded for July 11th (Entom. xxxvi. 317), and, all being well, I mean to look out for this little prize next season. *Aspilates strigillaria* was just appearing on June 27th, but was represented throughout by smaller numbers than I have observed in former years. I met with *Anarta myrtilli* on July 4th to July 11th; on the latter date both males and females, in fine condition, were swept off the tops of the heather. I recommended the spot to my friend Mr. J. Thompson in September, and he went there and obtained a considerable number of larvæ off the heather; these larvæ a few days afterwards pupated. All the above are Delamere Forest Lepidoptera, and the list was extended from October 3rd to October 10th by *Peronea ferrugana* (beaten from birches), *Ephippiphora similana* = *bimaculana*, *P. caledoniana* (dark forms), *Dictyopteryx contaminana*, and *Plutella cruciferarum*.

I tried "assembling" with a fresh female *Bombyx quercus* on the Delamere heaths, July 11th, but the experiment was a total failure; a few males were seen on the wing.

Electric lamps were almost useless for attracting insects; this is not to be wondered at, for the latter are always most active in high temperatures. A male *Cossus ligniperda* was taken, June 23rd. I had only two favourable nights—June 29th and July 10th. On the first date *Amphidasys betularia* var. *doubledayaria*, *Dicranura vinula*, *Plusia pulchrina*, and *Habrostola triplasia* were my best captures; and on July 10th, the heat being almost tropical, *Uropteryx sambucaria*, *Pyralis glaucinalis*, *A. betularia* var. *doubledayaria*, *Nola cucullatella*, *Caradrina alsines*, *Mamestra sordida* (*anceps*), *Miana arcuosa*, *Acronycta rumicis*, *Bryophila*

perla, *Plusia pulchrina*, *P. iota*, *P. chrysitis*, and *H. triplasia*. A fine *Acherontia atropos* was taken from a lamp, October 24th.

Abnormal appearances were represented by a fresh *Xylophasia monoglypha* (*polyodon*), taken at an electric lamp, September 24th. A specimen of *Caradrina quadripunctata* (*cubicularis*) was bred on November 10th.

Among insects reared from the chrysalis, the following, with dates, may be of interest:—*Eupithecia centaureata* (eggs from a female taken September 4th, 1892, at an electric lamp), May 18th, May 24th, and May 31st; *Macaria liturata*, all var. *nigrofulvata* (Collins), May 24th to May 30th; these were from Delamere Forest larvæ, and I netted a worn example of the variety in the Forest, June 27th; *Cerura furcula* emerged June 10th to June 25th, the larvæ were collected in the district. Ova obtained from these moths were all infertile. *Notodonta dictæa* appeared June 24th; *Noctua brunnea* (from Delamere larvæ), June 27th and June 28th; *Aplecta nebulosa* (Delamere larvæ), with the almost black form *robsoni* (Collins), June 8th to June 29th; *Agrotis ashworthii*, July 1st to July 6th; *Gonoptera libatrix* (pupæ spun up in the tops of low sallows in August), September 4th; *Cheimatobia boreata* and *C. brumata* (Delamere larvæ), November 9th to end of the month. A few eggs of *Epione apiciaria*, from a female taken at an electric lamp, August 28th, 1902, hatched June 11th to June 21st. I could only count seven larvæ; but they all turned up as perfect insects between August 10th and August 16th.

What prompted Mr. J. Thompson and myself to join our forces of *Smerinthus ocellatus* and *S. populi* with the view of obtaining a cross, it is, after this lapse of time, difficult to say. It was certainly no desire to assist Nature in the evolution of species, so it had best be put down to a morbid interest or idle curiosity. Anyhow, we brought about, in captivity, four pairings, with eight moths, of the two species; and the resultant eggs were all infertile, although the weather conditions were most favourable. A fifth pairing between a male *ocellatus* and a female *populi* (fresh moths, of course) resulted in fifty more infertile eggs; *but a second pairing of these two moths brought twenty-seven fertile eggs.* These began to hatch, July 8th. My share was thirteen eggs, Mr. Thompson's, fourteen; and mine were the last laid—in fact, they were taken in a cluster from off the outside of the terminal segment. All Mr. Thompson's larvæ died in the course of the various stages; but luck favoured me, and I have now eight pupæ. The larvæ partook of the characters of both species. I did, relatively, better than with ninety-six eggs of *S. tiliæ* I had sent me. The larvæ from the latter died off fast in their early stages, and I have only fifteen pupæ. These pupæ, I believe, I owe to removing the remaining larvæ to a warm kitchen-shelf.

Out in the open country, larvæ seemed to be, comparatively, scarce throughout the season, and I frequently came upon dead caterpillars. In Delamere Forest, also, dead larvæ were sometimes met with, but, to those who know the runs, even good things were to be had in that sheltered locality in satisfactory numbers. The rich, coffee-coloured caterpillar of *H. defoliaria*, with its interrupted side stripe of yellow dashes, was well in evidence, July 28th, and before that date. So were

N. dromedarius, *A. betularia* (the latter species to be had right into October), and *Cymatophora duplaris*. These were found to repeat themselves, August 3rd, with the addition of one *A. leporina* and some *Panolis piniperda*, the last-mentioned being sometimes mistaken for *M. liturata*. All these could have been beaten from birch (with the exception of *P. piniperda*, from Scotch firs) until well into October. In addition, I got five *N. dictæoides* (deep purplish shiny brown, with a broad yellow side stripe, and very geometer-looking), a good many *N. camelina*, and three *A. nebulosa* (the last caught napping, as they are night-feeders), all in October, off birch. Perhaps the most curious experience of the season in the way of larvæ was finding a colony of *Orgyia antiqua*, August 12th, feeding on meadowsweet, mace-reed, and water-dock.

It was a bad season for dragonflies. The only record worth showing is the abnormal capture of a solitary male *Sympetrum scoticum* on Hatchmere Heath (Delamere Forest), October 10th.—J. Arkle; Chester.

Early Appearance of Cidaria picata.—On May 16th, 1903, when cycling near Hadleigh, Suffolk, I saw a good-sized geometer on the wing, and on capturing it was surprised to find it was a fine female *Cidaria picata*. Some years ago I took a specimen on June 1st, which I then thought was a very early date, so that this capture may be worthy of record.—P. Harwood; "Marlborough," Chesterfield Road, Newbury.

SOCIETIES.

South London Entomological and Natural History Society.—*October 22nd*, 1903.—Mr. E. Step, F.L.S., President, in the chair.—Mr. C. W. Simmons, of Tufnell Park, N., and Mr. J. Ovenden, of Frindsbury, Rochester, were elected members.—Mr. South exhibited very interesting series of *Anthrocera* (*Zygæna*) *trifolii* and *A. filipendulæ* from localities in Middlesex and Surrey, together with aberrations and supposed hybrids, and read a short paper on the exhibit.—Mr. McArthur, a short series of *Hepialus humuli* var. *hethlandica*, taken in Unst in 1882. Mr. Dodds, specimens of the Coleopteron, *Corynetes rufipes*, found alive in a box of cigars.—Mr. Edwards, a wedding-cake which had been over twenty years under a glass shade in a city confectioner's; the interior was thoroughly demolished by beetles, and the sugar was burrowed in an extraordinary way by them. The species was recognized as *Anobium paniceum*.—Mr. Carr, series of bred and captured males of *Orgyia antiqua*, of which the former were very considerably the larger.—Mr. Tonge, very fine photographs of the larvæ of *Sesia* (*Macroglossa*) *stellatarum*, *Eumorpha* (*Chærocampa*) *elpenor*, *Theretra* (*Chærocampa*) *porcellus*, and *Asphalia flavicornis*.—Mr. West, short series of two species of Hemiptera, *Microphysa elegantula* from Darenth, and *Cardiastethus fasciventris* from Box Hill.—Dr. Chapman, an album of photographs, showing the embryonic development of *Botys hyalinalis*, taken by Mr. Hammond and Mr. Jeffreys of Canterbury. It consisted of a

unique series taken at short intervals, from the time of the laying of the egg until the exclusion of the young larva.—Mr. Kaye, bred specimens of *Theope endocia*, *T. foliorum*, and *Nymphidium lysimon*, with figures of the larvæ and pupæ from Trinidad. The larvæ were found to live on friendly terms with species of ants, who milked them from papillæ above the anal segment.—Mr. R. Adkin read the reports of the field-meetings at Limpsfield and St. Paul's Cray.

November 12*th*.—The President in the chair.—Mr. Jäger exhibited a specimen of *Ophiusa stolida*, a Noctuid new to Britain, taken at sugar near Dartmouth, on Sept. 23rd, 1903.—Mr. Kaye, two remarkable aberrations of *Tæniocampa stabilis* (1), a female, with shiny pale hind wings, the fore wings brick-red, and the transverse line and lunule distinct; (2), a female with grey fore wings, the lines strongly black, and a broad blackish fascia passing through the reniform stigma.—Mr. McArthur, a specimen of *Hippotion* (*Chærocampa*) *celerio*, captured at Brighton on Oct. 24th by Mr. Clayton.—Mr. Cothrup, a large number of the various species and forms of British Anthrocerids (Zygænids), including *A. hippocrepidis*.—Mr. Fremlin, an example of *Hemaris bombyliformis*, from the New Forest.—Mr. Tonge, very finely executed photographs of the ova of *Numeria pulveraria*, *Oporabia autumnaria*, and *Hemerophila abruptaria*.—Mr. West (Greenwich), a short series of *Sitones griseus* from Oxshott, where it was common on broom. At Yarmouth he had usually met with it at the roots of grass.—Messrs. Dennis, Goulton, Main, Tonge and West (Streatham) then showed a large number of lantern-slides, comprising studies of flowers, ova, larvæ and pupæ of Lepidoptera, resting habits of imagines, diatoms, and geological formations in North Wales.—Hy. J. Turner (*Hon. Rep. Sec.*).

Lancashire and Cheshire Entomological Society. — The Fifth Ordinary Meeting was held in the Royal Institution, Liverpool, on Monday, November 16th, Mr. Wm. Webster, M.R.S.A.I. (St. Helen's) presiding over a large attendance of members. Messrs. A. H. Garstang, F.R.S.L., of Southport; H. A. Sweeting, M.A., of Liverpool; and Carrington B. Williams, of New Brighton, were balloted for and duly elected members of the Society. On the motion of Mr. P. N. Pierce, seconded by Mr. J. R. le B. Tomlin, a vote of condolence was unanimously accorded the President, Mr. Samuel J. Capper, F.E.S., on his recent bereavement, and the Secretary was desired to write a letter conveying the same to him. Details in connection with the next (St. Helen's) meeting having been discussed, Mr. E. J. B. Sopp, F.R.Met.S., F.E.S., communicated an interesting paper "On the Birth and Infancy of *Dytiscus punctulatus*, F." After explaining the manner of ovipositing, and describing the varying effect of temperature on the length of time required for the development of the ova in spring and winter, he gave particulars of diseases to which the eggs were liable both in their earlier and later stages. The birth of the larva, process of change of skin at the various ecdyses, &c., were described from notes in his diary written at the time of observation. The paper was illustrated by eggs, cast skins, larvæ in various stages of growth, and perfect insects. Amongst the large number of exhibits on view were the following:—A drawer of

Xanthias, including *Dasycampa rubiginea* and *Xanthia aurago* var. *fucata*, by Mr. F. N. Pierce, F.E.S.; a fine collection of Lepidoptera from Cumberland and Westmoreland (1903), including the Alpine species *Erebia epiphron*, *E. cassiope*, *E. medon*, &c.; an exotic Orthopteron—*Acridium* (? sp.)—captured on a vessel in the Liverpool Docks, and a fine specimen of the oleander hawk-moth (*C. nerii*), captured on the steamship 'Achilles,' Liverpool, by Mr. H. B. Prince. Long series of *Melanargia galatea* and *Cidaria picata*, a curiously bleached form of *Epinephele ianira*, and specimens of *Anticlea sinuata* and *Cidaria unangulata* from Devonshire, by Mr. W. A. Tyerman. Mr. J. Roxburgh distributed a series of *Erebia medon*. Mr. J. W. Dutton exhibited Coleoptera collected at Stromness by Mr. George Ellison, of Liverpool, including *Amara spinipes*, *Donacia discolor*, *Chrysomela sanguinolenta*, and *Otiorrhynchus blandus*. Mr. Guy A. Dunlop's local Coleoptera contained *Bembidium saxatile*, *Melanotus rufipes*, *Leiopus nebulosus*, and *Metœcus paradoxus*; whilst Dr. J. W. Ellis's Easter captures on Slieve Donard and in the neighbourhood of Newcastle, Co. Down, included *Leistus montanus*, *Nebria gyllenhali*, *Pterostichus vitreus*, *Silpha atrata* var. *subrotundata*, and *Otiorrhynchus maurus*. Mr. J. R. le B. Tomlin, F.E.S., showed recent additions to the list of British Coleoptera, including *Gynandrophthalma affinis*, *Aphanisticus emarginatus*, *Lathridius bergrothi*, and *Hydroporus bilineatus*. Mr. Richard Wilding exhibited the British Donaciæ. Mr. C. B. Williams, collections of Japanese Lepidoptera and Coleoptera; a small collection of local Coleoptera; and a living lepidopterous larva from a barrel of Canadian apples. Mr. E. J. B. Sopp exhibited *Anisotoma furva* from Leasowe, and the large locust, *Acridium cristatum*, from British Guiana; and Mr. W. H. Jennings, a fine specimen of *Sphodrus leucopthalmus*, found under a kitchen floor at Hoylake. Amongst miscellaneous exhibits also made were two excellent photographs of the larvæ of *Euchelia jacobææ* feeding on ragwort, taken from nature by Mr. Henry Ball, M.P.S.—E. J. B. Sopp, F.R.Met.S., and Fred. Birch, *Hon. Secretaries*.

Manchester Entomological Society.—*November 4th*, 1903.—Dr. W. E. Hoyle, M.A., F.R.C.S., the President, in the chair.—Mr. G. Kearey read a paper on Coleoptera, in which he described the requirements necessary for collecting, and the most suitable places for obtaining insects. He then briefly explained their structure, food and habits, commenting on several species from personal observation, and concluded his remarks by an urgent appeal, showing the advisability of members of societies recording their captures. The following exhibits were made:—Mr. R. Brauer, insects belonging to the Mantidæ, and including species of *Deroplatys arida* from Borneo. *Mantis religiosa* and others.—Mr. L. W. Atkinson, a scorpion found in Manchester, taken out of wood from Jamaica.—Mr. L. W. Hewett, *Sphinx convolvuli* captured at Blackpool in October, 1903.—Henry S. Slade, Lepidoptera taken at Ashton-on-Mersey, Cheshire.—Mr. W. Warren Kinsey gave a demonstration on larvæ preserving.—Mr. C. F. Johnson, Lepidoptera from Deal, North Wales, and Staffordshire.—R. J. Wigelsworth, *Hon. Sec.*

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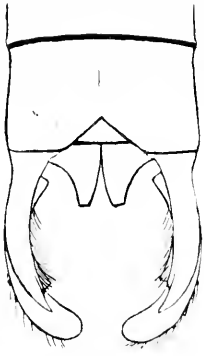

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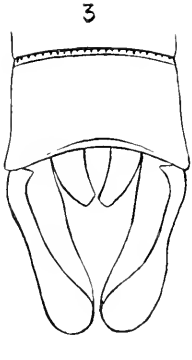

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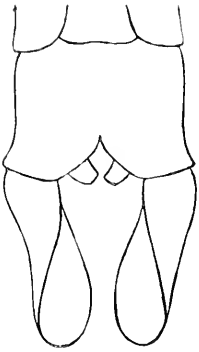

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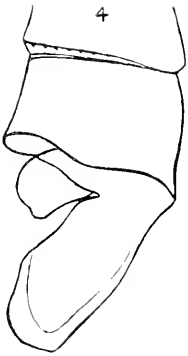

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DRAGONFLIES. (See p. 34.)

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DRAGONFLIES IN 1902 AND 1903.

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

(PLATE III.).

BOTH seasons were ushered in by a late, ungenial spring, and, though casual emergences took place fairly early, the season proper was late in commencing in each case. With most species the bad weather seemed to make no great difference as regards numbers later—a result which might be expected with insects that pass their early stages in the water. Consequently the scarcity so marked in the case of Lepidoptera was not so very noticeable amongst the Odonata, at any rate in Surrey and the New Forest.

In 1902 Mr. F. M. B. Carr met with *Pyrrhosoma nymphula* as early as April 24th in the New Forest, and with a freshly emerged *Libellula depressa* on April 28th; but the first dragonflies observed by myself were *Libellula quadrimaculata* and *Cordulia ænea* at the Black Pond, Esher, on May 19th. In fact, dragonflies were shy in emerging in Surrey till after the beginning of June.

Though the weather promised better in the earlier part of the spring of 1903, ungenial weather later again kept the insects from emerging. My first sight of a dragonfly was on May 4th in the New Forest, and the species was probably *P. nymphula*. The first *L. quadrimaculata* was seen at the Black Pond on May 24th. The warm weather of the last day or two of May put a new complexion on things, and on the glorious summer day that ushered in the month of June dragonflies were very numerous at the Black Pond.

Curiously, on February 24th, 1903, a fine female specimen of *Hemianax ephippiger* was taken flying in a street in Devonport. The species somewhat resembles, and is nearly as large as,

Anax imperator. It is, of course, in no sense a British insect, nor was it even a migrant; it was the merest casual, like the specimen of *Gomphus flavipes* taken in 1818, of *Leucorrhinia pectoralis* in 1860, and of *Lindenia forcipata*, all three of which have often been quite unjustifiably placed on the British list. *H. ephippiger* is a native of Africa, and Mr. M'Lachlan, into whose possession the insect passed, suggests that it "may have come on board a passing vessel off the African coast, and then have fallen into a lethargic condition, waking up during the high temperature that prevailed in the English Channel towards the end of February." The figure (Pl. III., fig. 1) is reproduced from a photograph of the insect, taken natural size.

As regards the termination of the seasons, the various species disappeared about the usual time. In 1902 one or two male specimens of *Enallagma cyathigerum* were seen on Esher Common on September 17th; one *Sympetrum scoticum* was noticed at the Black Pond as late as November 2nd, and a few *Sympetrum striolatum* at the same place on November 9th. In 1903 the early species, *Agrion puella* and *P. nymphula*, were both seen in the New Forest, connected *per collum*, on August 12th, this being rather late for the second species, though perhaps not so much so for the former; a female *Pyrrhosoma tenellum* was found at the Black Pond on September 20th.

Having thus glanced at the two seasons as a whole, those British species which have afforded points of interest to myself will be noticed in order. Unfortunately in most cases there is little new to record.

It is always interesting to note the time of the day (or night) at which dragonflies emerge; it is therefore worth recording that a specimen of *Sympetrum striolatum* from Richmond Park that emerged in captivity on July 10th, 1903, was found hanging expanded, but quite yellow in colour, about 10.30 p.m., having no doubt come out in the evening. By the next morning, about 7 a.m., it had flown to the window. Though perhaps dragonflies more often emerge in the night or early morning, one not seldom meets with them in nature emerging during the day. A male of this species emerged in captivity in the early morning of July 28th, 1902, when it was noticed that the abdomen before it extended resembled much in appearance that of a *Libellula*, thus shewing its affinities at that stage.

Sympetrum flaveolum was not seen in either year at the ponds on Ockham Common, so we may conclude that there was no migration. *S. sanguineum*, however, was found there both seasons, and on September 6th, 1903, at least one male was taken (H. J. Turner) at the Black Pond, Esher, making yet another new record for that locality.

Nymphs sometimes travel some distance from the water before disclosing the imago. On May 25th, 1902, I saw a

L. quadrimaculata clinging to the empty nymph-skin two or three yards from the brink of the Black Pond.

Libellula fulva has occurred more plentifully than used to be the case, probably because it is better known than it was, and is more sought for. Major Robertson has taken several during the last season or two near Pokesdown. Mr. Edelsten took the species in the Norfolk Broads in 1902, from June 26th–30th; in 1903, June 18th–22nd. Mr. Porritt also took twelve in the Norfolk Broads from June 29th to July 1st, 1903. It is possible that this dragonfly breeds in rivers rather than in ponds, judging from some of the localities in which it has been taken. In this connection it should be noted that M. René Martin gives as the habitat of the nymph in France—"étangs, rivières, et surtout ruisseaux lents."

As regards *Orthetrum cancellatum*, one male was taken at Wisley Pond, Surrey, on July 5th, 1902, and Mr. Edelsten took it in the Norfolk Broads from June 26th–30th, 1902, and from June 18th–22nd, 1903. Apparently this still remains a rather uncommon species.

In 1902 Major Robertson found *Oxygastra curtisii* in fair numbers in its one locality. He took his first on June 27th, and the last on July 24th. The species was also found in 1903.

Early in the morning of June 7th, 1902, or during the previous night, a fine female *Cordulegaster annulatus* emerged from a New Forest nymph secured about the last day of April. From the beginning of May, when it was put into a fish-globe in Kingston-on-Thames, it was remarkably sluggish, as a rule scarcely moving a limb even if touched. A day or so before emergence it kept its head and the upper part of the thorax out of the water. It was given no food after capture. On August 10th one or two half-grown nymphs were found in the New Forest, shewing that the insect passes two seasons at least in that stage. On July 13th in the same year a male was taken (A. Lane) by the side of the Byfleet Canal, near the station. It was a good specimen, and adds another to the meagre list of Surrey localities for this grand insect.

On August 5th, 1903, a very blue female *Anax imperator* was taken in the New Forest. The next day a male and a female were taken at Pokesdown, and again the female was bluish.

Of *Æschna mixta*, I have only two captures to record, both being in 1902—a female on Esher Common (F. Carter) on Sept. 4th, and a male (R. South) two days later in the same district. The species seems to have become scarce again. Is this due to the late inclement seasons? *Æ. juncea* seems to have quite disappeared from the Black Pond; in fact, I have but one record—a female near Pokesdown, August 2nd, 1902. *Æ. cyanea* has been common enough. On August 6th, 1902, I came across a male flying at Hurst Hill in the New Forest a few minutes before

7 o'clock p.m. Though the sun had not set, the light was poor amongst the trees there. On September 2nd of the same year I watched an *Æ. grandis* near Oxshott hawking about in the rain amongst the fir-trees, where a number of small insects were in the air. On June 26th, 1903, a number of Æschnid nymphs were dredged from a small pond in Richmond Park. I suspected them to be *Æ. grandis*. One that had recently changed its skin on the evening of July 2nd was seen to be of a brilliant green colour except the eyes, which were dark. The markings shewed a little on the dorsal surface of the abdomen. It was one of these that Mr. H. T. Dobson reared, establishing its identity, and whose emergence he so minutely described in the 'Entomologist,' xxxvi. p. 253.

One of the most interesting points I have to record is the placing of *Æschna isosceles* on a sure footing in the British fauna. For many years scarcely a specimen had been taken. In 1902 (on July 27th) Mr. Edelsten saw one in the Broads, but did not secure it. In 1903 Mr. Porritt determined to make a strict search for the insect, with the result that, as described in the Ent. Mo. Mag., he saw a considerable number, and captured a few. Mr. Edelsten also captured two the same season, on July 26th. Mr. Edelsten's dates are rather late for what is looked upon as one of the early Æschnas. The last four or five years have seen all the dragonflies (except *Lestes barbara*, *L. virens*, and *L. viridis*), whose position on the British list was precarious, safely established there. These species are *Leucorrhinia dubia*, *Libellula fulva*, *Orthetrum cancellatum*, *Somatochlora metallica*, *S. arctica*, *Oxygastra curtisii*, *Æ. mixta*, *Æ. cærulea*, *Æ. isosceles*, *Lestes dryas*, *Ischnura pumilio*, and *Agrion mercuriale*. Messrs. Briggs, King, Morton, and Porritt have been especially assiduous in working up many of these species, particularly in remote districts, and students of the British Odonata owe them a debt of gratitude for the trouble they have taken, though probably the success they attained was sufficient reward.

On August 11th, 1902, a large number of nymphs of *Calopteryx virgo* were dredged in the New Forest. Some were of a fair size, and others quite small. None of these could emerge till 1903: would the small ones not arrive at the perfect condition till 1904?

In this country we do not often obtain evidence of dragonflies falling a prey to other animals, but on June 24th, 1903, upon the footpath of the canal near Byfleet, I came across scattered wings of *C. splendens*—in one case about a dozen together. Something, I presume, had been catching them, and feeding on the bodies. On August 4th, 1902, a male of this species was found near Rinefield in the New Forest, and Major Robertson had previously shewn me specimens from Holmsley. *Virgo* is the common *Calopteryx* of the New Forest.

Mr. Edelsten took a single specimen of *Lestes dryas* in South Kent on August 1st, 1903. He did not identify his specimen till he returned home, and so hopes for a better "bag" next season. This adds another to the few localities for the species. Some months back Mr. E. R. Speyer sent me for examination a male *Lestes*, which he took on August 11th, 1899, flying swiftly over an alder-bush on the side of a large lake at Shenley, Herts. It arrived in fragments, but the appendages (fig. 6) left no doubt as to its being *Lestes viridis;* but I should rather hesitate to add it to the British list till more specimens are captured. Perhaps this note will cause others to search for it next season. It is already reputed to be British, but the evidence is not sufficient.

Platycnemis pennipes, which does not seem a common insect in Surrey, was noticed in July, 1902, more plentifully than usual at the canal between Byfleet and Weybridge, more especially towards the latter.

Pyrrhosoma tenellum was on the wing as early as June 1st in 1903 at the Black Pond. The varieties *æneatum* and *rubratum* were taken as usual in the New Forest.

At the end of June, 1902, *Ischnura pumilio* was common in the locality discovered a year or two since in the New Forest, and the variety *aurantiaca* was plentiful. It again seemed to be over there by the beginning of August. But in 1903, on August 1st, 2nd, and 9th, I was delighted to find this species about a mile from the former locality, but on similar ground. On the 2nd and 9th both sexes were found, and in fair numbers, but no var. *aurantiaca* were taken or noticed on either day. This discovery is interesting as extending the range of the species in the New Forest, and also the latest date at which it has been observed there upon the wing. Further, a single male was discovered (A. L. Walker) on August 3rd, some distance from either locality, and quite near to Brockenhurst village.

On July 5th, 1902, Mr. South caught, at Wisley Pond, an *Ischnura elegans*, flying off with a small moth, *Crambus pascuellus*.

Mr. Edelsten records *Agrion pulchellum* for both seasons from the Norfolk Broads in June.

Another extension of the range of a scarce species has to be recorded. On August 11th, 1902, both sexes of *Agrion mercuriale* were taken at a bog some miles away from the other known localities in the New Forest, and in a different drainage-basin. It was plentiful in the better known locality, and was seen in 1903 as late as August 23rd.

In 1903 an *Agrion*, new to Britain, was taken (one of each sex) in the Norfolk Broads by Mr. Balfour Browne. *Agrion armatum* is a small but rather stout insect, which appears to be scarce everywhere. It will be a welcome addition to our somewhat meagre list, and the male should be easily identified, if

anyone is lucky enough to meet with it, by the very highly developed appendages, and (except from *Agrion hastulatum*) by the spots on the dorsal surface of the second segment (figs. 2, 3, 4, 5). It is strange that Mr. Edelsten should have taken one in 1902. He placed it in spirit to preserve its colour, intending to send it to me; but it came to grief on his journey home, and it was not till after seeing Mr. Browne's specimens that he recognized the identity of his capture.

A female *Sympetrum fonscolombii* was taken by Mr. W. C. Boyd in June, 1903, near Trewoofe in W. Cornwall.

Mr. J. J. F. X. King has taken again *A. hastulatum* in 1903 in Aviemore.

Explanation of Plate III.

FIG.

1. *Hemianax ephippiger* (nat. size).
2. Anal appendage of *Agrion armatum*, ♂ (ventral). Figs. 2–6 all much
3. ,, ,, ,, ,, ,, ,, (dorsal). [magnified.
4. ,, ,, ,, ,, ,, ,, (lateral).
5. Segments 1 and 2 of ,, ,, (dorsal view).
6. Anal appendage of *Lestes viridis*, ♂ (dorsal).

DESCRIPTIONS OF TWO NEW SPECIES OF ACULEATE HYMENOPTERA FROM JAPAN.

By P. Cameron.

Dielis testaceipes, sp. nov.

Black; the clypeus, labrum, mandibles, except at the apex, the apex of the pronotum (the line dilated laterally), the apices of the basal four abdominal segments above, and of the second to fourth laterally below, yellow; the legs testaceous; the apical half of the fifth and the whole of the sixth and seventh abdominal segments rufous. Antennæ black, the scape rufous beneath. Wings fuscous-hyaline, darker along the radius, the nervures dark testaceous. ♂. Length, 14 mm.

Hab. Japan (*George Lewis*).

Vertex almost smooth, the front deeply furrowed in the centre, the lower part deeply punctured, bordered above by an indistinct curved furrow. Clypeus smooth, sparsely covered with long rufous hair; the occiput thickly, the front sparsely, covered with long testaceous hair. Thorax thickly covered with rufo-testaceous hair; the mesonotum and scutellum sparsely punctured; the metanotum more closely and finely punctured. There is a small mark on the sides of the scutellum at the base. Abdomen shining, the basal segments with blue and violet tints; the segments fringed with long testaceous hair, the apical more

thickly haired than the basal. The front coxæ are yellowish, the four hinder black; the legs are thickly covered with long pale hair.

The males of the recorded Japanese species of *Dielis* are known, and the female of the present species is probably undescribed. Characteristic are the rufo-testaceous legs and the rufous apical segments of the abdomen.

Eumenes micado, sp. nov.

Black; the antennal tubercle, a large irregular mark, about three times longer than wide, on either side of the base of the clypeus, a small line on the upper side of the outer eye-orbits, the base of the pronotum narrowly, the base of the propleuræ broadly—the mark extending to near the centre above and half-way below—the greater part of the tegulæ, two large marks, broader than long, on the base of the scutellum, the post-scutellum, a large irregular mark, broader than long and with irregular edges, on the sides of the metanotum. Two slightly smaller ones below them, these having the outer side straight, the inner rounded and irregular; the apex of the first abdominal segment narrowly, and of the second more broadly—the band narrowed in the centre—yellow. Legs black, the knees, the anterior tibiæ in front, the basal half of the four posterior and the spurs testaceous. Wings hyaline, tinted with fuscous-violaceous, the nervures and stigma dark fuscous. ♀. Length, 18 mm.

Hab. Sharo-Kowa, Japan (*George Lewis*).

Antennæ brownish at the apex, Front and vertex closely and distinctly punctured, sparsely covered with short fuscous pubescence. Clypeus sparsely punctured, the apical part less strongly, more depressed, and with a curved broad incision on the apex. Mandibles brownish at the apex. Thorax above coarsely and closely punctured, the metanotum more coarsely than the rest. Pleuræ less strongly and closely punctured, the apex of the meso- and the base of the metapleuræ more broadly smooth. Petiole longer than the second segment, the dilated part strongly and closely punctured, the punctuation closer and stronger at the apex; the second segment closely and much more finely punctured.

This species is closely related to *E. punctata*, but that species is smaller (13 mm.), has the head and thorax densely pilose, the clypeus shorter compared with its width, the antennal tubercle more distinctly dilated above, the apex of the metanotum more distinctly roundly dilated, its petiole is more distinctly longer compared with the second segment; the abdomen is more and the thorax much less largely marked with yellow, the metanotum is less rugosely punctured, and more clearly furrowed; and the scutellum has a more oblique slope, and is less rounded.

NEW CULICIDÆ FROM THE FEDERATED MALAY STATES.

By Fred. V. Theobald, M.A.

(Continued from p. 15.)

MEGARININA.

Genus Toxorhynchites, Theob. (Mono. Culicid. i. p. 244, 1901).

Toxorhynchites leicesteri, n. sp.

Thorax with metallic green scales, an azure spot over the wings. Abdomen purple, banded with pale blue. Legs unbanded in the male, banded with white in the female; last two tarsi white.

♀. Head black, covered with broad flat scales; along the orbital margin is a narrow band of scales broadening out laterally, which are peacock-blue, in some lights they show purple; the rest of the upper surface of the head is clothed with metallic golden scales. Immediately around the nape are a few upright forked scales, dark golden in colour; on the vertex are four golden-brown bristles. Eyes black. Antennæ with basal joints black, frosted, naked; remaining joints black at the nodes, brown at the internodes; verticillate hairs black. Palpi three-jointed, very short, not more than one-sixth the length of the proboscis; first joint swollen at the base and constricted, the last joint small and nipple-like; scales broad, spatulate, under a hand lens dark brown, in stronger light rich blue, except at the tip, where the scales vary from rose-purple to a mauve according to the angle at which the light strikes them. Proboscis broad at the base, long and bent, covered with purple or rose-purple broad scales; at the angle the scales are golden green and some peacock blue mixed among them. Prothoracic lobes small, oval, rather prominent; thickly clad with scales which are purple-blue or rose-purple as the position to light is varied. Mesonotum black, densely covered with broadly spindle-shaped metallic green scales; over the bases of the wings the scales are larger, longer and spatulate-shaped. (In a fresh specimen the colouring is said to be like a green bottle-fly.) If the thorax is examined through a lens, the central part looks dark coppery brown to purple, while the sides, where the light strikes at an angle, show metallic green—in other lights the scales appear bluish green or dark coppery red; at the anterior margin of the mesonotum is a band of scales which appear violet, rose-purple or purple according to the light, and below this a triangular patch of silvery scales immediately behind the prothoracic lobes, and over the roots of the wings a patch of peacock-blue scales and a row of short stout black bristles. Scutellum densely clothed with broad, long flat scales, which on the lateral lobes are of peacock blue or metallic green according to the light, and on the central lobe of a dark green fringed with lighter green posteriorly. Scutella bristles short, dark brown. Metanotum dark brown. Wings brown in colour; the costa and first longitudinal vein clad with broad, flat scales, which are peacock blue, golden green, and purple according to the light; the position of the cross-veins, the

size of the fork-cells and the scaling of the other veins is that of a typical Toxorhynchites. Legs with the coxæ yellowish, mid and hind clad with creamy scales on their outer face; fore legs with the upper surface of the femora clad with rose-purple scales; at the extreme apex is a tuft of long spindle-shaped scales which are white or peacock blue; just behind these are black spines placed in a semicircle; the whole of the under surface is covered with bright golden scales; tibiæ entirely covered with purple scales; a short distance from the base on the metatarsus is a ring of creamy yellow scales; third and fourth tarsals mostly covered with creamy scales, the rest of the tarsus and metatarsus with purple scales; mid legs, femora and tibia as in the fore legs; the basal half of metatarsus with creamy scales, apical half purple scaled; all the tarsal joints creamy scaled. Hind legs golden at the base and on the under surface, purple above; scales at apex similar as in the other legs; tibia purple scaled; metatarsus purple scaled except for a broad ring of creamy scales a little beyond its base; first and second tarsal joints purple scaled; third and fourth creamy scaled; ungues equal and simple on all the legs. Pleuræ dark brown, for the most part covered with silvery grey scales. Abdomen with the dorsum of the first segment covered with peacock-blue scales, in some lights a dark green; the other segments covered with rose-purple scales, basal banding of peacock-blue scales. Venter bright golden except for a patch of dark scales on the fourth segment; the last segment fringed with pale golden hairs, no caudal tuft.

♂. Head with a deep depression in the middle line; the scaling is much as in the female. Antennæ banded brown and white; plumes black; basal joint black; second joint scaled with numerous broad golden scales; the two last joints dark and elongated. Palpi 3-jointed, the first joint with a swollen base, having the appearance of a joint constricted in the middle; the second scaled with golden scales except at the apex, where there is a narrow band of purple-blue scales; in the middle there is also a band of purple scales, and towards the base there are on the upper surface purple scales. Proboscis purple scaled, green scaled at the angle. Thorax as in the female. Legs with the coxæ and under sides of femora gold scaled; knee spots peacock blue, or creamy in some lights; the remaining parts of legs purple scaled; no banding. Ungues, fore and mid, unequal; the larger tooth uniserrate. Abdomen as in female. Length 10 mm.

Habitat.—Kuala Lumpur.

Observations.—Described from two perfect specimens sent by Dr. Leicester. The beautifully adorned abdomen, metallic green thorax, with azure wing root-spots, and the last two white hind tarsals of the female, are very characteristic.

TOXORHYNCHITES METALLICUS, n. sp. (Leicester.)

"Thorax brilliant metallic green; abdomen deep rose-purple, with basal creamy yellow bands, no caudal tuft. Legs in the male unbanded, in the female the mid legs have a basal creamy white band; fore and mid unbanded. Male palpi with the second and third joints mostly golden yellow.

" ♀. Head black; a narrow band of creamy yellow scales along the orbital margin, which laterally broadens into a distinct patch; the rest of the upper surface of head is covered with broad flat scales which vary in colour. If looked at from behind, the central patch looks bronze-green and the scales at the sides blue-green. In one specimen the whole patch is a deep rich blue, while the marginal scales are silver. Immediately above the occipital foramen are a few fawn-coloured upright scales scarcely notched; a few small bristles are placed on the vertex which look black or purple or even golden brown according to the light. Antennæ with the basal joint black, with a silvery tomentum, naked save for a few short white hairs; the second joint scarcely swollen, light yellow in colour, with a few black spatulate scales on its upper face; the succeeding joints black with white pubescence; the verticillate hairs black. Clypeus black, with silvery sheen, notched on either side. Palpi short, not more than one-fifth the length of the proboscis, 4-jointed (?); last joint small and nipple-like. First two joints with golden scales at the sides and beneath; the two last joints are covered with scales which are coppery or rose-purple according to the angle the light strikes them. The proboscis is long, swollen at the base; the scales are purple or coppery. Prothoracic lobes small, thickly covered with broad, flat racquet-shaped scales of a creamy yellow colour, with some light brown bristles. Mesonotum black, thickly clad with spindle-shaped flat scales, which laterally become very broad and blunt-ended, and which in a good light appear of a brilliant metallic green to the naked eye in a fresh specimen. Under a lens the colour varies, peacock blue, bronzy purple and metallic green appearing intermixed, now one colour predominating, now another, as the fly is shifted to different angles. On the anterior margin are some golden scales and numerous golden bristles, and laterally in front, immediately behind the prothoracic lobes, there is a band of metallic rose-purple scales, and beneath this is a triangular patch of creamy yellow scales. The two patches meet in a straight line, but the external edges are convex; hence with the prothoracic lobe they form a rough ellipse. The upper band is to be seen when looking down upon the mesonotum, and is very ornamental. The scutellum is clad with rather long, flat spatulate scales, which are coppery, bronzy or purple-bronze as the direction of the light varies. There is a tuft of bristles over the root of each wing. Scutellar bristles are brown in colour. The pleuræ are a dark, glistening chestnut brown, naked in parts, scaled in other parts with creamy yellow scales. The wings are quite typical; the costa and first longitudinal vein are scaled with metallic rose-purple scales. Legs with the coxæ and femora light yellow; tibia and tarsi much darker; the coxæ, bases and under surface of femora clad with metallic golden scales; the upper and lateral surfaces of femora and the whole tibia and tarsi of fore leg covered with brilliant metallic scales, varying from coppery-bronze to rose-purple or bronze-purple; there are creamy scales at the apices of all the femora. Mid leg as the fore, except for a band of golden scales at the base of the metatarsus and golden scales covering the penultimate tarsal joint; tibia and tarsi of hind legs the same as the fore. Ungues equal and simple. Metanotum black. Halteres with pale yellow stems and dark scaled knobs.

Abdomen with the first segment scaled creamy yellow laterally, rose-purple centrally; the other segments brilliant rose-purple, with creamy yellow banding expanding laterally into triangular patches; venter scaled with metallic golden scales, except segment four, which has a patch of dark purple scales.

"♂. Head black, with a deep furrow in the centre; there is a large central patch of flat scales of a bronze green or golden green colour; the scales along the orbital margins are peacock blue, laterally there is a patch of scales peacock blue or rose-purple according to the light in which they are seen. Antennæ with the basal joint black, nude; remaining joints creamy, growing darker towards the apex; the second joint scaled with spatulate and elongated scales of a dark brown colour; a few scales show metallic colouring. There are numerous dark brown hairs on the joints; the verticillate hairs dark brown, almost black, neither very dense nor very long. The antennæ are not nearly so marked a feature as they are in a *Megarhinus*. Palpi, 3-jointed; first joint shows a slight swelling at the base, and there is a thinning of the chitin which looks like a joint but is not; there is also a second thinning, and the chitin is folded in more basally; the whole joint is very long. The second joint is about half the length of first; the third is long and pointed, almost as long as the first joint, which is almost entirely golden scaled except on its upper surface near its base, where there is a patch of rose-purple scales and a band of the same about its middle and a few dark scales dorsally at the apex; the second joint golden scaled beneath and also the sides, except apically; the upper surface is purple scaled; the third joint is entirely purple scaled. Proboscis scaled with purple scales to the angle, then green scaled. The markings of both proboscis and palpi vary. In one specimen I have the first joint of the palpus is entirely gold scaled save for a ring of purple scales on the middle and apex. The thorax is similar to the female. Legs with the coxæ and under sides of femora golden scaled. The upper surfaces of the femora and the rest of all the legs are clad with purple scales; a few pale scales are inserted at the apices of the femora; fore and mid ungues unequal, the larger uniserrate. Abdomen scaled as in the female. No caudal tuft. A few rather long golden hairs inserted on the two last segments."—(Leicester). Length 10 mm., male and female.

Habitat.—Kuala Lumpur.

Observations.—This is a very distinct species. The most striking features are the honey yellow and purple male palpi and the single creamy band on the mid legs of the female. Had this species been described from the dried types sent me by Dr. Leicester, I should have described the abdomen as unbanded, for in the female it is evidently shrunken, and no trace of the bands seen in the fresh specimen can now be noticed.—(F. V. T.)

(To be continued.)

CURRENT NOTES.

By G. W. Kirkaldy.

(Continued from p. 12.)

Geo. H. Carpenter & Denis R. Pack-Beresford, Sept., 1903: "The Relationship of *Vespa austriaca* to *Vespa rufa*" ('Irish Naturalist,' xii. pp. 221–38, pl. 2). [Hymenoptera.]

M. V. Slingerland, 1903: "The Insects destructive to Fruits" (Thomas' 'American Fruit Culturist,' ed. 21, chap. xii. pp. 160–210, text-figs. 210–78). A practical working manual for the amateur and farmer. Prof. Slingerland's name is a guarantee of the scientific accuracy and the lucidity of the entomological contribution of fifty pages.

M. V. Slingerland, 1903: "A big fight with Grape Pests" (Proc. Forty-eighth Ann. Meeting Western New York Hort. Soc., pp. 1–4 [? sep.]). An account of ravages of the Grape Rootworm (*Fidia* ——) and the Grape Leafhopper (*Typhlocyba comes*).

John Fields, E. E. Bogue, and others, Sept., 1903: Bulletin Oklahoma Agr. Exp. Sta. no. 59 (being reprints from Bulletins 47, 50, and 52, and Ann. Reports 8–11), pp. 1–200; text-figs. Notices on grape insects.

W. van Deventer: "Insecteneieren welke veel op het suikerriet gevonden worden," 1903 (Archief voor Java-Suikerindustrie, xi. pp. 437–46, pl. vii. & viii.). An important paper on the eggs of certain Javan sugarcane pests. These are delineated *in situ* and separately. Among these are *Hesperia conjuncta*, *Euproctis minor*, *Procodeca adara*, *Psalis securis*, *Dreata petola*, *Scirpophaga intacta*, *Chilo infuscatellus*, and *Diatræa striatalis* among the Lepidoptera, and various unidentified spiders, bugs, and flies.

A. Zimmermann, 1903: "Ueber einige auf den Plantagen von Ost- und West-Usambara gemachte Beobachtungen," (Bericht über Land- und Forstwirtschaft in Deutschostafrika, i. pp. 351–81, pl. iv. (coloured)). An account of observations made on some of the plantations in German East Africa, principally of coffee; a number of injurious insects of different orders are figured with their work, &c.

"Proceedings of the Fifteenth Annual Meeting of the Association of Economic Entomologists" (Bull. U. S. Div. Entom., new series, 40, 1903, pp. 1–124, 2 plates and 6 text-figs.). The proceedings of last meeting of the above Association were as usual full of general interest. The address of the President (Dr. E. P. Felt) has been previously noted (see Entom. 1903, p. 311). Herbert Osborn (pp. 35–6) gives "a method for mounting Dry Coccidæ for permanent preservation." C. L. Marlatt has a most instructive article on "Applied Entomology in Japan" (pp. 56–63), illustrated by two plates, representing

Japanese insect placards, the first showing the Rhynchoton *Selenocephalus cinctiiceps*, an enemy of the rice plant, with its parasites, &c.; the second the Lepidopteron *Hemerophila atrilineata*, an enemy of mulberry, also with its parasites. Dr. J. B. Smith discusses "Mosquitocides" (pp. 96–108), and concludes that there are several preparations that will serve both as disinfectants and larvicides, even when highly diluted. We note that the Association numbers eighty-six active, forty associate, and forty foreign members, a total of one hundred and sixty-six.

K. Nagano (July 15), 1903: "*Smerinthus planus*, Walker (*Uchi-suzume*)" ('Insect World,' vii. no. 7, 1 p. Engl. suppl.). [Lepidoptera.] Stated to be the same apparently as *S. ocellatus*, L. A figure is given, together with one of the larva, which is also briefly described; its food-plants are noted as *Salix*, *Prunus pseudocerasus*, and *Pyrus malus*. Plate vii. contains twelve figures of waterbugs, named only in Japanese, but recognizable; among them are the imago and ova of *Notonecta triviittata*, Motschulsky.

H. A. Gossard, 1903: "Whitefly (*Aleyrodes citri*)" (Bull. Florida Agric. Exp. Sta. 67, pp. 595–66, pls. i.–vi.; with a note on its allies by T. D. A. Cockerell, pp. 662–6). [Rhynchota.] This is a valuable contribution to our knowledge of this remarkable family, which links together in some ways the Coccidæ and Aphidæ, and the type of which was described by Linnæus as a *Tinea*. The Citrus whitefly is described and figured in all stages and in great detail; it is of unknown origin, though probably American, and is the worst orange pest where it now occurs. In Florida there are three annual broods, and there are few insect enemies, though two fungous diseases are more or less efficient in suppressing it.

P. Preuss: Ueber Pflanzenschädlinge in Kamerun," 1903 (Der Tropenpflanzer, vii. pp. 345–61, 5 text-figs.). Descriptions and figures are given, amongst others, of various Longicorn Coleoptera injurious to coffee, cocoa, and india-rubber.

H. A. Kelly, 1903: The Culture of the Mulberry Silkworm (Bull. U. S. Div. Ent., new series, 39, pp. 1–32, text-figs. 1–15).

E. E. Green, 1903: The Tea Tortrix (*Capua coffearia*, Nietner) (1903, Circulars and Agric. Journal, Botanic Gardens, Ceylon, ii. pp. 33–46, 1 plate and 1 text-fig.).

E. E. Green, 1903: "The Lobster Caterpillar," a tea pest in Ceylon (*op. cit.*, ii. pp. 95–107, 3 pl.). *Capua coffearia* was described as far back as 1861, but has only come into prominence as a tea pest of late years. Mr. Green has worked out the complete life-history. The Lobster Caterpillar (*Stauropus alternus*, Walker) was formerly considered as somewhat of a prize by the collector of Lepidoptera, but has recently appeared in enormous numbers on certain tea estates in Ceylon. It occurs also in

Burmah and Java, and has been noted as occasioning considerable mischief in India. The life-history is worked out.

Among papers on American insects that will be useful to European workers may be cited:—

J. D. Evens: "List of Canadian Coleoptera," commenced in 'Canadian Entomologist,' xxxv. (1903) pp. 239–43.

W. T. Clarke: "A list of Californian Aphididæ," *l. c.*, pp. 247–54.

J. R. de la Torre Bueno: "Notes on the Stridulation and Habits of *Ranatra fusca*, Pal. B., *l. c.*, 235–7.

Prof. C. H. Fernald states that graduate students in entomology in the Massachusetts Agricultural College are tested for colour-blindness, to prevent possible errors in descriptive entomology (*l. c.*, p. 206).

H. F. Wickham has two short papers (*l. c.*, pp. 205–6, fig. 7, and p. 207, fig. 8) on gynandromorphism in *Lucanus elaphus*, and on a remarkable instance of duplication of part of the left posterior leg, which bears a bifurcate tibia, two tarsi, one of which is also bifurcate and carries two pairs of claws, thus six in all on one leg.

John H. Lovell: "The Colours of Northern Gamopetalous Flowers" (1903, 'American Naturalist,' xxxvii. pp. 365–84 and 443–79). On pp. 472–9 are discussed the relations between flowers and insects of the orders Coleoptera, Diptera, Lepidoptera, and Hymenoptera. The author believes that "the colours of flowers, both in general and particular, have been determined by their utility rather than by an æsthetic colour-sense in insects. Insects distinguish between different colours, but they do not receive greater pleasure from one hue than from another. Any preference they may manifest has arisen from the association of the colours with the presence of food substances. Conspicuousness, or contrast of the inflorescence with the foliage, has been induced by insects. It is of advantage to insects, since it enables them to find nectariferous flowers quickly, and to plants because it aids in securing cross-fertilization."

K. Nagano continues his descriptions and figures of imagines and larvæ of Japanese Sphingididæ [Lepidoptera]. Two of the latest are *Cephonodes hylas*, Linné (*O-sukashiba*), and *Chærocampa lucasii*, Walker (*Beni-suzume*), both from Formosa ('Insect World,' 1903, vii., nos. 8 & 9, English page). In the former number is a plate (viii.) of the Lepidopteron *Zephyrus taxila*, Brem., and its metamorphoses; in the latter, one (ix.) representing an exhibition of insects used in secondary education.

(To be continued.)

NOTES AND OBSERVATIONS.

Notes on Variation in Malacosoma (Bombyx) neustria.—On the 30th May I found a nest of the larvæ of *M. neustria*, about half grown, feeding on wild plum. Wishing to discover whether different food-plants had any part in causing the considerable variations in the imago, I divided the larvæ roughly into two batches—giving one ordinary garden plum, and the other apple. In due course about thirty-five pupated, and the moths began to emerge on July 22nd—ten females and one male on that day, and three females and four males on the 23rd. Twelve more, all males, emerged up to August 4th. It will therefore be noted that the bulk of the females emerged first. Of course, a much longer series of experiments would be necessary before arriving at any definite conclusion; but it may be interesting to put some of the facts on record, as a starting-point for further investigations. I must here acknowledge my indebtedness to Mr. F. A. Oldaker, of Dorking, for some interesting notes with respect to larvæ fed on apple and blackthorn, which notes I have incorporated. In the first place, there was a much greater disparity between the numbers of the sexes in those fed on apple and blackthorn than in those fed on plum, *viz.* on apple—(Dorset) three females, eight males; (Surrey) seven females, eleven males; or a total of ten females to nineteen males. On blackthorn—(Isle of Wight) two females, eight males; while on plum (Dorset), ten females to nine males. In colour there was nothing sufficiently distinctive of either batch to be noted; but there was an abrupt line of demarcation between the brown and yellow males—the brown, though varying in intensity, being always brown, never approaching yellow; the yellow constant in tone. As to number—Mr. Oldaker was not fortunate enough to get any yellow males either from the apple or blackthorn; but of mine, the apple produced six yellow and two brown; the plum, four yellow and five brown. The sizes across the wing when set were—Apple: Dorset, females 38–39 mm., males 29–30 mm.; Surrey, females 36½ mm., males 28 mm. Plum: Dorset, females 37–38 mm., males 29–30 mm. Blackthorn: Isle of Wight, females 32 mm., males 28 mm.—James Douglas; Sherborne, Dorset.

Acidalia degeneraria partly double-brooded. — Last year (1902) I took, at Portland, a few worn *A. degeneraria*, and, contrary to my expectations, obtained some ova from them, which duly hatched. The larvæ fed up satisfactorily, and the perfect insect commenced emerging on June 2nd last. On the 7th a pair mated, and ova were deposited on the 12th. Two other pairs were mated on the 22nd and 23rd, and eggs were laid on the 25th and 26th. On the 25th the first batch of ova hatched; and on July 1st the other two lots, which had been put into one box, commenced hatching. All the larvæ were subsequently put together. Towards the end of July I noticed that six of the larvæ were much larger than the others, and on Aug. 10th one of them spun up. On the 15th another had spun, on the 20th two more, and I found two that had pupated without spinning any web, one of which was deformed. On Sept. 2nd a pair of perfect insects emerged, and I found them mated on the night of the 3rd. Eggs were laid on the

4th and 5th. On the night of the 6th the same pair were *in cop.* again. Three other imagines, all males, subsequently emerged. On the 27th the ova hatched, and so far the larvæ have progressed satisfactorily. I am keeping the two lots of larvæ separate for observation in the spring.—Jno. V. Hyde; "Cranbourne," Kirtleton Avenue, Weymouth, Dec. 22nd, 1903.

CAPTURES AND FIELD REPORTS.

Sirex gigas in the Isle of Man.—A somewhat small specimen was taken in Molly Quirks Glen, Isle of Man, August, 1902, by T. H. Shepherd, Carr Lane, Shipley.

Sphinx convolvuli at Cardiff, Glamorganshire.—On Sept. 25th last I took a male specimen of this fine insect on the ground beneath an electric lamp here. It might easily been have passed unnoticed, had it not been that its brightly banded body could be seen between the parted wings.—Thomas J. Shelley; 103, King's Road, Cardiff, South Wales.

Laphygma exigua at Chester.—On Sept. 25th of last year I took a moth at one of the Chester electric lamps which has been identified as *L. exigua*. This is the second recorded capture of the species here, the first being taken at an electric lamp in 1900, by Dr. Herbert Dobie. Unfortunately, my specimen is minus the tip of the right upper wing. —J. Arkle; Chester.

Chœrocampa celerio at Saxmundham.—I have much pleasure in recording the capture of a specimen of *C. celerio* at Saxmundham, on 15th or 16th of October last, by Mr. J. G. Franklin, who found it at rest at the base of a plant of *Nicotiana affinis* in his garden. I have not noted any mention of the appearance of this moth in this country for some time.—Wm. A. Carter; 4, Burr Villas, Bexley Heath.

[An example of this species was taken at Brighton, on Oct. 24th last; *vide* Entom. for 1903, p. 292.—Ed.]

Ennomos autumnaria (alniaria) at Fareham.—In August last, one of my choir-boys brought me a few larvæ of a "thorn" I did not know, which he had found feeding on a cherry-tree in a neighbouring garden. It seemed that already a large number had been destroyed by the owner of the garden, as the larvæ had been found in great abundance. The resultant imagines turned out to be *E. autumnaria*, but very small in size, though the larvæ were nearly full-fed when received. The species has been taken elsewhere in Hants, but is not cherry an unusual food-plant for the larvæ?—(Rev.) J. E. Tarbat; Fareham, Hants, Jan. 18th, 1904.

Hemerophila abruptaria in January.—On January 16th I opened a cage containing pupæ of *Hemerophila abruptaria*, and was surprised to find that a female specimen had emerged. It was somewhat worn, so had probably been out some days.—B. Stonell; 25, Studley Road, Clapham, S.W.

HYRIA AURORARIA AND MELITÆA ARTEMIS.—I was recently shown a series of these insects taken, I was informed, on Wimbledon Common in 1900. I should be pleased to hear if these species have been taken by other collectors in this district.—B. STONELL.

LEPIDOPTERA IN N. DORSET, 1903.—I think the most noteworthy fact this year after (and certainly consequent on) the abnormal rainfall was the paucity of individual specimens. Most of the species commonly occurring in the district put in an appearance, but the numbers of each could be counted with at least one nought less than usual, with one or two exceptions. Of these the most noticeable were *Bryophila perla*—a lichen-feeder and therefore one which would naturally revel in a wet season—and *Polia flavicincta*. The latter seems to have appeared in many places where not previously taken, and to have been abundant in its usual haunts; but for this I am unable to assign any reason. I should mention that various causes prevented any entomological work being done until April, and that I was away from home from July 23rd to Sept. 3rd, thus considerably shortening my list, which, however, does not include many of the very common species, of which no note was taken.

Smerinthus ocellatus, June 20. *Macroglossa stellatarum*, April 7. *Gnophria rubricollis*, June 1. *Arctia plantaginis*, July 8. *Hepialus humuli*, June 30. *Porthesia auriflua*, July 19. *Dasychira pudibunda* (from pupa), March 30. *Trichiura crataegi*, Sept. 24. *Pœcilocampa populi*, Dec. 8, 9. *Malacosoma neustria*, July 22 to Aug. 4. *Lasiocampa quercus*, July 7. *Dicranura vinula*, May 22 to 30. *Thyatira derasa*, July 20. *Bryophila muralis*, July 20. *B. perla*, July 8 to Sept. 7. *Acronycta psi*, July 14. *Diloba cæruleocephala* (males), Oct. 12 to 19. *Leucania pallens*, Sept. 23 to Oct. 2. *Hydrœcia micacea*, Oct. 17. *Xylophasia lithoxylea*, June 25 to July 6. *Luperina testacea*, Sept. 11 to Oct. 1. *Mamestra sordida*, July 6. *M. brassicæ*, Oct. 2 (just emerged). *Apamea basilinea*, June 22. *Miana fasciuncula*, July 6. *M. furuncula*, July 15 to 19. *Caradrina morpheus*, July 16. *C. cubicularis*, Sept. 6 to 30. *Agrotis suffusa*, Sept. 22 to Oct. 9. *A. saucia*, Sept. 22. *A. segetum*, Sept. 26 to Oct. 3. *Noctua plecta*, Sept. 3 to 7. *N. c-nigrum*, Sept. 18 to 26. *N. rubi*, Sept. 4 to 26. *Amphipyra tragopogonis*, Sept. 3. *Orthosia pistacina*, Sept. 26 to Oct. 10. *O. rufina*, Oct. 2. *O. litura*, Sept. 12 to Oct. 10. *O. lunosa*, Sept. 16, 17. *Xanthia circellaris*, Oct. 2. *Polia flavicincta*, Sept. 17 to Oct. 5. *Miselia oxyacanthæ*, Oct. 19. *Phlogophora meticulosa*, June 22, Sept. 9 to Oct. 3. *Euplexia lucipara*, July 18. *Hadena oleracea*, June 21 to July 18. *Cucullia umbratica*, July 20. *Gonoptera libatrix*, May 21. *Habrostola tripartita*, July 16 to 20. *H. triplasia*, June 29 to July 19. *Plusia chrysitis*, July 10. *P. iota*, July 10 to 18. *Heliaca tenebrata*, May 22. *Phytometra ænea*, May 21 to June 27. *Rumia luteolata* (*cratægata*), July 18, Sept. 13 to 23. *Venilia maculata*, May 31 to June 1. *Odontopera bidentata*, May 19. *Crocallis elinguaria*, July 7. *Ennomos fuscantaria*, Sept. 23, *Himera pennaria*, Nov. 22. *Biston strataria*, March. *Hemerophila abruptaria*, May 21 to 28. *Boarmia rhomboidaria*, July 10 to 18. *Zonosoma annulata*, Sept. 5. *Asthena luteata*, June 20 to July 7. *Acidalia dilutaria*, July 21. *A. remutaria*, May 31. *A. imitaria*, July 15. *Timandra amataria*, July 15. *Bapta temerata*, June 1. *Halia*

vauaria, July 9 to 17, Sept. 13 to 17. *Panagra petraria*, May 31. *Numeria pulveraria*, May 31. *Fidonia atomaria*, May 21, 22. *Ligdia adustata*, July 10. *Emmelesia affinitata*, May 30. *E. decolorata*, May 30. *Melanippe procellata*, July 8. *M. rivata*, May 31. *M. sociata*, May 24 to 31. *M. montanata*, May 24. *Anticlea badiata*, May 4. *Coremia ferrugata*, May 24 to 30. *Triphosa dubitata*, Sept. 15. *Cidaria miata*, Sept. 25 to Oct. 24. *C. testata*, Sept. 27. *C. associata*, July 9 to 18. *Eubolia plumbaria*, July 11. *Tanagra atrata*, July 11.

The most notable absentees were *A. puta*, *A. corticea*, *A. pyramidea*, *O. lota*, *O. macilenta*, *C. ligula*, *S. satellitia*, *X. socia*, *E. alniaria* (*tiliaria*), *E. cervinata*. Some of these are accounted for by the atrocious weather in October, and the fact that ivy was a complete failure, the continuous and heavy rains washing off the pollen and rotting the unexpanded flowers.

L. pallens, in this district, appears either to be double-brooded, or to emerge over a much longer period than usual, as the specimens taken at the end of September, both this year and last, were perfectly fresh.—James Douglas; Sherborne, Dorset.

Lepidoptera at Light during 1903, in the Dorking District.—I devoted special attention to this method of collecting last year, and the results obtained are, I think, very encouraging, especially when the adverse climatic conditions are considered. The chief drawback to it is that one has to be out so late, the best work being done between 11 p.m. and 1 a.m., and scarcely anything is to be taken before 11, as a rule. I employed the Dixon lamp-net to a limited extent, and I only used it for lamps which were difficult to climb. But most of the lamps here have a projecting ridge about three feet from the ground, and this provides a fairly safe foothold. My captures consisted chiefly in males, quite ninety per cent, of the whole; but I was fortunate in taking several fertile females, such as *Dasychira pudibunda*, *Dicranura vinula*, *Notodonta dictæoides*, *Agrotis puta*, *Odontopera bidentata*, and *Biston strataria*. I append a list of the insects taken, with the date of capture of the first specimen in each case:—

Smerinthus ocellatus, May 27. *S. populi*, June 11. *Euchelia jacobææ*, May 25. *Arctia caia*, July 18. *Spilosoma lubricipeda*, May 24. *S. menthastri*, May 10. *Hepialus humuli*, June 17. *H. lupulinus*, June 10. *Porthesia similis*, July 17. *Dasychira pudibunda*, May 28. *Malacosoma* (*Bombyx*) *neustria*, July 22. *Dicranura vinula*, May 31. *Pterostoma palpina*, May 23. *Lophopteryx camelina*, June 6. *L. carmelita*, May 1. *Notodonta dictæa*, May 28. *N. dictæoides*, May 31. *N. trepida*, May 31. *N. trimacula*, May 23. *Phalera bucephala*, July 4. *Cymatophora duplaris*, July 16. *Bryophila perla*, June 27. *Diloba cæruleocephala*, Oct. 19. *Leucania conigera*, July 24. *L. comma*, June 16. *L. impura*, July 12. *L. pallens*, July 1. *Hydræcia micacea*, Sept. 26. *Xylophasia rurea* var. *alopecurus*, June 20. *Neuria reticulata*, June 24. *Cerigo matura*, July 26. *Luperina testacea*, Sept. 14. *L. cespitis*, Sept. 14. *Mamestra brassicæ*, July 17. *M. persicariæ*, July 16. *Miana strigilis*, July 5. *M. fasciuncula*, June 27. *M. arcuosa*, July 18. *Grammesia trigrammica*, May 31. *Caradrina morpheus*, June 27. *C. taraxaci*, June 29. *C. quadripunctata*, June 4. *Rusina tenebrosa*, June 27. *Agrotis puta*, May 18. *A. exclamationis*, June 11. *A. corticea*, July 1.

A. cinerea, May 28. *A. nigricans*, July 1. *A. strigula*, July 5. *Noctua c-nigrum*, Sept. 6. *N. rubi*, June 4. *N. xanthographa*, Sept. 6. *Triphæna ianthina*, July 26. *T. pronuba*, July 22. *Amphipyra pyramidea*, July 24. *Pachnobia rubricosa*, May 8. *Tæniocampa gothica*, March 21. *T. incerta*, March 26. *T. stabilis*, March 26. *T. munda*, March 26. *T. pulverulenta*, March 21. *Orthosia macilenta*, Oct. 28. *Anchocelis pistacina*, Sept. 25. *A. lunosa*, Sept. 12. *Cerastis spadicea*, Oct. 28. *Dianthœcia carpophaga*, June 23. *Aporophyla lutulenta* var. *luneburgensis*, Sept. 21. *Miselia oxyacanthæ*, Oct. 19. *Phlogophora meticulosa*, Sept. 26. *Hadena dentina*, June 17. *H. pisi*, June 29. *Habrostola tripartita*, June 23. *Plusia gamma*, June 22. *Acontia luctuosa*, July 1. *Zanclognatha grisealis*, June 23. *Z. tarsipennalis*, June 26. *Hypena proboscidalis*, July 14. *Urapteryx sambucaria*, July 9. *Rumia luteolata*, May 18. *Metrocampa margaritaria*, July 7. *Selenia bilunaria*, March 26. *S. lunaria*, May 28. *Odontopera bidentata*, May 18. *Ennomos alniaria*, Sept. 14. *Himera pennaria* Nov. 3. *Phigalia pedaria*, Feb. 11. *Amphidasys strataria*, March 20. *A. betularia*, June 18. *Hemerophila abruptaria*, May 15. *Boarmia repandata*, July 4. *B. roboraria*, June 5. *Tephrosia crepuscularia*, May 10. *Asthena candidata*, July 1. *Acidalia imitaria*, July 16. *Cabera pusaria*, June 25. *Halia vanaria*, July 16. *Strenia clathrata*, May 28. *Panagra petraria*, May 20. *Ligdia adustata*, May 21. *Lomaspilis marginata*, May 27. *Hybernia rupicapraria*, Feb. 13. *H. aurantiaria*, Nov. 13. *H. marginaria*, Feb. 13. *H. defoliaria*, Oct. 19. *A. æscularia*, March 26. *H. brumata*, Nov. 3. *O. dilutata*, Oct. 19. *Eupithecia oblongata*, May 18, *E. subfulvata*, July 28. *E. vulgata*, May 22. *E. absinthiata*, June 16. *E. assimilata*, May 2. *E. exiguata*, May 31. *E. pumilata*, May 23. *E. rectangulata*, May 28. *Lobophora viretata*, May 29. *Thera variata*, July 26. *Melanippe fluctuata*, May 4. *Anticlea badiata*, March 25. *Coremia ferrugata*, May 10. *Phibalapteryx vitalbata*, May 8. *Eucosmia certata*, May 14. *Cidaria truncata*, Sept. 26. *C. suffumata*, July 28. *C. fulvata*, July 5. *C. dotata*, July 4. *Pelurga comitata*, July 28. *Eubolia cervinata*, Sept. 22. *E. bipunctaria*, Sept. 14. *Anaitis plagiata*, May 4. *Chesias spartiata*, Oct. 19.

It will be observed from this list that there is an absence of records for August. I was away from Dorking during that month, and though on my return in September the lamps afforded a fair harvest, the results for October, November, and December were very poor, a great many insects that I had taken in 1902 during those months being either entirely absent or present in very small numbers. Still, the results for the year as a whole may be regarded as good.—F. A. Oldaker; Parsonage House, Dorking, Jan. 19th, 1904.

Polyommatus (Lycæna) argiades in Somersetshire. — I have a male specimen of *P. argiades* in my collection which I captured in 1895 or 1896 at Wrington, about twelve miles north of Bristol. I was not aware of the name of my insect until I saw the figure of this butterfly in the new issue of Mr. Kirby's 'Butterflies and Moths of Europe.'—R. D. R.; 3, Tirlestane Road, Edinburgh.

SOCIETIES.

Entomological Society of London.—*November* 18*th*, 1903.—Professor E. B. Poulton, D.Sc., F.R.S., President, in the chair.—Mr. John Rowland Cattle, of Nettleton Manor, Caistor and 59, Chancery Lane, E.C., and Mr. E. J. Hare, of 8, Hillsboro' Road, East Dulwich, S.E., were elected Fellows of the Society.—Mr. G. C. Champion exhibited numerous specimens of both sexes of *Xyleborus dispar*, from Moncayo, Spain, taken out of beech-stumps.—Mr. F. B. Jennings (1), on behalf of Mr. H. Britten, of Great Salkeld, Cumberland, a specimen of *Tropiphorus tomentosus*, Marsh, from Great Salkeld, showing the deciduous false mandibles intact; (2), a female specimen of *Anchomenus parumpunctatus*, F., from the same locality, showing a malformation of the middle right tibia, which was abnormally thin, and bent in the centre, but thickened at the base; the right antenna also had the last seven joints flattened and dilated.—Mr. Jennings also exhibited, on his own behalf, *Apion sanguineum*, De G., taken at Brandon, Suffolk, in August last, on *Rumex*.—Mr. H. St. J. K. Donisthorpe, *Apium sorbi*, male, taken this year at Freshwater, Isle of Wight, and said that the male of this species was extremely rare.—Mr. M. Burr, two females and two males of the largest known earwig, *Anisolabis colossea*, Dohrn., from New South Wales.—Mr. A. J. Chitty, a specimen of the rare *Homalium testaceum* taken in Blean Wood in 1900, and a pair of bees, *Nomada guttulata*, of which the male has never been recorded hitherto in Britain, taken by him at Huntingfield, Kent, in May last.—Dr. Norman Joy (1), *Euconnus maklini*, Mannerh., taken at Bradfield in July, 1901, new to the British list of Coleoptera, and (2), a series of beetles taken at Bradfield at the exuding sap of trees attacked by *Cossus ligniperda*.—Colonel J. W. Yerbury, specimens of rare British Diptera from Portheawl, including *Leptopa filiformis*, Zett., *Pelidnoptera nigripennis*, *Lucina fasciata*, and *Thyreophora fuscata*. Dr. T. A. Chapman, specimens of *Chrysophanus phlæas* from Reigate, Locarno, and Spain, showing the apparent effects of temperature on the wing markings and coloration. Mr. G. J. Arrow showed specimens and diagrams illustrating a remarkable kind of variability noticed in beetles of the Trogid genus *Acanthocerus*. The President showed an exhibit sent by Mr. A. H. Thayer, of Mondarock, N.H., U.S.A. The greyish silhouettes of two butterflies were represented in a tint nearly the same as the basal ground, but sufficiently distinct to be easily recognisable. Mr. Thayer considered the dark ground colour of many Rhopalocerous insects represented shadow under vegetation, the white submarginal lines and dots a generalization of flowers and flower-masses. But these markings also had a second meaning in that they tended to obliterate the tell-tale margin of the wings. The President also exhibited specimens of *Drurya antimachus*, together with the butterflies which he suggested as forming a group synaposematic with it. The central species appeared to be *Acræa egina*, round which clustered a number of other species of the same genus so much alike as to be probably indistinguishable upon the wing. Examples of these were exhibited, viz. *A. zetis*, *perenna*, *rogersi*, and *pharsalus*. Another beautiful Papilionian member of the group, *P. ridleyanus*, was also shown; in pattern it was nearest to that of the male *A. egina*. In fact, so close was the resem-

blance, that Godart had been entirely misled by it, and had described the *Papilio* under the name of *zidora* as the female of *Acræa egina*.—Mr. E. Saunders, F.R.S., communicated "A Supplementary Note to a Paper entitled 'Hymenoptera Aculeata collected by the Rev. A. E. Eaton, M.A., in Madeira and Tenerife, in the spring of 1902.'"—H. Rowland-Brown, *Hon. Sec.*

December 2nd.—The President in the chair.—Mr. F. H. Day, of Carlisle; the Rev. Thomas Prinsep Levett, of Frenchgate, Richmond, Yorkshire, and Parkington Hall, Lichfield; and Mr. Robert C. L. Perkins, B.A., of Honolulu, were elected Fellows of the Society.—Mr. H. Goss, one of the secretaries, again read the names of the officers and members of the council proposed for election at the General Meeting.—Mr. G. T. Porritt exhibited, on behalf of Mr. T. Ashton Lofthouse, a specimen of *Xylophasia zollikoferi*, taken at sugar near Middlesbrough, Yorkshire, on Sept. 26th last. He said he believed that this was only the second specimen which had been recorded as having been taken in Britain. Mr. McLachlan, F.R.S., said the strongest evidence existed that a very large immigration of insects from the nearest continental coast took place during the exceptional (for this year) spell of warm and calm weather prevailing towards the end of September, and he was of opinion that the specimen of *Xylophasia zollikoferi*, taken by Mr. Lofthouse in Yorkshire, formed an item in this migratory swarm.—Mr. Malcolm Burr exhibited, and remarked on, a specimen of *Dinarchus dasypus*, Illig., belonging to a family of five or six species confined to the Balkans.—The President, a series of photographs sent by Mr. A. H. Thayer to illustrate his views on the significance of the colours and patterns of butterflies' wings. The insects had been photographed on masses of foliage and flowers, and it was obvious that the dark ground colour harmonized with the the dark shadow behind and under the vegetation, while the light markings stood out as unconventionalized representations of single flowers and flower-masses. Also the eyeless imagines and pupa cases of *Ennomos autumnaria*, in illustration of his remarks at the meeting on November 18th. Imagines produced by unblinded larvæ were also shown for comparison. Dr. Chapman made some remarks on the specimens exhibited by the President.—The Rev. Francis D. Morice, M.A., read a paper entitled, "Illustrations of the Male Terminal Segments and Armatures in Thirty-five Species of the Hymenopterous genus Colletes."—H. Goss, *Hon. Sec.*

The 70th Annual Meeting of the Society was held on Wednesday, Jan. 20th, 1904, the President in the chair.—After an abstract of the Treasurer's accounts, showing a large balance in the Society's favour, had been read by Mr. R. W. Lloyd (one of the Auditors), Mr. Herbert Goss (one of the Secretaries) read the Report of the Council. It was then announced that the following had been elected Officers and Council for the Session 1904–1905:—President, Professor Edward B. Poulton, D.Sc., F.R.S.; Treasurer, Mr. Robert McLachlan, F.R.S.; Secretaries, Mr. Herbert Goss, F.L.S., and Mr. Henry Rowland-Brown, M.A.; Librarian, Mr. George C. Champion, F.Z.S.; and as other members of Council, Lieut.-Colonel Charles Bingham, F.Z.S., Dr. Thomas A. Chapman, F.Z.S., Mr. Arthur John Chitty, M.A., Mr. James Edward Collin, Dr. Frederick A. Dixey, M.A., Mr. Hamilton

H. C. J. Druce, F.Z.S., William John Lucas, B.A., the Rev. Francis D. Morice, M.A., the Hon. N. Charles Rothschild, M.A., F.L.S., Dr. David Sharp, M.A., F.R.S., Colonel Charles Swinhoe, M.A., F.L.S., and Colonel John W. Yerbury, R.A., F.Z.S. The President referred to the loss sustained by the Society, in common with other communities for the advancement of science and thought, in the death of Mr. Herbert Spencer. He then spoke of the losses Entomology had sustained during the past Session by the deaths of Mr. F. Bates, Mr. W. D. Crotch, M.A., Mr. E. R. Dale, Herr Johannes Faust, Prof. A. Radcliffe Grote, the Rev. J. Hocking-Hocking, M.A., the Rev. T. A. Marshall, M.A., Dr. P. Brookes Mason, the Rev. Canon Bernard Smith, Mr. J. S. Stevens, and Mr. S. J. Wilkinson. He then delivered an address on the subject of "What is a Species?" What is there to fill the vacancy left by the disappearance of the Linnean conception, founded on "special creation"? In many respects it would be advantageous to abandon the word, or to use it solely with its original logical meaning of "kind," or, as zoologists would say, "form." This view was, however, regarded as "a counsel of perfection," impossible of attainment; and the attempt was made to show that the conception of a naturally and freely interbreeding (or syngamic) community lies behind the usual definitions; and that the barrier between species is not sterility, but simply cessation of interbreeding (or asyngamy).—H. Goss, *Hon. Secretary.*

RECENT LITERATURE.

The Moth Book. By W. J. Holland, D.D., Ph.D., &c. Royal 8vo, pp. xxiv, 479; pls. 48; figs. 263. New York: Doubleday, Page & Co. Price 4 dollars net.

This handsome volume forms one of a series of "Nature Books with Coloured Plates and Photographs from Life" issued by an enterprising American firm at an incredibly low price. Many of our readers are probably already acquainted with Dr. Holland's 'Butterfly Book,' uniform with the present volume, which must have done more to popularize the study of American butterflies than all previous works on the subject put together.

Moths are so much more numerous than butterflies that it would have been impossible to treat them with equal fulness, unless a whole series of volumes had been devoted to them; but nevertheless nearly eighteen hundred species are illustrated, including most of the larger and more interesting species of North American moths, and a few representative species belonging to the *Micro-Lepidoptera*. Introductory chapters are devoted to such subjects as life-history and anatomy, capture, preparation and preservation, classification, and books; and much space is devoted to habits, economic importance, silk-culture, &c. The non-technical portions of the work are written in an easy and attractive style, interspersed with poetical and other quotations, even from so little known a poem as Oehlenschläger's 'Aladdin.' Here and there we meet with small popular digressions, such as the section entitled "The World of the Dark" (pp. 77–80). Why should not

entomology, as well as other branches of natural history, be made more generally interesting? Everybody cannot read text-books or catalogues, or even Kirby and Spence; and lighter books, like Acheta Domestica's 'Episodes of Insect Life,' have their place too. We are very pleased to see readable matter, not exclusively entomological, scattered through the works of such American writers as Scudder and Holland; and we should like to see the example followed in this country. On the other hand, the extent of Dr. Holland's book has left little room for detailed descriptions, the illustrations being the main feature of the more technical part of the book; and the matter on many pages (p. 251 especially attracted our attention) is as bald as that in the later volumes of Morris's 'British Moths.' English as well as Latin names are attached to many of the species. We note that many moths are being rapidly exterminated in America by the extensive use of artificial light. Thus we read (p. 95), under *Anisota rubicunda*, "The disappearance of the moth [in Pittsburgh] is due no doubt to the combined influence of the electric lights, which annually destroy millions of insects which are attracted to them, and to gas-wells and furnaces, which lick up in their constantly burning flames other millions of insects. Perhaps the English sparrow has also had a part in the work of extermination." This moth is still common in other localities in the United States; but we have been informed that the American representative of the European *Deilephila galii*, formerly common at Toronto, has almost disappeared from that locality during the last few years, having probably been destroyed in the same way by the electric lights.

There is much more interesting and important information in Dr. Holland's book which we have no space to allude to; but we most cordially recommend it to the notice of all lepidopterists who do not confine their attention exclusively to one continent or one country.

W. F. K.

Aquatic Insects in New York State. Albany. 1903. [Bulletin 68.]

In this Bulletin of the New York State Museum, consisting of 300 pages and 52 plates, besides a number of illustrations in the text, we have the result of work carried on at the entomological field-station at Ithaca in 1901. The chief papers have to do with—Life-histories of Dragonflies and Diptera (J. G. Needham), Aquatic Chrysomelidæ (A. D. MacGillivray), Aquatic Nematocerous Diptera (O. A. Johannsen), The Sialididæ of North and South America (K. C. Davis).

W. J. L.

Ichneumonologia Britanica: The Ichneumons of Great Britain. By Claude Morley, F.E.S. Pp. i–l, and 1–315. With one plate and text illustrations. Plymouth: James H. Keys. 1903.

Six families of Hymenoptera are comprised in the suborder Ichneumonidea, and, with the exception of certain members of the Cynipidæ, all the species belonging to the group are generally understood to be parasitic on other insects, spiders, &c. The family Ichneumonidæ is again divided into five subfamilies, and one of these,

Ichneumoninæ, has been monographed by Mr. Morley in the volume before us.

On pages xi–xxii are presented a copious glossary and a list of works consulted. Then follows the introduction (twenty-eight pages), dealing with, among other things, metamorphosis, structure, the history of the study of Ichneumonidæ, and classification. In his excellent descriptive account of the tribes, genera, and species known to occur in the British Islands, the method of treatment will be warmly appreciated, not only by the student of the group, but by all who desire to work out the identification of their ichneumons.

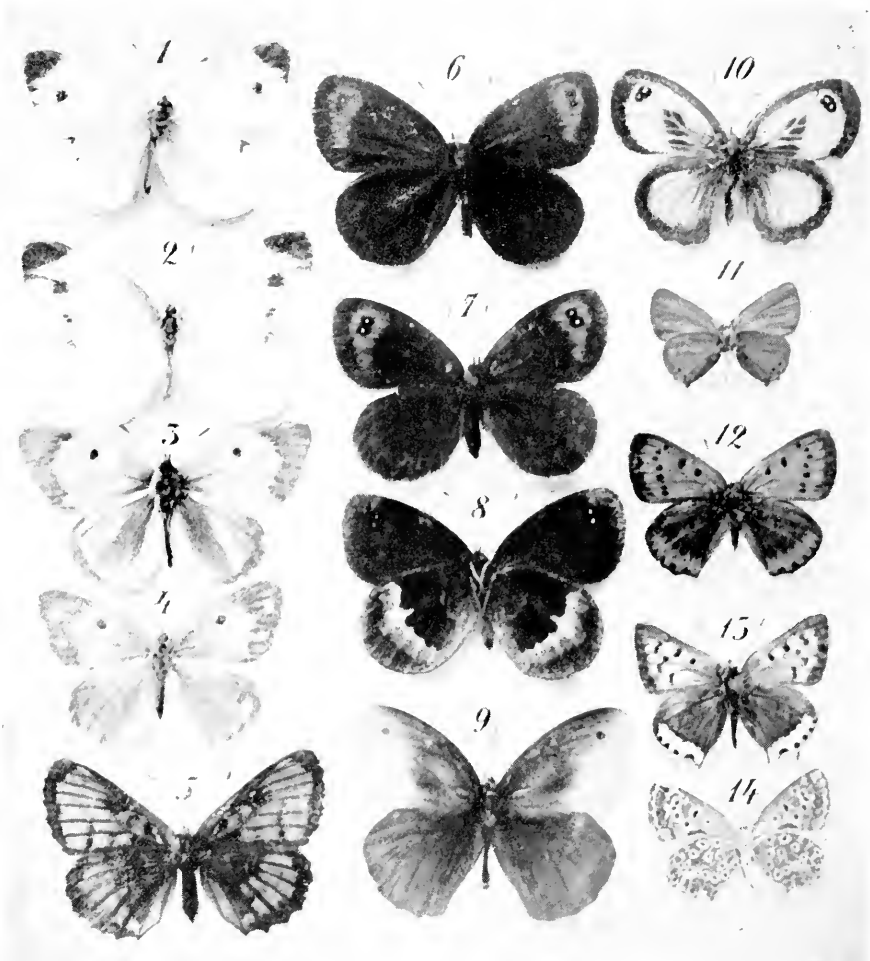
The number of indigenous species seems to be about three hundred and eight, while there are only about eight hundred that are so far known to occur in Europe altogether. These species are distributed among the ten tribes and subtribes as follows:—

	Genera.	Species.
1. Listrodromides . .	2	2
2. Joppides . . .	7	35
3. Ichneumonides		
(*a*) Oxypygini .	9	119
(*b*) Amblypygini .	9	53
(*c*) Platyurini .	5	26
4. Phæogenides		
(*a*) Heresiarchini .	1	1
(*b*) Phæogenini .	16	71
5. Alomyides . . .	1	1

To those who collect lepidopterous larvæ with a view of rearing moths and butterflies, the parasitic hymenoptera are by no means strangers. In fact, they are probably better known than appreciated. Although familiar, however, with the appearance and habits of these attractive insects, few lepidopterists are acquainted with the scientific names or the systematic position of even those species that most frequently come under their notice. With the majority of people especially concerned in lepidoptera, the presence of a "wretched ichneumon" in the breeding-cage is ruefully regarded, and although usually slaughtered on sight, is rarely preserved as a specimen. The publication of Mr. Morley's book on the Ichneumoninæ will most certainly moderate present aversion to the tribe, even if it does not entirely transform that feeling into one of kindly interest.

OBITUARY.

We have to record with regret the death of Thomas Kelsall, who recently passed away at his son's house at Blackpool, at the age of eighty-three. He was formerly employed in the Geological Department of the Manchester Museum, Owens College, where for many years he rendered efficient service. He was a member of the Entomological Society in 1859, together with G. Aspinall, Benjamin Cook, Joseph Chappell, John Hardy, B. B. Labrey, and others. Mr. Kelsall was a man of marked and original character. His loss will be regretted by many, who will feel sincerest sympathy with his family.—R. J. W.



Some forms of Lepidoptera Rhopalocera found in Tuscany.

(See p. 53.)

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NEW FORMS AND NEW LOCALITIES OF SOME EUROPEAN BUTTERFLIES.

By ROGER VERITY, F.Fr.E.S., F.It.E.S.

(PLATE IV.)

PIERIS RAPÆ, L. var. ROSSII, Stefanelli, Trans. of the Ital. Ent. Soc. xxxii. (1900).—This fine and well-marked variety is the summer form of var. *mannii*, Meyer, of the spring brood. It can at a glance be separated from all the other forms of *P. rapæ* by the great development in size and intensity of the black markings, and may well be said to be the variety of *P. rapæ* corresponding to var. *cheiranthi*, Hb. of *P. brassicæ*, L. The apical marking extends to more than one-third of external margin and has the shape of an equilateral triangle; the black spot in the middle of fore wing is in the male distinctly reniform in shape, much larger than in the type, and suffused along the edges; a well-defined black streak connects its upper end to the outer margin, which it joins just at the lower corner of apical patch; another streak runs parallel to the first, from lower end of reniform spot. Very often the space between these two streaks is filled up with dusky. In the female the first spot is more or less square in shape, three or four times as large as in type, and it has the two streaks connecting it with margin more marked than in the male. The second spot is distinctly crescent-shaped, with the concave side turned towards the base. The costal spot of hind wings is somewhat larger than in *P. rapæ*. As to the under side, it only differs from that of type in having the yellow colour much brighter.

This variety is so distinct that it might be thought a true species, if intermediate forms, which connect it with *P. rapæ*, did not occur commonly. Prof. Stefanelli collects var. *rossii*

sparingly in the neighbourhood of Florence every summer; I have found it in the pine-woods that run along the coast of Northern Tuscany: its habits and appearance at a distance are quite similar to those of *Leptidia sinapis*, L.: it flitters lazily about the undergrowth in sunny spots in the woods, but scarcely ever wanders out into the meadows where *P. rapæ* is abundant. (Plate IV., fig. 1, ♂; 2, ♀).

P. DAPLIDICE L., ab. RAPHANI, Esp., Die Schmett. in abb. nach der Nat. p. 163.—This form differs from the type in having the green markings on the under side of hind wing replaced by yellowish ones. It is found commonly in Morocco and Persia, where it often replaces true *daplidice* entirely. I found a specimen of it along the coast in Tuscany, where it seems to occur as an aberration, though very rarely indeed.

COLIAS HYALE, L., ♂ AB. — This accidental variety has been caught near Modena in September, 1900. It has the black borders very wide, just as wide as those of female *C. edusa*; the yellow spots upon it are nearly obsolete, and there is a wide dash of black joining the discoidal spot to the border. On the under side this dash is reproduced, though more faintly; and on the hind wings each of the crescentic reddish spots is prolonged in a dash of the same colour; these converge and join at the back of discoidal spot.

C. EDUSA, Fab., ab. MINOR, Failla, Naturalista Siciliano, vii.–viii. (1889). [PYRENAICA, Gr. Gr. Horæ, Soc. Ent. Rossicæ, xxvii. (1893)].—This is an exceedingly small form of *C. edusa* which occurs occasionally with type. The male and female figured in plate were caught in Tuscany, but I have lately obtained a still smaller specimen, which is not larger than *Chrysophanus dispar*. I also possess a specimen which combines the characters of ab. ♀ *helice*, Hb. and of ab. *minor* (Plate IV., fig. 3, ♂; 4, ♀).

C. EDUSA ab. CÆRULEA, ab. nov.—I propose this name for a most beautiful form of *C. edusa*, of which I possess a specimen (unique, I believe), caught in August, 1902, on the top of Mount Matanna, 4000 ft. (Alpi Apuane, the coast range in Northern Tuscany). The specimen is a female, and has the ground colour white as in ab. *helice*, Hb., but it differs from this form in having all the green colour of the under side replaced by the most lovely pale sky-blue. The whole of the upper side, too, is suffused with strong silvery reflections.

MELITÆA PHŒBE, S. V., ab. ALBINA.—I possess a specimen of this species caught in the province of Lucca in September, 1902, which has the ground colour of both right wings yellowish white, both on the upper and under surface.

M. ATHALIA, Rott., ab. PYRONIA, Hb., Samml. Europ. Schmett., figs. 585–8.—Of this well-known but exceedingly rare aberration figure a specimen which I found in a small collection made

more than half a century ago. The specimen comes from Central Tuscany (Plate IV., fig. 5).

Argynnis lathonia, L., ab. alba, Spüler.—This is an albino, with the ground colour of all the wings white, of the well-known *Argynnis*. I possess a good specimen of it, caught in Tuscany, as well as one of the corresponding form of *A. aglaia*, L.; for the latter I propose the name of ab. *albescens*, ab. nov.

Erebia neoridas, Boisd., Europ. Lepid. Ind. meth. p. 23.—Since the discovery of this species towards the beginning of the last century, it had never been found beyond the French frontier, and it had always been thought that its range was limited to the south of France; but at the end of August, 1901, I received a specimen that had been caught by a friend of mine on the Pania della Croce (Alpi Apuane, the Tuscan mountains mentioned above). Soon after, a gentleman who was collecting for me during the same time on another mountain of the same range, sent me thirty males and three females, and during the two following years I discovered the species to be quite common in the second half of August on all the higher tops of the Alpi Apuane towards 1200 or 1300 m. (=3500 or 4000 ft.). Considering that the Alpi Apuane have a much older geological formation than the Apennines, being in fact a continuation of the Maritime Alps, it is interesting to notice that *E. neoridas* has never been found in the Apennines, where *E. æthiops*, *ligea*, *cassiope*, and other species of the genus, are common.

On examining an extensive series of specimens of *E. neoridas* from the south of France and others from Tuscany, one is immediately struck by the much greater variation this species undergoes in this locality. Some specimens are in fact so different from the typical form that one would certainly think they belonged to a distinct species, if there did not occur a series of intermediate forms to connect them.

E. neoridas var. etrusca, var. nov.—I possess some Tuscan specimens in which the submarginal fulvous band of the fore wings is reduced to half the width it has in the type; it rapidly tapers to a point towards the hind margin, and ends abruptly on or before the first medial nervule, instead of reaching the submedial. There are only two coalescent apical spots, greatly reduced in size, all the others being absent. The hind wings are uniform brown, with no fulvous band or ocellated spots. For this markedly different form I propose the name given above. (Plate IV., fig. 6, ♂; 7, ♀).

E. neoridas ab. albovittata, ab. nov.—Another fine variety which occurs in Tuscany has the apex of the fore wings on the under side, as well as the base of hind wings and submarginal band, bluish silvery white instead of light greyish brown as in type of the species. This light colour stands out well on the

dark ground colour, and gives this form quite a different look from true *neoridas*. I should call it ab. *albovittata*. It corresponds to ab. *leucotænia*, Stgr. of *E. æthiops*, Esp. (Plate IV., fig. 8).

Epinephele jurtina, L. ab. anommata (ἀνόμματος = without eyes), ab. nov.—I propose this name for a new form of this well-known species, in which the apical white pupilled spot of the fore wings is entirely wanting. I possess a male specimen of it captured last July on Monte Senario, not far from Florence.

E. jurtina ab. semialba, Bruand.—The specimen figured is an uncommonly fine example of this exceedingly variable aberration. It was captured on Mount Matanna (Alpi Apuane) in August, 1902. I possess a few more specimens with large white patches on different parts of the wings, amongst others a male and a female with both the hind wings entirely white, the female having also the greater part of the fulvous patch on the fore wings replaced by white (Plate IV., fig. 9).

E. ida, Esp., ab. subalba, ab. nov.—M. Fallou described, in the Transactions of the French Entomological Society for 1883, an albino of *E. ida*, in which all the brown colouring of the wings was replaced by white, and he gave it the name of ab. *albomarginata*. The specimen figured in the plate, which is the exact reverse of it, was captured in August, 1902, at the foot of the hills at the back of Viareggio on the coast of Tuscany. It has all the ground colour yellowish white, instead of fulvous. This form, as well as the following, which is the corresponding one of *tithonus*, L., has, I believe, never been described (Plate IV., fig. 10).

E. tithonus, L., ab. subalbida, ab. nov.—I possess two males and one female of *E. tithonus*, collected on Mount Matanna in August, 1903, which have the ground colour yellowish white. I would give this albino form the name mentioned above.

Thecla acaciæ, F., ab. beccarii, ab. nov.—Signor Nello Beccari, in the month of July, 1902, captured on Mount Senario, not far from Florence, a most interesting *Thecla*. I certainly think it is an aberration of *T. acaciæ*, though it differs so much from this species that it might even be at first sight an aberration of *T. w-album*, Knoch, or *T. ilicis*, Esp. As may be seen from the figure, it is much smaller than any of these three species; it has not got on the under side the faintest trace of the white streak; and only one of the marginal orange markings is distinctly visible (the one above the tails); the other two, on the right and left of it, can scarcely be seen; the tails are exceedingly short (Plate IV., fig. 11).

Chrysophanus dispar, Haw., var. rutilus, Wernb., Beitr. zur Schmett. (1864), p. 391.—This Continental form of the celebrated English large copper had in Italy only been found in the

provinces of Modena and Milan, and doubtfully, perhaps, also in Piedmont and in the Pontine Marshes. I have three specimens captured in the small marshes that extend along the coast of Tuscany, from Pisa nearly to Spezia; these are the first specimens recorded from Tuscany. The two females differ strikingly from specimens from Modena or other localities by their smaller size (one not being larger than good-sized *C. phlœas*), and by the minuteness of the spots on the fore wings (Plate IV., fig. 12).

C. DISPAR, Haw., ab. NIGROLINEATA, ab. nov.—I propose this name for a new aberration of which I have a specimen collected near Modena on the 6th of September, 1900. It may be said to correspond to ab. *radiata*, Tutt, of *C. phlœas*, having on the fore wings each of the black spots of the subterminal row greatly increased in size and prolonged across the submarginal brown band to the base of cilia. On hind wings the black dots are so enlarged and lengthened as to fill up entirely the internervular space up to the edge of coppery bands. The copper-colour also differs greatly on fore wings from that of type, as it is thickly strewed with reddish scales, which give it a much richer reddish tone. These scales are in every respect similar to those that may be seen very thinly strewed here and there on the fore wings of some female specimens of var. *rutilus*. On the under side of fore wings each spot of the submarginal row is greatly prolonged outwardly and ends in a sharp point, which, in the case of the three last spots, blends itself with the corresponding small black dots plainly visible in the type on the inner edge of the hind marginal grey border. The hind wings have nearly no blue at the base.

C. PHLŒAS, L., ab. SCHMIDTII, Gerh.—I have had the luck of being able to examine an uncommonly large number of specimens of the well-known albino of *C. phlœas*. In the last three years I was able to secure eight specimens from two Tuscan localities. Three were collected in the neighbourhood of Florence in September, 1901. One of these is represented in the plate. It has an unusually pure white ground colour, and also has the characters of var. *eleus*, F., well marked. The other two are very slightly suffused with pale coppery reflections. The five other specimens were found this summer, after a year of patient search in a locality at the back of Viareggio (province of Lucca), where *phlœas* is particularly abundant. One of these specimens is pure milky white; another has a remainder of metallic reflections; a third has both the left-hand wings normal, and both the right-hand side albino (I had already heard of specimens of this form); a fourth has the fore wings pure white, and the submarginal band of hind wings copper colour; whilst a fifth is exactly the reverse of this one, having the fore wings normally bright copper, but the band of hind wings white. The two last specimens are, I believe, unique (Plate IV., fig. 13).

C. DORILIS, Hufn., ab. UPOLEUCA (ὑπόλευκος = whitish), ab. nov. — The locality that has proved so rich in albino forms of *C. phlœas* has also produced some very interesting ones of *C. dorilis*. I possess a male, caught last year, with the hind wings quite white, and a female, collected near Modena, with the ground colour of fore wing pure white; the fulvous colour only remains along the costa and on an exceedingly small area of the base. The hind wings are quite similar to those of typical specimens. I may add there is not the slightest trace of blackish suffusion on fore wings, so that this specimen also belongs to ab. ♀ *fulvior*, Stef., a fine form that occurs probably in the whole of Southern Europe, but has at present only been recorded from Central Italy.

LAMPIDES TELICANUS, Lang, ab. nov.—I do not think it advisable to give this accidental form a name, but it is distinct enough to be noticed. Though I have never seen the Sicilian specimen named ab. *bellieri* by Ragusa [Nat. Sicil. i. (1881–2), p. 37, pl. 3, f. 2], I gather from his description that my specimen is a very near ally to it. Both forms differ from type on the under side only. The aberration, of which I possess a specimen has on this surface the whole of the ground colour of all the wings uniform greyish brown. On the fore wings are two subterminal rows of light grey lunules and three transverse oblong rings of the same colour, which cross the upper half of the wings respectively towards the middle of cell, at the end of it and between this point and first row of lunules. On hind wings the submarginal pattern of fore wings is prolonged, but the inner row of lunules widens greatly, and these take the shape of arrow-heads; at the end of discoidal cell is a very oblong ring, a very small round one is on costa above it, and a row of three extends from costa to hind margin across the middle of discoidal cell. Near anal angle are, as in type, two greenish spots surrounded by orange rings. This specimen was caught on July 31st, 1902, in the neighbourhood of Modena.

LYCÆNA ICARUS, Rott., ab. MELANOTOXA, Pincit. Marott. Giorn. Sc. Nat. Pal. xiv. (1879).—This well-marked form is but little known. It differs from the type in having a black streak parallel to the hind margin on the under side of the fore wings. This streak is formed by the last spot of marginal row and by the second of basal spots; these have, so to say, increased in length towards each other, and have blended together. Signor Pincitore thought this form was only to be met with in Sicily, and that it was only a female aberration. So did all the other writers think, who mention the form, up to the present day; but this summer I caught two males with the black streak very well marked, and discovered that specimens of this form, as far as the female is concerned, are not rare in Tuscany. (Plate IV., fig. 14).

L. ESCHERI, Hb., ab. ♀ SUBAPENNINA, Turati.—This new form, discovered only a few months ago, corresponds to ab. ♀ *ceronus*, Esp., of *L. bellargus*, Rott. It has the entire area of both fore wings and hind wings suffused with bright violet-blue. The orange spots are few, and much reduced in size. I possess a very fine specimen, caught in the Modenese Apennines, and had the intention of describing it, when I found out Signor Emilio Turati had anticipated me.

L. DAMON, Schiff. ab. AGRAPHOMENA (ἀγραφόμενος = not streaked), ab. nov.—I propose this name for an aberration of *L. damon* that I believe to be undescribed; it has the white streak on the under side of hind wings entirely obliterated. I describe this form from a specimen collected in July, 1902, on the Grand Salève Mountain, south of Geneva. The discovery of this aberration is more important than might be thought, when one considers that the chief difference between many Lycænæ of the *damon* group, considered by most entomologists as distinct species, consists simply in the presence or absence of this white streak.

If anyone has met with the forms mentioned above, or with others allied to them, I would be glad to know of it.

1, Via Leone X, Florence, Italy: Nov. 26th, 1903.

EXPLANATION OF PLATE IV.

FIG.

1. *Pieris rapæ*, Z., var. *rossii*, Stefan., ♂ (coast of Northern Tuscany).
2. ,, ,, ,, ♀ ,, ,,
3. *Colias edusa*, Fab., var. *minor*, Failla., ♂ (Northern Tuscany).
4. ,, ,, ,, ♀ ,, ,,
5. *Melitæa athalia*, Rott., ab. *pyronia*, Hübn. (Central Tuscany),
6. *Erebia neoridas*, Boisd., var. *etrusca*, Verity, ♂ (N.-E. Tuscany).
7. ,, ,, ,, ♀ ,, ,,
8. ,, ,, var. *albovittata*, Verity ,, ,,
9. *Epinephele jurtina*, Z., ab. *semialba*, Bruand ,, ,,
10. *Epinephele ida*, Esp., ab, *subalba*, Verity ,, ,,
11. *Thecla acaciæ*, F. ab. *beccarii*, Verity (neighbourhood of Florence).
12. *Chrysophanus dispar*, Haw., var. *rutilus*, Wernb., ♀ (N.-E. Tuscany).
13. *Chrysophanus phlæas*, L., ab. *schmidtii*, Gerh. (neighbourhood of Florence).
14. *Lycæna icarus*, Rott., ab. *melanotoxa*, Pincit., ♀ (coast of Northern Tuscany).

NOTE.—To my great regret, the photograph has not accurately reproduced the black markings of *P. rapæ* var. *rossii* (figs. 1 and 2). They should be much more strongly developed, especially the two streaks connecting the spot with the outer margin.—R. V.

AN INTERESTING FORM OF *CHESIAS SPARTIATA* (VAR. *CAPRIATA*, N. VAR.).

By Louis B. Prout, F.E.S.

It is curious that although Guenée points out that *Chesias spartiata* varies much, and *C. rufata* "much less," and mentions three marked aberrations of the former (one almost becoming a local race in the South of France), yet there does not seem to be a single named form of it; whereas of *C. rufata* Staudinger catalogues no less than three. In the British Islands, to be sure, *C. spartiata* seems a very constant insect, excepting for the rather strong sexual dimorphism, but further south it would appear to be much more unstable, and its variation will deserve more attention than it has yet received.

My kind correspondent, Mr. C. Seymour Browne, who is doing such good work in investigating and making known the very interesting fauna of the Island of Capri, has brought to our notice a striking variety which occurs with him, and has suggested that if I think it of sufficient interest, I should describe it as "var. *capriata*."* I certainly do think it of sufficient interest, and have much pleasure in subjoining a description. I must not omit to add that Mr. Browne has generously presented me with the specimen which I am describing as the type, and to publicly tender him my thanks for this and other kindnesses.

Chesias (*Eucestia*, Hb.) *spartiata* (Herbst in Fuess. Archiv), var. *capriata*, mihi, n. var.

Ground colour delicate pale grey, weakly marked, the characteristic white (or whitish) "streak" and the dark markings at the base and on the three "amygdaloid" patches in the central area being entirely absent. The result is that there are only two colour-shades present, and even these seem rather abnormally arranged and somewhat ill-defined. Basal area irregularly blended of the grey ground colour and light brown; "first line" (*i. e.* inner boundary of the narrow central area) light brown, forming two acute angles, or a kind of irregular Greek sigma (Σ), the upper angle not completely intersecting the central area, but the lower (on the fold between veins 1 and 2) intersecting it completely, thus leaving one amygdaloid grey blotch at inner margin. A rather broad light brown band runs obliquely from the apex, thence forming the outer boundary of the central area, narrowing and becoming more indistinct towards inner margin. Pale subterminal line traceable, though not very conspicuous, the colour again light

* Perhaps when more southern material is to hand we shall have to write "var. et ab." I find amongst my Canales (Northern Spain) geometers a small worn specimen, taken by Dr. Chapman in July, which was apparently intermediate between the new form and the type.

brown between this and the termen. A rather conspicuous dark mark at the origin of veins 3 and 4. Hind wings normal or rather pale. Occurs on Capri in autumn, apparently supplanting the type.

Type (♀) in coll. L. B. Prout. Paratypes (♂ ♀) in coll. C. S. Browne et Brit. Mus.

NOTES ON THE GENUS *METROCORIS* (RHYNCHOTA).

By G. W. Kirkaldy.

A monographic revision of this genus and its immediate allies has, owing to a variety of causes, been shelved for some time, and is likely to remain so for a little longer. I hasten therefore to describe now a new species which was placed in my hands for study by Mr. Distant, and was returned to him a long time ago with a manuscript name attached.

Although it would not be profitable at the present moment to discuss any of the other species at any length, each of these is enumerated.

The generic synonymy is detailed in Lethierry and Severin's 'Catalogue des Hémiptères-Hétéroptères,' vol. iii. p. 64, and need not be copied here. *M. lituratus*, Stal, appears to be marine, but the record requires confirmation; it may well be so, however, as *Rhagovelia*, Mayr, contains a few estuarine or semi-marine forms, the majority being fluviatile or paludicolous. The other four species of *Metrocoris* are frequenters of fresh water.

Tables for the determination of the Species.

Males:

1. Anterior femora strongly incrassate, with tubercles . . 2.
1a. Anterior femora not, or not strongly, incrassate, without tubercles beneath . . . 3. *compar* (F. B. White).
2. Dark, with pale markings; one tubercle . . 5. *stali* (Dohrn).
2a. Pale, with dark markings; two tubercles . . 1. *lituratus* (Stål).

Males of *histrio* and *distanti* unknown.

Females:

1. Ground colour pale flavous, with black markings (only apterous forms known) . . . . . 2.
1a. Ground colour black, with pale markings . . . 3.
2. Medio-longitudinal black line on the thorax reaching to the abdomen; abdomen truncate apically beneath. China: Wampoa, Hongkong . . 1. *lituratus* (Stål).
2a. Same line on thorax not reaching abdomen, which is apically angular (almost rounded beneath). Japan 2. *histrio* (White).

3. Ventral surface dark. India: Kurseong . . . 3. *compar* (White).
3a. Ventral surface pale . . . . . 4.
4. Base of pronotum practically uninterruptedly black, straight; anterior femora not incrassate; first ventral "genital" segment not visible above. South Africa . . . . . 4. *distanti*, n. sp.
4a. Pronotum black, with a "ɔ" on each side pallid; femora subincrassate; first "genital" (ventral) segment visible above. India, Ceylon . . . 5. *stali* (Dohrn). The pattern in both sexes is very similar.

1. *M. lituratus* (Stål).—The colours in the female are brighter and more distinct than in the male. The type is in the Stockholm Museum, and was from Wampoa; I have it from Hongkong.

2. *histrio* (White). — This species I know only by White's description. I believe the type is in the British Museum.

3. *compar* (White).—This was recorded by White from "India." Through the kindness of my friend Mr. G. Severin I have seen some examples in the Brussels Museum, from Kurseong. I believe the type is with *M. histrio*.

4. *stali* (Dohrn). — Of this I have seen specimens, both macropterous and apterous, sent to me by my friend Mr. E. E. Green from Ceylon (Pundaluoya), from sheltered pools in rocky streams; my friend Mr. M. Burr has also given me examples from Assam, Chenapunghi (Khasia Hills). The type appears to be lost.

5. *distanti*, n. sp.—This species may be best described by comparison with *M. stali*. As I believe Mr. Distant will describe in detail and figure it, I need only point out the salient characters.

The colouring and pattern in these two species is almost identical, except that the pallid markings on the mesonotum are more rounded exteriorly in *stali*, more angular in *distanti*. The base of the pronotum in *distanti* is practically uninterruptedly pale, while in *stali* there are two rounded pale markings; the pale marks are also redder in the former. The form of the "genital" segment is also very different; in *distanti* it is subtriangular, while in *stali* it is subrotundate; in the latter the apex of the "sixth" is almost truncate, and of the "seventh" is widely bisinuate; in the former the apex of the "sixth" is apico-laterally produced subrotundately, obtuse-angularly, and the "seventh" is truncate.

♀. Length, $5\frac{3}{4}$ mill. South Africa, Zoutspanberg (Koessner). Type in coll. Distant. ♂ unknown.

Honolulu.

DESCRIPTIONS OF SOME NEW SPECIES OF *MASTOSTETHUS* (PHYTOPHAGOUS COLEOPTERA).

By Martin Jacoby F.E.S.

The species described here are contained in my collection, and seem to be new; these insects are proportionately rare, and form generally but a very small proportion in collections received from tropical South America, where they are principally found.

Mastostethus nigrovarians, sp. n.

Narrow and parallel, flavous; the head with two spots; thorax impunctate, with an M-shaped mark; scutellum black; elytra closely punctured, a transverse band before the middle extending up the shoulders, the extreme basal margin and another band below the middle, black; breast and the flanks of the thorax spotted with black; femora flavous, with black streaks. Length, 8 mill.

Head closely punctured near the eyes, pale fulvous, a spot at the base of the vertex and a larger more elongate one between the eyes black; clypeus separated from the face by a deep transverse sulcus; antennæ black, the lower four joints shining, the basal joint flavous below; thorax nearly twice as broad as long, entirely impunctate; a black mark in shape of an M extends across the entire disc; elytra rather strongly and closely punctured, flavous, with two narrow transverse black bands, one before the other below the middle, both with their margins deeply indented, the anterior band extending with a narrow streak upwards at the shoulders, and connected with the black basal margin, the flavous portions dividing these bands of about the same width, the apical portion of the elytra more broadly of the ground colour, and more finely punctured than the rest of the surface; below flavous, the flanks of the thorax and the anterior coxæ with two black spots, the upper portion and the sides of the breast as well as the metasternum black, femora with a black band above, tibiæ and tarsi entirely yellow.

Hab. Prov. Goyaz, Brazils.

I possess two exactly similar specimens of this species, which seems most nearly allied to *M. aurantiacus*, Lac., but the head with two black spots only, the elytral bands connected, not composed of spots, the second one not at but below the middle, and of regular transverse, not oblique shape, but with its outer portion slightly widened at the lateral margins.

Mastostethus funereus, sp. n.

Black; thorax nearly impunctate; elytra very closely and finely punctured, flavous, the extreme basal margin, the apex, and four small spots at the middle black. Length, 11 mill.

Head black, finely punctured in front of the eyes, the anterior margin of the clypeus and that of the labrum fulvous; antennæ black,

the lower four joints shining; thorax about one-half broader than long, black, nearly impunctate; scutellum very finely punctured, black; elytra broad and flattened, extremely closely and rather finely punctured, yellowish white, the basal margin narrowly black, this colour extending to the shoulders and to the extreme lateral margins, the apical third portion in shape of a triangular patch and two small spots placed obliquely at the middle of the disc of each likewise black; under side and legs of the latter colour, clothed with long yellowish pubescence.

Hab. Peru.

This species is easily known by its system of coloration, and the four black spots at the middle of the light-coloured portion of the elytra.

MASTOSTETHUS FEMORATUS, sp. n.

Dark fulvous; the antennæ, breast, and legs blackish; head with three, thorax with two, black spots; elytra closely and finely punctured, the posterior femora with a strong tooth. Length, 10 mill.

Broad and flattened; head sparingly punctured at the vertex, more closely so near the eyes; between the latter is a black spot, and two others are placed at the base of the vertex; posterior edge of the clypeus raised in shape of a transverse ridge, testaceous as well as the palpi, the rest of the head reddish fulvous; antennæ black, the basal joint fulvous below; thorax nearly twice as broad as long, very sparingly and finely punctured, fulvous, the disc with two small black spots; scutellum finely punctured, fulvous; elytra broad, not narrowed posteriorly, the lateral margins below the shoulders strongly raised and preceded by a longitudinal sulcus, the surface closely and finely punctured; thorax below fulvous, the flanks with a black spot; the anterior coxæ likewise black; breast deep black; the mesosternum strongly produced, compressed and truncate anteriorly; legs nearly black, the anterior femora and their tibiæ within, as well as the anterior and intermediate tarsi, flavous; posterior femora strongly thickened, with an acute tooth; abdomen fulvous.

Hab. Bahia.

From all other uniformly coloured species, in regard to the upper side, the present one differs in the colour of the legs and the strong femoral tooth; a single specimen is contained in my collection.

MASTOSTETHUS ERICHSONI, sp. n.

Fulvous; the antennæ, tibiæ, and tarsi black; head and thorax spotted with black; elytra finely punctured, with two transverse narrow pale yellow bands. Length, 10 mill.

Head very finely punctured near the eyes, reddish fulvous, the vertex, a central longitudinal band, and a narrow stripe at the inner margins of the eyes black; clypeus and labrum with a transverse black band; antennæ black, the lower four joints shining, the rest opaque, strongly transverse; thorax narrowed anteriorly, the sides straight, the posterior angles strongly produced and pointed, the disc very finely and sparingly punctured, reddish fulvous, a U-shaped mark

at the middle and two spots at the sides black; scutellum black; elytra finely and rather closely punctured, the base more strongly so, black, with two transverse yellowish narrow bands, the edges of which are irregularly notched, the first band placed immediately before the middle, the other of slightly concave shape near the apex; under side fulvous, the sides of the breast and an obscure oblique streak at the sides of the mesosternum black, the latter strongly produced into a conical point; legs fulvous, the femora with black stripes above or below, tibiæ and tarsi entirely black.

Hab. Peru.

Almost identical in coloration with *M. alternans*, Lac., but the elytral pale bands much narrower and irregular in outlines, the basal margin not pale as in that species, and the elytral punctuation finer. From *M. trifasciatus*, Lac., the species differs in the markings of the head and thorax, also in the absence of the basal elytral pale band.

MASTOSTETHUS LACORDAIREI, sp. n.

Flavous; the antennæ, tibiæ, and tarsi black; head with a black band; thorax very finely punctured, black, the margins flavous; elytra extremely closely and finely punctured, flavous, a broad transverse band at the base (not extending to the basal margin) and another one below the middle black. Length, 10 mill.

Head strongly punctured at the vertex, the lower portion near the eyes more finely and closely punctate, flavous, the upper portion with a broad longitudinal band extending to the middle of the eyes; antennæ black, terminal joints broadly dilated; thorax of usual shape, rather closely and finely punctured, the disc black, the margins narrowly flavous; scutellum black; elytra distinctly narrowed posteriorly, very closely punctured, a broad transverse band at the base, narrowed towards the suture, and not extending quite to the basal margin, and another narrower band below the middle black; under side and the femora flavous; the tibiæ and tarsi, the anterior and intermediate femora, with a black streak above; mesosternum produced anteriorly.

Hab. Peru.

Closely allied to *M. tibialis*, Fab., but with the basal elytral band extending right across the suture, the thorax with the margins flavous only, the posterior band of the elytra placed higher, not concave at its upper edge, the margins not black but flavous.

MASTOSTETHUS ARGENTINENSIS, sp. n.

Flavous; the upper portion of the head, the disc of the thorax, the scutellum, and the tibiæ and tarsi black; elytra strongly and closely punctured, flavous, with a transverse band before, another behind, the middle, and the extreme apex black. Length, 8 mill.

Head closely and strongly punctured near the eyes, black, the lower portion flavous, the two colours separated by a straight margin, the space between the antennæ impressed with a deep transverse sulcus; antennæ black, the lower four joints shining, the rest opaque;

thorax about one-half broader than long, narrowed anteriorly, the disc very finely and sparingly punctured, black, the lateral and the posterior margin narrowly flavous; scutellum black; elytra rather strongly punctured, flavous, with two transverse black bands, the first placed before the middle, rather narrow, not wider than the following flavous space, its edges irregularly dentate; the second band rather broader, and nearly regular in outlines; both bands do not quite extend to the lateral margins; the extreme apex likewise black; under side flavous, the sides of the breast with a small black spot. the anterior and intermediate femora with a black streak above; tibiæ and tarsi entirely black.

Hab. Prov. Tucuman, Argentine Republic.

Of this species I received two specimens from the La Plata Museum. The insect is closely allied to *M. 5-maculatus*, Lac., but in that species the vertex of the head is fulvous, the basal elytral band is wider and of more regular shape, and the apex of the elytra is fulvous; the under side also differs in coloration.

MASTOSTETHUS NIGRICOLLIS, sp. n.

Black; thorax impunctate, with an obscure fulvous spot at the base; elytra dark reddish fulvous, closely punctured. Length, 10 mill.

Head black, shining, with the usual group of punctures near the eyes; antennæ with the lower four joints shining, black; thorax scarcely twice as broad as long, the angles very pointed, the disc entirely impunctate, black, with a small obscure fulvous spot at the middle of the base; scutellum fulvous, with a few fine punctures; elytra rather closely and finely punctured, the punctures much finer posteriorly, dark chestnut-brown; under side and legs black; the last abdominal segment fulvous or partly so; mesosternum strongly produced.

Hab. Prov. Goyaz, Brazils.

Closely allied to *M. abdominalis*, Klug, but the elytra dark brown without black basal margin, the abdomen with the last segment fulvous only, and the thorax with a fulvous spot, as well as the scutellum entirely, of this colour; two exactly similar specimens are contained in my collection.

MASTOSTETHUS BALYI, sp. n.

Testaceous; the head with a longitudinal black band; thorax with a few minute punctures; scutellum black; elytra strongly and closely punctured, the extreme sutural and lateral margins, a spot on the shoulders and the extreme apex, black; sides of the breast, the outer margin of the tibiæ, and the posterior tarsi black. Length, 9 mill.

Head testaceous, finely punctured near the eyes, the latter very large, the indented portion black; the middle of the vertex with a broad and long longitudinal band, which consists almost of two parts, joined at the middle; labrum black; antennæ obscure flavous, the lower joints with a black streak above; thorax short and transverse, the angles acute but scarcely produced, the posterior ones with a deep

fovea, the surface testaceous, extremely minutely and remotely punctured; scutellum black; elytra very slightly narrowed posteriorly, testaceous, closely impressed with deep and dark punctures, the margins very narrowly and a triangular spot on the shoulders black; at the apex this colour is slightly widened; under side and legs flavous, the sides of the breast black, femora darker fulvous, the posterior ones incrassate, the outer margin of the tibiæ and tarsi black.

Hab. Upper Amazons.

MASTOSTETHUS BOLIVIANUS, sp. n.

Flavous; a central band at the head, the disc of the thorax, and the breast and legs, black; elytra finely punctured, flavous, a broad longitudinal band occupying the entire disc and abbreviated at the apex black. Length, 7 mill.

Head with the usual punctures near the eyes, pale fulvous, the base, a longitudinal central band, and the space in front of the eyes black, the clypeus and the labrum with another transverse black spot, the indented portion of the eyes and the palpi fulvous; antennæ black, the basal joint flavous below; thorax twice as broad as long, the posterior angles acutely pointed, the disc nearly impunctate, black, the sides narrowly flavous; scutellum black; elytra somewhat remotely and finely punctured, each with a broad longitudinal black band, pointed at the apex, obliquely rounded anteriorly; this band leaves the extreme lateral and sutural margin, as well as a narrow space round the scutellum, of the flavous ground colour; the apex of the elytra in shape of a triangular patch remain likewise flavous; under side black, the apex of the anterior femora and the base of the abdominal segments are flavous; the tibiæ are strongly curved.

Hab. Bolivia.

In its system of coloration this species resembles somewhat *M. ephippiger*, Mann., but in that species the elytral black band is of quite a different shape, strongly narrowed at the shoulders, and constricted at the middle, the whole base of the head is black, and the entire abdomen is flavous.

MASTOSTETHUS QUADRIPLAGIATUS, sp. n.

Fulvous; the head with one, the thorax with two spots and the sides black; elytra closely punctured, the extreme sutural and lateral margins, a triangular spot at the base, and a transverse one at the middle black. Length, 8 mill.

Head closely punctured near the eyes, fulvous, with a black spot between the latter parts; first joint of the antennæ fulvous, with a black spot above, the other joints wanting; thorax about twice as broad as long, the lateral margins slightly concave, the angles acute, the disc with a few scarcely perceptible punctures, fulvous, the sides with a slightly curved black band near the lateral margins, the middle of the disc with two black spots; scutellum impunctate, fulvous; elytra closely and finely punctured, fulvous, the extreme sutural and lateral margins black, the middle of the base with a triangular black spot, the disc with a short transverse band at the middle, not extending to either

margin; under side and legs flavous, the flanks of the thorax and the sides of the breast with a black spot, the upper portion of the latter part likewise black, the posterior tibiæ at their outer edge, and the posterior tarsi entirely, black.

Hab. Bahia.

I know of no other similarly coloured species, of which a single example is contained in my collection.

DESCRIPTION OF THE EGG OF *COLEOPHORA MURINIPENNELLA*.

By T. A. Chapman, M.D., F.E.S., &c.

Eggs of *Coleophora murinipennella*, laid in heads of *Luzula campestris*, were received from Mr. A. Sich on May 17th, 1901. The eggs are deposited at the base of the flower (or fruit) outside the perianth, within the scale or glume from within which each flower arises, occupying the little hollow between the scale and the flower-stalk, if so short a stem can be so called.

The egg is white, with pearly lustre. They vary a little in size, from a length of 0·26 to 0·33 mm., and a width of 0·15 to 0·19 mm. These measurements may be to some extent in error, since the egg is a very soft one, and moulds itself readily to the position in which it is laid, and also appears to dry readily, and show various hollows in consequence. Eggs placed in water for a minute or two rounded up, and measured the full sizes just noted. In looking for any sculpturing, the first things observed were some very definite striæ, very unlike, however, any ordinary egg-sculpturing. These proved to be the impressions received from the veins of the glume, within which the egg is laid. The long axis is the micropylar one, and the other two were not detected to be different; no surface sculpturing was detected. The micropylar area is a raised mammilla, about one-ninth of the width of the egg in diameter, *i. e.* rather less than 0·02 mm., and of half this height, or barely so. The whole so transparent that its rosetted structure was not very clear, but appeared to give the little prominence a scolloped margin.

Betula, Reigate.

NOTES ON A COLLECTION OF BUTTERFLIES AND MOTHS MADE IN TOURAINE.

By Geoffrey Meade Waldo.

The following notes cover a collection made from the end of May until the end of August round Tours, and for the most part at St. Avertin, a small village some four miles from it. In France, as elsewhere, the weather was most unseasonable, hence the not very large results in the number of species. Sugaring at the beginning of August was the most satisfactory method, although the weather then was not any better.

To begin with the Rhopalocera, *Papilio machaon* was taken on May 22nd and not seen again during my whole stay, though *P. podalirius* was out the first week in June, and again in the middle of August, when several perfect specimens were caught. The three "whites" were common everywhere, *Pieris napi* coming out much later than his congeners. *Leucophasia sinapis* was also common during most of my stay, males being by far the commonest. *Anthocharis cardamines* was abundant, as was *Gonepteryx rhamni*. Among the Lycænidæ, *L. cyllarus*, *L. hylas*, *L. arion*, *L. argiolus*, *L. argiades* were taken, as well as *L. semiargus* (*acis*). *L. arion* made its appearance the first week in July, and were out for about ten days only. A few hybernated *Vanessa antiopa* were seen, and any number of *V. io* larvæ could be obtained, which pupated about the middle of June and hatched in due course, producing a second brood of larvæ in August. Not many *V. egea* were seen, but I got a larva which safely pupated, but was unfortunately thrown away by the servant. *V. urticæ* was swarming, but *V. polychloros* and *V. atalanta* were much scarcer. *Aporia cratægi* was in splendid condition during the first half of June, and was followed by *Melanargia galatea*. *Limenitis sibylla* and *Thecla ilicis* were common in the oak woods, and *Colias hyale* and *Nemeobius lucina* were sometimes to be seen along roads and railway cuttings. *Polyommatus phlæas* was out principally in July and August, but *P. dorilis* was out in June. *Melitæa didyma* was plentiful and varied. *M. phœbe*, *M. dia*, and *M. athalia* were also taken. In early June some beautiful *Pararge mæra* and *P. megæra* were to be seen sitting sunning themselves on stone walls, and *P. egerides* was abundant in the woods. *Epinephele ianira* was, of course, almost a plague in July, and *E. tithonus* was very common. A beautifully fresh *Cœnonympha arcania* was caught on June 22nd, followed by plenty more afterwards, *C. pamphilus* was very common. Among the Hesperidæ, *sylvanus alceæ* and *sao* were caught, but very few Hesperidæ were seen at any time. On Aug. 14th a solitary *Satyrus hermione* was

caught during a shower of rain. This was the only one seen; *S. hyperanthes* and *S. semele* were also taken. I saw *Argynnis paphia* often along the high roads, but never saw any of the dark variety.

During the greater part of my stay, going round the flowers at night constituted my collecting for moths. By this means I caught *Sphinx ligustri*, *S. pinastri*, *Chœrocampa elpenor*, and *C. porcellus*, all at honeysuckle. *Saturnia pyri* was seen often, but only one taken; a batch of ova of this species, found on a poplar-leaf, all turned out to be ichneumoned. I rescued a very damaged *C. elpenor* from my killing-bottle one evening (June 24th), and kept her for ova; on the 25th she laid eight, which was all I got; these hatched on June 30th; two died during the skin-changing; the rest fed up well on vine, buried during the first week in August, and were six healthy pupæ when I packed them up on Aug. 25th. I also had ova from a *C. porcellus* (laid in a chip-box on May 29th): these took exactly a fortnight to hatch (June 12th) and, feeding well on *Galium*, were all buried by July 21st. It seems strange that whereas *C. porcellus* ova take a fortnight to hatch, *C. elpenor* only takes five days! *Euchelia jacobææ* swarmed as larvæ and imagines all the summer, and *Zygæna trifolii* was very common in the hayfields during June. From several larvæ of *Lasiocampa quercus* I obtained imagines from Aug. 9th onwards, and by means of "assembling" got several males; in fact, when I was bottling the female, a male flew in at the window and followed her into the killing-bottle. Males of *Euthemonia russula* were common enough, and I also got two females. *Spilosoma menthastri*, *Arctia caia* (common in larval stage, end of July, hatched in September), *A. villica*, *Spilosoma fuliginosa*, and *Diacrisia mendica* were also taken, and *Callimorpha hera* was caught by night and day, flying along the walls against which fruit-trees grew. Some ova of *C. hera* laid by the moth when on the setting-board Aug. 6th, hatched on the 18th, but never did any good I bred a series of *Porthesia chrysorrhœa* from larvæ on sloe, and later on found a batch of ova in their warm covering on a hawthorn-leaf. Larvæ of *Ocneria dispar* were common on willow. *Cossus ligniperda* was taken at sugar on July 24th. *Acronycta aceris*, *A. rumicis*, *A. tridens*, and *Actinotia hyperici* were also taken at sugar in August, and *Celæna cytherea* (*matura*) was in beautiful condition at the end of August. *Cucullia umbratica* and *C. scrophulariæ* were caught at honeysuckle in the beginning of July, and *Hecatera serena* and *Mamestra capsincola* at lavender. *Bryophila perla* (at the top of Tours Cathedral) and the beautiful *B. algæ* (at sugar). Other catches at sugar were:—*Mania maura*, *Catocala nupta*, *Thyatira batis*, *Amphipyra pyramidea*, *Phlogophora meticulosa*, *Triphæna pronuba*, *T. comes*, *T. fimbria*, and *T. ianthina*, *Agrotis segetum*, *A. exclamationis*, *A. c-nigrum* and *A. puta*, *Diptergyia pinastri* (*scabriuscula*), *Mamestra brassicæ*, *M. persicariæ*, *M. genistæ*, *M.*

lithoxylea, *Calymnia trapezina*, *Caradrina ambigua*, and *Apamea didyma* (*oculea*). Most of these species were abundant, but some nights were absolutely blank; nights with a wind and slight drizzle gave the best results. On Aug. 26th I caught a male *Macrothylacia rubi*. *Acontia luctuosa* was common at the end of July, and *Plusia chrysitis*, *P. gutta* and *P. gamma*, and *Habrostola urticæ* were caught at different times, mostly on lavender. *Plusia festucæ* was bred from ova found on willow. *Euclidia mi* and *E. glyphica* were also common. Among Geometers, which I did not much work for, I took *Cidaria bilineata*, *Ematurga atomaria* (males only), *Larentia truncata*, *L. fluctuata*, *L. tersata*, *Eubolia bipunctaria*, *Phasiane clathrata*, *Venilia macularia*, *Rumia luteolata*, *Boarmia rhomboidaria*, *Deilinia pusaria*, *Idæa ornata*, *I. rubiginata*, *Timandra amata* (*amataria*), *Abraxas grossulariata*, *Agrophila trabealis*, *Rhodostrophia vibicaria*, *Iodis vernaria*, and *Gnophos variegata*. The very different dates on which I took imagines of *Chœrocampa porcellus* rather point to a second brood, for I took a very worn specimen on June 24th, and perfectly fresh ones on August 2nd and 4th. There was no resident collector that I ever discovered, although there was a naturalist's shop, with the usual assortment of exotic butterflies, but the proprietor did not know much about the Lepidoptera of the district, so I could not find out what does occur usually. *Plusia gamma* occurred very sparingly, as also did *Macroglossa stellatarum*, both insects generally being abundant on the Continent. Altogether the summer was most unkind for collecting, despite one or two spells of beautifully warm weather.

Stonewall Park, Edenbridge, Kent.

DESCRIPTION OF A NEW SPECIES OF *CYRESTIS*.

By Percy I. Lathy, F.Z.S., F.E.S.

Cyrestis gilolensis, sp. nov.

Fore wing white, the basal half crossed by numerous irregular brown lines; a submarginal row of obscure dark spots faintly encircled by brown lines; nearer the margin a row of lunular brown markings, followed by a dark brown line; outer margin brown. Hind wing white, the basal half crossed by irregular brown lines, forming a W just above anal angle; marginal markings as in fore wing, but the inner series much more pronounced, and a yellowish patch at anal angle; wing produced into a short tail at upper median nervule; anal angle lobed. Under side as above, but basal markings much less; also those on outer margin.

Hab. Gilolo. Type in coll. H. J. Adams.

Allied to *C. paulinus*, Feld., but may easily be distinguished by the absence of the wide marginal dark borders.

CURRENT NOTES.

By G. W. Kirkaldy.

(Continued from p. 42.)

1. F. M. Webster, 1903: "The Price of Dairy Products as influencing the abundance of some Insects" (Journ. New York Ent. Soc. xi. pp. 59–60).
2. F. M. Webster, 1903: "The Diffusion of Insects in North America" ('Psyche,' pp. 47–58, pl. 2 (map)).
3. Lawrence Bruner, 1903: "A Plea for the Protection of our Birds" (Spec. Bul. Dep. Ent. & Ornith., Univ. Nebraska, no. 3, 4 pp.).
4. T. W. Kirk, 1902: "Rep. of the Biologist" (10th Ann. Rep. New Zealand Dep. Agr., app. x., pp. 359–470, 18 plates and several text-figs.).
5. W. W. Froggatt, 1903: "Insects that damage Wheat and other Foodstuffs" (Agr. Gaz. N. S. Wales, pp. 481–92, and plate).
6. N. A. Cobb, 1903: "Letters on the Diseases of Plants; 2nd series" (Agr. Gaz. N. S. Wales, pp. 627–52, and 681–712, 2 coloured plates, and text-figs. 1–71).
7. J. R. de la Torre Bueno, 1903: "Brief Notes towards the Life-history of *Pelocoris femorata*, Pal. B., with a few remarks on Habits" (Journ. N. York. Ent. Soc. xi. pp. 166–73, text-figs. 1–2). [Rhynchota.]
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9. Harrison G. Dyar, 1902: "A Lepidopterous Larva on a Leafhopper (*Epipyrops barberiana*, n. sp.)" (Proc. Ent. Soc. Washington, v. pp. 43–5).
10. Harrison G. Dyar, 1903: Discussion in Proc. Ent. Soc. Wash. v. pp. 180–1, on the above.
11. L. Reh, 1903: "Zur Naturgeschichte mittel- und nordeuropaeischen Schildläuse" (Allg. Zeitschr. für Ent. viii. pp. 301–8 and 351–6). [Rhynchota.]
12. D. W. Coquillett, 1903: "The Genera of the Dipterous Family Empididæ, with notes of New Species" (Proc. Ent. Soc Wash. v. pp. 245–72).
13. Rud. Endlich, 1902: "Die Aussichten für die Bekämpfung des Texasfiebers und der Tsetsekrankheit" (Der Tropenpflanzer, vi. pp. 269–85). [Diptera, &c.]
14. Carl Börner, 1903: "Eine neue im weiblichen Geschlecht flügel und halterenlose Sciariden-gattung, nebst Bemerkungen über die Segmentierung des Hinterleibes der Dipterenweibchen" (Zool. Anzeiger, xxvi. pp. 495–504, text-figs. 1–7).

15. W. Geest, 1903: "Neue Schmetterlings-Aberrationen" (Allg. Zeitschr. für Entom. viii. pp. 308–13, text-figs. 1–5). [Lepidoptera.]
16. P. Bachmetjev, 1903: "Über die Anzahl der Augen auf der Unterseite der Hinterflügel von *Epinephele jurtina*, L." (Allg. Zeit. für Ent. viii. pp. 253–6). [Lepidoptera.]
17. E. Fischer, 1903: "Lepidopterologische Experimental-Forschungen" (Allg. Zeit. f. Ent. viii. pp. 221–8 with 42 text-figs., pp. 269–83 with 11 text-figs., and 356–68).
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24. Arthur M. Lea, 1903: "Rep. of Govt. Entom.," Chief Inspector of Stock Rep. for 1902, Parlt. of Tasmania (no. 32), pp. 10–12. [Principally Rhynchota.]
25. W. W. Froggatt, 1903: "The White Ant City" (Agr. Gaz. N. S. Wales, pp. 726–30, plate, and 7 text-figs.). [Neuroptera.]
26. L. Zehntner, 1903: "(*a*) De Zeuzeraboorder (*Zeuzera coffeæ*, Nietner); (β) Een Rupsenplaag veroorzakt door *Orthocraspeda trima*, Moore" (Proefstation voor Cacao te Salatiga Bul. 2, pp. 1–23, pl. i.). [Lepidoptera.]
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(To be continued.)

A FORTNIGHT IN MID-NORTHUMBERLAND.

By J. Arkle.

A more extended list of insects than the following could doubtless be obtained in Mid-Northumberland in the latter half of August, provided the weather conditions were more favourable than those for that period in 1903. But records from the county, under any circumstances, appear to be so rare, that the species forming the subject of these remarks may, possibly, be of general interest. I took the long cross-country railway-ride from Chester on the morning of the 14th of August, and reached Morpeth, on the river Wansbeck, late in the afternoon. Here I stayed for the night, and then went on next day by the Wansbeck Valley Railway to the hotel at Scots Gap, which I had already fixed upon as my chief quarters. The day was one of fierce wind and rain storm; but, next morning, I began my list of captures by taking a fine female *Boarmia repandata* as it rested low down on a wayside beech trunk. It is paler in general coloration, and less distinctly marked, than the Cheshire examples I have seen, and particularly so when compared with the dark, richly marked Delamere form. From this female I obtained about a hundred eggs, which hatched September 4th; and the larvæ, evidently night-feeders, are now (January 7th) hybernating and doing well.

The district I had visited to spend a fortnight in is composed of rolling and often well-wooded uplands, with extensive moors covered by coarse grass or heather, the heather being at the time in all the purple glory of fullest bloom. Here and there the moors rise in stately slopes, and terminate in abrupt, tumbled, blackened, and overhanging crags of coarse, pebbly millstone grit. Shaftoe Crags would be three or four miles to the south of my hotel; Simonside Hills eight miles to the north; Rothley Crags about two to the north-east; and Wannie's Crags about eight to the south-west as the crow flies; the whole enclosing the upper part of the Wansbeck basin. Nestling on the upward slope of Wannie's Crags is Sweethope Lake, where the river takes its rise. Beyond Simonside Hills is Rothbury, on the river Coquet, and west of Wannie's Crags is Bellingham, on the North Tyne—two small country towns which each command a ten miles' view of the border range of the Cheviots. There were many evidences, other than insect life, of the retarded appearance of things in this north-country district. Lime and elder trees, for example, were just coming into bloom.

August 17th was a fine sunny day, and was spent on Shaftoe Crags. Here I took my first *Larentia cæsiata*, a fine female, resting on some white-blossomed heather. This moth had a distinct green tinge, which has not yet altogether disappeared. Other insects were *L. didymata*, two or three *Cidaria russata*,

Crambus culmellus, and *Charæas graminis*. The last-named species was common everywhere in the pastures leading up to the moor, resting among and creeping about the grass.

At Rothley Crags, on the 19th, *L. cæsiata* was plentiful enough. *C. culmellus*, *C. tristellus*, *Aphelia osseana*, and the pretty *Amphisa gerningana* were common moths. I came upon a female *C. associata* = *dotata* at rest upon the heather. This was the only locality were I found *A. gerningana*, and it was certainly plentiful. Flying lazily, and in numbers whenever the sun broke out, was a curious-looking coal-black dipteron. This has been identified as *Bibio marci*; and the sight of it, with its easy aerial motions, and trailing its long russet and black legs behind it, was something very odd. In size this insect is a little larger than our common housefly, but with very much longer legs. The wings are also longer. At dusk I netted a fresh *C. prunata* = *ribesiaria* in a garden.

At Bellingham I found the moors in the neighbourhood apparently destitute of insect life at this time of the year. On the 21st, on a piece of rough grassy ground near the railway-station, and covered with knapweed, scabious, galium, St. John's wort, harebells, yarrow, and thistles, all in full bloom, I netted *Pieris rapæ*, *P. napi*, a chipped *Lycæna icarus* = *alexis*, several *Eubolia limitata* = *mensuraria*, as well as a lot of *Scopula lutealis*. The last-mentioned occurred by every roadside in the district. One of the *limitata*, a male, is a very dark insect, and almost unicolorous. Hareshaw Linn is a fine waterfall at the top of a lovely wooded glen about a mile or so from the town. Here my captures were only one *P. napi*, two *Hypsipetes sordidata* = *elutata* (both dark insects, and one of them almost unicolorous), and *L. didymata*. But I could not help thinking what a fine locality this must be earlier in the summer. Netting at dusk only showed a solitary *C. pyraliata*; and in my comfortable hotel, redolent with the scent of sweet peas, I found a *Caradrina quadripunctata* = *cubicularis* at rest on one of the windows. I only saw a single caterpillar in all the fortnight—a full-fed *Notodonta ziczac*, on sallow.

At Wannie's Crags, on the 24th, *L. cæsiata* was most abundant. The moth, throughout the district, is more clearly marked with waved and almost black striæ—on an almost white ground—than examples I have taken in North Wales. I have met with the same distinctly-marked form on the Cumberland hills. In two of the Wannie's specimens the median band across the fore wings is sooty black, and unicolorous except for the smallest possible indication of the grey blotch close to the costal margin. The males of *L. didymata* on these crags have an ochreous tinge, and the females, throughout the whole district, appear to be very pale in coloration, and similar in this respect to those on Clougha Pike, North Lancashire. I met swarms of the black

dipteron (*B. marci*) sailing above the heather; and the common Crambidæ, already referred to, occurred on the low boggy ground at the foot of the rocks. This weird and lonely spot very likely saw an entomological net that day for the first time. A more desolate lake than that under the curious misnomer of Sweethope can hardly be imagined; nothing but heaving, heather-clad moors about, with a few dwarf trees at the east end, evidently imported, and dragging on a miserable existence. An east breeze set in, and the only insect that would then condescend to fly was the caddis- fly, *Limnophilus lunatus*. The pale lunule on the outer margin of each upper wing, together with the markings generally, are darker and more clearly defined than in our Hatchmere specimens (Delamere Forest).

At Rothbury, Aug. 26th, the weather was so thoroughly broken up that I saw no insects except *L. didymata* and a few dark *Bryophila perla* sitting on the stone walls; and I was glad to get back to my quarters at Scots Gap. In a pine wood hard by I netted, one evening (the 25th) a male *Ellopia prosapiaria* = *fasciaria*, but the nights throughout my stay were too cold for either sugaring or sport with the net, and I was not sorry to get back to Chester on the 29th, and more within the influence of the Gulf Stream.

Only once did I meet with an irate gamekeeper. As to my doings with the net, he assured me "naething disturbed game sae much as gannin aboot like that." The only thing I had disturbed was a fox from its lair among the rocks, and, after all, the keeper and I parted on friendly terms with each other. On one or two of the localities named, however, intending visitors will do well to get a permit from the owners.

I had a good look through the collection of the late Mr. Edward Pearson, of Wallington. The collection, if secured for the benefit of future lepidopterists in the neighbourhood, and placed under care in the adjoining village institute, would form a valuable work of illustration and reference for this part of Northumberland. The following list is a personal note of some of the species in Mr. Pearson's collection which had been taken in the fertile valleys or on the extensive moorlands of the district :—

Colias edusa. Occasional at Middleton.

Epinephele hyperanthus. Almost black; white fringes on all the wings.

Cœnonympha typhon = *davus*. Not such a good form, I thought, as that taken in Delamere Forest (Cheshire) and in North Lancashire.

(*Vanessa antiopa*. A specimen used to be in the collection of Mr. Hedley, of Wallington. Another was nearly captured by Mr. Pearson and others.)

Acherontia atropos. Belsay; South Middleton.

Sphinx convolvuli. Close Houses; Wallington; Mr. Pearson's garden.

Deilephila galii. Six; Mr. Pearson's garden.—*D. livornica.* One; Humshaugh, near Hexham.

Chærocampa porcellus. One; Mr. Pearson's garden.

Macroglossa stellatarum. Numerous; Wallington.

Lasiocampa quercus. Numerous; moorland; one a fine dark female.

Saturnia carpini. Numerous, and very fine; moorland.

Spilosoma mendica. Numerous.

Plusia bractea, *P. festucæ*, and *P. iota.*—*P. pulchrina.* Numerous, and very dark.

Xylophasia rurea. Ground colour of upper wings pale grey; markings as usual, and distinct; a fine form.

Euclidia mi and *E. glyphica.* Numerous.

Uropteryx sambucaria. A few.

Anaitis plagiata. Numerous; typical.

NEW CULICIDÆ FROM THE FEDERATED MALAY STATES.

By Fred. V. Theobald, M.A.

(Continued from p. 39.)

CULICINA.

Genus Scutomyia, nov. gen.

Head covered with flat scales except in the mid region, where there are narrow-curved ones. Scutellum with all flat scales. Other characters as in *Macleaya.*

One species, so far, has only been observed.

The genus differs from *Stegomyia* in having narrow-curved scales on the head, and from *Macleaya* in having the scutellum entirely clothed with flat scales. From the new allied genus (*Leicesteria*), described here, it differs in having all flat scutellar scales.

Scutomyia albolineata, n. sp.

Thorax black, with a broad median silvery white line in front and a median silvery spot on the scutellum. Abdomen black, with basal silvery white lateral spots, the last two segments with basal silvery white bands. Fore and mid legs black, unbanded, the hind with the metatarsi and the first two tarsals with basal white dorsal patches.

♀. Head clothed with black flat scales except in the middle, where there is a median broad area of white, narrow-curved scales; palpi, clypeus, proboscis and antennæ black, the basal joint of the latter with white scales inside; proboscis long, nearly as long as the whole body. Thorax black, with long narrow-curved bronzy black scales and with a broad median silvery white line running from the front of the mesothorax to about its middle; numerous long black bristles project in front and over the roots of the wings; scutellum black, very

deeply trilobed, the mid lobe with dense flat silvery white scales, the lateral lobes with black flat scales; there are also a few black ones bordering the posterior edge of the mid lobe, which has five brown bristles; metanotum black and shiny; pleuræ brown, with silvery white spots. Abdomen narrow, basally broadening to the apex, which is truncated, smoky black, with triangular silvery white lateral basal spots, the two last segments with basal white bands (under the microscope the lateral spots look pale blue), border-bristles black; the first segment densely black scaled, large, with black scales forming two backwardly projecting patches, and with black bristles; venter with broadish basal white bands. Legs black, the fore and mid pairs unbanded, the hind with the base and venter of the femora yellowish-white, a small snowy white apical spot; the metatarsi and first two tarsi with a basal streak of white on the dorsal sides, giving a banded appearance when viewed from above; ungues all equal and simple. Wings with brown scaled veins, the costa dark, fork-cells small, the first submarginal longer and narrower than the second posterior, its stem nearly as long as the cell; stem of the second posterior as long as the cell; the bases of the fork-cells nearly level; posterior cross-vein rather more than its own length distant from the mid; median vein-scales small and spatulate, dark; lateral ones short and rather thick on the first and second veins, others longer and thinner. Halteres short and with contorted yellow stems, the knobs broadly expanded, with black scales. Length 4 mm.

Time of capture.—June.

Habitat.—Kuala Lumpur (in jungle, six miles away).

Observations.—Described from a single female. It bears at first sight a close resemblance to *Stegomyia scutellaris*, Wlk., but the median white thoracic stripe is wider, and the markings of the abdomen and legs are different; moreover it cannot be placed in the genus *Stegomyia*. I am not sure if the narrow waist of the abdomen is natural or due to subsequent contraction in drying. The fact that the white abdominal lateral patches appear blue under the microscope and yet not under a hand lens is peculiar. I have not observed the same in any specimen before.

Genus Danielsia, nov. gen.

Head covered with small flat scales, with truncated ends, loosely and rather raggedly placed on the head, a few long narrow-curved ones behind, and small upright forked ones with them. Scutellum with small narrow-curved scales; mesothorax with narrow-curved scales. Palpi short in female, densely scaled; in the male as long as the proboscis, the two apical joints short, the apical rather shorter than the penultimate, hair-tufts scanty; fork-cells rather short.

A single species only occurs at present. It comes near *Macleaya* and the former genus, but can at once be told by the narrow-curved scutellar scales, and from *Catageiomyia* by the long male palpi.

(To be continued.)

A "BUTTERFLY SUMMER" IN ASIA MINOR.

By Margaret E. Fountaine, F.E.S.

Asia Minor is a part of the world that for some time has had a particular attraction for me; in fact, ever since I visited the Natural History Museum at Athens, some three years ago, and found that I was almost invariably informed by Herr Krüper, in reply to any exclamation of admiration on my part over some special insect I saw in the collections there: "Das ist von Klein Asien bekommen!" But the accounts I received of this "happy hunting-ground" from those in authority at Constantinople were scarcely encouraging. The British Consul did not hesitate to tell me that the country was *not* safe, and when I divulged to him some of my plans for the summer, he remarked dryly: "There would need to be an Englishwoman at the back of all that!"

However, I had made up my mind to risk it. So, on the 17th of April, I started for Broussa (a place easily reached by a short sea trip on the placid Sea of Marmara, to Moudania, and from thence in about two hours by train); having secured the services of a first-rate courier called Bersa, and with a strong belief in the infallibility of the butterfly-net as a protection, inasmuch as its presence to the ignorant and uninitiated natives of these remote regions is generally looked upon as a badge of harmless lunacy, and no one troubles to interfere with a poor lunatic, especially if he is such an apparently harmless one.

I remained five weeks in this neighbourhood, at a place called Tchekirghé, about three miles to the west of the town of Broussa, which is most beautifully situated at the foot of Mount Olympus. The country was quite lovely, and water was abundant, but I was too early for most of the butterflies, and did not get anything special, except *Doritis apollinus*, some *Melitæa* I believed to be *arduinna*, *Lycæna anteros*, and *L. semiargus* var. *bellis*—a very distinct form, and quite unlike var. *helena* from Greece, or var. *antiochena* from Syria. It was much too early to make the ascent of Mount Olympus, and much as I enjoyed the wonderful beauty of the country, and the eternal songs of the nightingales, about the 20th of May I returned to Constantinople, intending to go on by the next steamer leaving for the Black Sea to Samsoun, *en route* for Amasia.

As the result of a letter of introduction Mr. Elwes had given me to Dr. Washburn, the Principal of the Robert College, I now obtained from him another letter of introduction to Dr. Riggs, of the American College at Mersivan. This was, of course, invaluable to me, and I resolved that I would in consequence first go to Mersivan, and from thence to the much-longed-for Amasia.

I reached Samsoun on May 25th, my impressions of the Black Sea having been far from favourable, and that same day I started with Bersa for the interior. Now there are so-called carriage-roads in most parts of Asia Minor, but the advantages of this in practice I soon found to be somewhat dubious, for anything more appalling than the condition of these roads would be quite inconceivable. Heavy rains having recently fallen, the entire surface was one deep quagmire of mud for miles. The carriages I had secured at Samsoun (kind of covered vans, called "yileys," whose occupants had nowhere to sit except on the floor) were constantly over the axles of the wheels in thick mud, while the horses sank in above their knees, and the holes were so deep, and the joltings so frequent and yet so sudden, that it really seemed as though the horrors of the Black Sea were being "continued in our next." Outside and away from the town I hoped for better things, but if anything matters grew worse, and the "arabaje" (yiley driver) looked very gloomy when asked if the road was going to be like this the whole way. So I declared that I would take only the one yiley for my luggage, that they must procure saddles for the two horses now attached to the other one, and that I and Bersa would ride, rather than be shaken to atoms. But all kinds of obstacles were raised in the way of this arrangement, which I afterwards found out was because the two yileys I had engaged did not hail from Samsoun, but were returning anyhow to Mersivan. The man they belonged to therefore did not wish to leave his yiley behind in exchange for a couple of saddles. So we persevered, and I resigned myself to my fate, with an inward reflection that travelling in Asia Minor was not exactly "travelling made easy." Neither was it possible to get out and walk, for the mud was so deep and thick that in many places I might almost as well have decided "to get out and walk" from the Austrian Lloyd steamer on the Black Sea. And yet every peasant here is taxed three francs a year for the maintenance of these roads, the money being unscrupulously appropriated by the authorities.

As we got up into the mountains rain came on—a perfect deluge; we passed through dense clouds of vapour, sometimes scarcely able to see a yard ahead, and towards evening experienced the effect of driving through the heart of a thunderstorm. It was a marvellous sight, as from time to time the thick atmosphere became one mass of lurid fire from the lightning, and the simultaneous roar of the thunder was quite deafening. For we were *in* it, and it was all around us, and the torrential rain descended with unabating violence. Then darkness came on, and still through the night the rain fell heavily, though the thunderstorm had swept away. The road was wild and deserted, but the very violence of the storm was in itself a protection, and one must be prepared to encounter some inconveniences in order

to reach such a butterfly paradise as Amasia was to prove afterwards to be. At about 9 p.m. we reached a village called Tchakaler, where there was a khan (there are no hotels or even inns in the interior of Asia Minor). Here I put up for the night. Bersa had procured provisions at Samsoun, enough to last for the three days' journey to Mersivan; so, having had an open stove of charcoal placed in my room, I soon became warm, and passed an excellent night.

It was still raining the next morning, but the weather was better that day on the whole, and so were the roads—just a little better, I thought—though it might only have been that I was getting more accustomed to them. In some places where they were under repair, and in others where they were too hopelessly bad, the yileys would strike down into the fields, and go for miles along temporary tracks, which were certainly less rough than the main road even at its best; but the descent and ascent to and from this lower level was exciting, to say the least of it. The bridges across the rivers were generally so hopelessly out of repair as to be practically useless, so that one of these precipitous leaps over the side of the road would be made, and then, in order to cross, a swollen ford must be scrambled through, to the imminent peril of the yileys being upset over and over again; and sometimes they are upset, I was told.

Kauzar was the next stopping place, and on the third day I reached Mersivan, where Dr. and Mrs. Riggs most kindly invited me to stay as a guest at their house, the luxury of which was wonderfully appreciable after the hardships of that journey. Here I made the acquaintance of Prof. Manissajiàn, the zoologist at the College, and he showed me the collections, which were most interesting, and gave me many useful hints about Amasia, also providing me with a letter for two Armenians, with whom, he said, I could stay during my sojourn there, as there were nothing better than khans even in Amasia. During the two days I spent at Mersivan I met with much hospitality and kindness, more especially from my host and hostess, Dr. and Mrs. Riggs.

The way to Amasia lay across a wide flat plain, and I was told that the road was better than that from Samsoun, but nothing would induce me to resign myself again to the tender mercies of a yiley; so I told Bersa to hire only one for the luggage, and two saddle-horses. This was a much better arrangement, but when I had ridden for the better part of eight hours on a Turkish saddle, I could stand it no longer; so a Greek master from the College, who had joined forces with me for the journey, said he would take my horse and gallop on to Amasia with the professor's letter, so that the old couple with whom I was going to lodge would be all in readiness to receive me. I thought this an excellent arrangement, but I could not stay in the yiley, so I got

out and walked; for this conveyance was by this time, as usual, filled up with Turks and Armenians, of that class who wear European clothes surmounted by the never-failing tarboosh. Persons of this description always did seem to occupy my luggage-waggon, though how they got there, or what became of them afterwards, I never knew; and I would only stipulate that no one should sit on my hold-all.

It was still over an hour before I came within sight of Amasia (1500 ft.), and, though I was very tired, footsore, and otherwise, I thought I had never seen any place so beautiful before. The town was, as it were, wedged into a huge cleft in the mountains, by which it was shut in on all sides, and the surrounding country in every direction presented an aspect which made me long to explore it at once.

Neither were my anticipations doomed to be disappointed; the neighbourhood of Amasia was quite delightful, and the butterflies wonderful. Every day I came across some species new to me, and some days two or even three new ones; and these in most cases were so abundant that good series were easily obtained of almost everything. My only regret was that I had not come to this "butterfly paradise" a month earlier, for the first brood of *Pieris chloridice* had quite disappeared, and the few specimens of *Chrysophanus ochimus* which still remained were so worn that I could only wait for their second appearance also; while the beautiful *Zegris menestho* was, alas! practically over too, with no hope of a second brood there. That *Thaleropis ionia* was also quite worn and faded, I scarcely troubled about; it was, I knew, so certain to return in far greater numbers in its second brood towards the end of June. Besides, there were plenty of species fresh enough, some just emerging, and many yet to come.

The country was quiet and settled, and the peasants civil and obliging. Prof. Manissajiàn had told me of an old Armenian peasant, who, having collected with himself for years, knew all the specially favoured haunts in the neighbourhood, having also acquired a certain amount of knowledge relating to nearly all the most important of the local species, calling them for the most part by their Latin names. The services of this old man, when I first got to Amasia, were invaluable, for Bersa had not previously visited this district, so that the country was as new and unexplored to him as it was to me. But I soon discovered that he was possessed of a wonderful faculty for finding his way about, which proved most useful, as I have no talent at all for doing so. We had only to go once to some favoured haunt - say, the little narrow gorge on the Caraman, where *Thestor nogellii* flitted over the hot rocks below—and the next day, or a week later, or at any time, Bersa would take me back to the exact spot with an unerring certainty which was most convenient; for Amasia abounded in special localities, and none there were which did not demand many subsequent visits.

Prof. Manissajiàn had also most kindly lent me Dr. Staudinger's book on the 'Lepidoptera of Asia Minor,' especially treating of Amasia, where he spent the summer himself some thirty years ago. I took most of the species he mentioned, and in one or two instances, such as *Satyrus bischoffii*, I seemed to meet with rather better success. But there were also some he referred to, such as *Hesperia alcides*, which I never saw at all. A place called Guelly, not more than forty minutes' walk from the town, was capital hunting-ground. But for the Lycænidæ, and all the "valley" species, the Tschirtschir Valley was the most prolific; *L. hopfferi* and *L. dolus* var. *menalcas* literally swarmed here towards the end of June and throughout July. The females were much less abundant than the males, and it was extremely difficult to separate the individual species from each other, all having got the white dash, as in *L. damon*, on the under side, and the markings almost similar. Var. *menalcas* was comparatively distinct, I thought, for it was always smaller, and there was also a strong family likeness on the under side to the males of that species, which was to me unmistakable. But *L. hopfferi* and *L. poseidon* were almost impossible to distinguish (as even the males of those two species were identical underneath), so I have only separated the females of them by the more strongly accentuated venation visible on the upper side of those I consider to be *L. poseidon*, as there were more like this on the Caraman, where *poseidon* was the commoner of the two, and very few in the Tschirtschir Valley, where the preponderance of *hopfferi* was very decided indeed. Added to all this, *L. admetus*, with an occasional var. *ripartii*, flew abundantly in the same localities at the same time, to say nothing of *L. mithridates*, of which last, however, I only succeeded in taking one magnificent male, and one rather doubtful female.

The Kerasdere (Cherry Valley), which seemed to have been Staudinger's most happy hunting-ground, was always disappointing; so that I could only conclude that during the thirty years which had elapsed since then an increase of cultivation had diminished its attractions from an entomological point of view.

On the top of the Lokman, three or four hours' ride from the house where I was staying, I found but little in June, and, though I went there at frequent intervals, at the time when *Colias aurorina* var. *libanotica* was due to be out, I never saw a sign of it. Staudinger did not seem to have met with much success with this species either, but there it most certainly must occur sometimes, for I saw a pair myself in the museum at Mersivan, taken by Prof. Manissajiàn on this very mountain. Another of my disappointments was *Melitæa aurinia* var. *orientalis*—a most beautiful insect, which I had also seen in that museum—for it appears to fly only in May, and towards the beginning of

the month; so that I had to resign myself to the loss of that too by spending so many weeks at Broussa, where there was comparatively little to be got.

(To be continued.)

NOTES AND OBSERVATIONS.

Larva of Apatura iris on Poplar.—In looking through my notes for 1903, I find that a full-grown larva of *Apatura iris* was taken on a poplar (*Populus*) in June near the village of Rottingdean, Sussex. I hope this note may be of interest to the readers of your paper.—J. A. Croft; Charterhouse, Godalming, Feb. 11th, 1904.

[Nearly all continental authors mention poplar as well as sallow as the food-plants of the larva of *A. iris*, but in works on British Lepidoptera sallow alone is given.—Ed.]

Dragonflies in 1902 and 1903.—In connection with my paper on this subject (*ante*, p. 29), Mr. G. T. Porritt tells me that he found *Orthetrum cancellatum* plentiful in the Norfolk Broads in 1903. He further reminds me that he found *Æschna mixta* very common in S. Devon in 1902, and that it then occurred over a wider area than that in which he had found it previously.—W. J. Lucas.

Dipterous Parasite attacking Silkworm Larvæ. — Wishing to breed a few *Cherocampa eson* this season, I collected about fifty larvæ of the species. Over thirty of these were badly "ichneumoned"; this, however, was not apparent until they reached the pupa state. From these thirty there must have been over two hundred dipterous flies, and many remained in the room, on the windows, &c. My wife was rearing a large number of silkworms in the same apartment. On Dec. 2nd she showed me several of these silkworms turning black, and in many places swollen. I opened some, and found them full of maggots. I killed over fifty of the worms that were attacked in this way, keeping three or four. They never spun up, but two managed to turn to pupæ, and I have since bred several of the same parasitic flies that emerged from the *C. eson*. One, however, was so full of the grubs that, before it finally burst, fifteen large maggots emerged. Thinking this was something unusual, I have written these few notes. In any case the fly must have made a mistake, as besides the one that burst as mentioned, I am sure many that I killed were too full of the grubs for the latter to be able to feed up in their host. From the two that pupated without spinning, only eleven flies resulted. I conclude the silkworm is "ichneumoned" in the natural state, but this is the first time I have ever seen any, or heard of any, being attacked when kept in confinement, and my wife has been rearing silkworms for years. I may mention that the silkworm is double-brooded here.—G. F. Leigh; Durban, Natal.

Note on a Sawfly from New Zealand.—Some years ago I described a small species of Tenthredinidæ from New Zealand, which appears

to be the only sawfly known from that locality. Mr. P. Cameron, however, sinks it as a synonym of the well-known European species, *Eriocampa adumbrata*, Klug; and repeats the statement in a list of Hymenoptera published in vol. xxxv. of the 'Transactions of the New Zealand Institute.' Col. C. T. Bingham has kindly examined my types with me, and we find that the New Zealand species is a true *Monostegia*, with only one middle cell in the hind wings, whereas Klug's species is a true *Eriocampa* with two cells. It is, of course, possible that Mr. Cameron may have received specimens of the real *E. adumbrata* from New Zealand, in which case it would be a second (and probably introduced) species; but it would not be my *M. antipoda*, though the two insects are superficially alike.—W. F. Kirby.

The National Collection of British Lepidoptera.—Paymaster-in-Chief, Gervase F. Mathew, has presented three specimens of *Leucania favicolor*, Barr.; also an example of a form of *Apamea gemina* closely resembling var. *oblonga*, Haw. (Steph. Ill. ii. 182).

CAPTURES AND FIELD REPORTS.

Carabus nitens in Isle of Man.—I have to record the capture of *Carabus nitens* in the Isle of Man by Mr. J. H. Shepherd in August, 1903. It is a rather small specimen.—E. C. Ansorge; 12, Addison Road, Bedford Park, W., Feb. 4th, 1904.

Agrion hastulatum, Æschna juncea, and Æ. isosceles. — Mr. C. W. Dale informs me that he has specimens of *Agrion hastulatum* taken by Mr. Richard Weaver in Sutherlandshire in 1842, and that he has taken *Æschna juncea* near Penzance. He tells me also that his father took *Æ. isosceles* at Whittlesea Mere in 1818 and 1824.—W. J. Lucas.

Gryllus campestris.—I have four specimens of the Orthopteron, *Gryllus campestris*, taken by my brother at Christchurch in 1885.—C. W. Dale; Glanvilles Wootton, Dorset.

Nothochrysa capitata.—My brother took this species (sub-order Planipennia of the Neuroptera) here in 1868. My father took it in the New Forest in 1827 and 1830.—C. W. Dale; Glanvilles Wootton, Dorset.

SOCIETIES.

South London Entomological and Natural History Society.—*November 26th*, 1903.—Mr. E. Step, F.L.S., President, in the chair.—This evening was set aside for the Annual Exhibition of varieties, special forms, and notable captures of the year. There was a very large attendance of members and their friends, and many very interesting exhibits were made.—Mr. J. A. Clarke exhibited a gynandromorphous specimen of *Cyaniris argiolus*, taken in Yorkshire in May,

1903; and a uniformly smoky example of *Ligdia adustata*, taken at Bexley in March, 1903.—Mr. Chittenden, *Heodes* (*Chrysophanus*) *phlæas*, light and dark forms, from Kent; *Hydriomena* (*Hypsipetes*) *sordidata*, dark from Yorkshire, and red-barred from Ashford; and black-fringed *Spilosoma lubricipeda* var. *zatima*.—Mr. McArthur, a very pale example of *Amorpha* (*Smerinthus*) *populi*, and a very strongly suffused reddish example; with a photograph of a *Pieris rapæ*, having two large black spots on the under side of the left lower wing.—Mr. R. Adkin, examples of *Argynnis aglaia* from Brighton, with the black markings on the upper side elongated and joined up, as were also some of the silvery markings of the under side; also several richly coloured females; a partially bleached female of *Epinephele jurtina* (*ianira*); a *Cleora glabraria* with a much extended series of black markings; a hybrid *Smerinthus ocellatus-populi*, bred July, 1903, from a 1901 larva; and a long series of *Boarmia repandata* from various localities, to show local variation.—Dr. Chapman, a large number of specimens of *H. phlæas*, taken in various parts of Western Europe, especially to illustrate the geographical and seasonal variation rather than the possible aberrational variation. He discussed the named forms—var. *suffusa*, var. *eleus*, and var. *hypophleas*—with regard to size, form, tail development, and colour.—Mr. Simmonds, a long series of the rare *Cucullia gnaphalii* from Sevenoaks; a variety of *Epunda lichenea* without the usual reddish or greenish markings, perhaps corresponding to var. *calvescens* of *P. flavicincta*.—Mr. Colthrup, long and varied series of *Bryophila perla* and *B. muralis*, the various shades of green; a pink form, from the Isle of Wight; a black form; very dark forms from South Devon, and most of the named forms of the latter species, including var. *par;* of the former species were many pale, dark, and suffused forms.—Mr. G. B. Browne, varied forms of *Aplecta prasina*, *Polyommatus icarus*, *H. phlæas*, *Camptogramma bilineata* (banded), *Melanthia ocellata* (dark black band), and a brown form of *Tæniocampa munda*.—Mr. Main, a living example of *Blatta australasiæ*, found among imported bananas. Mr. Dodds, some very remarkable and aberrant bred male forms of *Oeneria dispar*, having numerous irregular patches and streaks of light colour on all four wings. The species had been inbred for three years.—Mr. Pickett, series of *E. jurtina* with bleached vars.; of *Polyommatus corydon* with vars. and abs.; *suffusa*, *marginata*, *obsoleta*, *striata*, &c., with dwarf examples; very deep-banded females of *Cyaniris argiolus;* various local races of *H. phlæas;* *Callimorpha dominula* with much suffused hind wings; *Abraxas grossulariata* with var. *lacticolor*, and a very dark form; long series of forms of *Angerona prunaria*, including numerous beautifully banded examples; a long and graduated series of *Arctia lubricipeda* and var. *radiata*, some being exceptionally dark; and a curiously marked *Arctia caia* with streaked arrangement of the markings.—Mr. Moore, *H. phlæas* from the Himalaya Mountains and from North America (Indiana to Cape Breton); the former was an exceedingly dark example, while the latter were much like the Lapland forms in Dr. Chapman's exhibit.—Mr. Carpenter, series of *H. phlæas*, bred, from Abbot's Wood, Folkestone, and Bude, each of which showed a racial facies, although the divergence was but small.—Mr. Montgomery, long series of *H. phlæas*, including many pale and sparsely

spotted specimens, some of which were emergences as late as November.—Mr. Harrison and Mr. Main, series of *Dianthœcia nana* (*conspersa*), *Eupithecia venosata* and *Aplecta nebulosa*, showing their various geographical forms and races; series of *Noctua brunnea* and *Notodonta dromedarius*, bred from Delamere Forest larvæ, comparatively darker than South England forms; and Cornish specimens of *Hipparchia semele*, considerably darker on the under side than Eastbourne forms.—Dr. J. H. Spitzby discussed the variation of Edmund Reitter's group of the Carabidæ, *Carabi multisetosi* and of *Cetonia aurata*, and exhibited a large number of examples from various parts of Europe.—Dr. Sequiera, a box of most interesting and remarkable aberrations of Lepidoptera, including *Vanessa io*, slate-blue suffusion; *Catocala nupta* with smoky black margins; *Polygonia c-album* without a trace of the C-mark; a strongly marked melanic form of *Hemerophila abruptaria* from the New Forest; *Nemeophila russula*, female, with wholly black hind wings; pale salmon *Anthrocera filipendulæ*; and *Colias edusa* with exceedingly pale margins.—Mr. Lucas, specimens of the earwig, *Labidura riparia*, from Bournemouth, and a pupa of *Leucanus cervus*.—Mr. Cannon, a series of *Eucanessa antiopa*, bred from ova deposited by a female taken in the South of France; *Limenitis sibylla* with only faint white markings showing through the almost uniform black of the upper side; a long series of bred *Melitæa aurinia* from Ireland; bred *M. cinxia* from Isle of Wight larvæ; a very fine series of *Cœnonympha typhon* var. *rothliebii* taken at Witherslack; a deeply marked female of *Brenthis euphrosyne*, from Reading; and captured examples of *Melinia ocellaris*.—Mr. Mauger, a case containing more than twenty species or named forms of the gorgeous South American genera, *Catagramma*, *Perisama*, and *Callicore*, including the type-form of the genus *Catagramma*, *C. astarte* (*hydaspes*).—Mr. Schooling, a varied series of *Spilosoma fuliginosa* bred from ova; and a fine series of *Xylocampa areola* (*lithorhiza*).—Microscopes were lent by Messrs. Cant, Edwards, Fremlin, Warne, and West (Streatham).

December 10*th*.—The President in the chair.—Mr. Smallman, of Herne Hill, and Mr. Ansorge, of Kingston-on-Thames, were elected members.—Mr. Edwards exhibited a specimen of the floral simulator, the orthopteron *Gongylus gongyloides*, from India.—Mr. McArthur: (1) a specimen of *Hepialus humuli*, male, showing white patches of scales on the under side; (2) two examples of *Dianthœcia nana* (*conspersa*) from the Isle of Lewis, both very dark, and five examples from Shetland, all much, and two very much lighter, from the development of white and orange patches.—Mr. West (Greenwich), two species of aquatic Rhyncophora from near Montreal—the huge *Belostoma americanum* and the smaller *Zaitha fluminea*—as well as an example of *Cicada tibicen*.—Mr. Dobson, a very light specimen of *Amphipyra pyramidea*, taken in his garden at sugar; it was a striking contrast to the rich mahogany form characteristic of the New Forest race; *Pygæra curtula*, bred, rich in colour; one captured at light very pale; a series of *S. fuliginosa* of a rich coloration.—Dr. Chapman, a large number of species of Lepidoptera he had captured during a tour in Spain, in company with Mr. Champion, and read notes on his journey.

January 14*th*, 1904.—E. Step, F.L.S., President, in the chair.—

Mr. East, of Stoke Newington, was elected a member.—Mr. R. Adkin exhibited a short bred series of *Acontia luctuosa*, and contributed notes on their life-history.—Mr. Edwards, ova of *Hybernia rupicapraria*, and a specimen of the large and curious Orthopteron sent by M. Montandon from near Bucharest.—Mr. Tonge, a series of capital photographs of the ova of Lepidoptera, including *Hybernia rupicapraria*, *Hemerophila abruptaria*, *Melinia circellaris*, *Argynnis thore*, and *Anchocelis rufina*.—Mr. West, specimens of *Dermestes lardarius*, which he had bred from almonds, among which it had occurred freely.—Mr. Browne, a large number of species of Lepidoptera captured at Dawlish between July 23rd and Aug. 7th, 1903.—Mr. Turner, a few species of Lepidoptera taken at the same place and at about the same time. Mr. Browne then read a paper descriptive of his holiday-collecting at Dawlish, to which Mr. Turner added a few notes on the Micro-Lepidoptera and other orders.—The report of the field-meeting held on July 11th, 1903, at Wendover, was read.

January 28th, Annual Meeting.—The President in the chair.—The first half of the meeting was devoted to the receiving of the Treasurer's Report and Balance-sheet, the election of the Officers and Council for the ensuing year, and the reading of the Annual Address by the President.—The following is a list of the Officers and Council for 1904:—President, Alfred Sich, F.E.S.; Vice-Presidents, H. Main, B.Sc., F.E.S., and E. Step, F.L.S.; Treasurer, T. M. Hall, F.E.S.; Librarian, A. W. Dodds; Curator, W. West (Greenwich); Hon. Secretaries, Stanley Edwards, F.L.S. (Corresponding), and Hy. J. Turner, F.E.S. (Report); Council, R. Adkin, F.E.S., F. Noad Clark, F. B. Carr, H. L. Fremlin, M.R.C.S., L.R.C.P., F.E.S., M. J. Lucas, B.A., F.E.S., H. A. Sauzé, and M. West (Streatham). Subsequently Mr. Thompson, of "Garlands," Redhill, was elected a member.—Mr. Tonge exhibited several admirable photographs of the ova of Lepidoptera; Mr. Step, a specimen of the Dublin prawn; and Mr. Turner read notes on the natural history of Canada, sent to him by Mr. A. J. Croker.—Hy. J. Turner, *Hon. Rep. Sec.*

Lancashire and Cheshire Entomological Society.—By the courtesy of the St. Helen's and District Naturalists' Society the concluding meeting of the present session was held in the Association Buildings, St. Helen's, on December 21st, the gathering partaking of the nature of a joint meeting of the two societies, of which a large number of members were present. Mr. Wm. Webster, M.R.S.A.I., Vice-President, occupied the chair. The minutes having been confirmed, the Secretary announced the following donation to the library: "The Coccidæ of the British Isles," vol. ii., by Robt. Newstead, A.L.S., F.E.S., Hon.F.R.H.S., &c., presented by the author. On the motion of the Council it was unanimously resolved to elect Major Ronald Ross, F.R.C.S., F.R.S., &c., an Honorary Member of the Society. The following gentlemen were proposed for election as ordinary members in January: Messrs. H. Mousley, of Buxton, and Donald Kent, of Sefton Park, Liverpool. Certain amendments to the rules of the Society having been adopted, communications were read by Messrs. R. S. Norman, F.G.S., and J. G. Wallbridge, M.P.S. Mr. R. S. Norman's paper on "Fossil Insects" dealt in an exhaustive manner with

the palæontological branch of historical geology. Having first briefly described the process of formation of the great groups of stratified rocks, he dealt *seriatim* with the principal systems that have proved prolific of fossil insect remains in both Europe and America, special attention being paid to those occurring in Britain. In dealing with the wealth of material from the carboniferous strata, the lecturer dwelt interestingly on the vast number of insects that had been recovered from the coal-measures of Commentry. Passing to the secondary series of rocks, he alluded to the abundance of insect remains that had recently been discovered in certain of the limestone formations. In commenting on the Coleoptera and Diptera from the Wealden rocks, he attributed the smaller size of the majority of specimens therein found to a lowering of the temperature during the period in which the deposits were laid, contending that, other things being equal, the lower the temperature the smaller would the insects tend to range. On the whole, however, he was of opinion that with some few exceptions the climate of the geological past differed little from that of the present day.—Mr. J. G. Wallbridge's interesting communication on "Economic Insects" was divided into (1) a general survey of his subject under the headings of (*a*) beneficial and (*b*) injurious insects; and (2) the consideration of the life-histories of several of our better known hexapods, with special reference to the honey-bee. Treating of oak-galls, he remarked that perhaps the most commercially valuable was that of the dyer's oak (*Quercus infectoria*). From this we obtain gallic and pyrogallic acid, whilst the powdered galls constitute the essential ingredient in gall ointment, and are also largely used in the manufacture of ink and dyes. An interesting account of the blister beetle (*Cantharis vesicatoria*) was given, and the use of cantharides in hair restorers explained. The habitat and habits of the cochineal insect (*Coccus cacti*) were dealt with in full, and the commercial value of the carmine dyes commented on, a colouring we constantly meet with in our confectionery, jellies, and tooth-powders, and which is not altogether unknown to ladies who are given to adorn nature. The lac insect and others were also instructively referred to.—On the conclusion of the papers an interesting discussion took place, in which many of the members participated, and a cordial vote of thanks was accorded the readers.—E. J. B. Sopp and Fred. Birch, *Hon. Secs.*

The Annual Meeting was held in the Royal Institution, Liverpool, on Jan. 18th, Mr. William Webster, M.R.S., Vice-President, in the chair. Major Ronald Ross, C.B., F.R.C.S., F.R.S., was elected an honorary member, and Messrs. H. Mousley (Buxton), and Donald Kent (Sefton Park, Liverpool), ordinary members of the Society. The report of the Council was read by Mr. E. J. B. Sopp, who congratulated the Society on its marked and steady progress. The Hon. Treasurer then presented his balance-sheet, by which it was seen that notwithstanding an increased expenditure the credit-balance in the Treasurer's hands was the largest of recent years. The following officers were elected to serve during 1904:—President, Samuel J. Capper, F.E.S.; Vice-Presidents, R. Tait, F. C. Thompson, and Rd. Wilding; Hon. Treasurer, Dr. J. Cotton, F.E.S.; Hon. Secretaries, Messrs. E. J. B. Sopp, F.R.Met.S., F.E.S., J. R. le B. Tomlin, M.A., F.E.S., and W.

D. Harrison; Hon. Librarian, Mr. F. N. Pierce, F.E.S.; Council, Dr. G. W. Chaster, and Messrs. B. H. Crabtree, F.E.S., J. F. Dutton, A. Tippins, H. Tonkin, W. A. Tyerman, and Wm. Webster, M.R.S.A.I. It was resolved that the summer meeting be held at Petty Pool, Delamere Forest, on Saturday, June 11th. This concluding the business, the retiring Vice-President delivered his Address, entitled "The Entomologist before the Law," in which he ably reviewed those laws of the land which affect the entomologist in the pursuit of his hobby. Property in law was described under the heading of real or land, and personal, after which the law of trespass as applying to collectors was fully dealt with, and much useful information furnished on rights of way and other matters of considerable importance to entomologists. After dealing exhaustively with the law as affecting ourselves, the lecturer described the influence that insects have had on the law. A brief allusion to the law of copyright brought a most interesting paper to a close. On the motion of Mr. R. Wilding, seconded by Dr. J. Cotton, a hearty vote of thanks was accorded Mr. Webster for his instructive discourse, as well as for his able services in the chair during the session just closed. Mr. E. J. B. Sopp, F.E.S., exhibited *Epilampra caraibea*, Sauss., captured in Liverpool, a Cuban cockroach which had not previously been recorded as having occurred in Britain. The insect had been kindly identified for him by Mr. M. Burr, F.Z.S., F.E.S.—E. J. B. Sopp and J. R. le B. Tomlin, *Hon. Secs.*

Birmingham Entomological Society.—*November 16th*, 1903.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. G. W. Wynn read a short paper giving an account of all the rarer and more noteworthy Lepidoptera he had found in Wyre Forest, and illustrated the paper by a boxful of selected specimens. The more noteworthy were our old friend *Endromis versicolor*, *Hylophila bicolorana* (very rare), the Cymatophoridæ (all the British species of which occur, *octogesima* being the rarest), *Stauropus fagi* (one specimen only having been taken so far), *Drymonia chaonia* (of which he showed five specimens, reared from seven eggs laid by a captive female; very rare), and *Plusia bractea*.—Mr. W. H. Flint showed a specimen of *Argynnis lathonia*, taken in Wyre Forest (on Worcestershire side) in 1899, when he believes he also saw one or two others, also Kent specimens for comparison.—Mr. A. H. Martineau, a little lot of Aculeates, the result of five or six days' collecting, at different times in 1901–2, at Budleigh Salterton. He also gave an account of the district, the coast-line, and geological formation, and the occurrence of each species in turn. Amongst other species taken were *Pompilus rufipes*, *P. cinctellus*, *Gorytes tumidus*, *Arpactus lucinctus*, *Andrena pilipes*, *A. fuscipes*, *Stelis phæoptera*, &c. He also showed a specimen of the Tachinid *Miltogramma punctata*, bred from a pupa found inside a cocoon of *Trypoxylon figulus*.—Mr. Gilbert Smith, a few nests of Hymenoptera, from various places.—Mr. G. H. Kenrich, a number of Lepidoptera, all having been bred this year, from various localities, amongst others were *Endromis versicolor* (from Wyre Forest), *Thecla pruni*, *T. w-album*, *Xanthia gilvago* (from Northamptonshire), *Demas coryli* and others (from Sutherlandshire). He mentioned that in Sutherlandshire he had found larvæ of *Gonodontis bidentata* commonly on birch, in three well-marked forms,

one grey, one purple, one black and white, each agreeing perfectly with different parts of the birch trees.—Mr. W. H. Flint, drawers containing his collection of the genus *Cucullia* and the Sesiidæ, both containing fine series of most of the species. In *Cucullia* was a fine series of *absinthii*, all taken in one night at light near Rossall; also *scrophulariæ*, Capieux, from Cambridge, *asteris* from Kent, and *lychnitis* from Arundel. Amongst the Sesiidæ were *Sesia formicæformis* from Sutton Park (one), *vespiformis*, L. (*asiliformis*, Rott.) from near Knowle, *tipuliformis* from Sutton, *culiciformis* from near Knowle, Shirley, and Wyre Forest, *ichneumoniformis* long series from Forest of Dean, *scoliæformis* from Dolgelly, and *spheciformis* from Wyre Forest and Abrewaa.—Mr. Bethune-Baker, various new books.

January 18th, 1904.—The President in the chair.—Mr. R. C. Bradley exhibited *Cœliosage acuminata* and *Crabro cetratus*, both taken in his garden at Moseley, in 1903.—Mr. A. D. Imms read a paper upon tsetse flies and nagana, in which, with the aid of lantern-slides, blackboard diagrams, &c., he gave an account of all that is known at present about the flies of the genus *Glossina*, their structure, life-history, distribution, &c.; and also described the disease nagana and the *Trypanosana brucei* which causes it.—Colbran J. Wainwright, *Hon. Sec.*

Manchester Entomological Society.—*December 2nd*, 1903.—At the Manchester Museum, Owens College, Dr. W. E. Hoyle, M.A., F.R.C.S., President, in the chair, the meeting took the form of an exhibition evening, and included specimens captured by members of the Society. These were much appreciated, being of a very interesting character. The following is the complete list:—Mr. B. H. Crabtree, varieties of *O. bidentata*, ranging from very pale forms to black, from South Manchester district. Mr. W. Buckley, Lepidoptera taken at Wallasey, Delamere, Padgate, and Anglesey, during the year. Mr. Geo. O. Day, a series of *T. opima*, and Lepidoptera bred in 1903. Mr. R. Tait, junr., a case containing *H. atriplicis*, *L. albipuncta*, *A. ashworthii*, *C. absinthii*, &c. Mr. R. Brauer, a collection of preserved larvæ (British), and a specimen of *Cleniza californica* with trap. Mr. R. J. Wigelsworth, insects captured on the River Plata, and at Ensenada (Argentine Republic). Mr. J. Ray Hardy briefly referred to the late Thomas Kelsall, and commented on the valuable work he did on behalf of entomology, especially in connection with the collection at the Manchester Museum. A case containing Coleoptera mounted on cards, by Mr. Kelsall, was shown by Mr. G. Kearey. Some recent publications from the British Museum, concerning several orders of insects, were reviewed.

January 6th, 1904.—Annual Meeting held in the Manchester Museum, Owens Collage. The President occupied the chair. The report from the Secretary showed a membership of forty, and ten meetings and two excursions having been held during the year. The Treasurer's report was satisfactory; notwithstanding heavy expenses, there was an encouraging balance in hand. The following officers were elected for the current year:—President, Dr. W. E. Hoyle; Vice-President, B. H. Crabtree, F.E.S.; Treasurer, W. Buckley; Secretary, R. J. Wigelsworth, 131, Duke Street. Old Trafford, Manchester; Librarian, J. Ray Hardy; Council, C. F. Johnson, R. Tait,

and W. W. Kinsey.—Exhibits were afterwards shown by the members: Mr. B. H. Crabtree, case containing species of the Acidalias. Mr. Brauer, a case of *V. cardui*, *V. c-album*, *V. atalanta*, and *V. polychloros*, showing in each instance their foreign relations. The members, under the guidance of Mr. J. Ray Hardy, afterwards inspected the collection of British Curculionidæ belonging to the Manchester Museum. In the group Rhyncophora 460 species out of the 480 known were shown, including the grain- and the whole of the timber-destroying species. Also the group Scolytidæ, the species of which were notorious for the ravages inflicted, both in its larval and perfect state, upon elm-trees, especially in London parks. — R. J. Wigelsworth, *Hon. Secretary*.

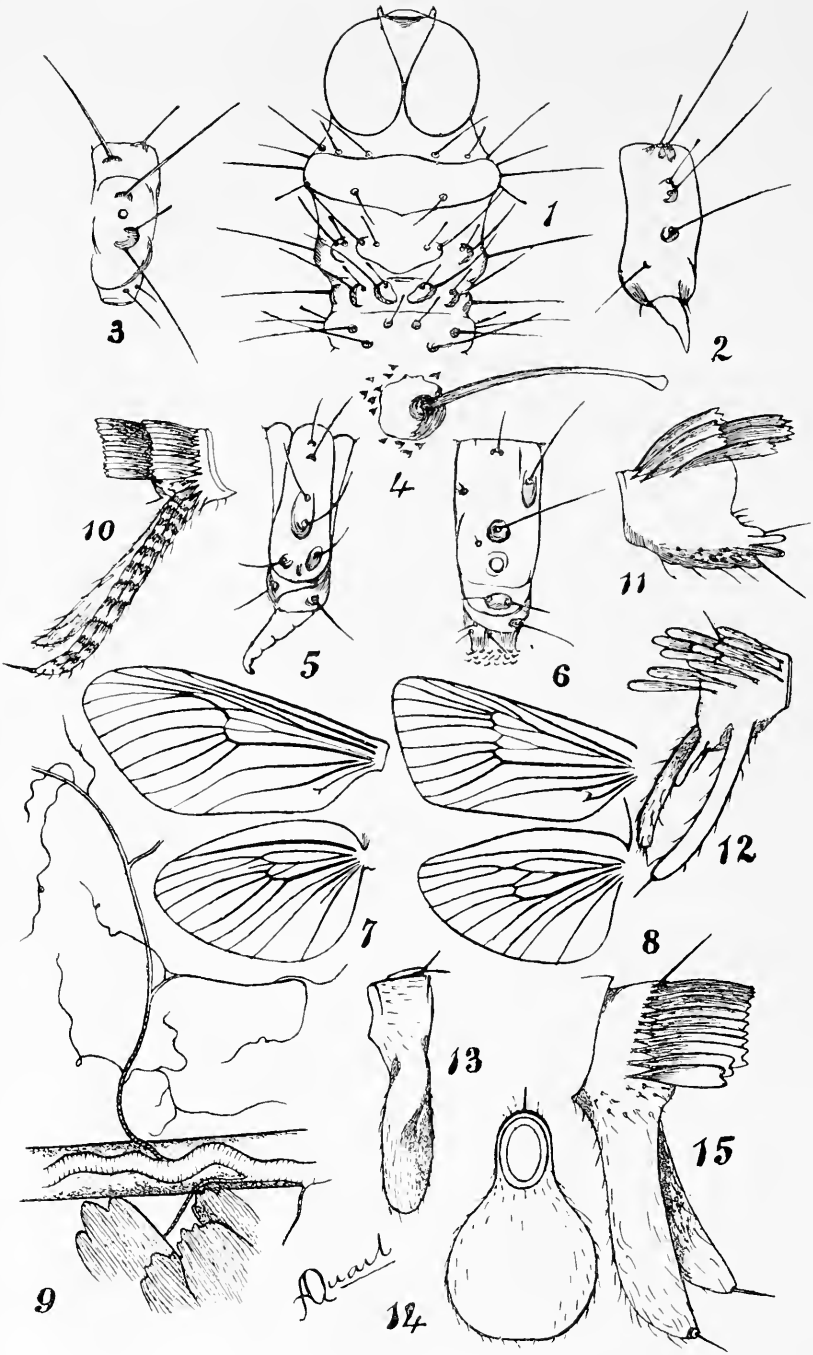
RECENT LITERATURE.

British Tyroglyphidæ. By Albert D. Michael, F.L.S., &c. Vol. II. 183 pp. 20 plates. London: Ray Society. 1903.

The first volume of this important work was issued by the Ray Society to its subscribers for 1901, and a notice of it was published in the 'Entomologist' for 1902, p. 176. In this, the concluding volume, the remaining nine genera and sixteen species are described and their habits discussed. There is a list of the principal foreign species which have not so far been recorded as British. The chief books and papers dealing with the Troglyphidæ are also referred to in the bibliography, and a most convenient index has been provided. As in the previous volume, the plates are excellent, and many of the numerous figures are coloured. When one understands that the author had to rely almost entirely upon his own exertions in obtaining British species for study, and that he drew all the figures on the thirty-nine plates, one can form some idea of the enormous amount of labour that he has bestowed in the preparation of this work.

Who's Who? 1700 pp.; *Who's Who Year-Book*, 112 pp.; and *The Englishwomen's Year-Book*, 352 pp. London: Adam and Charles Black. 1904.

As we have been favoured with a copy of each of the above-mentioned works, we have much pleasure in calling the attention of our readers to them. Among the host of notable personages whose biographies are given in 'Who's Who,' we find, among others, the names of Bateson, William; Distant, William Lucas; Elwes, Henry John; Godman, Frederick DuCane; Hampson, Sir George Francis; McLachlan, Robert; Meldola, Raphael; Poulton, Edward Bagnall; Rothschild, Hon. Lionel Walter; Sharp, David; Tutt, James William; and Lord Walsingham. In the 'Year-Book,' which used to form part of 'Who's Who?' there is much information of a useful and general character, and this is conveniently arranged in tabular form.



COSSIDÆ. (See p. 93.)

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NOTES ON COSSIDÆ.

BY AMBROSE QUAIL, F.E.S.

(PLATE V.)

A LOCAL species of Lepidoptera discovered by Mr. Illidge was described as *Culama expressa* (Cossidæ) by Dr. Lucas, of Brisbane, Queensland,* some two years ago. I handed over a pair (male and female) of this species to the collections at South Kensington a few months since, and was informed "it is not a Cossid," but could not learn from the Museum officials why it is not, or what it is!

The present writer in not responsible for placing the species among Cossidæ, but has some sort of proprietary interest in the moth, having dealt with the habits and structure of its embryological stages in our paper "Australasian Wood-boring Cossidæ,"† and would be better pleased believing it to be a Cossid. I have been unable to look into the literature of the subject, involving the original diagnosis of the genus *Culama* (Walk.), but have examined by way of pastime some stray material of Cossidæ which was available, and trust my notes thereon will prove of interest to readers, even also of some slight value to systematists.

Having dealt already with the habits of Cossidæ so far as known to us in the above-mentioned paper, I will only say here that anyone knowing *C. cossus* would consider the larva of *Culama expressa* to be a Cossid, from its resemblance in shape, colour, and habits to the larva of *C. cossus* in its first year. At pupation *C. expressa* prepares a similar cocoon of silk and chips, but the pupa does not seem to bear out the resemblance to *cossus*.

Dr. Dyar,‡ on the classification of lepidopterous larvæ, says:—"From a consideration of the first larval stage in conjunction

* Trans. Linn. Soc. N. S. W. 1902.
† Roy. Soc. Qnsld. Proc. 1903 (Illidge and Quail).
‡ New York Acad. Sci. Trans. 1894.

with the later stages, I believe that a series of superfamilies can be satisfactorily defined. This is as far as classification from the arrangement of the tubercles can be carried. . . . Superfamily Cossina (Micro-Lepidoptera): Tubercles with single seta, normal, fourth and fifth approximate or consolidated, the rest remote Includes the families Adelidæ, Psychidæ, Cossidæ, Pyralidæ, Tortricidæ, Sesiidæ, Tineidæ, Orneodidæ, and Lacosomidæ"

The ovum of *C. cossus* has been described by Mr. J. W. Tutt, F.E.S. (Ent. Rec. xv. 333), and to Mr. A Bacot, F.E.S., I am indebted for specimens of newly-hatched *C. cossus* larvæ; these are quite large animals, in length 3·5 mm. I believe the species has not hitherto been figured in this larval stage, and some remarks on the homology of the thoracic tubercle setæ with abdominal tubercle setæ are suggested by examination of these newly-hatched larvæ of *C. cossus*.

Looking further afield than Cossidæ, one notes that a fundamental arrangement of abdominal setæ, of newly-hatched larvæ especially, largely prevails throughout the Lepidoptera. Approximation and loss of certain tubercles is admitted to be specialization. In Hepialidæ, newly-hatched larvæ have this fundamental arrangement also on the thoracic segments—*i. e.* anterior first, posterior second, supraspiracular third, subspiraculars fourth and fifth, and basal—correspond in number and *position* with the abdominal tubercle setæ. It is here necessary to note that I refer only to the meso- and post-thoracic segments, the prothorax everywhere has a special arrangement of the setæ. In Hepialidæ * iii is applied to two setæ—in fact, iii *a*, *b*, the spiracle, and iv, v, tubercles, are curiously associated on one common area in the newly-hatched stage.

As indicated by Hepialidæ, no doubt the primitive arrangement of the tubercle setæ was alike on both thoracic and abdominal segments. Movement (noticably approximation) of setal tubercles has taken place to a greater extent on the thoracic than on abdominal segments. Elimination of the spiracles—outward indication of internal modification in connection with wing development—has not affected the abdominals, but is probably the chief cause of the altered positions of the tubercles on thoracic segments.

In lateral descending order the abdominal tubercle setæ of newly-hatched *C. cossus* (figs. 1 and 3) are i and ii normal in position single seta each, iii single seta.† I cannot trace iii *b*,

* Figure, Trans. Entom. Soc. Lond. 1900.

† Mr. Bacot believes he can detect iii *b* on *C. cossus*. [Not so! Mr. Quail uses iii *b* as denoting the second supraspiracular setæ on Hepialidæ larvæ. The tubercle I remarked on to Mr. Quail as being present on larvæ of *C. cossus* is a minute free spiracular point of very general, if not universal, occurrence on the abdominal segments of lepidopterous larvæ, and probably has no relation at all to iii *b* of Hepialidæ.—A. Bacot.]

iv and v approximate on one plate common to both, and basal setæ. Most of the setæ are typical, long, hollow, bristle-like, and pointed; but on the anterior trapezoidal and anterior subspiracular tubercles are short setæ with curious tips, which we will call trumpet-like. Immediately on noticing these curious setæ, I observed also that the thoracic segments had two exactly similar setæ (fig. 2). These were conspicuous on the specimens which I first examined. Mr. Bacot questioned the shape of the setæ, the specimens he had examined not apparently exhibiting the trumpet-like form of seta. I therefore gave further attention to the matter, and am satisfied that the two setæ on the thoracic segments are exactly similar to the two on the abdominals. The figure (4) of an abdominal anterior trapezoidal seta was drawn from one of Mr. Bacot's slides; on that specimen are other more or less trumpet-like setæ, the curve of the seta is probably due to pressure of the cover-glass. Although not absolutely certain, I believe we have here a functional seta of a remarkable kind *which can open and shut;* when open at the tip the seta is trumpet-like, closed it loses this appearance.

The position of all the tubercle setæ on the thoracic segments differs from that of the abdominals. On *C. cossus*, in addition to the displacement of thoracic setæ from spiracular reasons above referred to, one notes iii B has been eliminated, resulting in the approximation of iii and the anterior subspiracular tubercle, and, moreover, the movement of this to a position above iii. The homologues appear to be in lateral descending order on the thoracic segments: i, ii approximate, subspiracular seta moved up; then iii; single subspiracular below and basal.

It is unfortunate that I cannot carry these observations further as regards *C. cossus*. The nearest material I have being adult *Zeuzera pyrini*, which is not really of value to compare with *C. cossus* newly-hatched. On the thoracic segments of *Z. pyrini* adult larva (fig. 5): i, ii are separate; iii *a*, *b* approximate—I do not think the subspiracular seta is here moved up, iii *a*,* *b* exists definitely on the abdominal segments; iv, v are curiously *above* what is perhaps a scar of the eliminated spiracle, and, moreover, the setæ are on separate tubercles—such spiracle scars exist in all Zeuzerinæ I have seen; vi is below, and on the base of legs another single seta.

The abdominal tubercle setæ of *Z. pyrini* (fig. 6): i, ii remote normal; iii *a*,* *b*; iv, v approximate; vi posterior; and three basal setæ. A minute, subdorsal, anterior seta may also be noted; this, like the spiracular scar, persists on all species allied to *Zeuzera*.

As the result of criticism, Dr. Dyar admits that the tubercle setæ of the thorax are homologous with those of the abdominal

* See my note, foot of p. 94.—A. B.

segments, and should bear corresponding identification numbers. I do not know where or in what form Dr. Hofmann's criticism was published, and am unacquainted with his arguments, with which mine should be more or less in accord.

When the imaginal wings of a lepidopteron are examined under a high power, it is seen that veins pass through the nervures (fig. 9), sending forth smaller veins from either side, and still smaller veins, until they pass into the whole wing area. These veins are of course easily seen in the wings of the very large foreign Cossids, but if looked for can always be demonstrated. These veins are not identical with the nervures—the latter act merely as hollow protecting tubes; nor are the veins confined to the nervures—they may be observed, for instance, on the inner area of the fore wing between the anal nervure and inner margin. These veins, if functional in connection with wing expansion, may also be functional throughout the existence of the insect, the wing being unquestionably a "live" organ. Are the erect wing-bristles and the nervule "discs" of Dr. Chapman associated with the veins? I know nothing about the matter, but it appears to be one of interest; perhaps some abler microscopist, or someone who knows where to refer for information, will tell us something about the matter, which I believe would interest others as well as myself.

We are concerned, however, with the remarkable constancy of the nervures in maintaining definite positions on the wings, thus affording assistance in classification.

In the pattern of wing-neuration of *Cossus cossus* (fig. 7) some of the radial nervules of the fore wings are forked. *Zeuzera pyrini* shows this more definitely than, at any rate, the specimen of *C. cossus* from which this figure was drawn; and Professor Comstock's American type of Cossidæ—*Prionoxystus robiniæ*—is very definitely forked. Although I have only this material to hand, speaking from memory of other species which I have seen, the forking of the fore wing radial nervules is characteristic of the group. Now, comparing (*Culama?*) *expressa*, which I have enlarged (fig. 8), for that purpose (the insect expands 28 mm. to 38 mm.), one notes there is no forking of the radial nervules, but the hind wings of *cossus* and *expressa* are almost identical. The wing-pattern of the Tortricidæ is very similar to that of *C. expressa*, of fore and hind wings also.

The imaginal antenna of *Zeuzera pyrini*, male, is a partially bipectinate and rather pretty form, the pectination gradually increasing, then decreasing in length droop with gentle curve, forming a convexity with thread-like terminal of unpectinate segments. The antenna is devoid of scales, except on a few basal segments, which have slight dorsal scaling, but none on the dorsa of pectinations.

Phragmatœcina arundinis male antenna (fig. 12) is not unlike

that of *Z. pyrini*, but of less pronounced convexity. The dorsum of shaft is covered with numerous scales arranged in irregular rows across each segment; there are scales also on the dorsa of pectinations and numerous ventral sense-hairs. Three segments are transitional between the bipectinate and the terminal segments. These have a ventral appendage, with sense-cones, sense-hairs, and bristles; the short lateral extensions are of the appendage, not of the shaft itself.

The female antenna of *Z. pyrini*, *C. cossus*, and of *C. expressa* are without pectination, and bear ventral extension with anterior sense-cones, sense-hairs, and bristles. Comparing the male unpectinate terminal segments of *Z. pyrini* with the female antennal segments, and remembering the transitional segments of *P. arundinis*, one concludes that ventral extension preceded bipectination among these insects.

Thus, I should say, *P. robiniæ* is a higher—more recent—species than *Z. pyrini*, as in the former species both sexes are bipectinate. The male pectination being slender, smooth, devoid of scales, without scaling on the shaft, and very like *Z. pyrini*, except that the segments are bipectinate to tip of antenna. The female segments (fig. 15) have stout bipectination to the tip, and one row of scales per segment on shaft.

It is interesting to find that the male antennal segments of *C. cossus* have simply a tongue-like ventral appendage, which, viewed in section, is almost round (figs. 13, 14); two rows of scaling per segment are represented by somewhat diminutive scales on the dorsum of shaft. The female antenna has cones on the anterior surface of the appendage.

C. expressa male antenna (fig. 10) approaches that of *P. arundinis* more nearly than either of the Cossids in regard to scaling. The dorsum of shaft very closely covered with scales, two rows per segment, and the dorsa of the pectinations are likewise covered very closely with scales to the tips. The female antenna (fig. 11) has a close resemblance to the Cossid antenna, the dorsum of shaft having two rows of scales per segment.

From the foregoing it is evident *C. expressa* is not a Cossid; still, it has Cossid affinities, and if in other respects it is a Tortricid, it must be rather low in that family. There is also some reason to suggest that *Zeuzera* and *Cossus* are not such near relatives as is sometimes supposed, but more material in the newly-hatched larval stage must be examined.

Explanation of Plate V.

FIG.

1. *Cossus cossus*, First larval stage, dorsal aspect of thorax, and first abdominal segments, × 80.
2. „ „ „ „ „ mesothorax laterally, × 80.
3. „ „ „ „ „ third abdominal segment, × 80.
4. „ „ Anterior trapezoidal third abdominal seta, × 400.
5. *Zeuzera pyrini*, Adult larva, mesothorax, enlarged.
6. „ „ „ „ third abdominal segment, enlarged.
7. *Cossus cossus*, Imaginal wing neuration, nat. size.
8. *Culama expressa*, „ „ „ enlarged.
9. „ „ Fore wing anal nervure about one-third from base, showing enclosed vein and subsidiary veins which ramify through the wings, × 400.
10. „ „ ♂ antennal segment, × 200.
11. „ „ ♀ „ „ × 400.
12. *Phragmatœcina arundinis*, ♂ transitional antennal segment, × 400.
13. *Cossus cossus*, ♂ transitional antennal segment, laterally, × 80.
14. „ „ ♂ „ „ „ transverse, × 80.
15. *Prionoxystus robiniæ* ♀ transitional antennal segment, × 200.

Note.—Fig. 8 has really somewhat stouter nervures than should be the case. Tortricids are very fine, and difficult to examine therefore; also the two inner anal nervures of the hind wings should be a little wider spaced.

CURRENT NOTES.

By G. W. Kirkaldy.

(Continued from p. 73.)

F. M. Webster concludes (1) that "Lucrative prices for dairy products stimulate dairying; this increases the area of timothy meadows, and tends to their continuance for a series of consecutive years. This increases the abundance of" *Blissus leucopterus* [Rhynchota] and *Sphenophorus parvulus* [Coleoptera], "and consequently the magnitude of their ravages." The same author deals (2) with the diffusion of North American insects, principally Lepidoptera and Coleoptera. L. Bruner makes a powerful plea (3) for the protection of birds, not only from a humane point of view, but as a contribution to economic entomology. He calculates that the estimated 75 millions of birds in Nebraska require, at a very low estimate, 1875 millions of insects for each day's rations—that is, roughly, 15,625 bushels of insects. "Birds, like all other animals, feed upon that food which

is most readily obtained, hence the insectivorous kinds destroy those insects which are most numerous—the injurious species." T. W. Kirk (4) relates experiments on Coccidæ, and notices of the wharf borer (the Coleopteron *Nacerdes melanura*), the rest of the extensive report being occupied with fungous diseases, &c. W. W. Froggatt (5) notices the weevils and moths that damage foodstuffs. The paper of N. A. Cobb (6) is concerned principally with fungous diseases, but refers to the exciting causes of Stigmonose, &c., being the punctures of Coccidæ, Aphidæ, Thysanoptera, &c. (pp. 694–704).

De la Torre Bueno (7) has presented us with the first modern account of the metamorphoses and habits of a Naucorid; he finds that the oval instar lasts about twenty-four days, the five nympal about fifty, while the adult may under favourable conditions live for over a year; oviposition seems to be continuous during the summer. The paper is a distinct advance in our knowledge. W. W. Froggatt (8) gives descriptions and notices of the habits, &c., of the Australian Cicadidæ, with a bibliography of the literature. This, like all Froggatt's papers, is of high value, but he is the victim of his publishers in the detestable manner in which his papers are presented. The original source of the present contribution is 'Agricultural Gazette of New South Wales,' xiv. pp. 334–41, and 418–25, published in April and May respectively of this year. It is republished, however, as a miscellaneous publication "of the Department of Agriculture, N. S. Wales," pp. 1–15, without any proper indication of its original source. The plates and woodcuts also are never numbered. It is to be hoped that Mr. Froggatt will use his influence to have these publications brought into line with modern methods.

When discussing Miss Nawa's paper on "A Parasitic Moth" (Entom. xxxvi. 130), I was unaware of Dyar's notice of a lepidopterous larva on a leafhopper (9). This larva was found firmly attached to the dorsal surface of the abdomen, under the wings, of a species of *Issus* (near *aurorens*, Uhler) from New Mexico. Nawa's paper was further discussed by Dyar (10), who thought that *Epipyrops* might be a true parasite after all.

Reh gives the first two instalments (11) of what promises to be a valuable contribution to our knowledge of the Coccidæ of the northern and central portions of Europe. To Coquillett (12) we are indebted for "an attempt to settle the type species of each North American and European genus of Empididæ, and to bring some kind of system out of the present confused condition into which the genera of this family have fallen." The well-known genus *Mantipeza* is replaced by *Chelifera*, *Rhamphomyia* by *Macrostomus*, *Sciodromia* by *Helcodromia*, *Syneches* by *Acromyia*, and *Cyrtoma* by *Bicellaria*. Endlich (13) discusses, with copious bibliographical references, the fight against Texas fever and the Tsetse sickness. Börner (14) describes a new genus of

Sciaridæ from Sicily, in which the female is without wings and halteres; the segmentation of the abdomen in female Diptera is also discussed at some length.

Geest (15) describes aberrations of a number of butterflies, with figures of aberrations of *Melitæa cinxia*, *Argynnis aglaia*, *Acronycta rumicis*, *Apatura clytie*, and *Argynnis levana*. Bachmetjev (16) gives an account of the number of "eyes" on the under side of the hind wings in a quantity of *Epinephele jurtina* captured in Sophia. Fischer provides (17) the third part of his experiments on temperature variations, dealing in this principally with the Vanessines. Ulmer notes the occurrence of claws on the tarsi of trichopterous pupæ (18).

Friese (19) describes a colony of mason-bees, with a figure of a mass of rock with about one hundred and eighty nests of the species in question; while Wasmann deals with the guests of the Doryline ants (20).

Stockman (21) reports on a plague of *Acrydium succinctum* and *æruginosum* in the Central Provinces of India, methods taken for the protection of the crops, experiments with fungi, hatching observations, &c.; Caudell (22) criticises the recent papers of Rehn and Krauss, and correctly—in final effect through scarcely in detail of working—declares *orientalis* to be the type of *Blatta*; *Blattella* is proposed instead of the preoccupied *Phyllodromia* for *germanica*.

Busck contributes notes (23) on the tineid types of Clemens, based on the discovery of a box found in the Academy of Natural Sciences at Philadelphia; one hundred and ninety-two out of the two hundred species of Clemens have now been identified, and five more are known with certainty from the descriptions, leaving only three at present unknown.

Lea (24) is convinced that, although the San José scale was first officially reported from Tasmania two years ago, it is not now, and never will be probably, a serious pest in Tasmania. Froggatt contributes a "Nature Study" on *Termes lacteus* (25).

Zehntner discusses at some length the life-history of the coffee-borer (*Zeuzera*), a pest to cacao in Java, its metamorphoses, habits, and enemies; also of another lepidopterous cacao pest, *Orthocraspeda trima*. Figures in all stages are given of these two forms (26). The dentition of the Diptera is discussed by Harris (27); the anatomy and development of the larva of *Ephydra*, a dipteron, is considered at some length by Trägårdh (28). Schouteden supplements (29) his list of aphid galls already noticed in the 'Entomologist' (1903, pp. 287 and 262).

(To be continued.)

DESCRIPTIONS OF TWO NEW CETONID BEETLES FROM BRITISH EAST AFRICA.

By E. A. Heath, M.D., F.L.S.

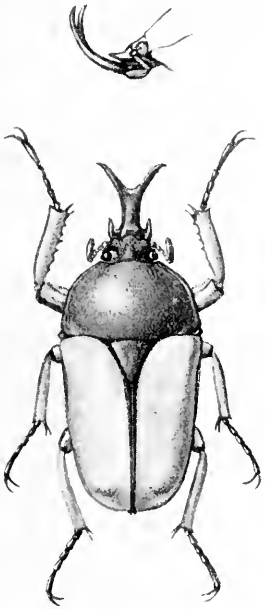

Fig. 1.

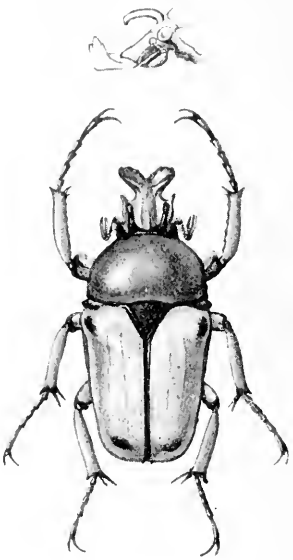

Fig. 2.

Cœlorrhina cornuta, sp. n. (fig. 2).

Head and frontal horn red. Pronotum and scutellum shining brown-green, iridescent; lateral and anterior margins of pronotum, lateral, posterior, and sutural margins of elytra raised, piceous. The head is anteriorly prolonged into an oblong channel-like process, with a lateral tooth on each side, and a terminal bilobed ear-shaped process turned upward. Length of head and horn, 4½ lines. At the base of the head are two lateral, curved horns, pointing forward and downwards, 2½ lines in length. The elytra are shining, pale yellowish brown; at the base and apex of each elytron near external margin is a dark brown spot. Elytra, scutellum, and thorax finely punctured. Body beneath dark olivaceous green, somewhat coarsely punctured. Abdomen with an obscure central longitudinal reddish-brown fascia. Legs reddish brown; apices of femora and the tarsi black; a thick fringe of light brown hair on the under side of front femora, a fringe of light brown hair on the posterior tibiæ, and on the yellowish pygidium. Long. 16 lines; max. lat. 7 lines.

Hab. Uganda, British East Africa.

Eudicella immaculata, sp. n. (fig. 1).

Basal half of head, pronotum, scutellum, epimera of mesothorax, and pygidium dark olive-green, thickly and finely punctured; lateral margins of pronotum raised, smooth, and shining. The head is prolonged into three shining mahogany-coloured horns, the central horn being bifurcate, pointed, 6 lines in length, curving upward; the lateral horns about 1½ lines. The elytra are shining, pale yellowish brown, and spotless. The sutural margins and body beneath are of the same dark green colour, the last finely punctured. The mesosternum sparingly covered with light yellow hair; the upper part of sternal process thickly covered with yellow hair. The legs are bright shining mahogany coloured; the tarsi bright shining black; the front femora has a thick fringe of light brown hair on the under side; there is also a slight fringe of the same coloured hair on the pygidium. The front tibiæ in the male are smooth on the outer side, but have seven or eight teeth on the inner side. The female is the same in every respect, except the horns and the front tibia, which are smooth on the inner side, but have three teeth on the outer side. Long. 17 lines; max. lat. 10 lines.

Hab. Uganda, British East Africa.

Closely allied to *E. smithi*, but differing in having a more finely punctured thorax and elytra, the pygidium green, and the elytra spotless; the pygidium in *smithi* is red.

114, Ebury Street, Eaton Square, S.W.

TWELVE MONTHS' WORK AMONG THE DRAGONFLIES OF SURREY AND HAMPSHIRE.

By H. T. Dobson, F.E.S.

Finding Lepidoptera very scarce during the summer of 1902, I decided to try my fortune among the Odonata, with the result that I captured, between September, 1902, and September, 1903, no less than twenty-six species out of the thirty-nine given for Great Britain by Mr. J. W. Lucas in his excellent work on 'British Dragonflies,' published in 1900.

Thinking there must be many readers of the 'Entomologist' who, like myself, are deeply interested in this important and splendid group of the Neuroptera, I venture to offer the following notes.

I shall consider the species according to the classified order used by Mr. Lucas, quite disregarding the rotation of my captures. Of the five species belonging to the genus *Sympetrum*, I took but two, viz. *striolatum* and *scoticum*. My first capture of the former was on August 8th, at the Black Pond, Esher, and I continued during 1903 to take it until the middle of October. I

also found the species in fine condition in the New Forest on September 30th, but the best dark forms I took in September, 1902, at Freshwater.

It was at the Black Pond, Esher, that I first captured *S. scoticum;* it was fluttering about in the immature state on July 21st. A series quickly fell to my net. I found it, however, a far more difficult insect to take in the New Forest on September 30th, when it was in a perfect condition; I also saw it flying in company with *S striolatum* at Wisley late in October.

With regard to the genus *Libellula*, I took or saw both *depressa* and *quadrimaculata* at Esher on June 1st; of the former I captured a splendid long series at Rhinefield on June 8th. Although the latter species was also common near Brockenhurst, yet my best success came from Esher, where on June 29th I took a beautifully suffused variety.

The commonest dragonfly to be seen in the New Forest during the second week in June, 1903, was *Orthetrum cærulescens;* it flew in thousands on the heaths in the vicinity of the bogs.

Of the beautiful *Cordulia ænea*, I captured a male and female in the hot sunshine on June 1st. A week later I found the species flying commonly close to Brockenhurst, but, although many specimens were netted, I only succeeded in taking one female.

Of the somewhat rare *Gomphus vulgatissimus*, I took three males, the result of searching for it in the New Forest on June 8th and 9th. On the first of these dates I also caught flying in company with it two males of *Cordulegaster annulatus;* I may add that I took a female of the latter species on September 17th, 1903, at Sidmouth, which appears to be much later than any date recorded for the insect.

A grander and more powerful dragonfly than *C. annulatus* is *Anax imperator;* this was flying commonly in the New Forest early in June. When the sun was shining it was certainly difficult to catch, but on the dull days (and we had plenty) my son and I caught between forty and fifty, from which I selected what I required, and then gave the others their liberty. While engaged in this interesting amusement my son took an example of *Brachytron pratense* flying round a pond.

I now pass on to the genus *Æschna*. Of the six British species comprised in this group, I have taken *mixta, cyanea*, and *grandis*. *Mixta*, although much smaller than either of the other two, is far more difficult to catch. After trying for several days at Freshwater, I succeeded, on September 18th, 1902, in taking two males. A couple of days later I saw another of these lovely flies, but could not capture it: I have not seen the species since. A much larger insect is *Æ. cyanea*. I look upon it as the commonest representative of the genus, and comparatively easy to capture. It made its appearance at New Malden towards

the end of July in 1903, but I took the species perfectly fresh at Yarmouth, Isle of Wight, on September 3rd. I also captured nine males flying over a pond in a brickfield at Brockenhurst on September 26th; three of these were splendid brown forms (no doubt due to age). All were taken between half-past four and five o'clock, when the lengthening shadows from the trees had almost covered the water; still there was one corner where the sun could be seen, and here I had no trouble in securing *cyanea*. Although *Æ. grandis* flies late in the day, and is often very busy during a shower, yet I have never found it fall so easy a victim to the net as *cyanea*. I first saw *grandis* last year at Esher on July 21st; later on I took several there, and also secured the species upon two occasions at Byfleet Canal.

I now wish to refer to those two brilliant dragonflies that belong to the genus *Calopteryx*. It was my pleasure to get both *virgo* and *splendens*; *virgo* was flying commonly in Brockenhurst and surrounding neighbourhood when I was there in June, but lovely *splendens* was not to be seen in the locality. I first took the last named species at Guildford on June 18th, but, as it was only just emerging, I waited till July 10th, which was about the hottest day we had last year; then, having made my way to Byfleet Station, I walked about two miles to a little stream. Here I secured a nice series, flying along the edge of a cornfield; one of the females shews no signs of possessing the usual pterostigma.

Of the remaining twelve species of the Agrionidæ, I succeeded in securing eleven, *Lestes dryas* being the one that eluded my search. However, to take them in order, I obtained a series of *L. sponsa* in the New Forest in July. I caught but a single specimen of *Platycnemis pennipes* on Ockham Common on July 10th. I also met with *Erythromma naias* upon one occasion only, when I took a few flying over the Byfleet Canal on July 25th.

The two crimson-bodied dragonflies which belong to the genus *Pyrrhosoma* were to be taken throughout June, July, and part of August at the Black Pond, Esher; but as I suppose entomologists must have met these many times, I will pass on to the rare *Ischnura pumilio*. I am glad to report that I took this on June 6th at a bog in the New Forest. It was Mr. Lucas's capital work that enabled me to identify this from the commoner species *I. elegans*, which I caught at the same time and in the same place. I should add that I found *elegans* in many districts, but perhaps nowhere was it so common as in Richmond Park, a light red variety being almost as numerous as the type. On July 4th I put one of this variety in a glass-top box with a normal coloured specimen. On the following morning the typical *elegans* was very frisky, but the whole of the body of the variety had vanished, the survivor having devoured it.

Although I captured our three species of *Agrion*, yet I only

obtained single examples of *pulchellum* and *mercuriale*, the former from the banks of the Byfleet Canal on July 25th, and the latter at Brockenhurst in the early part of June. I found *puella* commonly in the New Forest on June 8th; I also took it in the neighbourhood of Byfleet on July 10th.

I have now but one more species to say a few words about, viz. *Enallagma cyathigerum*, and I imagine that this beautiful blue-bodied dragonfly is the commonest of the Agrionidæ. It was in great evidence at the Black Pond, Esher, on June 1st, and I found plenty of them each time I visited the locality up to September. I could also have taken any quantity at the lakes in Richmond Park in July. Adverting to the question of preserving the colours of this and species of the genus *Agrion*, I have certainly not yet succeeded to my satisfaction. I have tried several methods, and shall continue to try, for if there could only be obtained results as good as I have had with the larger species, I think no one need say, "I do not collect dragonflies because they lose their colours."

Ivy House, New Malden, Surrey: Feb. 13th, 1904.

A "BUTTERFLY SUMMER" IN ASIA MINOR.

By Margaret E. Fountaine, F.E.S.

(Continued from p. 84.)

But I do not think on the whole I had much to complain of; the climate was as near perfection as anything could well be; for without that intense arid heat of the more southern countries I have visited, every morning in June, almost without exception, was gloriously fine, and the violent thunderstorms and heavy rain, which not infrequently came on in the afternoon, were as soon over as they were violent while they lasted, and a calm starlit night, with summer lightning quivering over the distant mountains, would invariably be succeeded by the dawning of another day, bringing with it that miracle of loveliness—a summer morning in the south; while, in consequence of these occasional downpours, the country remained fresh and green, and fruit of every kind was in the most amazing abundance everywhere.

On July 10th I left Amasia for Tokat, two days' journey farther inland. It was on my way there that I met with the only really unpleasant experience I ever did during all the time I was in Asia Minor. This was with some Circassians in a wayside khan. "The Circassians are all robbers!" was the verdict I had heard passed upon them, and I suppose they thought a lady

travelling alone with her courier would be an easy prey. But in this they found they were mistaken. There were some five or six of them, and the driver of my yiley (a brute I would like to have kicked many a time had I been a man) was evidently in league with these Circassians. Bersa behaved splendidly, as he always did, and I instinctively felt that the principal thing was to show no fear; neither did I feel any, for I knew they were cowards—all Circassians are—and to be met with courage, especially in a woman, would be the only way to get the better of them. But it was not till Bersa, at my bidding, had given them to understand that, as I was related to the British Consul at Constantinople, they would get into more serious trouble than they perhaps anticipated, that they gave in, sneaking away one after the other, till I was allowed to go on my way unmolested, without having relieved my purse of so much as one metelik.

The weather was now intensely hot, and during this journey I slept on the roofs of the khans, amongst the storks' nests, with nothing above me but star-strewn sky, and in the pale dawn it was wonderful to wake up, maybe to see the dark outline of a stork close by, standing on one leg beside his nest, or to hear the muffled, measured tread and clanging bells of a long line of heavily-laden camels passing along the dusty road below. I once counted one hundred and fifteen of these animals in one drove, to say nothing of the diminutive donkey at intervals, who leads each detachment, generally ridden by one of the drivers. We passed many of these caravans of camels, laden with grain and other produce, on their way from the interior to the coast, and sometimes it would be a long line of some thirty or forty bullock-waggons, frequently drawn by big patient buffaloes, who always looked hot and thirsty, and as if they were longing to be lying down in some stream or river-bed, as they so loved to do whenever they got the chance. The wheels of these waggons were apparently never oiled, so that as each one creaked on a different note, the discordant and almost deafening noise they produced is better imagined than heard, and I often knew when a troop of the clumsy vehicles was coming by these fearful sounds at some considerable distance off.

I soon found out that it was difficult to work the neighbourhood of Tokat: the mountains were high, and for the most part barren; there were very few of those lovely sunny glades and flower-strewn valleys which made the neighbourhood of Amasia so delightful. Also the country was by no means so safe as round that much favoured vicinity; indeed, for a long expedition I was obliged to take a zaptieh, which was however, I believe, quite a necessary evil. There was a lovely pine forest three or four hours' ride from where I was staying, through which wound the Old Sivas Road, but I never saw such apparently splendid collecting-ground in the month of July with so little to be got

there. It is true that I found here the only *Erebia* I ever saw in Asia Minor, but it was nothing but a fine form of *E. æthiops*,—I suppose var. *melusina*, which appeared to me to be almost typical. I had much hoped to come across *Chrysophanus thetis*, which does not occur at Amasia, but this is an insect which has always evaded me, and at Tokat it did so again. I never saw a sign of it. This place was at least a month behind Amasia, though the difference of altitude was insignificant, but I was told by my hostess (a German lady married to an Armenian) that strong winds blew here constantly throughout the summer, and this year they seemed to have had an unusual amount of rain during the month of June, so perhaps that in some measure accounted for my finding *Lycæna loëwii* and *L. damone* var. *carmon* still in perfect condition, whereas both these species had been practically over at Amasia before the middle of June. *L.* var. *menalcas* was only just beginning, and *L. hoppferi* did not appear at all.

At the end of a week my kind hostess had, I am sorry to say, been taken so seriously ill that I felt myself obliged to leave, so I returned to Amasia to await *Satyrus geyeri*. I got back in two days; this time without any adventures. The second day I travelled in company with a Turkish gentleman, who was travelling on a tour of inspection. He had many plans for the future respecting his native country, and was most sanguine that, in a year or two at most, the road from Sivas to Samsoun would be in such an improved condition, and with all the bridges in such a high state of preservation, that a diligence would be able to perform the journey thither in two days, instead of six or seven as at present. May his hopes be realized; but the Turkish Government is not encouraging to these progressive spirits, who must exist greatly to their own perpetual sorrow and constant mortification when born in Turkey.

I first caught *Satyrus geyeri*, July 25th, on the rock-strewn plateau on the top of the Lokman: here it soon became extremely abundant, and with Bersa's assistance I easily captured altogether from one hundred and fifty to two hundred specimens; for Bersa had become quite an expert in the use of the net, and collected admirably, also showing some considerable ability in learning to distinguish the different species. One can never be too thankful to have escaped being mixed up with with anything of the nature of a fool!

As soon as August was in I could feel that the season was on the wane. The green flowery valleys were now dried up, and full of prickly grass-stalks and seeds; and the tired earth, no longer throbbing and palpitating with the supreme effort to reproduce, now lay parched and languid beneath the scorching rays of the August sun; "bad specimens" became all too common amongst the Lycænidæ, the *Satyrus*, even *geyeri*, were

getting more and more chipped and worn, and though the second brood of *Chrysophanus ochimus* was just beginning, I began to feel at last that I could not put up with living "à la Turca" any longer.

So I hired one yiley and one saddle-horse and started for the coast. This proved to be a capital arrangement, as when I got tired of the jog-trot of the horse I retired into the yiley for an hour or two; and when the jolting of the yiley became unbearable, Bersa dismounted and I rode the horse again.

Towards the end of August and beginning of September I spent another fortnight at Broussa, hoping to make the ascent of Mount Olympus, which I attempted, but the weather was so hopelessly bad that day, that after reaching the second plateau I was obliged to retrace my steps, having seen nothing but dense clouds of vapour, and having got nothing except being drenched to the skin.

And thus ended my summer in Asia Minor, a country of vast possibilities, not only for the collector of butterflies, but in many other ways as well, too numerous to mention.

(To be continued.)

NOTES ON THE OVA AND EARLY STAGE OF THE LARVA OF *ACIDALIA EMUTARIA*.

By Alfred Sich, F.E.S.

In the Isle of Purbeck, on August 28th, 1901, I took a female *Acidalia emutaria* on or close to a plant of *Galium palustre*. During the next two days she laid several eggs, mostly in small groups, on the sides of the chip-box in which she was confined. In shape the ovum may be likened to an elongated barrel, standing upright. The long (micropylar) axis measures 0·9 mm.; the horizontal axes being about 0·4 mm., both being about equal. There are about two dozen ribs running up the walls of the egg, but they decrease, by concurrence, to about one dozen at the micropylar area. The interspaces, about double the width of the ribs, are broken up into oblong cells. The micropyle consists of about seven smaller and rounder cells lying below the points of the ribs, which terminate mostly just before reaching the micropylar area. In colour the ova were pale ochreous for the first twenty-four hours; afterwards, to the unaided eye, they assumed a pink tinge. By aid of a strong lens this tint was seen to be due to the appearance of numerous crimson rings and blotches.

On September 10th I noticed the ova were lead-coloured, and the next day two larvæ hatched. The bulk came out on the

12th, and the remainder on the 13th. The larvæ were very long and slender, and must have rested in the egg coiled like a wire-spring. I had no opportunity of making a description of them, but noticed the very curious thick club-shaped hairs with which many of the tubercles were furnished. Having no marsh-bedstraw (*Galium palustre*) at hand, I fed the larvæ on knotgrass. This, strange to say, they preferred quite fresh, in contrast to most other *Acidalia* larvæ, which seem to have a liking for rather dry food. I suggest that one of the natural food-plants of this species is the above mentioned *Galium*. None of this brood were reared, as I believe it was kept in too dry a condition.

Corney House, Chiswick, Middlesex: March 5th, 1904.

ON SOME NEW GENERA AND SPECIES OF HYMENOPTERA.

By P. Cameron.

CHALCIDIDÆ.

Oxycoryhpus, gen. nov.

Antennæ longish, the scape long; on the lower (almost) half it becomes gradually dilated, the end of the dilated part abrupt, forming a large sharply pointed tooth; the apical part becomes gradually, but not much, dilated; the pedicle longer than broad; the third joint distinctly longer than the fourth. Malar space as long as the eyes. Frontal depression narrow and widely distant from the ocelli. Temples very narrow, almost obsolete on the outer side. Mandibles bidentate. Scutellum large, as long as the mesonotum, narrowed towards the apex, which is narrowed, slightly incised in the centre, and projecting over the metanotum, which is irregularly reticulated, and has two stout keels in the centre, forming a large area, extending from the base to the apex. Abdomen short, the basal segment nearly as long as the other segments united, sessile. Hind femora swollen, indistinctly toothed. Submarginal vein long and narrow; the subcostal vein long and narrow; the costa and radius short, thick, and forming almost one vein. The prothorax is nearly as long as the mesonotum; the sides of the metapleuræ near the apex project; the base of the middle femora is broadly and much narrowed, compared with the apex, which has spurs. The antennæ are eleven-jointed; the last joint is as long as the preceding. On the base of the hinder femora, on the under side, is a broad rounded projection. The apical two joints of the antennæ are closely united; the pedicle is bare, narrowed.

The peculiar structure of the antennal scape makes the male of this genus easily recognized. Comes near to *Stomatoceras*, Kirby.

Oxycoryhpus pilosellus, sp. nov.

Black, densely covered with silvery pubescence; the hinder femora, the greater part of the four anterior and their tibiæ, and the middle tarsi rufous; the wings hyaline, the nervures fuscous, blackish at the apex. ♂. Length, 2½ mm.

Hab. Deesa (*Nurse*).

Antennæ nearly as long as the head and thorax united, the scape bare and shining, the flagellum opaque. Vertex and sides of front closely and distinctly punctured; the frontal depression smooth; the vertex only sparsely pilose; the rest of the head covered with long silvery hair, which hides the surface. Pro-, mesonotum, and scutellum closely and rather strongly punctured, the scutellum more strongly than the mesonotum. Metanotum irregularly reticulated; the base with a central area of equal width, about three times longer than broad. Pleuræ rugose; the apex of the meso- closely and distinctly striated. The second dorsal segment of the abdomen at the sides and the rest all over rather strongly punctured. Legs thickly covered with white pubescence.

Cœlochalcis, gen. nov.

Antennæ situated half-way between the lower part of the eyes and the mouth. Front deeply and widely excavated to the front ocellus, the sides of the depression sharply keeled, and to a less extent above. Lower outer orbits sharply margined. Antennal scape short, not reaching to the ocelli; of equal width throughout; the pedicle not longer than broad, pilose; the other joints long; the last longer than the penultimate, which is shorter than the preceding. Parapsidal furrows distinct, curved. Scutellum obtusely bidentate at the apex. Metanotum reticulated. Posterior femora not greatly dilated, not so thick as the coxæ; below without teeth; the middle coxæ spined. Abdomen sessile. Subcostal vein long, reaching close to the middle of the wing; the costal short, about four times longer than wide, the radius very short, broader than long. Mandibles shortly bidentate. The abdomen is shorter than the thorax; its basal segment is as long as the other segments united; the sides of the median segment are not spined or toothed; in its centre are two stout longitudinal keels; the hinder femora are stoutly bordered on the apical half beneath. The antennæ are shorter than the body; the scape of the antennæ is short, and does not reach to the ocelli; the pedicle is bare, broader than long; the first joint of the flagellum is slightly longer than the second.

This species, as regards the position of the antennæ, stands between *Halticella* and *Chalcis*, it being placed higher up than in the former, but not so high as in the latter. There are ten joints in the antennæ; the last is fully one-half longer than the ninth. It may be composed of more than one joint, but I cannot see any suture.

Cœlochalcis carinifrons, sp. nov.

Black, the mesonotum and scutellum covered with pale golden pubescence; the mandibles and palpi, the apex of the hinder coxæ,

the femora and tibiæ, red; the four anterior legs black, the apex of the femora, the base and apex of the tibiæ, and the tarsi rufo-testaceous; the wings hyaline, the nervures black; the tegulæ red. ♂. Length, 4 mm.

Hab. Sikkim.

The antennal tubercles and the scape smooth and shining; the flagellum opaque. Face roundly convex, smooth and shining; the malar space opaque, closely punctured, margined in front and behind. Centre of the frontal depression closely, transversely striated. Pro-, mesonotum, and scutellum closely, uniformly punctured. Metanotum irregularly reticulated and striated on the sides of the central area. The depressed base of the mesopleuræ striated; the rest irregularly, coarsely rugose; the metapleuræ irregularly reticulated. Third and following segments of the abdomen thickly covered with white pubescence.

(To be continued.)

NEW CULICIDÆ FROM THE FEDERATED MALAY STATES.

By Fred. V. Theobald, M.A.

(Continued from p. 78.)

Danielsia albotæniata, Leicester, n. sp.

"Thorax with the anterior half scaled shiny silvery white, remainder brown, a lateral brown spot on each side of the silvery anterior area. Abdomen brown, with basal white bands. Hind legs broadly pale-banded basally; fore and mid with indistinct pale bands to metatarsi and first tarsals.

"♀. Head black, with frosty tomentum; there is a bare line down the centre, with a few narrow-curved scales on either side of it; outside this behind, and in front between the eyes, the head is thickly clad with broad spatulate scales slightly brown-tinged; there is an oblong spot, parallel with the orbital margin, of broad black scales, laterally white flat scales, then another small spot of black scales; behind these are numerous upright forked scales, mostly black, with a few light brown ones. On the apex, between the eyes on either side, three bristles, light brown at the base, black at the apex, project forwards, more laterally there are three other bristles and then two. Antennæ with the basal joint muddy with a dusky hue, clad with white scales on its inner surface; second joint muddy at its base, black at the apex, clad with longish black scales; remaining joints black, pale at the nodes, verticillate hairs black; silky white hairs on the internodes. Palpi four-jointed; the two first joints round and small; the third joint somewhat swollen; the fourth longer than the third; fifth very minute and nipple-like, thickly covered with black scales with a few long black bristles. Proboscis covered with black scales, except for one-fourth its length in the middle, clad with creamy scales.

Clypeus rounded and black. Prothoracic lobes prominent, upper surface covered with broad white scales. Mesonotum dark brown; in front of the wing bases the mesonotum is entirely clad with long silky white scales, except for a small notch of bronzy scales on either side; the white scaling has much the appearance of an inverted Y with a very thick stem, and there are white scales on the lateral margin; at the root of the scutellum is a bare patch. On either side there are a few white narrow scales. The rest of the mesonotum is clad with bronzy narrow-curved scales. There are a row of bristles along the anterior margin of the mesonotum and over the roots of the wings. Scutellum yellowish-brown; central lobe clad with white and black narrow-curved scales; lateral lobes with white-curved scales. Scutellum bristles ochraceous. Metanotum dark brown. Wings of *Culex* type, clad with dark brown scales; the median scales rather long and narrow, lateral scales long and narrow with square ends. Fork-cells moderately long; first submarginal longer but scarcely narrower than second posterior, its base nearer base of wing; the stem about two-thirds the length of the cell. Supernumerary and mid cross-veins meet at an angle. Posterior cross-vein about three times its own length from mid cross-vein; fringe scales black. Pleuræ with seven patches of silvery white broad scales, arranged in two rows of three and one patch above the middle coxa. Metanotum dark umber brown. Legs with the coxæ creamy, fore and mid legs pale yellowish covered with black spatulate scales, except the under surface of the femora which shows a line of white scales, the under side of the base of the tibia, the apex of the tibia, which is ringed with creamy yellow scales in the fore leg, and the base of the metatarsus, and the first tarsal joint which in both legs show a white band; hind femora covered with black scales; a ring of white scales, about one-third of the total length, extends round the whole circumference save for a narrow line on the dorsum; on the under surface of the apex some creamy yellow scale and a minute ring of the same placed just before the apex. Knee spot and under surface of tibia white scaled; a broad white band at the base of the metatarsus and first three tarsal joints. Fore and mid ungues equal and uniserrate. There are some pale golden bristles on all the tibiæ. Abdomen covered with black scales with basal white bands which expand laterally into broad spots, especially large on the seventh and eighth segments. Segments beneath brown scaled, basally white banded.

"♂. Head black, frosted, clad almost entirely with broad white flat scales parted in the centre over the occiput, leaving a bare line of the black head showing broadest in front; laterally there is an oblong patch of black scales which may almost disappear if the head shrinks much in drying; more laterally still a round patch of black scales. Between the edge of the first patch and the orbital margin is a row of white narrow-curved scales; there are other narrow-curved scales on either side of the middle line just above the occipital foramen and a few on the vertex between the eyes. There are a moderate number of upright forked scales behind and a few inserted among the black scales of the most median of the two black patches; they are dark brown in colour; there are five brown bristles on either side projecting forwards; in some specimens the median bristles are pale

golden and white, and inwards more laterally there are three to five others. Antennæ 15-jointed; the two last joints long and thin; basal joint dusky dark brown in the depression; a few narrow-white scales on its internal face; remaining joints banded dark brown and white; the plumes dark silky brown tipped with white, except on segments seven to ten, where the plumes are pale yellowish brown. Proboscis black scaled. Palpi scarcely longer than the proboscis, black scaled, the two last joints clad with pale glistening white hairs; the brown lateral spots on the thorax smaller than the female. Wings scaly, less dense lateral scales being very few in number. Markings on the legs are similar to the female. Fore and mid ungues unequal, larger tooth biserrate. Dorsum of the eighth segment of the abdomen covered with pearly white scales, pale golden hairs dense laterally on all the segments."—(Leicester). Length 4·5 mm.

Time of capture.—April.

Habitat.—Kuala Lumpur, in bamboo jungle, Chang Road, five and three-quarter miles from town. Bred from larvæ.

Observations. — This species resembles *Stegomyia nivea*, Ludlow, but can be at once told by the leg banding and by the squamose characters as not being a Stegomyia. The female specimen has three border-bristles to the mid lobe of the scutellum, a character chiefly noticeable in Ædinæ.—F. V. T.

(To be continued.)

NOTES AND OBSERVATIONS.

Nymphs of Cordulegaster annulatus. — The Rev. J. E. Tarbat has sent me an empty nymph-case of the dragonfly *Cordulegaster annulatus*, of which he found a number last summer about one hundred feet above Lake Derwentwater. They were by the side of the road next to the fell, which rose steeply. The nymph-cases were on the earth at the bottom of the hill—not on rushes or grass. The nymphs must have travelled some distance before disclosing the imago, for the nearest water was a small pond some one hundred yards away, on the other side of the road.—W. J. Lucas; Kingston-on-Thames.

Butterflies of France.—I should be much obliged if collectors who have visited districts in France other than Alps (Savoy, Basses, and Maritimes), Pyrenees, and Riviera, would send me lists of butterflies (only), and dates if possible; or refer me to local lists, other than British. Any such information will be most acceptable, and I will willingly pay postage, and take care of and return any books or records submitted to me.—H. Rowland-Brown; Oxhey Grove, Harrow Weald.

Epinephele ida var. albomarginata, Fallou.—Mr. Verity's reference (*ante*, p. 56) to the aberrant example of *E. ida*, taken at Roquefavour in July, 1878, and described and figured by M. Fallou (Ann. Soc. Ent. Fr. 1883, p. 21, pl. i. figs. 2, *a*, *b*) reminds one of the parallel aberration

of *E. tithonus* taken by Mr. Spindler in Sussex in 1897 (Entom. xxx. 253, fig.).

Note on Zeuzera eucalypti.—A little while since, on going into my study, I was surprised to see, hanging down from one end of the table, what appeared at first sight to be a large spider's web, but on closer examination proved to be a vast number of minute larvæ of this moth suspended by threads, which from their intermingling had formed a web. I was at a loss for some time to account for the strange occurrence, but on reflection remembered that there was a female moth on a setting-board in the drying-cage standing on the table, which had laid a vast number of eggs before becoming quiescent. The colour of the larvæ was dark fawn, head black, with a few hairs projecting along the sides, and a greater number on the anal segment. Length, 2 mm. They were extremely active, both when making progress on a level surface, and when suspended over the edge of the table and letting themselves down by threads. The larvæ live for some three years or more in the trunks of the various species of *Acacia* (wattles), and attain to a length of from four to six inches, and as thick as one's thumb; they are then of a rich cream-colour flushed with pink. By many bushmen they are considered a delicacy when roasted over a fire. It is unfortunate that *eucalypti* was chosen as the specific name, as the larvæ never tunnel in any species of *Eucalyptus*. Their tunnels commence some distance up the trunk of a tree, and are pushed down towards the roots. Sometimes they extend below the surface of the ground. When a larva is ready to pupate, a large cocoon covered with sawdust-like fragments of wood is formed. When ready to emerge, the pupa works itself towards the opening of the tunnel by means of its strong deflected spines, then pushes itself half out of the burrow. The perfect insect then emerges, generally during the night. The female perhaps remains on the tree-trunk until a male comes along, when copulation takes place. The minute yellowish-white eggs are thrust, by means of the female's long rigid ovipositor, into nooks and crannies in the bark all over the tree. The damage done to the timber of the various species of *Acacia* is something enormous. It is hardly possible to find a tree that has outgrown the sapling stage without one or more—most frequently more—tunnels formed by the larvæ of this moth. The scarcity of natural enemies accounts for the ravages of these larvæ; there are no woodpeckers to lessen their numbers; parasitic flies and natural causes are practically the only enemies they have to contend against. Each female lays a prodigious number of eggs. — Frank M. Littler; Launceston, Tasmania.

Urticating Effects of Larval Hairs.—I have read with much interest the notes that have appeared from time to time on this subject, but have never until quite recently had any ill-effects from the very many cocoons of all species of moths that I have handled. A few days since I had occasion to move some two or three dozen cocoons of the moth *Dacala acuta* (one of the Liparidæ) from one box to another. Not anticipating any ill-effects, I handled them as freely as is my usual custom. Shortly after I had finished my forearms began to smart and tingle; on rolling back my sleeves I found them, from

wrists to elbows, covered with small hard white lumps about $\frac{1}{4}$ in. in diameter, and highly inflamed all round. In a short while the pain was intense; eau de cologne was applied, but with no effect; vinegar was then tried, with the result that in a few hours the pain had given place to a feeling of irritation. Next day the lumps had subsided, and appeared as angry red spots beneath the skin. It was some days before they disappeared altogether. The only place I was affected on the hands was between the fingers; it is a great wonder to me that my face and neck escaped. As is perhaps well known, the larvæ of *D. acuta* are very hairy, the greater part of which hair finds its way to the surface of the cocoon; it is then brown in colour, and broken quite small, and at the slightest provocation flies like dust. Sometimes, after handling the cocoons of this moth, I have had my fingers covered with the short barb-like hairs sticking into the skin.—Frank M. Littler; Launceston, Tasmania.

Two Questions of Generic Homonymy.—As the working out of exact dates of publication, on which hinges so much of our stability of nomenclature, is a somewhat laborious business, I hold it a duty to publish such results as one is able to reach. Two of the generic names brought forward in Heinemann's Schmett. Deutsch., Band i., 1859, viz. *Luceria* (p. 442) and *Sora* (p. 459), had the misfortune to collide with the same names in Walker (List, &c., xix. 853, and Ann. Mag. Nat. Hist. (3) iii. 259), both dating from the same year. *Sora*, by the way, is wrongly attributed to "White" in Marschall's 'Nomenclator.' I find that Heinemann's *Luceria* will be able to stand, which is fortunate, as it has been adopted by Staudinger and Rebel (Catalog, p. 190); but *Sora* will sink as a homonym. The dates, as nearly as I can ascertain, are as follows: *Sora*, Walk., April, 1859; *Sora* and *Luceria*, Heinem., Oct., 1859 (advertised in Brockhaus' Monthly Catalogue for Nov., 1859, p. 182); *Luceria*, Walk., after Nov. 12th, 1859 (date of preface).—Louis B. Prout; 246, Richmond Road, N.E., Feb. 17th, 1904.

Lycæna icarus var. melanotoxa.—I have a small specimen of *L. icarus* which corresponds almost exactly with that referred to by Mr. Verity (*ante*, p. 58, pl. iv., fig. 14); also a similar aberration, but with the line crescent-shaped instead of a bar. These examples are from the Isle of Man.—T. H. Shepherd; 15, Hope View, Carr Lane, Shipley.

[The form of *L. icarus* referred to by Mr. Verity as var. *melantoxa*, Pincit., is pretty generally known to lepidopterists in this country. The union of the lower basal spot with the last of the marginal series, on under side of the fore wing, is a form of aberration not confined to *L. icarus*, but is found to occur in its British congeners *L. corydon* and *L. bellargus*; in the former of these two species perhaps more especially. The last spot of the marginal series is geminate, and in the early stages of the development of the aberration it is the upper portion of this double spot that generally becomes elongated in the direction of the lower basal spot. The complete junction of the two spots usually assumes the arched form (ab. *arcua*, Fav.), sometimes termed a "horseshoe-mark" by collectors, but it may be bar-like, as in *melantoxa*.—Ed.]

The Generic Name Syntomis, Ochs., a Synonym.—In vol. i. of his 'Catalogue of the Lepidoptera Phalænæ,' p. 59, Sir George Hampson cites *Syntomis*, Ochs. (type *phegea*) and *Amata*, Fab. (type *passalis*) as generic synonyms, giving the date of both as 1808; and he naturally gives preference to the more generally employed name. But, unfortunately, Zeller's citation of the date 1808 for vol. vi. of Illiger's 'Magazin,' in which Fabricius's *Amata* and other genera are published, is as indefensible as it is inexplicable; the title-page is dated 1807; this date is accepted by Zeller's collaborators in Agassiz's 'Nomenclator,' and even Zeller himself is not consistent, for he gives 1807 in at least one case (*Castnia*). On investigation, I find definite proof that the names in question were really published in 1807, for they are quite freely cited by an anonymous reviewer of Hübner's 'Sammlung Exotischer Schmetterlinge" in the Allg. Lit. Zeit. for Dec. 19th, 1807 (1807, Band ii., No. 303, pp. 1177–1181). *Amata*, Fab., is therefore certainly prior to *Syntomis*, Ochs.—Louis B. Prout; 246, Richmond Road, N.E., Feb. 17th, 1904.

Migratory Flight of Crenis boisduvali, Wall.—On Feb. 10th we were surprised by the above flying over the district of Verulam in such numbers that I shall not perhaps be exaggerating when I say millions passed over within an hour. The direction of the flight seemed to me at the time to be from S.W. to N.E. There was nothing unusual at the time as regards the temperature, unless it was a little hotter for the midday; but old residents of this place tell me they have on other occasions seen a white butterfly (I believe them to be referring to *Pieris alba*, Wall.) swarm around the flats for hours, the fowls, &c., following them up for food. *C. boisduvali*, though never so common as *P. alba*, is commonly found down the South Coast, where it feeds upon a shrub named in Medley-Wood's 'Natal Plants,' *Excœcaria reticulata*, and known to the Kaffirs as "Hlya-im-punzi"; but there is no accounting for these flies putting in their periodical appearances in such numbers as mentioned. The larva is not gregarious, and can never be taken in dozens when collecting. Three years ago I made reference in this magazine (Entom. xxxiv. 98) to a butterfly migration when the regiment was stationed in Northern Natal.—H. W. Bell-Marley; Durban, Natal, Feb. 12th, 1904.

Aberrations of European Butterflies.—In the March number of the 'Entomologist,' Mr. Verity gives an account of several interesting varieties of butterflies from Tuscany, and inquires whether anyone else has met with similar forms. On p. 36 of my 'Butterflies of Switzerland,' &c., I have noted that *Polyommatus alexis* ab. *arcua* is the usual form around St. Triphon, and not uncommon elsewhere at the Vaudois end of the Rhone Valley. This form is identical with var. *melanotoxa*, Pincitore, as given in Mr. Verity's illustration. I described the form in the Ent. Rec. vol. xiv. p. 58, and inquired whether it was identical with *melanotoxa*. Not having received any answer to this query, I used the name current in the Rhone Valley, viz. *arcua*, Favre; this must evidently fall before Pincitore's name, which dates from 1879, Favre's name not having appeared in print (though previously current in conversation) until my mention of it in the Ent. Rec. as above. Colonel Agassiz, of Lausanne, has specimens of *Colias edusa* of much the same

size as those illustrated by Mr. Verity. I have compared them to-day. They are early spring specimens from the neighbourhood of Florence. With regard to the varieties of *Erebia neoridas*, is it really certain that the insects illustrated belong to that species at all? They lack the characteristic shape of the fore wings, which are usually very truncated. Another peculiarity of *E. neoridas*, even more universal, is that the inner edge of the rust-coloured band, upper side fore wing, is almost as straight and firm as if marked off with a ruler, and, although in the two upper side illustrations the band is broken off before its normal termination, yet there is more than enough remaining to show the strongly curved form of the inner edge of the band. If the illustrations are as good as they appear to be, I should have had no hesitation in referring all three to *Erebia euryale*. I have specimens from the Dent du Midi above Champéry, taken last August, which exactly correspond with the under side illustration, except that the light band is yellow instead of white. The deep tooth on the inner side of the band is very characteristic of *E. euryale*; that in *E. neoridas* is much slighter and less conspicuous. A specimen of *Chrysophanus phlœas* ab. *schmidtii* was taken by Mr. Sloper at Martigny in August, 1901 (see 'Butterflies of Switzerland,' &c., p. 18).—George Wheeler; Montreux, March 17th.

Recent Books on Coccidæ, or Scale Insects.—Those who are interested in this very important, but till lately much neglected, family of insects, may be glad to know that the study has been greatly facilitated during the last year or two, and is now receiving attention from many good practical observers both at home and abroad. Three large books on the subject may specially be mentioned:—

1. Robert Newstead, 'Monograph of the British Coccidæ.' Two vols. (Ray Society), 1901 and 1903. (Completed.)

2. Mrs. Maria E. Fernald, A.M., "A Catalogue of the Coccidæ of the World" (Special Bulletin, Hatch Experiment Station of the Massachusetts Agricultural College, Bulletin No. 88), 1903. (Completed.)

3. E. Ernest Green, 'The Coccidæ of Ceylon.' Parts 1–3, 1896, 1899, 1904. (In progress.)—W. F. Kirby.

CAPTURES AND FIELD REPORTS.

Morimus funereus in England.—A specimen of the longicorn *Morimus funereus* was taken either in 1899 or 1900 in the East India Docks, I believe for the first time in England. For this reason it may perhaps be well to record it.—E. C. Ansorge; 12, Addison Road, Bedford Park, W., March 17th, 1904.

Neuroptera from Cheshire.—The following species of Neuroptera were taken by Mr. R. South in 1895:—*Hemerobius subnebulosus*, Macclesfield. *Chrysopa flava*, Macclesfield. *Phryganea grandis*, *P. striata*, Macclesfield. *Limnophilus griseus*, *L. ignavus*, *L. lunatus*, *L. centralis*, Langley. *Asynarchus cœnosus*, Langley. *Micropterna lateralis*, Macclesfield. *Stenophylax stellatus*, Macclesfield. *Halesus radiatus*, Macclesfield. *Anabolia nervosa*, Macclesfield. *Plectrocnemia*

conspersa, Macclesfield. I should say that several of these were identified by Mr. McLachlan.—W. J. Lucas.

Leucophasia sinapis, ab. — At Grange, last June, I captured an example of *L. sinapis* in which the black apical spot is absent; thus the fore wings are pure white. — T. H. Shepherd; 15, Hope View, Carr Lane, Shipley.

[The specimen referred to above seems to be an example of ab. *erysimi*, Dup., which is a form of the female sex only.—Ed.]

Unusual Find of Sphingid Larvæ. — I think that January 18th, 1904, will long remain a record day so far as concerns finding Sphingid larvæ. The day was dull and a fine rain was falling, and I was out from 10 a.m. till 1.30 p.m., and from 3.15 p.m. till 6 p.m. During that time I found, entirely by searching, no less than fifty-three larvæ and thirteen different species, made up as follows:—*Andriasa mutata*, very rare, one; *Lophostethus dumolinii*, very rare, two; *Macroglossa trochilus*, three; *Cephonodes hylas*, nine; *Aellopos hirundo* (new; Dr. K. Jordan, of Tring, will describe), five; *Temnora marginata*, ten; *T. murina* (new; Dr. K. Jordan will describe), two; *Polyptychus grayi*, five; *Chærocampa eson*, two; *Nephele accentifera*, five; *Euchloron megerea*, rare, six; *Phlegethontius fulvinotata*, rare, two; *Manduca atropos*, one. The imago of *A. hirundo* has not been seen on the wing here since January, 1901, and is always very rare; larvæ were discovered by following up a female that was depositing ova on Saturday, 9th inst. *Temnora murina* is another very rare hawk-moth, and, although I found two or three larvæ last year, I did not preserve the same, as I wished to rear the moth. The *M. atropos* and *C. eson* larvæ I only took to make up two more species; both are very common, and I could have taken numbers more had I chosen to search for them. I may mention that, besides the hawk-caterpillars mentioned above, I took about fifty larvæ of other families of moths, but nothing out of the common, except two *Acripia poliotis*, a new and rare species.—Geo. F. Leigh; Durban, Natal.

Three Weeks in the New Forest, 1903.—My friend and co-collector Mr. H. G. Toye and myself decided to try the New Forest last year; being the first time we had ventured in that part of the country, we were greatly delighted with the scenery, and the insects to be taken. Considering the very bad season, I think we may congratulate ourselves on having done fairly well. A professional collector told us that it was the worst season for insects he could remember, a statement fully confirmed by several other collectors whom we met.

We arrived at Brockenhurst on June 26th. Amongst the captures during the daytime I may mention *Argynnis paphia*, in very good condition and in great numbers; the males were first seen on the 29th, and the females on July 7th; of the aberration *valesina* we took some twelve specimens and saw several others, mostly in very fair condition. We also took *A. adippe*, *Limenitis sibylla* (in great numbers and in very good condition during the first week of our stay), *A. selene* (one with bleached under wing), *Satyrus semele*, *Epinephele hyperanthus*, *E. tithonus*, *Thecla quercus* (one male on July 12th), *Pararge egeria* (poor), *Lycæna ægon*, *Hesperia sylvanus*, *H. thaumas* (*linea*), and a number of

larvæ of *Gonepteryx rhamni* from buckthorn (*Rhamnus frangula*), some young and some nearly full-grown, which pupated between July 9th and 18th, the first to emerge being a male on the 28th of the same month, males and females continuing to emerge until August 3rd. We also took larvæ of *Euchelia jacobææ* feeding on ragwort (*Senecio vulgaris*), together with several male and female examples of the perfect insect; *Gnophria rubricollis*, *Eucosmia undulata*, and one *Boarmia glabraria* on July 13th; I also obtained two larvæ of this local insect feeding on lichen on oak trees on July 4th, which pupated on the 23rd and 27th; the imagines emerged on August 5th and 8th respectively. On some of the moors I took fine series of *Euthemonia russula* (both sexes), *Fidonia atomaria*, *Lasiocampa quercus* (male), *Macrothylacia rubi* (male), *Anarta myrtilli*, *Pseudoterpna cytiscaria*, *Lithosia mesomella*, *Melanippe rivata*, and *Tephrosia extersaria*.

Sugaring was the worst I have known for years; though we sugared religiously every night, our take was very small, including *Leucania turca*, *Moma orion*, *Thyatira derasa*, *T. batis*, *Aplecta nebulosa*, *Euplexia lucipara*, *Dipterygia pinastri*, *Xylophasia hepatica*, *Caradrina morpheus*; we expected *Catocala sponsa* and *C. promissa*, but were disappointed. At dusking we were fairly successful—more in quantity, though, than in quality; *Melanthia albicillata*, *Cidaria fulvata*, *Boarmia roboraria*, *B. consortaria*, *Lithosia mesomella*, *Pseudoterpna cytisaria*, *Metrocampa margaritaria*, *Larentia pectinitaria*, *Aspilates strigillaria*, *Ellopia fasciaria*, *Cabera pusaria*, *Ephyra trilinearia*, and *Hemithea thymiaria* were amongst our captures in this line.

We tried light, both with and without a sheet, also acetylene gas, but the result was far from satisfactory. By these means we took *Pericallia syringaria*, *Plusia chrysitis*, *Agrotis porphyrea*, *Notodonta camelina*, *Urapteryx sambucaria*, *Boarmia roboraria*, *Macaria alternata* (one), and *Halia vauaria*. I also obtained from an oak tree a full-grown larva of *Liparis monacha*, which pupated on the 16th, and emerged a fine female on the 28th of July.

On June 30th we went to Ringwood, in the hope of taking *Emydia cribrum*, but, though we tramped the heather there all day, we did not see a single specimen; possibly we were rather late for this insect. The only insect taken worthy of note was a good series of *Bupalus piniaria*, including both sexes, flying round pine trees. Having heard that *Gnophos obscurata* was being taken, and wishing for a series ourselves, I broached the matter to several professional collectors, but found this class of collector very shy on such subjects, and could get no information whatsoever as to the spot to find this insect. I was afterwards told by a gamekeeper of the Forest of a spot where he used to take the species twenty years previously. We found this spot, and by rattling with a stick in the rabbit-holes, and by raking about under ridges of the ground, we disturbed them from their hiding-places, from which they flew out by dozens, so that after a very short time we had as many as we could possibly wish for, all being of the dark form. I also took *Angerona prunaria* and *Pachycnemia hippocastanaria*. I may mention that during the three weeks of our stay at Brockenhurst we only had one really rainy day.—Lawrence S. Hodson; "Maisonnette," Palmer's Green, N.

SOCIETIES.

Entomological Society of London.—*February 3rd*, 1904.—Professor E. B. Poulton, M.A., D.Sc., F.R.S., President, in the chair.—The President announced that he had nominated Dr. Thomas Algernon Chapman, M.D., F.Z.S.; Dr. Frederick Augustus Dixey, M.A., M.D.; and the Rev. Francis David Morice, M.A., as Vice-Presidents for the Session 1904–1905.—Mr. A. J. Chitty exhibited two specimens of *Ptinus tectus*, Boisd., taken by him in a granary in Holborn in the winter of 1892–93; also a complete series of the red Apions to compare with *A. sanguineum* from the late Frederick Smith's collection.—Mr. O. E. Janson exhibited specimens of *Papilio weiskei*, Ribbe, and *Troides meridionalis*, Rothschild, recently taken by Mr. A. S. Meek near the Aroa River in the interior of British New Guinea.—Mr. E. C. Bedwell exhibited the following species of Coleoptera taken by him in North Wales (on Snowdon) in the first week of August, 1903:—A fine series of *Chrysomela cerealis*, L., a pair of them being of the curious dull form, *Anthophagus alpinus*, Payk., *Acidota crenata*, F., *Arpedium brachypterum*, Grav., and *Quedius longicornis*, Kr., the latter taken close to the Llanberis Falls. There appears to be no previous record of this species occurring in Wales.—The Rev. F. D. Morice exhibited a series of lantern slides illustrating the structure of concealed ventral segments in males of the Hymenopterous genus *Colletes*. Mr. W. J. Kaye exhibited a Mullerian association of black and transparent species from the Potara Road, British Guiana, consisting of *Ithomiinæ; Ithomia zarepha*, *Ithomia florula*, *Heterosais sylphis*, and *Napeogenes* n. sp.; *Erycinidæ: Stalachtis phædusa, and Stalachtis evelina; Hypsidæ: Lauron partita*; *Geometridæ*, *Hyrmina*, n. sp. The whole of the specimens had been caught on one single forest-road, some 170 miles inland. Mr. Kaye called particular attention to the new species of *Napeogenes*, and said it was a most remarkable divergence from the usual coloration of the genus *Napeogenes* as a whole, where brown-yellow and black were the prevailing colours, while the present insect was black and transparent only, and conformed in a wonderful way with many true members of the genus *Ithomia*.—The President exhibited a male and female of *Papilio dardanus*, captured *in coitu* by Mr. George F. Leigh at Durban in 1902, and examples of the offspring reared from the eggs laid by the female. The latter was of the *cenea* form, as were the great majority of the female offspring; three, however, were of the black and white *hippocoon* form. More recently, in 1903, Mr. Leigh had captured a female of the rare *trophonius* form, and had bred from the seven eggs laid by it five butterflies, of which the two females were both of the commonest *cenea* form, The female *trophonius* was also exhibited, together with the five offspring.—Capt. C. E. Williams read a paper upon "The Life-history and Habits of *Gongylus gongyloides*, a Mantis of the tribe Erupasides, and a Floral Simulator," and exhibited a living female in the nymph stage, together with coloured drawings, photographs, and lantern-slides, showing both the adult and immature insect in various positions. The chief features of interest in the exhibitions lay in the peculiar modifications of shape and colouring by which this Mantis conceals itself and attacks the Lepidoptera and Diptera which constitute its prey.

The female exhibited was the sole survivor of twenty-one brought to England in June, 1903, from Rangoon. It was hatched during January, and had passed through eleven ecdyses, but failed to effect the last change to the imago stage in October, 1903.—Mr. G. A. J. Rothney communicated "Descriptions of New Species of *Cryptonæ* from the Khasia Hills, Assam, and a New Species of Bembex," by Peter Cameron.—Mr. Malcolm Burr contributed "Systematic Observations upon the Dermatoptera."—Dr. T. A. Chapman read a paper "On a New Species of *Heterogynis*," and exhibited specimens of this and other allied species.—Mr. Roland Trimen, F.R.S., read a paper "On some New or Imperfectly-known Forms of South African Butterflies," and exhibited, among other specimens illustrating his remarks, typical and aberrational forms of *Acræa rahira*, *Zeritis felthami* (a new species), *Z. molome*, Trim., and *Z. damarensis*, Trim.; typical *Colias electra*, L., from Natal, and a remarkable melanic aberration of the same species; also *Kedestas tucusa*, a very rare and unfigured Hesperiid, male and female, from the neighbourhood of Johannesburg.

March 2nd.—The President in the chair.—Mr. L. C. H. Young, of 1, Rampart Row, Bombay, was elected a Fellow of the Society.—Commander J. J. Walker, R.N., exhibited *Hecatesia fenestrata*, Bdv., an interesting Australian moth, the male possessed of a very marked power of stridulation, the stridulating organ being on the longitudinal transparent bar on fore wing, known in N. S. Wales as the "whistling moth;" *Dodonidia helmsi*, Butler, a rare Satyrid butterfly from New Zealand; and a gigantic species of the Thysanurid genus *Japyx*, found at Picton, New Zealand.—Mr. C. O. Waterhouse exhibited and commented upon a diagram of the mouth of one of the Mallophaga, *Læmobothrium titan*.—Mr. G. C. Champion exhibited specimens of two species of *Dorcadion* found during his recent journey in Spain—*D. almarzense*, Esc. ?, from the summit of Moncayo, and *D. neilense*, Esc., from the Sierra de Logroño. He also exhibited numerous examples of *Pyropsyche moncaunella*, Chapm., found by Dr. Chapman and himself on Moncayo.—Mr. A. J. Chitty, Mr. F. B. Jennings, and other Fellows, exhibited specimens of the genus *Triopiphorus*, which seemed to show that *T. tomentosus* and *T. obtusus* were in reality one and the same species.—The President exhibited a specimen of a beetle, *Glenea pulchella* (Thoms.), one of the three individuals of the species taken on June 25th of last year, near Barwood, in the Nilgiris, by Mr. Leslie Andrewes, which clearly mimics a large ichneumon fly. He said that when the whole genus *Glenea* is examined, the marked conspicuousness of some of the species suggests that the mimetic resemblance displayed by others is Müllerian or Synaposematic, rather than Batesian or Pseudaposematic.—Mr. L. B. Prout exhibited, on behalf of Mr. A. Bacot, long bred series of *Triphæna comes*, Hb., the result of breeding for two generations from a wild female of the *curtisii* form, taken near Forres. In the first generation, rather more than half the progeny followed, to a certain extent, the parent female, though varying from rich deep red to almost black. Pairings of these dark specimens resulted in a brood in which the percentage of ab. *curtisii* was slightly increased, although the type-forms were still well represented; but it was noticeable that in every specimen the orbicular stigma was filled up with the darker or melanic colour.—Dr. F. A. Dixey read a note on the "Bugong" moth, which is used for

food by some Australian natives in New South Wales. He pointed out that it was not a *Euplœa*, as supposed by Kirby in his 'Bridgewater Treatise,' but a *Euxoa*; and not a butterfly, as further stated by Westwood.—Mr. Arthur M. Lea communicated "Notes on Australian and Tasmanian Cryptocephalides, with descriptions of New Species."—Mr. Gilbert J. Arrow communicated "A Revision of the subfamily Pelidnotinæ of the Coleopterous family Rutelidæ, with descriptions of New Genera and Species," by the late Frederick Bates.—Colonel Charles Swinhoe, M.A., F.L.S., read a paper "On some New Species of Eastern Australian and African Moths in the British Museum."—Mr. George Charles Champion, F.Z.S., read a paper on "An Entomological Excursion to Moncayo, Spain, with some remarks on the Habits of *Xyleborus dispar*, Fabr., by Dr. Thomas Algernon Chapman, M.D."—Mr. Kenneth J. Morton communicated "Further Notes on Hydroptilidæ belonging to the European Fauna, with descriptions of New Species," and Mr. W. C. R. Shelford, M.A., communicated "A Note on *Elymnias borneensis*, Wallace."—A discussion on "What is a Species?" was opened by the Rev. F. D. Morice, in which Mr. H. J. Elwes, Dr. F. A. Dixey, Mr. A. J. Chitty, Mr. W. E. Sharp, the President, and other Fellows joined.—H. Rowland-Brown, *Hon. Sec.*

South London Entomological and Natural History Society.—*February* 11*th*, 1904.—Mr. A. Sich, F.E.S., President, in the chair.—Mr. Montgomery exhibited a curious malformation of the wings which had occurred in a brood of *Ocneria dispar*. A pair of the malformed specimens were selected, and from them was bred a brood, nearly the whole of which had the same peculiarity, *viz.* a large semicircular portion of the apical part of the hind wings being undeveloped.—Mr. South, albino and xanthic aberrations of *Epinephele tithonus*, taken by Mr. G. M. Russell, on the chalk downs in South Hampshire, in 1898, 1899, and 1900.—Mr. Kaye, photographs of the Potara River, British Guiana, where he had spent some months in entomological collecting. Mr. R. Adkin, series of *Leucoma* (*Liparis*) *salicis* reared from pupæ collected at Herne Bay last year, and made remarks on the scarcity and abundance of the species for some years past.—Mr. Newberry, several conspicuous species of Indian Coleoptera, and a very large species of water-bug.—Mr. West (Greenwich), an example of the rare Coleopteron, *Gynandrophthalma affinis*, from Wychwood, Oxford, where it was discovered in 1899.—Mr. H. Moore, specimens of Coleoptera and Orthoptera, from Natal.—Dr. Chapman, brilliant but dwarf specimens of *Cyaniris argiolus*, and bred examples of *Arctia fasciata*, one of the most gorgeous of Continental "tigers," from Moncayo. Spain, together with a bred series of *Chrysophanus amphidamus*.—Mr. Sich read a paper, "Notes on the genus *Coleophora*," dealing chiefly with the life-history of *C. fuscedinella*, with description of its egg, and with the method of constructing and enlarging its case.

February 25*th*.—The President in the chair.—Mr. Edwards exhibited a striking variety of *Hypena rostralis*, having a broad light-brown costa, and other unusual markings of the same colour.—Mr. Colthrup (1), a very light aberration of *Abraxas grossulariata*, having only a few black dots and marks on the disc and margins, with a narrow yellow band and base; (2), a blotched form of *Argynnis*

(*Brenthis*) *euphrosyne*; and (3), a series of photographs of varieties of *Bryophila muralis*, *B. perla*, *Polia chi*, and *Psilura monacha*.—Mr. Manger, an example of *Halicopis cupido* from Demarara, which was of a beautiful light ground colour, with more or less suppressed and diminished dark markings, together with the typical form from Brazil, for comparison.—Mr. Sich, a specimen of *Bedellia somnulentella*, with its pupa-case, which closely resembled that of a Pierid in miniature.—Mr. Montgomery, long and varied bred series of *Pieris napi*, largely from Ireland, and contributed notes.—A large number of lantern-slides were exhibited by Messrs. Tonge, Warne, Lucas, Hamm, Dennis, Harrison, Goulton, Main, and Clark. The objects represented were larvæ and ova of Lepidoptera, protective resemblance in insects, orchids, plants in their haunts, studies of trees, diatoms, and foraminifera.—Hy. J. Turner, *Hon. Rep. Sec.*

Birmingham Entomological Society. — *February 15th*, 1904. — *Annual Meeting*.—Mr. R. C. Bradley, Vice-President, in the chair.—The various Annual Reports were read, and Officers and Council elected for the ensuing year.—Mr. G. W. Wynn exhibited a boxful of varieties of various Lepidoptera, including, amongst others, the following:—*Argynnis valesina*, Esp., from the New Forest; pale *Vanessa urticæ*, L., from Teignmouth; *Spilosoma lubricipeda*, L. ab. *zatima*, Cr.; black *Hadena monoglypha*, Hufn., from Hampton-in-Arden; *Agrotis exclamationis*, L., from Wyre, with spots confluent; a beautiful variegated var. of *A. corticea*, Hüb., from Lapworth; *A. cinerea*, Hüb. var. *obscura*, from Wyre Forest; and *Mamestra pisi*, L., with the white markings lengthened out across the wing, from Sutton Park.—Mr. J. T. Fountain showed a series of *Larentia autumnalis*, Ström. (*impluviata*, Hb.) bred from sallow-bloom, from the Wye Valley. The larvæ were found in the old blossoms of the female trees, which still remained attached to the stems in June. There were but a few larvæ, but the resulting imagines showed almost the whole range of variation—unicolorous black, barred forms, dark marbled ones, light marbled ones nearly all green, and some with ochreous ground colonr.—Mr. H. Willoughby Ellis showed his collection of the Geodephaga, and gave a general account of the division and a running account of the species and their local occurrence, &c.—Colbran J. Wainwright, *Hon. Sec.*

Lancashire and Cheshire and Manchester Entomological Societies. —The first ordinary gathering of the current session took the form of a joint meeting of the two societies, which, by the kind invitation of Dr. Hoyle, was held in the Museum, Owens College, Manchester, on Feb. 15th, 1904. The President of the Manchester Society, Dr. W. E. Hoyle, presided over a large assembly of members. On the invitation of the chairman, Mr. J. Cosmo Melvill, M.A. (Manchester), extended a hearty welcome to the visiting Society, alluding in the course of his remarks to his having first taken up the study of entomology when in Liverpool, and first collected on the Wallasey sandhills with the late Messrs. Ben Cooke, Gregson, Roxburgh and others, prior to settling in Manchester in 1871. Having congratulated Mr. G. O. Day on his new List of Local Lepidoptera, he referred to his pending departure from Lancashire. Dr. Hoyle intimated that the Manchester Society hoped shortly to issue a List of the Lepidoptera of the District.

Letters having been read from Mr. S. L. Capper, F.E.S., President of the Lancashire and Cheshire Entomological Society, and Major Ronald Ross, C.B., F.R.S., the chairman called on Mr. F. N. Pierce, F.E.S., who communicated an excellent paper "On the Structure of the Lepidoptera," which was illustrated by the author's preparations thrown on the screen by a new micro-lantern, shown by Mr. Greenwood. The lecturer dealt in an interesting and instructive manner with the structure of the wings, legs, and other organs of the Lepidoptera, and, by the aid of a long series of most beautiful slides, showed the undoubted relationship existing between certain species and groups of moths as exhibited by the genitalia. A hearty vote of thanks having been accorded the reader, an adjournment was made for refreshments, kindly provided by Dr. Hoyle, after which the following exhibits, amongst others, were shown:—*Nonagria geminipuncta*, from the Isle of Wight, by Mr. R. Tait, Junr., who mentioned the fact of its attacking the reeds where they are more scattered, such as in the bordering hedgerows, rather than where they grow more closely in the centre of the marshes where it is found. He also showed two very fine dark forms of *Boarmia abietaria*.—Mr. B. H. Crabtree exhibited *Melitæa aurinia* from various English and Irish localities, the latter possessing clearer and more defined markings than the English specimens, which have a browner tinge.—Mr. J. Collins exhibited a valuable representative collection of Crambidæ.—Mr. L. Krah, fine specimens of *Caligula japonica* and *Rhodia fugax*, bred in England from Japanese ova, in exhibiting which he gave some interesting details regarding their food-plants, and stated that the cocoon of the former, consisting of a fine network, was usually attached, either to a piece of stick, or to folded leaves.—Mr. J. Kidson Taylor's British Coleoptera contained, amongst many other rarities, *Meloë brevicollis* (Millersdale), *Cryptocephalus coryli* (Sherwood), and *C. sexpunctatus* (St. Osyth's), *Heptaulacus villosus*, *Osphya bipunctata* (Cheltenham), and *Silpha reticulata* (Barmouth).—Mr. J. Ray Hardy's extensive collection of the Rhyncophora of the world found many admirers. He also exhibited three specimens of the very rare *Raphidia notata*, captured in Sherwood Forest; and gave some interesting introductory remarks anent the well-known Reston Collection of British Coleoptera, which, through the kindness of Dr. Hoyle and Mr. Hardy, was also on view. *Cynthia crota*, *Papilio epius*, and other exotic moths, were shown mounted between slips of glass, with the object of facilitating the examination of either side.—E. J. B. Sopp and R. J. Wigelsworth, *Hon. Secretaries*.

The Entomological Club.—On Tuesday, March 15th, a meeting was held at Wellfield, Lingards Road, Lewisham, the residence of Mr. Robert Adkin, the chairman and host of the evening. Five of the six existing members and eleven honorary members and friends were present. After supper, Professor E. B. Poulton and Mr. A. J. Chitty, who had been appointed honorary members at Mr. Verrall's meeting, held at the Holborn Restaurant on Jan. 19th last, were elected members of the Club. The membership of eight is therefore now complete. A meeting was also held on March 23rd at 58, Kensington Mansions, South Kensington, when Mr. H. St. J. Donisthorpe entertained fifteen visitors, four of whom were members of the Club.

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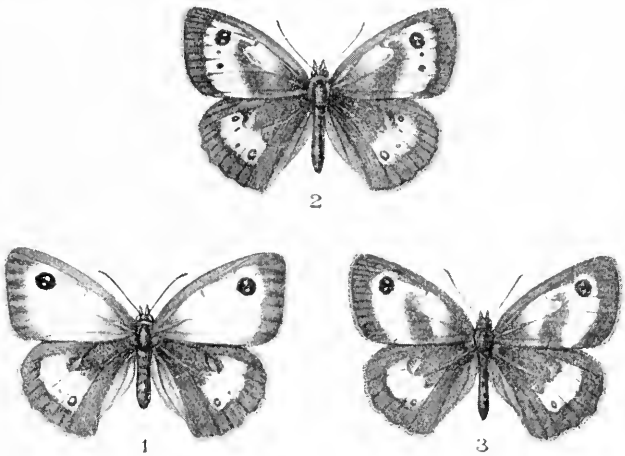
ON A SERIES OF ABERRATIONS OF *EPINEPHELE TITHONUS*.

BY G. M. RUSSELL, B.Sc.



IN the 'Entomologist' for 1898 (xxxi. p. 293), I recorded the capture, on the chalk downs of the south of Hampshire, of an aberrant specimen of *E. tithonus*, in which the normal ground colour was replaced by yellow. Since that time I have obtained other zanthic and also albino specimens from the same locality, with the result that I now possess a series of nine varieties in which the usual brownish orange ground colour is replaced by yellow in some specimens, and by white in others. This series of varieties seems to deserve special notice on account of the whole of them having been taken within a very limited area; one occasionally sees records of captures of odd specimens of

yellow varieties, but I am not aware that any other single locality has produced a number. Besides the insect taken in 1898, referred to above, two of the specimens were taken in 1899, and no less than six in 1900. In addition to these, a yellow male was taken in 1897, and another fine yellow male was seen on August 12th, 1903. In connection with the larger number taken in 1900, it may be mentioned that *E. tithonus* was exceptionally abundant in that year in the South Hampshire locality where the varieties were obtained; and this abundance probably extended to other districts, for the large numbers in which the species appeared at Christchurch and the New Forest were the subject of a note by Mr. W. J. Lucas in the 'Entomologist' (xxxiii. p. 350).

With the exception of two white females (one of which is figured, fig. 1), all the specimens are males. Although two or three of the yellow specimens are much alike as regards ground colour, the whole series shows a gradation in colour from a specimen which has partial normal colouring, through intermediate chrome-yellow specimens, to the three white ones. The beautiful specimen shown in fig. 2 differs from the normal not only in having a clear yellow ground colour, but also in possessing additional spots on all the wings, the upper spot on the hind wings being white-centred.

The whole of the varieties were taken at spots within a mile of each other, and about a mile or so from the sea. Three of the specimens were taken, in different years, at spots only a few yards apart, but any conjecture as regards the transmission of the variant character from parent to offspring is, of course, useless until a direct appeal is made to experiment. All the specimens were taken on chalk hills, and it is interesting, and perhaps suggestive, to note that the white male, fig. 3, was most difficult to capture on account of its matching so closely the lights and shades of the chalky soil of the field in which it was taken. Although only a feeble flier, some half-dozen unsuccessful attempts at capture were made, and at each attempt the insect at once left the grass-bordered hedgerow and made for the cultivated part of the field. Its absolute and sudden disappearance as it passed over the edge of the broken-up ground was most astonishing, and one could only wait for its return to the hedge, where in a few moments it was again found some yards off.

I may mention that the form, called by Tutt ('British Butterflies') ab. *excessa*, which possesses one or two additional black spots but has normal colouring, is not uncommon in the South Hampshire locality where I have collected, thus supporting Barrett's statement ('Lepidoptera of the British Islands') that this variety occurs in the immediate neighbourhood of the sea. It would be interesting to learn in what localities the albino

specimens figured and described by Barrett were taken. The one or two records which I have seen of the captures of yellow and white specimens seem to indicate that these varieties also are found only in the vicinity of the coast. The yellow specimens seem to be similar to the form described by Seebold under the name var. *mincki* (Berliner Entom. Zeitschrift, xxxvi. 1891, p. 467). The yellowish white form, *subalbida*, Verity (*ante*, p. 56), appears to be intermediate between var. *mincki* and my white specimens. I therefore propose the name *albida* for the white form (figs., 1, ♀ ; 3, ♂).

On looking at this series one can hardly help speculating as to the possible cause of the albinism. The question is essentially one for experiment, and the observations which appear to give a clue to the answer are those of Standfuss, who showed that the majority of aberrations were caused by the effect of abnormal temperature conditions on the pupa. He showed, moreover, that the general effect of treating the pupa as in his "heat" experiments was to produce aberrations in which the colours were paler than the normal. Numbers of aberrations similar to those actually occurring in nature were produced in this way, but I am not aware that *tithonus* was one of the species treated.

LEPIDOPTERA IN JERSEY, 1903.

By G. B. Coney.

The following is a list of moths taken and reared during the past year in Jersey, with dates of capture of the more interesting species. From July 6th to 31st, being away, I did no collecting in the island :—

Sphinx convolvuli, August 25th to October 14th.
Smerinthus populi, June 27th.
Macroglossa stellatarum, March 26th.
Hylophila prasinana, July 1st.
Nola cristulalis, May 31st.
Lithosia complanula. *L. caniola*, August 17th to September 24th.
Euchelia jacobææ.
Callimorpha hera, August 25th.
Nemeophila russula, June 27th.
Arctia caia. *A. villica* (reared).
Spilosoma fuliginosa, August 12th. *S. mendica*, May 23rd and 24th. *S. lubricipeda*. *S. menthastri*.
Cossus ligniperda (reared).
Porthesia chrysorrhœa (reared).
Liparis auriflua, August 8th to 12th.
Dasychira pudibunda, June 26th.

Lasiocampa quercus. *L. trifolii*, September 24th.

Odonestis potatoria.

Drepana hamula, August 19th.

Cilix spinula, June 3rd to 27th, and August 2nd to 11th.

Lophopteryx camelina, May 21st to 30th, and August 9th to 30th.

Notodonta dictæa, May 25th. *N. dictæoides* (reared). *N. ziczac* (reared).

Petasia cassinea, December 10th.

Phalera bucephala, August 26th.

Diloba cæruleocephala (reared).

Thyatira batis, August 20th to September 3rd.

Cymatophora ocularis, June 26th to July 1st.

Bryophila glandifera, August 12th.

Acronycta psi. *A. megacephala*, July 4th. *A. rumicis*.

Leucania vitellina, October 3rd. *L. lithargyria*. *L. albipuncta*, August 19th to October 17th. *L. putrescens*, August 12th to September 1st. *L. l-album*, September 8th to November 2nd. *L. pallens*.

Gortyna flavago, September 20th.

Axylia putris, May 30th to July 4th.

Xylophasia lithoxylea. *X. polyodon*.

Aporophyla australis, September 24th to 26th.

Heliophobus hispidus, September 8th to October 3rd.

Cerigo cytherea, August 12th to 27th.

Luperina testacea, August 28th to September 14th.

Mamestra brassicæ.

Apamea basilinea, May 28th. *A. oculea*.

Miana strigilis. *M. furuncula*, August 6th.

Grammesia trilinea, May 30th to June 17th.

Stilbia anomala, September 15th to 18th.

Caradrina morpheus, May 31st to June 30th. *C. alsines*, July 2nd and September 9th. *C. ambigua*, June 9th to July 5th, and August 28th. *C. cubicularis*, September 9th to November 3rd.

Rusina tenebrosa, May 31st to June 27th.

Agrotis puta, August 12th to November 13th. *A. suffusa*, October 28th to November 2nd. *A. saucia*, August 22nd to November 9th. *A. segetum*. *A. exclamationis*. *A. corticea*, July 2nd and August 22nd. *A. nigricans*, August 12th to 19th. *A. tritici*, August 19th to September 12th. *A. porphyrea*, August 2nd.

Noctua glareosa, September 29th to October 28th. *N. plecta*, May 27th to June 17th, and August 2nd to September 12th. *N. c-nigrum*, June 9th and 17th, and August 17th to 30th. *N. triangulum*, July 2nd. *N. festiva*, June 9th to 26th. *N. rubi*, June 1st and August 9th to 30th. *N. xanthographa*, August 12th to October 14th.

Triphæna ianthina, August 6th to 30th. *T. fimbria*, September 4th to 20th. *T. orbona*. *T. pronuba*.

Amphipyra pyramidea, August 8th to September 17th. *A. tragopogonis*, August 12th to September 6th.

Mania typica, August 12th. *M. maura.*

Tæniocampa gothica, May 27th. *T. instabilis*, March 8th. *T. stabilis*, March 9th to April 24th.

Orthosia upsilon (reared). *O. lota*, October 20th to November 13th. *O. macilenta*, October 20th to 28th.

Anchocelis rufina, September 30th to November 4th. *A. pistacina. A. lunosa*, September 29th.

Cerastis vaccinii, October 17th to 28th. *C. ligula*, October 17th to November 9th.

Scopelosoma satellitia, March 12th.

Xanthia silago, October 20th. *X. ferruginea*, October 3rd to November 2nd.

Calymnia trapezina, September 1st. *C. affinis*, August 12th.

Dianthœcia conspersa, May 19th to July 5th. *D. capsincola*, May 13th to June 27th, and August 21st.

Hecatera serena, June 27th to 29th.

Polia flavicincta, September 23rd to October 23rd.

Epunda lichenea, October 20th to 29th. *E. nigra*, October 7th to November 13th.

Miselia oxyacanthæ, October 12th to November 2nd.

Agriopis aprilina, October 3rd to November 2nd.

Phlogophora meticulosa.

Trigonophora empyrea, September 30th to November 4th.

Euplexia lucipara, May 22nd to June 17th.

Hadena dentina, June 8th. *H. chenopodii*, August 11th to September 5th. *H. oleracea. H. pisi*, June 2nd to 17th.

Cucullia verbasci, May 20th to 30th.

Habrostola urticæ, May 21st to June 27th. *H. triplasia*, September 20th to 24th.

Plusia chrysitis, June 27th to July 4th, and August 26th. *P. gamma.*

Acontia luctuosa, July 1st.

Erastria fuscula, May 31st to June 27th.

Phytometra ænea, June 17th.

Catocala nupta, August 22nd to October 20th.

Uropteryx sambucata.

Rumia cratægata.

Venilia macularia, June 12th.

Metrocampa margaritaria.

Eurymene dolobraria, June 25th to 30th.

Selenia illunaria. S. lunaria, May 28th to June 1st, and August 22nd.

Odontopera bidentata, May 13th to June 15th.

Crocallis elinguaria, August 15th to 22nd.

Ennomos alniaria, August 2nd to September 23rd. *E. erosaria*, August 27th to September 15th.

Himera pennaria, October 30th to November 23rd.

Phigalia pedaria, February 26th.

Amphidasys betularia (reared).

Hemerophila abruptaria, May 19th to June 11th.

Cleora lichenaria, August 1st.

Boarmia repandata. *B. rhomboidaria*. *B. consortaria*, May 28th.

Nemoria viridata, June 27th.

Iodis lactiaria.

Hemithea thymiaria.

Ephyra porata, August 26th. *E. punctaria*, May 24th and August 12th.

Acidalia rubricata, August 13th. *A. scutulata*, June 30th and September 1st to 16th. *A. incanaria*, May 28th to June 16th. *A. promutata*, August 15th to September 25th. *A. imitaria*. *A. aversata*.

Timandra amataria.

Cabera exanthemata.

Bapta temerata, July 1st to 5th.

Macaria alternata, June 17th.

Panagra petraria.

Selidosema plumaria, August 6th to 13th.

Ematurga atomaria.

Aspilates citraria, May 10th to 25th, and August 13th to September 23rd.

Abraxas grossulariata.

Lomaspilis marginata, June 28th to July 5th.

Hybernia rupicapraria, February 12th. *H. marginaria*, March 11th to April 6th. *H. defoliaria*, December 20th.

Cheimatobia brumata, January 20th to 26th.

Oporabia dilutata, November 9th to 23rd.

Larentia pectinitaria.

Emmelesia albulata, June 9th. *E. decolorata*, May 28th to June 17th.

Eupithecia oblongata. *E. subfulvata*, August 25th to September 22nd.

Lobophora viretata, June 6th.

Melanthia ocellata.

Melanippe subtristata. *M. galiata*, June 1st to July 2nd, and August 1st. *M. fluctuata*.

Anticlea rubidata, June 4th to July 5th. *A. derivata*, May 11th.

Coremia propugnata, August 12th to 27th. *C. ferrugata*. *C. unidentaria*.

Camptogramma bilineata.

Cidaria psittacata, October 28th to November 3rd. *C. corylata*, May 30th to June 27th. *C. russata*. *C. suffumata*, April 24th to June 8th. *C. testata*, August 21st to September 30th. *C. pyraliata*, June 26th to July 1st.

Peluga comitata, August 2nd to 18th.

Anaitis plagiata, June 17th to 27th, and September 22nd.

Aventia flexula, July 1st.

Other species of the genera *Eupithecia* were taken, but are at present unidentified.

A few notes on the best captures may be of interest. *Sphinx convolvuli* was abundant at tobacco plants, thirteen specimens being taken, and many more seen. Ten specimens of *Lithosia caniola* were taken at a lamp placed in the window of a room overlooking the seashore. One *Leucania vitellina* at sugar. *L. albipuncta* was common. *L. putrescens*, eight specimens at sugar and light. Eight *L. l-album* at sugar. Nine *Heliophobus hispidus* (all males) at light. Nine *Epunda lichenea* at light and ivy. *Trigonophora empyrea*, very plentiful at sugar. The specimens of *Selenia lunaria*, taken in August, were very much smaller than the early brood. *Ennomos erosaria*, two specimens at light. Five *Acidalia rubricata* on sandhills by day; these varied in colour from drab to dull crimson. *Aspilates citraria* was found commonly, and *Melanippe galiata* swarming. Though searched for on several nights, I only obtained four specimens of *Cidaria psittacata*, and two of these were chipped. The only butterflies worth mentioning are a fine series of *Melitæa cinxia*, reared from larvæ found on the sandhills in April.

Glen Vale, St. Martins, Jersey.

ON NEW SPECIES OF BUTTERFLIES FROM EQUATORIAL AFRICA.

By Emily Mary Sharpe.

Mr. A. H. Harrison has entrusted me with the determination of a very large collection of Lepidoptera which he made in various districts of Equatorial Africa, such as Nandi, Nairobi, Nyangori, Kamagombo, &c.

I have found the collection to be one of great interest, and have described several new species, amongst which is a very fine *Charaxes*.

I have not given a detailed list of the species collected by Mr. Harrison, but the following will give some idea of the number procured by him:—Danaidæ, 12; Satyridæ, 26; Acræidæ, 41; Nymphalidæ, 91; Lycænidæ, 56; Pieridæ, 81; Papilionidæ, 20; Hesperidæ, 36; Heterocera, 29.

Mr. S. A. Neave has seen and examined some of the specimens in this collection, when working at Mr. Wiggins's series of Lepidoptera from the same region, in the 'Novitates Zoologicæ,' vol. xi. p. 323, 1904. He has helped me considerably in my determination of Mr. Harrison's collection. I must also thank

Prof. Poulton, F.R.S., for the help and advice he gave me when I visited the Hope Museum.

Family Acræidæ.

Acræa harrisoni, sp. n.

Closely allied to *A. egina*, Cram., but distinguished from that species by the bright red streaks between the nervules of the fore wing.

♂. Fore wing: Ground colour smoky black, rather more transparent towards the apical area. The brilliant red patch on the inner margin extends slightly more to the base, and the black spots, although situated exactly as in *A. egina*, are somewhat larger. Hind wing very similar to that of *A. egina*. The under side, although brighter and having the spots and markings more pronounced, agrees in other respects with that of the above mentioned species. Expanse, 3 in.

Hab. Nyangori. (Type in A. H. Harrison coll.)

♀. Differs somewhat from that of *A. egina*, the apical band on the fore wing in this species being yellowish buff instead of white. The black spots on the hind wing are also rather smaller. Fore wing: Ground colour smoky brown, with a light suffusion of red; two spots, one in the cell situated between two black spots, and the other near the posterior angle, also red and brighter in colour; red streaks between the nervules also indicated as in the male. The yellowish-white band near the apical area not so white as in the female of *A. egina*. Hind wing: General colour bright red, the costal and inner margins deep yellow; the basal area suffused with brown, and the black spots much reduced in size. The under side of both wings does not differ from that of *A. egina* and *A. areca*, Mabille. Expanse, 3 in.

Hab. Nyangori. (Type in A. H. Harrison coll.)

This species may turn out to be only a local form, but, as a fair number have passed through my hands, I venture to give it a name. Besides the types above described, Mr. Harrison has in his collection a male from Nairobi (October 17th, 1903), a male from Nandi, and a female from Nyangori.

Family Nymphalidæ.

Euphædra paradoxa, Neave, Nov. Zool. xi. p. 333, 1904.

♂. Fore wing: Costal margin, apical area, and hind margin glossy greenish black, the apical area relieved by an oblique creamy-white band; the base and central portion of wing of a much brighter green tone. Hind wing: Ground colour of bright glossy green colour, with a narrow hind marginal border of greenish black, relieved by internervular spots of paler green. The under side, with the exception of being a pale uniform green, does not differ from the description given by Mr. Neave of the female. Expanse, 2·3 in.

Hab. Nairobi, March 17th, 1903. (Type in A. H. Harrison coll.)

Both sexes are represented in Mr. Harrison's collection, of which there are two pairs; all taken at Nairobi, March 17th, 1903.

Charaxes harrisoni, sp. n.

Allied to *C. epijasius*, Reiche, and the European species *C. jason*, Linn., but differs from the former species in having a distinct submarginal row of orange-buff spots on the fore wing. The blue on the hind wing is more restricted than in the former species, although more strongly marked than in *C. jason*.

♂. Fore wing: The whole of the basal area chestnut-brown; discal area brownish black, relieved by a transverse line of chestnut spots from the costa to as far as the inner margin, and situated between the nervules; a second row of orange-buff spots also strongly indicated, but not extending beyond the first median nervule. The orange-buff border on the hind margin agrees with that of *C. epijasius*, but is decidedly narrower. Hind wing: Ground colour brownish black, suffused near the base with dull chestnut; about the centre of the costal margin is a very distinct white patch suffused with chestnut; the lower portion (which becomes somewhat narrower) bright chestnut-brown, and terminating above the radial nervure. The submarginal line of blue deeper in colour, but narrower than in *C. epijasius*. The orange-buff hind marginal border not so broad. The under side is similar to that of *C. epijasius*. Expanse, 3·1 in.

Hab. Kamagombo, January 24th, 1903. (Type in A. H. Harrison coll.)

Family Lycænidæ.

Spindasis nairobiensis, sp. n.

Allied to *S. victoriæ*, Butl., and *S. mozambica*, Bertol, but is distinguished from both species by having the bands on the under side of both wings bright chestnut-brown.

Fore wing: The extent of the orange-yellow area on the apical portion somewhat larger than in *S. victoriæ*, the two spots in the cell being also tinged with yellow. Hind wing similar to that of the species mentioned above, but exhibiting a little more red on the anal angle. Fringe of both wings reddish yellow. Under side nearest to that of *S. victoriæ*, but has the ground colour of both wings yellowish white; the silver lines heavily outlined by chestnut-brown. Expanse, 1 in.

Hab. Nairobi, March 17th, 1903. (Type in A. H. Harrison coll.)

Family Pieridæ.

Teracolus xantholeuca, sp. n.

Allied to *T. evenina*, Wallengren, but differs in wanting the black border on the inner side of the orange apical patch on the fore wing.

♂. Fore wing: The whole of the central area creamy white, faintly dusted with grey on the inner margin near the base; the apical area bright orange-yellow, narrowly edged with black on the costal

and hind margins to as far as the first median nervule. Hind wing: Ground colour creamy white; the nervules terminating in black spots on the hind margin; the costal margin greyish black; a slight dusting of grey visible at the base of the wing. Under side: Central area of the fore wing white, the apical area orange-yellow, but paler than on the upper side; black nervules relieving the orange patch, but not extending beyond the second median nervule. Inner margin blackish grey, but not continued for the whole length. Hind wing: Ground colour white, all the nervules indicated in black, a faint indication of a brownish band across the discal area just visible, although more strongly marked in some of the other specimens. Expanse, 1·4 in.

Hab. Kavirondo, January, 1900. (Type in F. J. Jackson coll.)

The female resembles those of *T. carteri*, Butl., and *T. isaura*, Lucas.

♀. Fore wing: Central area creamy white; the basal area rather thickly dusted with greyish black; the apical area brownish black, relieved by five orange spots of a somewhat pale tint; a faint line of this pale orange colour being also visible on the inner edge of the dark apical patch. Near the posterior angle, on the inner margin, is a dusky grey spot, a thin dusky line uniting it to the dark apical area. Hind wing: Central area white, the base dusted with grey, hind marginal border brownish black, rather heavily marked; a broken transverse discal line of brownish black also shown on the costal margin, and again across the median nervules, almost uniting with the hind marginal border. Under side: Ground colour white; on the apical area an oblique band of orange, with a smoky suffusion of brown, the latter extending to the posterior spot; the apex pale sulphur-yellow; the costa and nervules near the hind margin smoky brown. Hind wing: Ground colour greenish white, the nervules strongly emphasized as brown lines; the reddish-brown discal band well pronounced, but broken between the third median and radial nervule; the usual orange streak present along the costal margin. Expanse, 1·5 in.

Hab. Kavirondo, January, 1900. (Type in F. J. Jackson coll.)

Some of the females vary somewhat, the yellow spots on the apical area of the fore wing being replaced by white ones. This is an interesting little species, and I shall figure it shortly in my 'Monograph of the genus *Teracolus*.' It seems to have a fairly wide distribution, as specimens are in Mr. Harrison's collection from Nairobi, Nyangori, and Kamagombo.

In the Hope Museum at Oxford are specimens sent by Mr. Wiggins from Lake Victoria Nyanza, north-east shore, 3800 ft., South Kavirondo, Ugaia to Kisingiri; all collected January 1st–14th, 1903.

A "BUTTERFLY SUMMER" IN ASIA MINOR.

By Margaret E. Fountaine, F.E.S.

(Continued from p. 108.)

The following is a list of my captures:—

Papilio podalirius, L. — Generally distributed; very common at Broussa in April and May. Some of the specimens of the summer brood at Amasia had an inclination, more or less, for var. *zanclæus*, Z.

P. machaon, L.—Not so common as the preceding.

Thais cerisyi, B.—I took some magnificent males at Broussa, at the end of April and in May; they did not differ from the typical form, except in being rather larger. At Amasia, at the end of May, this butterfly was over, but I collected a good quantity of the larvæ, which I found feeding on a small-leaved dwarf aristolochia, from which I have about thirty healthy pupæ, so that I hope in the spring to obtain some var. *deyrollei*, Oberth.

T. polyxena var. *cassandra*, Hüb. — Two specimens only from Broussa in April and May.

Doritis apollinus, Hbst.—Common locally near Broussa towards the end of April. The specimens are larger and finer than those I have from Syria; but though the females are much darker, and generally more or less suffused with red on all the wings, the small red marks which are present on the fore wings of the males in all my Syrian specimens, are either entirely, or almost entirely, absent in everyone I took at Broussa. At Amasia this butterfly was completely over, and the larvæ, even on the Lokman (4000 ft.) already nearly full-fed.

Aporia cratægi, L.—A splendid form, common at Broussa in May.

Pieris brassicæ, L.—Not very common; all the specimens I saw were typical.

P. rapæ, L.—Not common anywhere; I only observed it occasionally, and seem to have but one specimen, which I took at Broussa in September.

P. napi, L.—Also not common. I have one typical specimen from Broussa in May.

P. daplidice, L.—Abundant at Amasia. The females were large, and broadly marked, whereas the males were for the most part small and undersized.

P. chloridice, Hüb.—The summer brood appeared at Amasia about the second week in June. Up a side valley, with a dried-up watercourse, off the north side of the Kerasdere, it flew abundantly, but the males were extremely difficult to catch. It was also not uncommon in the Tshirtshir Valley, fresh specimens being easily met with throughout July.

Anthocharis belia var. *ausonia*, Hüb.—Common on the plateau at the top of the Caraman on June 16th.

A. cardamines, L.—Common at Broussa in April.

Zegris menestho, Mén.—Over at Amasia when I got there at the end of May; I only took one good female on the 30th of that month, and two more females early in June; but neither of these were really

fresh, and the few males still left were almost past recognition. I hoped to find the larva, but did not succeed in doing so.

Leucophasia sinapis, L.—Common at Broussa in April and May.

L. duponcheli var. *æstiva*, Stgr.—Very common at Amasia in June and July.

Colias edusa, F., and *C. hyale*, L.—I took no other *Colias* but these two species. The former was common everywhere; the latter rather less so.

Gonepteryx rhamni var. *farinosa*, Z.—All at Amasia were of this variety, and when compared with the type are quite distinct, the lower wings in the males being of a pale greenish yellow, and the upper wings also much suffused with the same tint towards the outer margins. The females, too, were slightly greener than the type. I saw two broods of this insect at Amasia; the first was out when I arrived at the end of May, and the second appeared towards the end of July and August.

Thecla spini, L.—Aggressively abundant in the Maidan, and other localities near Amasia in June.

T. ilicis, Esp.—Just coming out before I left Broussa in the middle of May.

T. quercus, L.—Two very fresh specimens (both males) in the pine forest, above the old Sivas Road, near Tokat, in July.

T. rubi, L.—Common at Broussa in April and May.

Thestor nogellii, H.S.—Fairly common on one spot near the top of the Caraman; also singly in the Maidan, and other places near Amasia, at the end of May and beginning of June. The orange patch on the fore wings, which is such a decided sexual distinction in *T. ballus*, was in this little butterfly not only by no means restricted to the females, but neither was it necessarily always present in that sex. Of the two female specimens I was able to procure, in one of them the orange patch is very large and conspicuous, whereas in the other it is, on the fore wing, almost invisible; and of the males I have a series gradually diverging from entirely dark, till the patch in at least two of them is very nearly as broad and distinct as in the one female.

Chrysophanus virgaureæ, L.—One very fine male taken near Tokat.

C. ochimus, H.S.—Bad specimens were not infrequent near Amasia, in the Maidan, &c., at the end of May and beginning of June. The second brood began the first week in August, but I did not stay late enough to get any females.

C. thersamon, Esp.—Extremely common at Broussa in August and September. I had also observed some few specimens there in the spring. It also occurred at Amasia and Tokat, but I took none belonging to the var. *omphale*, Klug.

C. asabinus, H.S.—One rather damaged specimen on the Caraman in July. I saw no others.

C. rutilus, Wernb.—In the marshy meadows of the plain near Broussa; not uncommon, but rather the worse for wear when I first discovered it there early in September.

C. alciphron var. *melibœus*, Stgr.—One splendid female only, two days before I left Broussa (May 19th). The species was evidently only just beginning to come out, and at Amasia all I saw, which was not many, belonged to the var. *gordius*, Sulz.

C. dorilis, Hüb.—In May, and again in August, at Broussa. The females were dark, except for the orange band on both wings; but I have specimens equally so from Austria and Hungary.

C. phlæas var. *eleus*, F.—A very good form of this variety occurred at Broussa in August and September. Bersa caught a fine male, in which the submarginal row of black spots on the under side of the fore wings were elongated into broad black bands, almost confluent.

Lycæna bætica, L.—Fairly common at Broussa in August and September.

L. telicanus, Lang.—Common in certain places on the plain near Broussa in September.

L. balcanica, Frr.—A succession of broods seemed to appear at Amasia throughout the summer. It also occurred singly at Broussa, spring and autumn. The specimens were smaller and darker, with more black spots on the upper side than those I took in Palestine two years ago. Possibly the latter were *L. theophrastus*, F. (?).

L. trochilus, Frr.—A brood was just out in the Maidan when I first got to Amasia at the very end of May. Later on another brood appeared in July, and I took a female on the Caraman, in which the ground colour is black instead of dark brown, and the orange bands above and below of a pale straw-colour, the freshness of the specimen entirely precluding any possibility of its being faded. At Broussa this species was rather rare.

L. ægon, S.V.—Very common on the top of the Lokman, near Amasia, in June.

L. loëwii, Z.—At Amasia early in June. The males were very common at Guelly, especially up a small narrow gorge, where a tiny stream was still trickling down through the rocks; later on this stream was quenched in the drought of summer, *Loëwii* was also common at Tokat, and both sexes were in fresh condition in the middle of July.

L. zephyrus, Frr.—One male taken at Mersivan, the end of May, and a few females at Amasia a little later.

L. eurypilus, Frr.—Very common all round Amasia in June and July, and it also occurred at Tokat. The females were sometimes only distinguishable from those of *L. loëwii* by the orange band being brighter and less suffused with black on the under side of the fore wings.

L. bavius, Ev.—Only two females caught in the Maidan, at the beginning of June, the species being nearly over, and I should imagine not common at any time.

L. baton, Berg.—At Broussa in April, and Amasia in June; not very common.

L. panagæa, H.S.—I have only two specimens of this little butterfly. One I took in the "Nogellii Gorge," on the Caraman, and the other in the Tschirtschir Valley; both in June, I think I ought to have taken more, but at a place like Amasia, with so many interesting species, mostly occurring in swarms, things of insignificant appearance are not uneasily overlooked.

L. astrarche, Bgst.—Common at Amasia throughout the summer.

(To be continued.)

CURRENT NOTES.

By G. W. Kirkaldy.

(Continued from p. 100.)

1. A. E. Shipley: "The Orders of Insects" (Zool. Anzeiger, xxvii. 259–62 (1904).
2. R. C. L. Perkins: "Later Notes on Lantana Insects" (Proc. Hawaiian Live Stock Breeders' Association, 2nd Ann. Meeting, pp. 58–61 (1904)).
3. E. Bergroth: "Neue Myrmecophile Hemipteren" (Wiener Ent. Zeitung, xxii. 253–6 (1903)).
4. J. D. Alfken: "Beitrag zur Insectenfauna der Hawaiischen und Neuseelandischen Inseln (Zool. Jahrb., Abth. für Syst. xix. 561–628. Plate 32 (double) (1903)).
5. A. J. Turner: "Revision of Australian Lepidoptera" (Proc. Linnean Soc. New South Wales, xxviii. 42–92 (1903)).
6. F. W. Goding: "A Monograph of the Australian Membracidæ" (*l. c.* 2–41; Plate 1 (1903)).

Shipley's arrangement of the orders of Insecta (1) is identical with that of D. Sharp (1898), except that the Panorpatæ are separated as a distinct order; the opportunity, however, is taken to disturb several well-known names in order to have a uniform termination of "-ptera"; it is to be hoped that this somewhat childish mnemonic will not be followed. The sequence is as follows, a supposed new name being indicated by a star:—

	Old Name.	Shipley's Name.
Apterygota:—		
1.	Thysanura.	Aptera.
2.	Collembola.	*Apontoptera.
Anapterygota:—		
3.	Mallophaga.	*Lipoptera.
4.	Anoplura.	*Ellipoptera.
5.	Siphonaptera.	Aphaniptera.
Exopterygota:—		
6.	Orthoptera.	Orthoptera.
7.	Perlidæ.	Plecoptera.
8.	Psocidæ.	*Psocoptera.
9.	Termitidæ.	Isoptera.
10.	Embiidæ.	*Embioptera.
11.	Ephemeridæ.	*Ephemeroptera.
12.	Odonata.	*Paraneuroptera.
13.	Thysanoptera.	Thysanoptera.
14.	Hemiptera.	Hemiptera.
Endopterygota:—		
15.	Neuroptera.	Neuroptera.
16.	Mecaptera.	Mecaptera.
17.	Trichoptera.	Trichoptera.
18.	Lepidoptera.	Lepidoptera.
19.	Coleoptera.	Coleoptera.
20.	Strepsiptera.	Strepsiptera.
21.	Diptera.	Diptera.
22.	Hymenoptera.	Hymenoptera.

The correct fixation of the Linnean orders Aptera and Neuroptera is a matter of very great difficulty, and should be very carefully worked out. The original spelling of the first order was Thysanoura. The fleas have a prior name, viz. *Suctoria*; while the correct name of the Orthoptera is, as pointed out by Westwood, undoubtedly *Dermaptera*. The prior name of Trichoptera is *Elinguia*. While keeping apart the Trichoptera, Siphonaptera, various "Neuropteroidea," &c., it is perhaps a little inconsistent not to recognize the earwigs as *Euplexoptera*. The Procidæ have a prior ordinal name, viz. *Corrodentia*; and the Ephemeroptera* should be known as *Plectoptera*. While giving these recent names, what becomes then of the more ancient Pseudoneuroptera, Anisoptera, Megaloptera, Rhaphioptera, &c.?

Perkins (2) brings up to date the account of the insects that were imported into the Hawaiian Islands from Mexico, to check the growth of lantana. Although the difficulties of transportation were very great, five species of Lepidoptera have thoroughly established themselves, as have also two species of Diptera and one bug; "of the two species of flies, the success of the one was instant and phenomenal." With the exception of the imported bug, which has natural enemies in the shape of other bugs, all the other imported lantana insects are "at present practically free from attacks from other predaceous or parasitic insects; and it is quite certain that the parasites, which in Mexico destroy at least ninety per cent. of the individuals of the lantana-eating species, were entirely eliminated here before the latter was liberated. To this fact is due the astonishing rapidity of increase of some of the quicker-breeding insects in these islands, so that, after three months, from two or three dozen of the berry-eating fly originally liberated the progeny, had already run into many millions." This dipteron is as yet undetermined.

(To be continued.)

NOTES AND OBSERVATIONS.

Hertfordshire Lepidoptera and Coleoptera. — A meeting of the Hertfordshire Natural History Society was held at Watford on March 29th, Mr. B. Daydon Jackson, Secretary, Linn. Soc., President, in the chair, when Mr. A. E. Gibbs, Recorder of Insecta for the Society, presented his annual report. He remarked that it was satisfactory, at the close of a season which had proved so disappointing as 1903, to be able to announce the addition of nine species of Lepidoptera to the list of a county which had been so well worked as Hertfordshire. It was true that all these records could not be credited to 1903, but

* For it is stated that *Ephemeroptera* is a new name; it was, however, employed by J. B. Smith in 1896.

the majority of them were the result of last season's work. They were:—*Tapinostola hellmanni*, *Mamestra furva*, and *Agrotis aquilina*, all taken at light at Hitchin by Mr. A. H. Foster, of The Grange, Hitchin; *Noctua glareosa*, captured on heather-bloom at Ashridge by Mr. A. H. Goodson, of Tring; *Dicycla oo*, taken at sugar in the garden by Miss Alice Dickinson, of New Farm, St. Albans; *Polia chi*, a very light specimen, from larva taken at Hitchin on monkshood when searching for pupæ of *Plusia moneta*; *Asthena sylvata*, taken in the same town at light; *Pyrausta aurata*, of which, after diligent search, two specimens were discovered near Tring by Mr. A. H. Goodson; and *Eriopsela fractifasciana*, beaten out of a hedge by Mr. Philip J. Barraud at Aldbury.

An interesting result of the work of the past few seasons had been the confirmation of several records made by F. J. Stephens, the well-known entomologist, in the earlier years of the nineteenth century, thus re-establishing in the county list species which it was feared had disappeared from Hertfordshire. Stephens, who was a clerk in the Admiralty, in the formation of his famous collections made frequent visits to many places in the vicinity of London, the neighbourhood of Hertford being a favourite hunting-ground. In his 'Illustrations of British Entomology' are given a large number of records of Lepidoptera, Coleoptera, Orthoptera, Hymenoptera, and Neuroptera from that locality, and these form the earliest, and in some cases the only, local lists. So far as the Lepidoptera are concerned, these have been collected together by Mr. John Hartley Durrant, F.E.S., and embodied in a valuable paper, which is printed in the 'Transactions of the Hertfordshire Natural History Society.' The Coleoptera noted by Stephens had been dealt with by Mr. E. Geo. Elliman in the first volume of the 'Victoria History of Hertfordshire,' and the comparatively few records of insects of other orders had been by himself (Mr. Gibbs) in the same work. In the 'Illustrations' Stephens mentions *Apatura iris* as occurring near Hertford in July, 1833, but from that time until the present no record of the presence of the insect in the county had, so far as he was aware, appeared. He was glad, however, to be able to state that it was almost certain that *A. iris* was still to be found in some of the larger woodlands. Mr. Foster, of Hitchin, had seen, but not taken, it, and the keepers in two woods stated that they had seen a beautiful purple butterfly settled on the dead animals in their "larders." This evidence, although perhaps not absolutely conclusive, was very suggestive, and he hoped another year would see *A. iris* definitely re-instated in the county list. Other records of Stephens's which after the lapse of many years had received confirmation were *Acontia luctuosa*, taken near Hitchin by Mr. Foster, and *Myelophila cribrella*, captured at light at Cheshunt by Mr. Boyd. The year 1903 was, he thought, generally regarded by entomologists as one of the worst seasons on record. The long-continued spell of cold wet weather was, he thought, the chief cause of the scarcity of insects. The bright interval in October appeared to have been the chief redeeming feature of a bad year. For a few evenings at that time he found sugar very attractive, one of the most abundant species in his garden being *Polia flavicincta*, of which insect and of *Hypena rostralis*, and one or two others, he exhibited a long and varied series. In Hertfordshire,

as elsewhere, *Vanessa cardui* appeared in thousands, and another butterfly which was in evidence in every garden was *V. atalanta*, which he found very partial to the overnight sugars. Some interesting reports from observers in various parts of Hertfordshire brought the paper to a close.

Mr. Gibbs subsequently read a second paper dealing with the species of Coleoptera which had been added to the county list during the year by Mr. E. Geo. Elliman, of Chesham. The number of species recorded by Mr. Elliman in the 'Victoria History' was 1542, and that gentleman now announced the discovery of thirteen other beetles, making a respectable total of 1555.—A. E. Gibbs.

Variation of Tæniocampa gracilis.—From about forty larvæ of *Tæniocampa gracilis* found in the Rannoch district on sweet-gale (*Myrica gale*), most of which were destroyed by ichneumons, I have bred six specimens, all of the soft bright red form. In four of these the stigmata are obscure, and the subterminal line is darker red. Two, however, are of a form I have not seen described. The subterminal line is bright pale green with no dark shading. The stigmata, including the claviform, are outlined with pale green clouding, a band of which joins the orbicular and the reniform. From the latter, rays of the same colour extend for a short distance along the nervures towards the subterminal line.—E. A. Cockayne; 6, Tapton House Road, Sheffield.

Note on the Hybernation of Gonepteryx rhamni.—January 17th, 1904, dawned extremely cold, no less than thirteen degrees of frost being registered. But the sun was shining brilliantly between ten and eleven, when I happened to notice a female *G. rhamni* sitting on a stem of *Jasminum nudiflorum* about a foot from the ground. Had she been in this position for any considerable time previously, I think I must have noticed her, as I pass the spot several times every day, seeing that it is between my front door and front gate. The jasmine clambers over an eastern wall, which is also partly covered with ivy, and my theory is that the butterfly had been previously sitting concealed in the ivy, but had been tempted by the bright sun to crawl out on to the jasmine, where her colour was in harmony with the multitudinous yellow flowers. The wall faces the east, and is built on Loddard's Hill, 161 ft. above sea-level. Thinking that under these bleak conditions she was not likely to remain in her seemingly ill-chosen position for very long, I observed her carefully, and took notes of the temperature for the next few days. But in spite of my anticipations to the contrary, there she remained until March 9th—a period of fifty-two days! During this time, through every possible vicissitude of weather (except deep snow), the insect never left the same stem, although she moved some two or three inches higher up it. One day I noticed that her antennæ were thickly covered with hoar-frost. The day when she took her departure, flying towards Maldon, was bright and warm, and a friend of mine residing some five miles off (in that direction) tells me he noticed a *rhamni* flying in his grounds on that day. "The same, or not the same, that is the question."—(Rev.) Gilbert H. Raynor; Hazeleigh Rectory, Maldon, April 5th, 1904.

Probable Effect of Last Season on the Occurrence of Insects.—I believe it will be a matter of general interest if field entomologists will note, during the coming season, the scarcity or otherwise of day-flying moths, butterflies, and dragonflies. Especially with reference to butterflies and dragonflies there seems reason to expect a falling-off in the numbers of species, since the small amount of sunshine, low temperatures, frequent winds and rains must have necessarily interfered with their matrimonial alliances.—J. Arkle; Chester.

Aberrations of European Butterflies.—I was somewhat surprised in reading Mr. Wheeler's observations (*ante*, p. 116) on my article, "New Forms and New Varieties of European Butterflies," or rather those in reference to my new variety *etrusca* of *Erebia neoridas*. Mr. Wheeler states he is not sure the specimens I figure belong to *E. neoridas* at at all, saying true *neoridas* presents two constant characters that my specimens lack, *viz.* that the fore wings "are usually very truncated," and that "the inner edge of the rust-coloured band, upper side fore wing, is almost as straight and firm as if marked off with a ruler." An accurate examination of a series of specimens from the south of France has proved to me that the two characters mentioned by Mr. Wheeler are *not* constant; about ten per cent. of the specimens having the rust-coloured band nearly half as narrow in the middle as at the ends, and the borders consequently very concave: as to the shape of the fore wings, some have them much less truncated than the specimens I figure. If Tuscan specimens are considered, it is found they vary much more than the French ones, and that the inner edge of rust-coloured band is *very rarely* straight. What is still more strange is that Mr. Wheeler "should have no hesitation in referring all three specimens figured to *E. euryale*," since the first character that distinguishes this species and *E. ligea* from all the others is the chequered white and black fringe; whilst even in the plate the fringes of my specimens are clearly uniform brown. As to the tooth on inner edge of band on under side of hind wings, it is just as marked in many French specimens of *E. neoridas* as it is in the one that I figure. I may mention here that one of my specimens of this species from Tuscany has the rust-coloured band on upper side of fore wings so broken up as to look rather like *E. cassiope*, and that another has this band replaced by a greenish grey one; I do not think any other *Erebia* has bands of this colour. If Mr. Wheeler or other readers of the 'Entomologist' are interested in Tuscan *Erebia neoridas*, I will willingly send them specimens. — Roger Verity; 1, Via Leone Decimo, Florence, Italy.

A Hint to Collectors of Parasitic Hymenoptera. — Examine closely the younger larval instars of various leaf-hoppers, especially of *Liburnia* and its allies.—G. W. Kirkaldy; Honolulu.

Aberration of Argynnis paphia.—When looking over back numbers of this Journal, I came upon a figure in vol. xxvi. p. 97, of an aberration of a female *Argynnis paphia*, which has pale spots on the fore wings similar to those found upon its variety *valesina*, and it struck me that I had a specimen—a male—not unlike it. On comparing it,

however, I found it to differ in some respects from the figure, my specimen having four smaller spots, one on each wing. Those on the fore wings are identical as regards position with the most prominent white markings of *valesina*, except that they are much smaller, round, and indented, like the effect produced by pressing the head of a pin upon paper. On the lower wings the spots, which coincide with those on the upper wings, have not the latter peculiarity. Still, the aberration strikes one as having been produced by something which had pressed heavily upon the wing-cases of the pupa of the insect. Mr. Frohawk (*l. c.*) tells us that specimens of *A. paphia*, mostly males, frequently have the white spots on each wing, as in this case, others on one wing only; whilst in other instances the primaries only are spotted. He adds that they seem to be found nowhere else but in the New Forest, whence I secured my example. Now, as there seems to my mind little doubt that the aberration of the latter was caused by accidental pressure upon part of the wing-cases of the pupa, may it not be possible that the occurrences of these spots in *A. paphia*, as well as of many of the other irregular forms of coloration in Lepidoptera generally, owe their origin to a like cause? If so, then the question arises, why should the aberration in the case of *A. paphia* be almost, if not altogether, confined to the New Forest?—F. G. Bellamy; Ringwood, April 11th, 1904.

Aberrations of Butterflies.—In reply to Mr. Verity's queries (*ante*, p. 59), I have one female of *Lycæna icarus* var. *melanotoxa*, taken on June 17th, 1895, and one example of the same sex, taken on September 12th, 1894. Both specimens are from Riddlesdown in Surrey, and that last mentioned also has the basi-costal spots of the hind wings confluent and strigated, and the superior basal spot of the fore wings geminate. Also three males taken in Malta on May 17th, 1902, June 14th, 1902, and July 19th, 1901. It is particularly to be noticed that these are all male specimens. Of *Eurymus croceus* (*Colias edusa*) ab. *minor*, Failla, I have two males, one taken in Malta on June 2nd, 1902, and the other at Plateali, in Greece, on February 7th, 1901.—Thos. Bainbrigge Fletcher; H.M.S. 'Impregnable,' Devonport, April 8th, 1904.

CAPTURES AND FIELD REPORTS.

Notes from Westcliff-on-Sea and District.—The season last year was a most wretched one here, as elsewhere, but, notwithstanding the almost continuous rains, I met with a few interesting species of Lepidoptera when the weather was kind enough to allow one an opportunity of doing a little field-work.

During April and May *Pygæra pigra* (*reclusa*) emerged freely in my breeding-cages from larvæ found on aspen and sallow in September, 1902, near Eastwood. From other larvæ found at the same time and place, and also on the same food-plants, were bred odd specimens of *Dicranura bifida* and *Notodonta ziczac*; also a short series of *Eucosmia undulata* and half-a-dozen specimens of the scarce "knothorn," *Nephopteryx hostilis*, Steph., the latter from larvæ found on aspen only.

On June 1st the larvæ of *Geometra vernaria* were found not uncommonly on clematis near Southchurch, and during the month *Melanippe unangulata* was beaten out of hedges here and there; the latter species appears to occur all over the district, but not commonly; a few *M. rivata* and one *Anticlea rubidata* were also taken, together with several *Eupithecia succentauriata*; *Phibalapteryx tersata* also occurred freely amongst clematis near Prittlewell.

I was unable to do any night-work until July, when Benfleet was visited on several occasions, and the palings, etc., near the railway were treacled, with very poor results; a few of the common Noctuæ which are out in July appeared, and four examples of *Mamestra abjecta* were taken; the commonest insect at the sugar was, strange to say, *Tortrix podana*, with several of the var. *fuscana*. A visit to a ditch full of reeds near was more interesting, as here I took one *Senta maritima* (*ulvæ*) at rest on a reed-stem, whilst *Chilo phragmitellus*, *Scoparia pallida*, and *Herminia cribralis* were flying over and amongst the reeds, and a fine *Phorodesma smaragdaria* was captured as it flew over an adjacent bank.

On July 15th, one of the few fine days we had last summer, I visited the woods near Hadleigh. *Eupithecia plumbeolata*, *Lithosia mesomella*, *Melanippe albicillata*, *Crambus pinellus*, *Rhodophæa consociella*, and *R. tumidella* were taken, with many other species. *Argynnis adippe* was seen in the woods, and *Melanargia galatea* was flying freely in the meadows near the woods; the latter butterfly I have never met with elsewhere in Essex, but in this district it is distributed, I am glad to say, over a wide area along the hills from Benfleet towards Leigh, and also inland, and it is also to be found on Canvey Island.

During August the larvæ of *Eupithecia isogrammaria* were in plenty feeding inside the buds of the clematis near Prittlewell, and on the coast the larvæ of *Chariclea umbra* (*marginata*) were not uncommon at the end of the month on the rest-harrow; whilst searching for the latter I took a single specimen of *Eremobia ochroleuca* at rest on a thistle-head. During this month also Tortrices were fairly abundant on the rough slopes facing the railway near Leigh, and the following species were netted in the course of two short afternoon visits to the locality:—*Dichrorampha politana*, *D. petiverella*, *Sphaleroptera ictericana*, and *Catoptria scopoliana*, all abundant, the last-named species particularly so; *C. cæcimaculana* (two only), and a few each of *Grapholitha nigromaculana*, *Conchylis francillana*, *Ephippiphora trigeminana*, and *Eupœcilia angustana*. At Shoeburyness, on September 20th, the larvæ of *Spilodes palealis* were found feeding in the seed-heads of *Daucus carota*, some nearly full-fed, others not half-grown.

There are still a few fields and hedgerows left between Westcliff and Leigh, although I am sorry to say the jerry builder is fast covering them with bricks and mortar. From September 24th to October 4th I sugared along one of these hedgerows on six occasions, and the following Noctuæ were seen or taken:—*Agrotis suffusa* (a series), *A. saucia* (two), *Phlogophora meticulosa* (abundant), *Noctua c-nigrum* (abundant), *Anchocelis pistacina* (abundant), *A. rufina* (one), *A. lunosa* (several), *A. litura* (two), *Xanthia fulvago* = *cerago* (several), *X. aurago* (six), *X. circellaris* (several), *Cirrhædia xerampelina* (one), *Epunda lutulenta* (one), and *Hadena protea* (three). I was rather surprised at

meeting several of the species named, *X. aurago* particularly, in open country, no woods being near; but I think their continued existence in the locality is due to the fact that many of the hedgerows hereabouts contain a varied growth of maple, oak, ash, and other forest trees and bushes, probably descendants of the original woodlands of the district; these hedgerows doubtless saved *X. aurago* and many other species from extinction when the woods were destroyed.

Although collecting in Essex, chiefly in the Epping Forest district, for the last twenty-five years, I have found a number of species here which I had not met with before in the county, and hope, with better weather during the coming season, to considerably extend the list.

In concluding these brief notes, I should like to express my great indebtedness to Mr. Whittle, of Southend, who has most kindly given me the benefit of his unrivalled knowledge of this locality.—G. Harold Conquest; "The Moorings," Westcliff-on-Sea, March 26th, 1904.

SOCIETIES.

Entomological Society of London. — *Wednesday, March 16th*, 1904.—Professor E. B. Poulton, M.A., D.Sc., F.R.S., President, in the chair.—Miss M. Maude Alderson, of Worksop, Notts; the Hon. Richard Orlando Beaconsfield Bridgeman, R.N., of Shifnal, Salop, and H.M.S. 'Clio,' Australian Station; Mr. W. A. Luff, of La Chaumière, Brock Road, Guernsey; Mr. Frank S. Mumford, of 10, Mountfield Gardens, Tunbridge Wells; Mr. Edward Harris, of 2, Chardmore Road, Upper Clapton, N.E.; Mr. Thomas Frederick Furnival, of Bushey Heath and Bishopstone, Sussex; and Mr. Geoffrey Mead-Waldo, of Edenbridge, Kent, and Magdalen College, Oxford, were elected Fellows of the Society.—Mr. G. T. Porritt exhibited a pair of *Æschna isosceles*, taken by him in the Norfolk Broads last summer. The species had been regarded as almost lost to the British list for many years.—Mr. J. E. Collin exhibited *Phora formicarum*, Verr., which is parasitic on the ant *Lasius niger*, obtained by sweeping the herbage in a paddock at Newmarket. Prof. Westwood, as long ago as 1840 (Intro. Mod. Classification Ins.) recorded having "repeatedly observed on disturbing the nest of the common brown garden ant a very minute species of *Phora* hovering over and flying upon the ants." This species has not been found or recognized by Continental dipterologists. He also exhibited *Phora* sp. found in a garden at Newmarket, running about at the entrance to a nest of a species of *Bombus*. Specimens received from Dr. Sharp, labelled "from *Bombus* nests," were also the same species.—Commander J. J. Walker exhibited a series of Buprestidæ from Sydney, N.S.W., and the adjoining district (including the nearest part of the Blue Mountains), comprising about a hundred and twenty species, of which seventy belonged to the genus *Stigmodera*. Also a dried specimen of *Angophora cordifolia*, Cav., a small tree of the natural order Myrtaceæ, the flowers of which are the great attraction in New South Wales for the Buprestidæ, as well as for many other Coleoptera; specimens of the "Bugong" moth, *Agrotis spina*, Guenée, from Jervis Bay, N.S.W. (referred to at the previous meeting); and

Carthæa saturnoides, Walk., a remarkable moth from Perth, W.A., now referred to the Geometrina, but possessing an extraordinary superficial resemblance to a Saturniid in aspect, though not to any of the known Australian species of that family.—Mr. A. J. Chitty exhibited a specimen of *Peribalus vernalis*, Wolff., a rare bug, of which only five or six specimens appear to have been taken, and pointed out that as the records in Saunders' 'Hemiptera' included Cumberland and Weston-super-Mare, and his own specimen was taken at Huntingfield, Kent, probably it had been overlooked. Mr. Claude Morley had also taken one specimen in Essex.—Dr. F. A. Dixey exhibited a remarkable pale form of *Mamestra brassicæ*, taken by Dr. G. B. Longstaff and himself at Morthoe, North Devon, on July 16th, 1903.—Mr. C. G. Barrett had examined the specimen, and pronounced it probably unique. Sir George Hampson had also seen it, and pointed out that it was provided with the spur on the anterior tibia, which is characteristic of *M. brassicæ* among the allied European species.—The President, Professor Poulton, read "Some Observations on the Gregarious Hybernation of certain Californian Insects," communicated by Professor Vernon L. Kellog, of the Leland Stanford Junior University, California. He also read a paper, "A Possible Explanation of Insect Swarms on Mountain-tops," and a discussion followed, in which Dr. Chapman, Mr. Chitty, Mr. Champion, Mr. Tutt, Colonel Swinhoe, and other Fellows joined.—Mr. O. E. Janson contributed, on behalf of Mr. F. P. Dodd, of Townsville, Queensland, a note upon "Maternal Instinct in Rhynchota;" and Mr. Rowland-Brown read a "Note on *Oncoptera intricata*," a moth extremely destructive to pastures in Tasmania, by Mr. F. M. Littler, M.A.O.U., of Launceston, Tasmania. He also exhibited examples of the imago and larva of the species,—H. Rowland-Brown, *Hon. Sec.*

South London Entomological and Natural History Society.—*March 10th*, 1904.—Mr. A. Sich, F.E.S., President, in the chair.—Mr. Tonge exhibited (1) specimens of *Danais chrysippus* and *Anosia plexippus*, with other species of butterflies he had just received from Siam; (2) a photograph of a female *Lycæna iolas*, bred by Dr. Chapman, showing its resting pose; (3) photograph of the ova of *Thera juniperata*, *in situ* on a juniper leaf, and also of the ova of *Hybernia rupicapraria*. Mr. Moore, a living specimen of the locust, *Acridium ægypticum*, found in Covent Garden Market in a basket of mimosa, and read notes on its habits.—Mr. Adkin (1), a female aberration of *Bupalus piniaria*, in which the usual dark markings were represented only by two small spots on the costa and a few spots on the fringes, the remainder being of a pale brown; (2) an aberration of *Callimorpha dominula* with the usual red colour of the hind wings replaced by yellow.—Mr. Sich, sketches of larvæ illustrating the main characters of the various lepidopterous groups.—Mr. McArthur, two specimens of the extraordinary South American owl-moth, *Thysania agrippina* (*strix*), one of which measured more than ten inches across the expanded wings.—Mr. Tutt gave an address entitled, "Some Modern Requirements in Oval and Larval Description," illustrating his remarks by blackboard sketches, and a large number of diagrams prepared by Mr. Bacot. A considerable discussion took place.

March 24th.—The President in the chair. — Mr. H. Rowland-Brown, F.E.S., of Harrow, was elected a member.—Mr. Main exhibited a collection of Coleoptera from Cape Colony, Hemiptera from West Africa, and a spider found in a cargo of sugar from Java.—Mr. Goulton, photographs of the ova of *Ptilophora plumigera* and *Eubolia cervinata*, with notes on their characteristics. He also showed photographs of various species of lepidopterous larvæ in their resting positions.—Mr. Mauger, a large Coleopteron, *Macrodontia cervicornis*, from Demerara.—Mr. West, an example of the rare British Longicorn, *Monohammus sutor*, taken on a doorstep at Great Yarmouth in 1903.—Mr. Malcolm Burr gave a very interesting address on his tour in Montenegro, and along the mountains on the eastern coast of the Adriatic; and illustrated his remarks with a large number of lantern slides, made from photographs taken by himself. — Hy. J. Turner, *Hon. Rep. Secretary.*

Lancashire and Cheshire Entomological Society.—The Second Ordinary Meeting of the Session was held in the Royal Institution, Liverpool, on March 21st, Mr. Robert Tait, Junr., presiding over a large attendance of members.—Mr. Wm. Mansbridge, F.E.S., Sefton Park, Liverpool, was elected a member of the Society.—A paper entitled "Notes of Captures, &c., near Simonswood Moss," was contributed by Dr. J. Cotton, F.E.S. After describing the situation and limits of the Moss, which is roughly a mile long by three-quarters of a mile broad, the lecturer entered into details of the best methods and most suitable nights for sugaring. He prefers to work with a sheet and acetyline lamp, manufacturing the gas on the spot by means of a simple and portable apparatus. The extent of ground to be covered makes a companion desirable, for the possibility of meeting with poachers is not a remote one. The only time a friend seems *de trop* is when single rarities such as *Acronycta alni* or black *A. leporina* turn up, and there comes the inevitable division of the spoil! The paper was largely devoted to a description of some twenty of the most noteworthy forms which occur on the Moss, including *Notodonta camelina*, *N. dictæoides*, *N. dromedarius*, *Hadena glauca*, *Triphæna fimbria*, &c., with earliest and latest dates of capture. An enumeration of the Lepidoptera taken on this Moss shows a total of one hundred and fifty-six species, twelve of these being butterflies. A discussion was afterwards carried on by Major Ross and Messrs. R. Tait, Junr., R. Willing, F. N. Pierce, F. Birch, and E. J. B. Sopp; and it was generally accepted that all the evidence forthcoming corroborated the theory that dampness is the predominant factor in producing melanism. On the motion of Mr. R. Wilding, a hearty vote of thanks was accorded the lecturer.—Dr. G. W. Chaster exhibited all the species of the genus *Agathidium*, including the recent addition to the British list, *A. badium*. — Mr. C. E. Stott showed *Periplaneta australasiæ*, a cockroach which has now become naturalised at Worsley (Lancs.).—Mr. F. N. Pierce, a specimen of *Cryptophagus acutangulus*, from Manchester.—Mr. J. J. Richardson, *Ptinus tectus*, from Liverpool; and Mr. Sopp, *Panchlora viridis* and *P. virescens*, from Liverpool, which had been kindly identified for him by Mr. Malcolm Burr.—E. J. B. Sopp and J. R. le Tomlin, *Hon. Secretaries.*

RECENT LITERATURE.

Catalogue of British Coleoptera. By T. Hudson Beare, B.Sc., F.R.S.E., F.E.S., and H. St. J. K. Donisthorpe, F.Z.S., F.E.S. 8vo. Pp. 51. London: O. E. Janson. 1904,

Appears to be a revised and extended edition of the Sharp-Fowler Catalogue, published in 1893. The species are numbered consecutively throughout, and with six mentioned in the addenda reach the respectable total of 3271. There are but few changes in the arrangement of families, and generic and specific nomenclature remain pretty much as they were. Lists of Introduced and of Doubtful Species are also given.

New Zealand Neuroptera: a Popular Introduction to the Life-Histories and Habits of May-flies, Dragonflies, Caddis-flies and allied Insects inhabiting New Zealand: including Notes on their Relation to Angling. With eleven Coloured Plates. By G. V. Hudson, F.E.S. 8vo. Pp. i–viii and 1–102. London: West, Newman & Co. 1904.

In this admirable little volume the author has entered pretty fully into details connected with the habits and life-histories of the more important and conspicuous neuropterous insects inhabiting the streams, rivers, and lakes in New Zealand.

Sharpe's arrangement of families has been adopted. These are eleven in number, but the Mallophaga and Psocidæ have been omitted, and of Embidæ and Panorpidæ no representative has been so far observed in the country. Altogether sixty-one species belonging to thirty-six genera are dealt with. Of these, twenty-four species belong to the Phryganeidæ, thirteen to the Ephemeridæ, ten to the Odonata, and seven to the Hemerobiidæ.

The plates, reproducing the author's own drawings, are exceedingly good.

Eighth Annual Report of the State Entomologist of Minnesota for the year 1903. Second Annual Report of F. L. Washburn. Pp. i–xvi and 1–184.

This volume is full of interesting matter connected with the occurrence of injurious insects in the State of Minnesota during 1903. The greatest loss to farmers during the year seems to have been caused by the chinch bug (*Blissus leucopterus*), whilst the Hessian fly (*Cecidomyia destructor*) has also been active, but not more so than in previous years. Forty-seven kinds of insects are mentioned as more or less destructive to apple-trees. Of these, eleven are beetles and twenty-three are moths.

Index Faunæ Novæ Zealandiæ. Edited by Captain F. W. Hutton, F.R.S. Pp. i–viii and 1–372. London: Dulau & Co. 1904.

In this exceedingly useful index to the animals of New Zealand the Insecta alone occupy one hundred and forty pages, eighty of which refer to Coleoptera and twenty-three to Lepidoptera. Synonymy, which would probably have greatly added to the size of the book, has been excluded, but references are given to the works where such particulars as well as descriptions can be found.

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NYSSIA LAPPONARIA, *Boisd.*

Figs. 1 and 2, males at rest. Fig. 3, female at rest. Fig. 4, female depositing ova on a reed. All slightly enlarged.

From photographs taken by E. A. Cockayne.

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ON *NYSSIA LAPPONARIA*.

BY E. A. COCKAYNE.

PLATE VI.

LAST spring I had hoped to have published some observations on the habits of *Nyssia lapponaria*. Unfortunately, a bitter cold north-west wind raged the whole time I was in the Rannoch district, and I only saw a single male and four females. This season I have been more fortunate, and hope the following notes will be of interest.

The ova are laid during the day in any deep chink, in batches of 10 to 150. The female walks slowly up anything which grows in the marshy ground they inhabit, probing with her extremely long ovipositor until a suitable place is found. I have actually observed wild females laying in reeds between the stem and outer sheath, in a crack in a dead bracken stem, and under flakes of bark on fallen sallow twigs; but the most usual place is undoubtedly in the dry brown corollas of the cross-leaved heath (*Erica tetralix*).

This last, with bog-myrtle (*Myrica*), appears to be the favourite food of the larvæ, which hatch from May 20th to the 30th, and are full-grown at the beginning of July, a few lingering on to the end of the month, or even till the second week in August. The pupæ lie very near the surface, and are quite without cocoons. Out of doors they probably always remain two years in this state; but in the house many emerge after one winter, and can easily be recognized, since in them the insect is fully formed a month or two after pupation, and they become very dark in colour. They are very sensitive to changes of temperature, and a cold night will prevent any from emerging. This, and their power of remaining in the ground till a more favourable season, probably explains the extreme irregularity of their appearance.

During the day they sit on the top of the bell-heather and common ling, frequently paired or a male and female close together, or about half-way up the stem of a bog-myrtle, with

head pressed against a small outstanding twig. When paired, the male is usually upside down—the only time it assumes this position—and is consequently rather difficult to see. Both sexes also sit on posts or the trunks of birches, if these occur in their chosen haunt. The males are very fond of sunshine, and sometimes spread their wings and bask like a butterfly. We saw one male even flying in the sunlight, low down and very swiftly. Their true flight-time I did not discover, but probably it is at night, which is also the time of emergence. The insect appears to be very sluggish, clinging very tightly, and finally falling with legs drawn up, feigning death, the wings either tightly closed or held up over the back.

We never met with a really worn specimen, though they continue to emerge the whole of April. In captivity the first emerged on January 31st, and the last on May 7th, in 1902. The insect is very local, many apparently suitable spots being quite untenanted. In all cases, however, they were near a small stream, doubtless owing to the abundance of their food-plants in such a situation.

The males vary only slightly in depth of colour and thickness of the black bands, and in ground colour both of fore and hind wings, which is white or pale grey. One I obtained was so dark grey as to appear almost uniformly smoke-coloured. In two others the reverse occurred; the black bands had almost vanished, being represented only by two thin black lines and a black discal spot. The scales on thorax and abdomen were also much whitened.

The females vary in the amount of orange dusting. In some it is absent altogether; while in one I took it is so intense that the insect appears to have an orange ground colour. In two others dull yellow replaces all the orange, and the hair is very short. I also found a female in which the rudimentary flaps representing the fore wings were more than twice the usual length, the hind flaps being normal; doubtless a case of reversion.

I have one other remark to make. The scales on the under surface of both wings are present, very thin, and not overlapping, it is true, but no thinner than on the upper surface; certainly not totally absent, as Barrett has described in his recent work. To the naked eye, however, the under surface does appear smooth and shiny.

[*Nyssia lapponaria* was made known as a British insect in 1871, but only one specimen was then obtained. This example, a male, was taken in Perthshire by Mr. Warrington (Knaggs, Ent. Mo. Mag. vii: p. 282; Ent. Ann. 1872, p. 116; 1874, pl. i. fig. 2). About ten years ago Mr. William M. Christy obtained the species in Scotland; and in 1895 he sent ova to Mr. F. W. Frohawk, who was thus enabled to study the metamorphoses of *N. lapponaria*, and to describe and figure its stages from ovum to imago (Entom. xxviii. pp. 163, 237).—Ed.]

SOME RECURRENT PHASES OF VARIATION IN THE LARENTIIDÆ.

By Louis B. Prout, F.E.S.

I suppose no lepidopterist can take up the systematic study of the variation in a particular family or genus, &c., without being struck with the parallel lines upon which it runs in the several species—a very evident suggestion, we may take it, of community of descent. To be sure, many of the most frequently recurrent phases of variation may almost as aptly be described as characteristic of the whole order of Lepidoptera, subject only to such limitations as are imposed by the nature of the general colour-scheme or pattern; and as some of these will be mentioned in the following tentative notes, I might, if I had not held a lengthy title inexpedient, have more accurately headed them "Some Recurrent Phases of Variation in the Lepidoptera, as especially exhibited in the Larentiidæ"; but it is none the less true that the *emphasis*, if one may so speak, of a particular type of variation is often restricted to a comparatively few families or genera, and that the student therefore gradually comes to associate such type rather with these than with the Lepidoptera *en masse*. Take, for instance, the characteristic costal darkening of *Apamea ophiogramma*, which appears again in one of the forms of the allied *A. secalis* (*didyma*), but is absolutely unknown in many other Noctuid genera, where it might conceivably have occurred; or, again, the pale costa which is apt to characterize certain forms of many Agrotids—*Triphæna pronuba*, *Peridroma saucia*, *Agrotis tritici*, *A. cursoria*, &c. And even some other variations, which appear in a wider range of unrelated genera than these—such, for instance, as the suppression of certain markings, or a variability in their position—are decidedly more prevalent in some groups than in others.

The distinctive types of marking of the Geometrides in general, and of the Larentiidæ in particular, seem to lend themselves to the following frequent phases of variation, amongst others:—melanism; a narrowing of the central area, by approximation of the first and second lines; a breaking up of a normal "central fascia" into lines, or, conversely, a consolidation of what are normally mere lines into a "central fascia"; and a suppression of markings in the basal and marginal areas, often accompanied by an intensification of them in the central. I want to call attention here to some of the principal Larentid species exhibiting these phases of variation, and I have called my notes "tentative" because I have not yet given adequate systematic attention to the matter, and am hoping, by writing on the subject, to obtain supplementary information from fellow-entomologists.

Melanism is, as is well known, of very wide occurrence in our fauna, but I think that even it can only be regarded as really *characteristic* of a comparatively limited number of groups. Confining our attention, for instance, to the Geometrides, we only find it at work to any large extent in two of the principal families, the Boarmiidæ (sens. lat.) and the Larentiidæ, although I admit that they are the two largest numerically; but even in the former of these the distribution of melanism seems somewhat partial and irregular. Thus the "thorns" (Ennominæ), although occasional dark aberrations of *Ennomos quercinaria*, &c., show that they are capable at least of "melanochroism," cannot be said to markedly favour variation in this direction; whereas the Boarmiinæ (the genera *Boarmia*, *Tephrosia*, &c.) show few British species indeed which are free from the tendency. The other principal geometrid families—the Acidaliidæ or "Waves," the Geometridæ or "Emeralds," the Orthostixidæ, Œnochromidæ, Cyllopodidæ, &c., of which we in England know so little—are practically a "negligeable quantity" when we are considering melanism; I am not forgetting a few isolated cases, such as a fine melanochroic specimen of *Acidalia aversata* bred by my friend Mr. W. G. Sheldon, but (with all deference to the Evolution Committee of the Royal Society) I cannot allow that the Linnean (banded) type of this species has any right to be included in the series of melanic forms. As to the absence of prominent melanism in the tropical families, &c., I can only say that, so far as is at present known, it seems to be mainly a phenomenon of the fauna of the holarctic region.

In the Larentiidæ melanism is decidedly conspicuous. Several species of *Eupithecia*, &c., have very interesting black or blackish forms—e. g. *Chloroclystis rectangulata* (ab. *nigrosericeata*, Haw.), *Eupithecia albipunctata* (ab. *angelicata*, Barr.), *E. virgaureata* (? var. *altenaria*, Stgr., pro parte), *E. vulgata* (ab. *subfuscata*, Haw.), *E. denotata* = *campanulata* (? var. *atraria*, H.-S.), &c. The Shetland form of *E. venosata* (var. *fumosæ*, Gregs. = *nubilata*, Bhtsch.*) is likewise well on the road towards melanism, compared with the pale typical form of the species. In *Larentia* (in sens. Guen.) we get *L. multistrigaria* (ab. *nubilata*, Tutt), *L. cæsiata* (ab. *glaciata*, Germ.), *L. flavicinctata* (Staudinger has recently named our dark Scotch race var. *obscurata*), and even *L. didymata* (ab. *nigra*, mihi, n. ab. = Barrett, Lep. Brit. viii. 176, pl. 346, fig. 2*c*). In *Hydriomena* (*Ypsipetes*), nothing could be much more extreme than some of the forms of *H. furcata* (*sordidata*). In *Thera*, *T. variata* var. *obliterata*, B. White

* I cannot trace the original reference to Gregson's overlooked varietal name, but it is certainly long prior to that of Bohatsch, for it appears in Robson & Gardner's list, 1886; probably it was a manuscript name before that date. I have to confess that I had also lost sight of Gregson's name for the Orkney var. of the same species—var. *ochraceæ*, Gregs. (Young Nat. vii. 128)—and renamed it *orcadensis* (Ent. Rec. xiii. 336).

(*scotica*, Stgr.), is sometimes intensely black. *Xanthorhoë*, *Epirrhoë*, &c. (*Melanippe*, Dup. et Gn., nom. præocc.*), furnish several interesting examples, especially as we get towards the north and east of their range—I imagine we must place North America to the northward from this point of view, as the connection seems to lie between Icelandic forms and those of Labrador, &c.; though I believe some run a long way south in the Rocky Mountains. Thus there are *X. fluctuata* var. *neapolisata*, frequent in Scotland, and the more extreme var. *thules* in Shetland; *E. alternata*, Müll. = *sociata*, Bkh., darkened in the Hebrides (var. *obscurata*, South); *Melanthia procellata*, almost melanic in Japan (var. *inquinata*, Butl.); *E. hastata* and *E. luctuata*, Schiff. (*lugubrata*, Stgr.), often extremely black in Labrador and the Rockies, &c. (var. *gothicata*, Gn., and var. *obductata*, Moesch., respectively; Petersen, Lep. Estl. 131, has recently added a "var. *borealis*" to the latter, occurring in Esthonia and in Northern Finland, and making a transition to the var. *obductata*). *E. hastata* is also darkened in Iceland, producing the curious "Darwinian species," *thulearia*. In Guenée's incongruous genus "*Melanthia*,"† melanism is well known in our interesting Scotch forms of *M. bicolorata*, and has even occurred in such an unlikely species as *M. albicillata* (ab. *suffusa*, Carrington). In *Perizoma*, Hb. (*Emmelesia*), it crops up in a very marked form in the Shetland var. *thules* of *P. albulata;* in *Oporabia*, in all the species; in *Venusia*, in the type-species *cambrica*. In "*Cidaria*," as used by our British writers, there are several interesting examples, such as *C. suffumata* ab. *piceata*, *C. truncata* and *C. immanata*, *C. populata* ab. *musauaria*, *C. testata* var. *insulicola*, Stgr.—our Shetland form. Lastly, I must not omit to mention the wonderful Irish forms of *Camptogramma bilineata* dealt with by Mr. Kane (*vide* Irish Nat. v. 74–80, 1896; Entom. xxxi. 85, 1898), and unaccountably overlooked in Staudinger's 'Catalog.' These are ab. *hibernica*, mihi,‡ = *infuscata*, Kane nec Gmppbg., with almost unicolorous fuscous-brown fore wings, and the still more extreme var. *isolata*, Kane, with all the wings sooty black.

The next phase of typical variation to be considered in the family is the narrowing of the central area. This is, I suppose, liable to occur in any species which has the wings divided by

* I have endeavoured to use chiefly generic names familiar to British readers, but I cannot bring myself to perpetuate error by maintaining a homonym, against all canons of zoological nomenclature.

† Guenée's *Melanthia* does not even retain the type of Duponchel's genus of that name, which the author himself fixed as *procellata;* as *procellata* seems to be *sui generis* (*cfr.* Tijd. Ent. xxxii. 207), it ought to be known as *Melanthia procellata*, not as *Plemyria*, Hb., as proposed by Snellen; the type of *Plemyria* is *bicolorata*, Hfn. (not "Hb."), as stated by Hulst.

‡ The "Geometrides" in Mr. Tutt's valuable "List of Species, Varieties, and Aberrations of Lepidoptera, so far only recorded from British Localities" were written up entirely by me (*i. c.* Ent. Rec. xiv. 202–204), although not so indicated.

transverse lines at all, and one meets with it occasionally in *Macrothylacia rubi*, in certain Noctuids, &c. But so far as my observation goes, it is nowhere else so persistently recurrent as in the Larentiidæ. There are very few of our "carpet-moths" in which it is not recorded, and in many it has appeared repeatedly; so that most of our moderately large collections can boast some characteristic examples of it. When I was specially interesting myself, some ten or eleven years ago, in *Coremia ferrugata* and *C. unidentaria*, I obtained information of the existence of some half-dozen very striking examples of the extreme narrowing of the median band in the latter (ab. *coarctata*, mihi, ex Warr. MS.), and I have since heard of others, and of two or three in the allied "*ferrugata*" (rightly to be called *spadicearia*, Schiff.). In *C. designata*, my friend Mr. Goldthwait has bred some nice examples, and one of Mr. Sydney Webb's is figured in Barrett (pl. 343, fig. 2 *b*); in *C. munitata* I have myself taken one in Aberdeenshire; whilst in such species as *Xanthorhoë fluctuata*, *X. montanata*, and *Epirrhoë alternata* (*sociata*), quite a large number are known. Are our friends on the Continent less keen on these chance aberrations than we? I have a rather extreme, narrow-banded *X. montanata* from Hamburg, priced at sixpence (only six times the value of typical specimens), which seems to me strictly parallel to the extreme *Coremia unidentaria* ab. *coarctata*, a form that fetches about a sovereign at Stevens'. My specimen of *Melanthia ocellata*, figured by Barrett, plate 338, fig. 2 *b*, was most generously presented to me by my old friend Dr. F. J. Buckell, who took it at Wimbledon on June 5th, 1890, and has been recorded by him. I have never yet seen nor heard of another to equal it, though specimens with the band narrowed to a less extreme degree turn up occasionally; but as the extreme form is always liable to recur, and most of the aberrations of this nature have received, or are receiving, distinctive names for convenience of recording, I propose to apply one in the present case as follows:—

Melanthia ocellata, L., ab. *coarctata*, mihi, n. ab. Median band extremely narrow, width hardly exceeding 2 mm. at the widest part, and the boundaries almost meeting at the narrowest. Type figure, Barrett's 'Lepidoptera of the British Islands,' vol. viii. pl. 338, fig. 2 *b*.

In *Perizoma* (*Emmelesia*) I have a North Devon specimen of *P. tæniata*, agreeing with Strand's recently described ab. *angustifasciata* (Arch. Math. og Nat. xxv. No. 9, p. 17, 1903)—"the dark median band so narrowed that its breadth is scarcely one-sixth of the wing-length." In *Anaitis plagiata*, the narrowing of the central area results in a very striking aberration, fairly well known to British entomologists, though, I think, unnamed as yet; for here, always and necessarily, we get what only extremely rarely happens in the forms with wider central area—that area

entirely filled in with dark colour, making a "central fascia," and rendering the popular name of "the treble bar" a misnomer.

It is very interesting to trace the still further reduction of the central area, resulting in the breaking up of the band into two separated portions, both of course very narrow; and finally in its almost reaching "vanishing point," a minute portion around the discal spot generally persisting. Of the former phase, *Epirrhoë alternata* (*sociata*) ab. *degenerata*, Haw., is a good example; *vide* Barrett, Lep. Brit., pl. 337, fig. 3 *a*, for an extreme development of it, and fig. 2 *a* for a similar thing in *E. rivata*. Mr. Embr. Strand, of Christiania, is to some extent following Mr. Cockerell's advice (Entom. xx. 151), by employing a uniform terminology for this variation, for he has already described it in several species as "ab. *constricta*." His *Larentia montanata* ab. *constricta* (Arch. Math. xxv. No. 9, p. 19, 1903) is synonymous with my ab. *degenerata* (Ent. Rec. vii. 249, 1896), suggested on the analogy of Haworth's "*degenerata*" mentioned above. Of the latter phase (reduction of band almost to vanishing point) I can cite well-known examples in *Thera variata* (compare Barrett, pl. 366, fig. 3 *b*), in *Xanthorhoë fluctuata* (ab. *immaculata*, Tutt, Ent. Rec. i. 322, et ab. *deleta*, Ckll., Ent. xxii. 100, *cfr.* Ent. Rec. viii. 103, 164), *X. montanata* (ab. *albicans*, Strand, Nyt. Mag. Nat. xxxix. 59, 1901, compare Barrett, pl. 341, fig. 1 *c*), &c.

The third line of variation which I mentioned as characteristic of the family, was in the dissolution or consolidation of the central fascia. What I mean is, that several of the banded species show a tendency to break up into the "waved" or lineated type of markings, which was perhaps the more ancestral; while several of the waved occasionally develop a well-marked dark central band. Of the former class I may instance the species of *Coremia*, and notably *C. munitata* var. *algidata*, Mösch., from Lapland; *C. spadicearia* (*ferrugata*), in some of the Scotch and Irish forms, &c.; and *C. quadrifasciata* ab. *dissolutaria*, Petersen (Lep. Estl. 127, 1902)—"alis anticis fascia media in strigis dissoluta." In the direction of consolidation I instance Mr. Sydney Webb's marvellous aberration of *Eucosmia undulata*, figured by Barrett, pl. 363, fig. 3 *a*; the well-known Rannoch forms of *Lobophora carpinata*; *Cheimatobia brumata* ab. *hyemata*, Huene, Berl. Ent. Zeit. 1901, pl. vi, fig. 3, Barrett, pl. 372, fig. 2 *c*; the corresponding *C. boreata* ab. *fasciata*, Petersen, Lep. Estl. 120; *Oporabia dilutata* ab. *latifasciata*, mihi, Entom. xxxiii. 60, pl. ii, fig. 12, = *bicinctata*, Fuchs, Jahrb. Nass. liii. 58; besides occasional aberrations of the variable *Camptogramma bilineata*, of *Venusia cambrica*, &c.

Finally, and perhaps closely connected with the last-mentioned massing of lines to form a dark central band, we get the not infrequent suppression of markings in the basal, and espe-

cially in the marginal areas, "often accompanied," as I said above, "by an intensification of them in the central." A perfect example of this is the exquisite *Cidaria suffumata* ab. *porrittii*, Robs. & Gard. (List Brit. Lep. 45), of the Huddersfield and Dover districts, probably well known to most of my readers, and well figured by Mosley (Var. Brit. Lep., *Cidaria*, pl. 3, fig. 4) and Barrett (Lep. Brit., pl. 359, fig. 1 *d*), with its beautifully clear creamy or even chalk-white wings marked only by the intense basal and central fasciæ and slight apical streak. But of course the existence of this aberration alone would not have warranted my inclusion of it in an article on "recurrent" phases of variation, and I must mention a few others. This is by no means difficult, and indeed some are hardly less striking than *C. suffumata* ab. *porrittii*. Iceland is famous for two of these—*Cidaria immanata* ab. *thingvallata*, Stgr., "al. ant. albid., basi fasciaque media atra vel fusca," and *Larentia cæsiata* ab. *gelata*, Germ.—diagnosed in nearly the same words; something very near the former has certainly been taken in Scotland. Of *Lobophora polycommata*, a very pretty form stands in our museum as ab. *hyemata*, Bkh., with just this same suppression of subordinate markings, leaving the central fascia in the boldest relief. Then, too, I have bred the same kind of thing in *Epirrhoë galiata* from Torquay; and very effective is the unusually dark central area on the clean, almost unmarked, chalk-white ground.* In *Eucosmia certata* Mr. Barrett figures, again from Mr. Sydney Webb's rich collection, an example which combines the narrowing of the central fascia with its darkening, and the disappearance of strigæ from other parts of the wings; it is certainly parallel to the cases we have been considering, although the fact that the ground colour is light brown instead of white renders its general effect somewhat less conspicuous.

I feel that I have by no means exhausted my subject, but I must have exhausted my readers' patience, and it is high time to close. In selecting the Larentiidæ for these investigations, I cannot help feeling that I have made a happy choice, as their dominance in those regions where variability seems to reach its highest point, conduces hardly less to the furnishing of material than does the particular adaptability of their type of pattern; and I could only wish that a larger number of my fellow-entomologists would awaken to a more lively interest in them, instead of reserving nearly all their affection for "tigers" and "magpies."

* The usual Huddersfield form approaches this, but is decidedly less extreme.

A "BUTTERFLY SUMMER" IN ASIA MINOR.

By Margaret E. Fountaine, F.E.S.

(Continued from p. 137.)

Lycæna anteros, Frr.—Fairly common at Broussa the first fortnight in May; singly at Amasia and Tokat. My best specimens of this species I took in some sloping flowery meadows at Arnaoutkeùy, near Constantinople, in the middle of September. It was evidently an autumn brood. The females were easily distinguished from *L. astrarche* by the warm tone of the ground colour underneath; the males not unfrequently had orange spots on the lower margin of the hind wings on the upper side, and the inclination to this was more decided in the autumn brood.

L. eros var. *candalus*, H.S.—Common round Amasia all the summer; the females were, however, rare and difficult to meet with, which was no doubt partly owing to their insignificant appearance.

L. icarus, Rott.—Common everywhere. A beautiful form in the female, shot with blue almost over the entire area of the wings, occurred not uncommonly at Amasia and Tokat. I caught one male at Amasia in July, almost without spots on the under side.

L. bellargus, Rott.—I did not see anything but typical specimens either at Broussa or Amasia.

L. corydon var. *corydonius*, H.S.—I took my first specimen of this lovely variety at Tokat, July 13th, but did not see any more till I returned to Amasia. It was not at all particularly common, and I only took two females, and some ten or twelve males, all told.

L. meleager var. *steveni*, Tr.—All the females belonged to this variety, both at Amasia and Tokat.

L. admetus, Esp.—Common at Amasia in June and July; principally the type, but there was an occasional inclination to var. *ripartii*, Frr., in some of the specimens.

L. mithridates, Stgr.—This was a very rare butterfly, and though I kept a sharp look-out for it, I only took one magnificent male at Amasia, in July, just before I left for Tokat; and afterwards, in August, one female, which, I think, is also *mithridates*.

L. dolas var. *menalcas*, Frr.—First specimen taken on June 20th, in Tschirtschir Valley, where it afterwards became extremely abundant, though the females were always much less common than the males. When flying, the male of this butterfly looks quite white; the ground colour of the under side varied from a dull drab to a pale fawn colour, and in the females the tone was much warmer.

L. hopfferi, H.S.—Also first captured on June 20th, in the Tschirtschir Valley, where it also became extremely abundant at the end of June and throughout July. The females were extremely difficult to distinguish from *L. poseidon*.

L. poseidon, Ld.—This most lovely "blue" was not nearly so common as the two preceding species. It flew at the same time, and in the same localities, but on the Caraman it was rather more common than either of them.

L. damone var. *carmon*, H.S.—This beautiful butterfly elucidated

the difficulty of distinguishing their females by appearing some ten days before the other closely-allied species; also she has the fringes of her wings white, instead of pale brown, as was the case with all the others. I first caught it on the Caraman on June 10th; but at Tokat, in the middle of July, it was apparently quite fresh out, and in fine condition, when every sign of it had long since disappeared at Amasia.

Var. *iphigenia*, H.S.—I took two examples of a paler blue at Tokat, which I suppose would be classed as belonging to this variety.

L. argiolus, L.—In the Kerasdere, &c., near Amasia, in June.

L. sebrus, B.—Fresh out on the Caraman and other places, end of May and beginning of June.

L. semiargus var. *bellis*, Frr.—A few very fine specimens at Broussa in May; one at Amasia in June; and a few, not very fresh, from the pine forest on the old Silva Road, near Tokat, in July.

L. cyllarus, Rott.—Common at Broussa in May.

L. iolas, O.—A remarkably fine form at Amasia in June, and Tokat in July. The specimens were fresher at Tokat, and I hoped for a second brood at Amasia, which, however, did not appear.

Libythea celtis, L.—Common at Amasia and Tokat.

Limenitis camilla, S.V.—At Broussa in May, and again in August and September. The autumn brood of this species was extremely plentiful. It also occurred at Amasia.

V. Grapta egea, Cr.—At Amasia in July, but rare.

V. G. c-album, L.—At Broussa in September. I took one specimen in which the dark marginal borders on all the wings were replaced by a pale greenish ochre, and the under side was a plain dull drab, with the markings much less distinct than is usual with this species, but the c mark is quite typical. The rest of the specimens from Broussa are of the form that is dark underneath. What is the rule (if there is one) about these light and dark "commas?" Of three I have from North Italy, one is light, one is inclining towards being dark, and the other is quite dark; they were all summer broods taken in the month of August, in different localities, the two first on the plains, the last-named in the mountains. One I have from Switzerland, in July, and another from Sicily, in June, are both light. One from Austria, and two from South-east Hungary, all in July, are decidedly inclined to be dark; therefore I cannot see that they can be said to be influenced by season or altitude, but I do not recollect ever having taken the two forms flying together at the same time and place.

Vanessa polychloros, L.—Fairly common round Amasia throughout the summer.

V. xanthomelas var. *fervida*, Stdg.—I took only one specimen on the Lokman, but saw several others; I did not observe it in the valleys. It seems to me to come nearer to *V. xanthomelas* than it does to *V. polychloros*, indeed I find it difficult to separate it from the former at all.

V. urticæ var. *turcica*, Stgr.—I secured over a hundred "lesser tortoiseshell" larvæ at Broussa, in April; and after Bersa had endured having his fingers stung with nettles several mornings, procuring their food-plant, they all duly pupated. I had expected that a good percentage of them would also have been "stung" in a different way, but as this was the case with only one out of all the number I had, there was indeed more than enough when the butterflies began emerging in the

beginning of May. Some were almost typical, others inclined towards the variety, and a good many decidedly belonged to it, though scarcely any quite so much so as those I have (also bred) from the Cedar Mountain in the Lebanon.

V. io, L.—There were hybernated specimens at Broussa in April, but I did not see it again in the autumn.

V. antiopa, L.—Rare in the neighbourhood of Amasia. I only caught two, both in the Tschirtschir Valley in June, and saw no others, except a few hybernated specimens in the Kevasdere.

Pyrameis atalanta, L.—Generally distributed.

P. cardui, L.—Towards the end of July, when I first got back to Amasia from Tokat, a perfect plague of these insects was swarming everywhere; there were hundreds and thousands of them, from the top of the Lokman down into the hot valleys below. They were all in perfect condition, and had no doubt been reared on the dwarf yellow thistles, which grew everywhere, by the roadsides, up the valleys, and on the mountains. It was quite a nuisance; everything else seemed for the moment to be comparatively exterminated by this gigantic visitation of "painted ladies." For three or four days I was quite in despair over them; then all at once, to my intense relief, they suddenly disappeared, nothing but a stray specimen here and there was to be seen; evidently a huge migration had taken place, for which I felt I could not be too thankful.

Thaleperis ionia, Ev.—The first brood was practically over when I first got to Amasia, but I knew it would come again, so awaited reappearance with hope and patience. Guelly and the Kevasdeve were the two best localities for this most interesting butterfly, and at the end of June it was soon common enough, but difficult to catch, as it generally flew far out of reach, hovering over the upper branches of the *Celtis* shrubs, which unluckily grew here to the size of big trees. It resembled an *Apatura* in its predilection for one special twig, to which, if not seriously alarmed, it would return again and again with unerring persistency; alas, that this favoured twig should so often have been just out of reach of the net. However, I got a very good series of males, though only three females. One of these Bersa caught, settled on me. We were stalking it with great excitement, when I felt something suspiciously like a stroke from the "business end" of a butterfly-net across my shoulders, and immediately guessed what had happened. Another I took early in June, and she was evidently a belated specimen belonging to the first brood. I did not see this butterfly at Tokat, though there was plenty of *Celtis* there. I also searched, even at Amasia, in vain for the larva; the *Celtis* trees were too plentiful and too tall.

Melitæa aurinia var. *provincialis*, B.—A few specimens, mostly worn, on June 4th, at one particular place on the Lokman, shown to me by Professor Manissajian's old guide.

M. cinxia, L.—Common at Broussa in May; it also occurred at Amasia.

(To be continued.)

CURRENT NOTES.

By G. W. Kirkaldy.

(Continued from p. 139.)

Bergroth (3) describes several new myrmecophil Rhynchota; among the Pyrrhocoridæ [Lygæidæ *auctt.*], *Neoblissus parasitaster*, a new genus and species from Brazil allied to *Blissus*, living in the nests of *Solenopsis geminata* (Fabr.). Wasmann states that the aphoid appearance of the young larvæ and the investment of fine yellow hairs of the adults seem to point to a true guest-relation (myrmecoxeny); but Bergroth notes that *Blissus*, which is not myrmecophil, has similar larvæ and a similar pilosity. In the Reduviidæ is noted *Enicocephalus* (or, as Bergroth spells it, "*Henicocephalus*") *braunsii*, a new species from South Africa, which lives in the nests of *Rhoptromyrmex transversinodis*, Mayr, an ant very much smaller than its visitor. This is the first known myrmecophyl Enicocephaline, and as this subfamily is insectivorous, the new form is probably myrmecophagous. In the Miridæ, *Lissocapsus wasmanni*, a new genus and species very near *Systellonotus*, Fieber. This is from Madagascar, and lives in the nests of *Cremastogaster ranavolonis*, Forel. Bergroth also mentions the occurrence of *Triphleps niger*, Wolff, in the nests of *Lasius flavus* in Germany.

Alfken (4) gives lists and descriptions of the insects collected by Schauinsland in the Hawaiian Isles, Laysan, New Zealand, and Chatham Island, during 1896 and 1897. The double plate contains six beautifully coloured figures of *Pyrameis gonerilla* and *itea* [Lep.] and ten plain figures of Orthoptera.

Turner (5) has commenced a revision of Australian Lepidoptera, beginning with the Notodontidæ and Yponomeutidæ; in these families seven genera and seventeen species are described as new.

The historian of the American Membracinæ has now given us [6] a monograph of the Australian forms; fourteen genera and thirty-two species are noted—surely a small proportion of the entire membracine fauna of Australia. Some of the species of *Tragopa* live in the ground in the nests of ants.

Among other recent publications may be noted:—

7. C. Börner: "Zur Klärung der Benigliederung der Ateloceren" (Zool. Anzeiger, xxvii. 226–43; text-figs. 1–5 (1904)): a Survey of Limb Articulation in the Arthropoda.
8. E. H. Sellards: "Discovery of Fossil Insects in the Permian of Kansas" (American Journ. Science (4) 16, pp. 323–4 (Blattidæ) (1903)).
9. H. Gadeau de Kerville: "L'accouplement des Forficulides" (Bull. Soc. Ent. France, 85–7; 1 text-fig. (1903)).

10. G. de Rocquiny-Adanson: "Accouplement de Névroptères" (*l. c.* 227 (1903)).
11. J. E. Guthrie: "The Collembola of Minnesota" Geol. & Nat. Hist. Survey Minn., Zool. no. 4, pp. 1–110, 16 plates (1903) [18 new species]).
12. T. Garbowski: "Parthogenese bei *Porthesia*" (Zool. Anzeiger, xxvii. 212–14 [Lepid.] (1904)).
13. W. P. Cockerell: "A Trip to the Truchas Peaks, New Mexico" (1903 [pub. 1904?]). American Nat. xxxvii. 887–91). Several insects recorded, with a new var. of *Bombus* [Hymen.].
14. W. W. Froggatt: "Notes on the Genus *Psychopsis*, Newman, with descriptions of new species" (Proc. Linn. Soc. New South Wales, xxviii. 453–6, pl. 21 (1903) [Neuroptera]).
15. G. d'Utra: "Contra os inimigos do fumo" (Bol. da Agricultura Sao Paulo, iv. 111–22; 3 text-figs. (1903)). Notices of a number of enemies of the tobacco plant.
16. Adolph Hempel: "Notas sobre alguns insectos nocivos" (*l. c.* iii. 237–55 (1902)). Notes on some of the insect pests of S. Paulo, containing detailed descriptions of several Brazilian Coccidæ and Aleyrodidæ.

(To be continued.)

ON SOME NEW GENERA AND SPECIES OF HYMENOPTERA.

By P. Cameron.

CHALCIDIDÆ.

(Continued from p. 111.)

Oncochalcis, gen. nov.

Antennæ short, thick, eleven-jointed, the scape not reaching to the ocelli; they are widely separated from the mouth. Mandibles 3-dentate; the teeth small, the central smaller than the others, almost obsolete. Temples short; the occiput transverse. Parapsidal furrows distinct, curved. Scutellum large, its apex broadly rounded, with a short projecting border. Metanotum short, reticulated, its apex with a steep slope. Abdominal petiole sessile, the ovipositor short. Hind femora largely thickened, beneath minutely dentate. Middle tibiæ spined. Submarginal vein twice the length of the marginal, the postmarginal half the length of the marginal, the stigmal vein short, about twice longer than broad. The mandibular teeth are small and indistinctly separated; the first abdominal segment is about one-third shorter than the others united; the scape of the antennæ is half the length of the flagellum; the femoral teeth in one species are distinct, in another indistinct.

ONCOCHALCIS MARGINATA, sp. nov.

Black; the tegulæ, apical third of anterior, apical fourth of four posterior femora, and the tibiæ and tarsi bright luteous; the four front tibiæ with a dark fuscous band on the basal half; the hinder femora with five stout teeth on the apical half, the apical two close together, the others more widely separated; the base indistinctly toothed; the apex of clypeus with a distinct projecting border, which is widest in the middle; the median segment coarsely and distinctly reticulated, the base with a row of areæ, of which the middle two are the wider. Wings hyaline, the nervures black. ♀. Length, 5–6 mm.

Hab. India.

Scape of antennæ shining, covered with a microscopic down; the flagellum opaque, covered thickly with a pale pile; the third and fourth joints equal in length, the last pale and hollowed on the apex in the centre. Front and vertex rather strongly punctured; the lower part of the front, the sides, and to a less extent the centre of the face, thickly covered with longish silvery pubescence. In the centre of the face is a smooth, shining, raised plate, which is obliquely narrowed above; the lower part slightly narrower and roundly incised laterally. Clypeus smooth, punctured closely in the centre. Apex of mandibles broadly piceous, the base opaque, closely punctured. Pro- and meso-notum closely punctured, the centre of the latter more strongly than the sides; the sides of the former indistinctly bordered at the base; the parapsidal furrows curved, shallow. The areæ on the metanotum are irregularly striated; the central basal is sharply, obliquely narrowed at the base. Propleuræ irregularly striated in the centre; the upper part of the meso- smooth, and with a row of large round foveæ; the lower coarsely, irregularly longitudinally striated and reticulated; the rest smooth, with the upper two-thirds irregularly striated. Metapleuræ closely, irregularly rugosely reticulated. The third and following segments of the abdomen are thickly covered with white pubescence; the penultimate segment closely and strongly punctured, and thickly covered with long silvery pubescence. The lower part of the outer orbits are distinctly margined, as is also, less strongly, the lower part of the malar space, the border on the latter being shining; the inner side has also a shining margin, which is continued obliquely upwards below the eye.

May be known from *O. deesæ* by the stronger femoral teeth, by the more strongly developed temples, and by its more robust form.

ICHNEUMONIDÆ.

CŒLOJOPPA, gen. nov.

Scutellum not much raised, its sides distinctly keeled to near the apex. Median segment completely areolated; the areola large, transverse at the apex; the basal half obliquely narrowed, with the centre at the base rounded; the segment is large; its apex has an oblique slope, and is toothed above laterally. Head large, the temples large, roundly narrowed; the occiput roundly and deeply incised, margined above. Face and clypeus flat, not separated; the apex of clypeus

broady transverse. Labrum hidden. The upper tooth of mandibles much longer than the lower. Palpi longer than usual. Areolet 4-angled, the nervures uniting above; there is a short stump of a nervure on the disco-cubital; the transverse basal nervure is interstitial. Petiole long, the post-petiole not much widened. Gastrocœli shallow, widely separated. Legs moderately long; the tarsi much longer than the tibiæ and sparsely spined. Antennæ long, distinctly dilated towards the apex. Eyes large, parallel, reaching below the middle of the face, the malar space being less than the length of the scape of the antennæ.

Comes near to *Charitojoppa* and *Xenojoppa*.

(To be continued.)

NEW CULICIDÆ FROM THE FEDERATED MALAY STATES.

By Fred. V. Theobald, M.A.

(Continued from p. 113.)

Genus Hulecoeteomyia, n. gen.

Head mostly covered with flat scales, but there is a pronounced median area of narrow-curved scales, which also exist along the nape and around the eyes. Palpi short in the female; in the male the palpi are long, but *shorter than the proboscis*, thin and devoid of hair-tufts; the apical joint about half the length of the penultimate. Scutellum with a rosette of flat and somewhat spindle-shaped scales to mid-lobe, scattered ones of similar form on lateral lobes; prothoracic lobes with small flat scales; fork-cells small.

This genus can at once be told by the cephalic characters, and by the scutellar scales, which, as pointed out by Dr. Leicester, differ entirely from those in *Stegomyia*. I have not yet detected any scales in the *Culicina* like those of the scutellum in this genus; they are somewhat difficult to make out in form, but apparently are all rounded apically, not pointed as in true spindle-shaped scales.

A single species has so far only been taken. They might easily be mistaken for Stegomyias unless microscopically examined.

Hulecoeteomyia trilineata, Leicester, n. sp.

"Thorax rich brown, with three narrow golden lines, the median one entire, the lateral broken before the roots of the wings. Abdomen black, with pearly white lateral basal spots in the female, with narrow white bands in the male. Legs black, basally pale-banded, most prominently on the hind legs. Fork-cells short. Male palpi about four-fifths the length of the proboscis.

"♀. Head black, clothed with flat black scales and numerous upright black forked scales; there is a line of narrow-curved scales,

creamy yellow in colour, running down the centre and along the orbital margins, and behind over the nape, scattered among the flat black scales, are a few white narrow-curved ones; laterally there is a patch of white flat scales succeeded by black scales, which are followed again by white scales; on the vertex, projecting forwards between the eyes, is a tuft of pale golden bristles; there are other bristles along the orbital margins which are black at the base and pale at the tip. Antennæ with the basal joint dusky black, with small black spindle-shaped scales on its inner face (in some specimens this joint is ferruginous), remaining joints black; second joint black-scaled; verticillate hairs black; all the joints after second clothed with short silky white hairs. Clypeus black, frosted. Palpi yellowish-brown, four-jointed; first joint constricted in the middle; fourth joint very small, clothed with black spatulate scales except towards the tip, which is white-scaled. The amount of this white scaling varies. In one specimen it includes little more than the last joint, in another one it includes half the penultimate joint. Proboscis yellowish-brown, black-scaled dorsally and laterally; beneath it is white-scaled; about half way white scales appear laterally, and may even go right round, forming a complete band. Prothoracic lobes simple, prominent, white-scaled. Mesonotum dark brown, clothed with narrow-curved scales, black under a hand lens, but under a two-thirds power the tips appear pale golden; there is a central line of pale golden scales which forks in front of the scutellum, enclosing an unscaled area; on either side there is another line which runs back about one-third the total distance; placed a little further out is another line running forwards from the scutellum and ending just a little to one side of the anterior lateral line; there is another golden line over the roots of the wings, and on the anterior margin, just above the prothoracic lobes, are scattered white scales; there are numerous black bristles arranged in lines. The scutellum is fawny brown; on the central lobe there is a patch of black almost spindle-shaped scales arranged in a rosette, with a central line of creamy white scales which become narrow-curved scales at the apex of the scutellum; the lateral lobes have a few black narrow-curved scales. The scutellum is not heavily scaled, and the scales are quite unlike those of an ordinary *Stegomyia;* there are four to six bristles on the central lobe, two of which are pale golden, four black. Pleuræ dark brown, with patches of broad white scales. Wings clad with black scales; median scales rather long and narrow spatulate-shaped; lateral scales lanceolate; some white scales on the costa at its base. Fork-cells of moderate length; first submarginal longer and narrower than second posterior, its base nearer the base of the wing, the cell longer than its stem. Supernumerary and mid cross-veins meeting at an angle; posterior cross-vein twice its own length from mid cross-vein. Legs with the coxæ creamy yellow; femora of fore and mid legs black-scaled dorsally and laterally, white-scaled beneath; a ring of golden brown spines around the apex; tibiæ the same as femora minus the spines, except that the extreme apex is clothed with a few creamy yellow scales; metatarsus and first tarsal joint basally banded with creamy yellow, the remainder black-scaled; ungues equal and uniserrate; hind femora scaled as the others, except for a patch of white scales about the middle of the anterior and posterior surfaces;

knee spot creamy; tibia entirely black-scaled, with four lines of short white spines running down its whole length; metatarsus basally banded; first two tarsal joints very broadly basally banded with creamy white. Ungues equal and simple. Metanotum dark chestnut-brown. Halteres with black-scaled stems and white-scaled knobs. Abdomen black-scaled; a few white scales at the bases of the segments after the second, but scarcely amounting to basal banding in some specimens; laterally there are triangular patches of white scales, and ventrally the segments are basally banded white.

"♂. Head as in the female; the antennæ have pale internodes and dark nodes; the two last joints are very long; verticillate hairs long and black; palpi about four-fifths the length of the proboscis, dirty white, black-scaled; a naked area in the middle of second joint which shows white under a lens; white scales, which may or may not form a complete band, at the apex of the second and third joints; these scales may involve both sides of the joint—they are variable. Proboscis long, black-scaled, with a narrow band of white scales about its centre. The thoracic scaling is the same as in the female, and the leg scaling also. Wing scaling similar but not so heavy. Abdominal banding more marked, all the segments showing fairly broad basal white bands and large lateral spots. The penultimate segment shows a dorsal patch of white scales with a pearly lustre. The fore and mid ungues large, unequal, larger tooth biserrate. Length, female, 5 mm.; male, 4 mm."

Time of capture.—April.

Habitat.—Kuala Lumpur.

(To be continued.)

NOTES AND OBSERVATIONS.

British Diptera Wanted.—I should be much obliged if anybody would send me fresh or recent specimens, for examination and description, of :—

Xylomyia varia, Meig. (male and female), and *X. marginata*, Meig. (female).

Beris geniculata, Hal. I know the female of the species, which is distinct from *B. fuscipes*, but I have not seen a male.

Sargus. Any yellow-legged species except *S. flavipes;* also *S. nubeculosus* (male), if such a thing exists.

Pachygaster minutissima, Zett.

Stratiomys furcata, Fall. I cannot distinguish what I have seen from *S. riparia*.

Odontomyia. Any species except *O. ornata*, *tigrina*, and *viridula*. I expect three or four species unknown to me occur in Britain.

Oxycera dives, Lw. (female), and *O. falleni*, Staeg.

Nemotelus brevirostris, Meig. I fear all ours are *N. nototus*, Zett.

Leptis conspicua, Meig. Said to be common in some places, but although I can distinguish *Syrphus ribesii* and *vitripennis* by the naked

eye at half a dozen yards' distance, I cannot distinguish *L. conspicua* yet even with the aid of a microscope.

L. strigosa, Meig. I have never seen any British specimens at all like this.

L. sp. ? One or two large species of *Leptis* occur in Britain which have no yellowish markings. I want to see more of them.

L. annulata, De G. I have never seen this from Britain.

Symphoromyia melæna, Meig.

Spania nigra, Meig. (female).

Xylophagus cinctus, De G.

Hæmatopota italica, Meig. (male). The species probably occurs freely at the mouth of the Thames Valley.

Tabanus glaucopis, Meig. (male).

Chrysops sepulcralis, Fabr.

Anthrax. Any clear-winged species except *A. paniscus*. I believe at least three others occur in Britain.

Bombylius. Any clear-winged species.

Psilocephala ardea, Fabr.

Oncodes pallipes, Latr., and *O. varius*, Latr.

Dioctria linearis, Fabr., as distinguished from *D. flavipes*, Meig.

Asilus. Several species unknown to me ought to occur in Britain belonging to the old genus *Asilus*, especially such as *Antipalus varipes*, Meig., *Neoitamus socius*, Lw., *Dysmachus* sp. ?, &c.

Eutolmus rufibarbis, Meig.

Scenopinus niger, De G., and *S. glabrifrons*, Meig. (male).

Or anything else apparently unrecorded as British in the above families.—G. H. Verrall ; Sussex Lodge, Newmarket, May, 1904.

Winter Treatment of Pupæ.—It might be interesting to others, as well as myself, if we could have a short discussion on the best method of keeping pupæ through the winter. The Rev. J. Greene, in his very practical book, mentions that he never "damps" his pupæ, and certainly I know personally that he has been very successful in rearing them. On the other hand, other entomological luminaries give elaborate directions for "damping" pupæ, and presumably are successful also. And to come to my own small experiences, I have found that if I keep pupæ without moisture they as a rule dry up, so that not one in ten emerges ; while if I damp them a larger proportion emerge, but a good many grow mouldy. It seems reasonable to suppose that some moisture would be beneficial, but probably the mode of application is the difficulty. As I hope that others will give their experiences, may I begin with one of my own ? I once had a brood of forty *Tæniocampa opima*, which I reared in two very large flower-pots half full of earth, into which in due course they retired and pupated in autumn. I left them strictly untouched, but once a month I gave the earth a good soaking from a watering-pot, and in the end the whole forty emerged, without a single cripple or failure of any sort. Now, I should like to combine this question with that of "forcing." And what I wish to know about this is : is forcing likely to be successful with all pupæ, or are there some to which it is simply destructive ? Again, I should like to narrate the system I have been trying during the past winter. I took a large wooden box and balanced

it on the hot water-pipes of a small greenhouse, which are kept hot day and night. In the box I placed a tin tray full of moss so as to retain water and so keep the moss always damp; on top of the moss reposes a smaller wooden box, in which are the pupæ on silver-sand, some with cocoons and some without, and covered over with gauze; finally, the outer box is covered by sheets of glass. The total result of all this is that the pupæ, without touching any damp substance themselves, are kept in a moist atmosphere of about eighty degrees F. This treatment I do not begin before January 1st, as I think the pupæ do not respond before the turn of the year. In some cases the result of it is startling. Thus *Cucullia verbasci*, *Hadena psi*, *Hylophila prasinana*, and a few others, come bolting out of their cocoons within a few days of the warmth being applied. *Cidaria picata* takes about a month; *C. asteris* and *Spilodes palealis* have only just begun to show up after nearly five months' treatment—*i. e.* at nearly the time they would be due naturally; and some, which ought to have been out very early, notably *Endromis versicolor* and *Nyssia lapponaria*, have not put in an appearance at all, but I fear are dead. Is it then possible that the above described arrangement is, in some cases, simply an apparatus for the extensive slaughtering of pupæ? And if so, can anyone say what class of pupæ should not be placed in it? I should be particularly grateful for information as to *N. lapponaria*, and the best way of carrying them through the winter. Being a northern insect, perhaps some exposure to frost would be good for them, followed by a turn in the hot-water machine. It seems to me that a ventilation of ideas on these subjects would be of use to collectors at least (I do not say entomologists!), the object in view being of course to get one's bred insects safely out of the way before the rush of summer collecting begins. In any case opinions as to the best way of keeping pupæ through the winter cannot fail to be interesting and instructive.—W. Claxton; Navestock Vicarage, Romford.

CAPTURES AND FIELD REPORTS.

Clytus arcuatus, L., in North London.—A specimen of this beetle, very rare so far as this country is concerned, was sent to me last year for identification by Mr. J. O. Braithwaite, of Chingford, Essex. It was captured by the warehouseman in Messrs. Bush & Co.'s Stores in Ash Grove, Hackney. On my writing for further particulars, the sender wrote:—"At that time we were having a lot of raspberries up from Welling, in Kent. It was in July, 1903. The man saw this beetle, and thought it was a kind of wasp, and stuck his pen into it before bringing it to me. We had had a recent consignment of chemicals from Germany. It may be that the 'fly' was imported in them, but I am more inclined to think he came with the raspberries." J. W. Williams; 128, Mansfield Road, Haverstock Hill, N.W.

Butterflies at Culliford Tree, Dorset.—It has occurred to me that, although a very large number of entomologists find their way annually to Weymouth, mainly for the purpose of being near Lulworth

for *Adopæa* (*Hesperia*) *actæon*, yet very few of them know of a little spot called Culliford Tree, which is a very El Dorado for entomologists. Several years ago, when a boy at school, I visited this place, and on every visit was eminently successful, but I very rarely heard of anyone else who knew of the locality. Culliford Tree is reached from Weymouth by going along the Preston Road until one is a few yards past the second milestone, and then bearing sharply to the left, and again to the right after a yard or two along Littlemoor Road, one gets into Chalbury Vale. Chalbury is hardly known to entomologists, but here one finds *Lycæna corydon* and *L. bellargus* (*adonis*) in very large numbers. *Zygæna filipendulæ* is also very common here. Continuing up Charlbury valley for about a mile and a half, Culliford Tree is at length reached, and here I obtained last summer several specimens of *Argynnis paphia*, and *A. aglaia* swarmed. Earlier in the year *A. selene* is very common, and *Thanaos* (*Nisoniades*) *tages* and *Hesperia* (*Syrichthus*) *malvæ* are in great numbers. Of the Lycænidæ, *L. astrarche*, *L. corydon*, *L. alexis*, *L. adonis*, and *L. alsus* are found, the latter being very common in July and August. *Colias edusa* and *Gonepteryx rhamni* are found there, but not commonly. Of the Vanessidæ, *Vanessa io*, *Pyrameis atalanta*, *P. cardui*, and *V. urticæ* are common. Of the "browns," *Epinephele tithonus* and *E. ianira* swarm, *Satyrus semele* is fairly common, and *Aphantopus hyperanthus* is common in the wood at the side early in the summer. *Pararge egeria* is also common in the wood, and as for *Melanargia galatea* it is found in every part of the field. I also got a very fine female of *Argynnis paphia* var. *valesina*, and a friend of mine captured another a day or two after I had found mine. I captured a remarkable variety of *L. corydon* here, which showed peculiar melanism on the under side, the markings on all four wings differing one from the other. Altogether, I think Culliford Tree one of the most delightful spots I have ever been to for entomology, and it is not lacking in choice botanical specimens, which may perhaps account for the large variety of butterflies. If you think this worthy of insertion in the pages of the 'Entomologist,' I shall be glad, as I think it very desirable that entomologists should have a knowledge of where to go when in a strange neighbourhood.—W. A. Bogue; Spring Cottage, Shepton Mallet, Somerset, May 6th, 1904.

Deilephila livornica at Bournemouth.—A fine specimen of *Deilephila livornica* was brought to me alive to-day. It was found on a plant in a garden, and had evidently freshly emerged from the pupa, as it is in perfect condition.—G. E. J. Crallan; Bodorgan Manor, Bournemouth, May 22nd, 1904.

SOCIETIES.

Entomological Society of London.—*April* 20th, 1904.—Dr. F. A. Dixey, M.A., M.D., Vice-President, in the chair.—M. Jules Bourgeois, St. Marie-aux-Mines [Markirch], Germany; Mr. James E. Black, Nethercroft, Peebles, N.B.; Mr. Maurice Frederic Bliss, "Coningsburgh," Montpelier Road, Ealing, W.; Mr. Edward F. S. Tylecote, M.A., Durham House, Lansdowne Road, Bournemouth; Mr. Francis

Gilliat, B.A., of Lloyds', E.C., and Forest Dene, Worth, Sussex, were elected Fellows of the Society.—Mr. M. Jacoby exhibited a male specimen of the beetle *Sagra senegalensis* with female characters, received from Mr. Barker in Natal, who had taken it *in cop.*—Dr. Norman Joy exhibited *Orochares angustata*, Ev., taken at Bradfield, Berks, in December, 1903—the second recorded British specimen; a species of *Tychius*, which he said might be a variety of *Tychius polylineatus*, Germ. (not now included in the British list), or, more probably, a new species closely allied to it, taken near Streatley, Berks, last year; and two specimens of *Pselaphus dresdensis*, Herbst, taken near Newbury this year. — Mr. C. O. Waterhouse exhibited an unnamed species of *Nemoptera* from Asia Minor, resembling *Nemoptera huttii* from Australia. —Mr. F. Enock, F.L.S., read a paper on "Nature's Protection of Insect Life, illustrated by Colour Photography," and exhibited a number of lantern-slides.—Mr. P. I. Lathy, F.Z.S., communicated a paper on "New Species of South American Erycinidæ."—A discussion followed on specimens of the dipterous families Stratiomyidæ to Cyrtidæ, opened by Mr. G. H. Verrall, who exhibited specimens, and said the object of the discussion was to determine as far as possible the number and distribution of the British species comprised in these families. The total number of species was but small, as there were only from 130 to 150 species in Britain, but the extreme difficulty consisted in finding out the correct names for them. Col. J. W. Yerbury said that on behalf of Professor E. B. Poulton, F.R.S., he had been asked to exhibit some specimens, mainly interesting on account of the specific names used, which names were useful as showing the nomenclature employed by a past school of dipterologists, and might give a clue to the manner in which some reputed species have found their way into the British list. Dr. F. A. Dixey and other Fellows joined in the discussion. — H. Rowland Brown, *Hon. Sec.*

South London Entomological and Natural History Society.—*April 14th*, 1904.—Mr. A. Sich, F.E.S., President, in the chair.—Mr. Tonge exhibited a series of photographs of the ova of Lepidoptera, including *Pamphila comma*, *Anticlea badiata*, *Biston hirtaria*, *Hoporina croceago*, *Cerastis vaccinii*, and *Hybernia marginaria*. — Mr. B. Adkin, examples of *Pachygastria* (*Bombyx*) *trifolii* showing the two extreme variations of the species in England, together with intermediate forms. The pale form ab. *flava* were from Kent, while the dark forms ab. *rufa* were from the Scilly Islands. — Mr. Main, photographs of *Gonepteryx cleopatra* (bred, from Cannes) and *Nyssia hispidaria* in their resting position, and also of the larvæ of *Selenia bilunaria*. He also exhibited ova of *Colias edusa* var. *helice*, laid by a female specimen sent to him from Hyérès by Dr. Chapman; they were deposited upright on a glutinous, pellucid base, singly or in small batches.

April 28th.—The President in the chair.—Mr. Tonge exhibited an album of photographs of a further series of the ova of Lepidoptera, including *Tæniocampa munda*, *T. instabilis*, *T. cruda*, *T. populeti*, *Asphalia flavicornis*, *Pachnobia rubricosa*, *Asteroscopus nubeculosa*, &c. As several members expressed the difficulty they experienced in breeding the last-named species, Mr. Adkin said that he had been very successful, no doubt from the care he had taken, first, in well washing the

food before giving it to the larvæ; secondly, by giving sufficient friable earth for the larvæ to pupate in; and, thirdly, by never disturbing the pupæ.—Rev. H. Wood exhibited a number of spiders to illustrate his paper, including *Epeira angulata*, *E. gibbosa*, *E. diadematа*, *E. cucurbitina*, and others, obtained by Mr. Carr in the New Forest, with living examples of *Argyroneta aquatica*. — Mr. Carr, a specimen of the rare beetle *Elater pomorum*, taken from a birch stump in the New Forest.— Mr. Garrett, ova of *Brephos parthenias* deposited by a female specimen taken on Wimbledon Common, and placed in a glass shade with twigs of birch in the sunshine.—Mr. Tonge showed photographs of the ova of this species. — Mr. Manger, a very perfect example of the elephant beetle, *Megasoma elephas*, from Venezuela. — Mr. Edwards, specimens of *Papilio neptunus* from the Malay, *P. karna* from Java, *P. andræmon* from South America, and *Morpho anaxibia*, male and female, from Brazil.—Mr. H. J. Turner, living larvæ of (1) *Coleophora lixella*, with the larva-case, which was made of pieces of grass-leaves; (2) *C. conyzæ*, with the case made from the hairy cuticle of *Inula conyza;* and (3) *C. troglodytella*, with the smooth case made of silk. All the material was received from Mr. Eustace Bankes, of Corfe Castle, who obtained it in the Isle of Purbeck, and to whom he was indebted for many details of the life-history of the species. — Mr. Sich, a short series of *Crambus chrysonuchellus* from the chalk-hills east of Guildford, with males and females; also cases of *Taleporia tabulosa* (*pseudo-bombycella*). —Mr. Wood read a paper entitled "Notes on *Argyroneta aquatica* and other Spiders," and a considerable discussion ensued.—Hy. J. Turner, *Hon. Rep. Sec.*

Lancashire and Cheshire Entomological Society. — The Third Ordinary Meeting was held in the Society's Rooms, Royal Institution, Liverpool, on Monday, April 18th, 1901; Mr. Richard Wilding, Vice-President, in the chair. Messrs. William Clitheroe, F.L.S., Ashton-on-Ribble; Thomas Dewhurst, Preston; Walter Rimmer Teare, Birkenhead; and Thos. Temple Morgan, Liverpool, were elected members of the Society. Donations to the Library were announced from Mr. H. St. John K. Donisthorpe, F.Z.S., and the Council of the Manchester Entomological Society. Communications were read by the Secretary from Major Ronald Ross, C.B., F.R.S., inviting the Society to hold its next meeting, on May 16th, in the Johnston Tropical Laboratory, University of Liverpool, and from the Manchester Entomological Society, accepting the invitation to visit Liverpool in October next. On the motion of Mr. J. R. le B. Tomlin, M.A., seconded from the chair, it was unanimously resolved that Rule IV. be reconstructed, to permit of the election of a certain number of persons, residing outside the counties of Lancashire and Cheshire, as corresponding members of the Society, at half the ordinary subscription, such members to enjoy all the privileges of ordinary members. Mr. E. J. B. Sopp, F.R.Met.S., communicated a note "On the Callipers of Earwigs."—Mr. F. N. Pierce, F.E.S., read a paper "On the Minor Structure of the Lepidoptera," in which, by the aid of a long and beautiful series of his preparations shown by the micro-lantern, he was able to show the undoubted general likeness to one another exhibited by the genitalia in certain groups of the order, which was in many cases very marked.

A cordial vote of thanks was accorded the lecturer, on the motion of Mr. Wilding, seconded by Mr. Willoughby Gardner, F.L.S., who congratulated Mr. Pierce on the excellence of his slides, and referred to the interest of the subject, as instanced, for example, in *Agrotis ashworthii*, which was shown by the genitalia to be a *Noctua*. Amongst the exhibits were the following:—By Mr. F. N. Pierce, *Cucullia scrophularia*, *C. verbasci* and *C. lychnitis*, *Acronycta venosa* and *A. albovenosa*.—Mr. Willoughby Gardner, specimens of the carpenter bee, *Xylocopa violacea*, from Northern Italy, with diagrams of its burrows in pine-wood, in showing which he gave some interesting facts of its life-history; also living examples of *Nyssia zonaria*, taken near the mouth of the Conway, North Wales.—Mr. J. J. Richardson, a case of South American, East Indian, and Mayalan hawk-moths.—Mr. J. R. le Brockton Tomlin, long series of the red Elaters, *E. lythropterus*, *E. pomonæ*, *E. elongatulus*, and *E. sanguinolentus*, from Wimbledon, Sherwood, and the New Forest.—Mr. W. Mallinson, ova of *Tæniocampa opima*, in natural position on branches of *Rosa spinosissima*, from Wallasey. — Mr. E. J. B. Sopp, a pair of the largest of the European grasshopper, *Acridium ægyptium*, captured in Southport during 1903. For comparison he also exhibited *Acridium cristatum* from British Guiana, one of the largest of the genus, and *Locusta viridissima*, the largest of our British grasshoppers, from Freshwater Bay, Isle of Wight.—E. J. B. Sopp and J. R. le B. Tomlin, *Honorary Secretaries.*

Manchester Entomological Society.—At the Manchester Museum, Owens College, on March 2nd, 1904, Mr. C. F. Johnson presided. A paper entitled "Sounds produced by Insects" was read by Mr. R. Brauer. Dealing in the first place with Coleoptera, one of the simplest cases is that of the *Anobium*, which produces the noise by the tapping of its body, and, if imitated, will again repeat the sound. Certain Longicorn beetles carry on their hind legs a small file, on which Landois has counted not less than 238 ribs, and this, coming in contact with the body, acts as the stridulating organ. Mr. Brauer also dealt with instances relating to British Curculionidæ, *Necrophorus*, and *Dytiscus marginalis*. In Lepidoptera *Acherontia atropos*, a well-known example, produces the sound, it is said, by rubbing the palpi against the base of the proboscis. *Angeronia feronia*, a South American insect, makes a peculiar clicking, which can be heard for a distance of several yards. In the tropics, the Cicadas become a positive nuisance in places where they abound, on account of the noises produced; to this Darwin, in his 'Descent of Man,' makes special reference. Some scientists believe that a horny scale or drum is responsible for this. Mention was made of *Gryllus campestris*, *G. domesticus*, and *Gryllotalpa vulgaris*; and a certain species, according to Professor Dolbear, acts as a thermometer, for by noting the number of chirps made per minute the exact temperature of the air has been estimated. Other groups dealt with were the Locustidæ, Acridiidæ, and the South African genus *Pneumora*. Singular as it may appear, with few exceptions it is the males that produce so much music in the insect world; doubtless it is intended as calls to the females, or it may be simply expression of joy in life, such as the singing of birds on a summer's day. Again, if so many insects of different orders are endowed with

noise-producing organs, there can be no doubt they also have the sense of hearing. Fresh fields for investigation open at every point, and the subject is one of interest and profit. The paper was followed by a short discussion. Microscopical slides dealing with entomological subjects were shown by Messrs. S. Taylor, R. Brauer, W. Buckley, and E. C. Stump. A number of preserved larvæ were distributed by Mr. W. Warren Kinsey.—Robert J. Wigelsworth, *Hon. Secretary.*

RECENT LITERATURE.

A List of Yorkshire Lepidoptera. By George T. Porritt, F.L.S., F.E.S. (Trans. Yorks. Nat. Union). 8vo, pp. i–xvi and 193–269. London: A. Brown & Sons. 1904.

A Supplement to the List of Yorkshire Lepidoptera, published in 1883, by same author. It contains fifty-three species not found in the first edition; of these seventeen are Tortrices and eighteen Tineæ. Fifteen species which were included in the former list are now withdrawn. The total number of species for the county is given as 1379.

The author's remarks on Melanism, in the preface, are of considerable interest. He mentions twenty-nine species of which black or nearly black examples are of regular occurrence in particular districts in Yorkshire, and, referring to a number of other species, he states that "specimens so much darker than the typical forms are so frequently taken as to indicate that they too are gradually being influenced towards the same end."

The list is a valuable addition to faunistic literature.

Proceedings of the South London Entomological and Natural History Society, 1903. Pp. i–xix, 1–90. With a plate and map. Hibernia Chambers, London Bridge. 1904.

Among other items, this modest little volume contains short papers on holiday collecting at Dawlish, and the reports of field-meetings of the Society held during the year 1903. A chart, or map, accompanying Mr. Robert Adkin's account of the excursion to Limpsfield is especially interesting, as it not only indicates the route taken by the party on that particular occasion, but it will also be exceedingly useful to anyone wishing to further explore the district.

In the Presidential Address, Mr. Edward Step, F.L.S., gives a *résumé* of the year's additions to the British Fauna Lists, and also touches on the subject of the tsetse-flies and their association with the African "sleeping sickness."

The reports of the meetings of the Society occupy over forty pages, and afford much interesting reading,

Obituary.—With much regret we have to announce the death of Mr. Robert McLachlan, F.R.S., &c. A further notice will appear in the July issue.

1.

2.

3.

1. CHLORIPPE GODMANI. 2. MONETHE JOHNSTONI.
3. DELIAS HEMPELI.

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DESCRIPTIONS OF THREE NEW BUTTERFLIES.

BY WALTER DANNATT, F.E.S.

(PLATE VII.)

DELIUS HEMPELI, sp. n. (Pl. VII. fig. 3, under side).

Male. Chalky white, with black markings. Fore wings have the lower discocelluar black, and a broad black patch beyond it, extending from just below the costa to near the outer margin, terminating at the second vein; its inner edge is diffuse, and from its outer edge the black is continued along the veins, forming five elongated white spots on the outer margin. Hind wings white, powdered beyond the middle with greyish, with four cuneiform spots faintly distinguished. Under side fore wings similar to upper side, but the black has a brownish tinge, and is diffused more or less over the whole of the area, the basal and inner margin being yellow suffused with black. Hind wings black, basal area yellow, extending along the inner margin, where it is powdered with black; marginal spots yellow, the upper two longer than the others. The under side of this species (a male) most nearly resembles the female of *Delias candida*, but the fore wings are much lighter, and the spots on under side of hind wings are reddish and of a different form. Expanse, 73 mm.

Hab. Gilolo. I have much pleasure in naming this species after an American friend, Mr. Adolph Hempel.

CHLORIPPE GODMANI, sp. n. (Pl. VII. fig. 1).

Female. Dark chocolate-brown, tinged with fulvous on the outer marginal area, crossed by a broad white band from the subcostal interspace to the inner margin; this is followed by a darker diffuse band. There is a reddish subapical spot, and another between the white band and the anal angle, and some bluish scales beneath. Under side of fore wings pallid; the subapical spot is almost white, the basal third of the wings fulvous, obscured by silver at its extremity and along the costal area, white opaque band; the outer marginal area is duller brown, becoming whitish beyond the cell; the whole area, except the margin itself, is washed with silver, outer margin whitish. Thorax and abdomen brown above, white beneath. This species is

very constant in the markings. Dr. Staudinger says it is nearest to *C. selina* female. Expanse, 68 mm.

Hab. Venezuela. I take the liberty of dedicating this species to Mr. F. Du Cane Godman, D.C.L., F.R.S., &c., through whose generosity our National Collection is being greatly extended, enlarged, and considerably enriched.

Monethe johnstoni, sp. n. (Pl. VII. fig. 2).

Male. Wings orange; apex blunt; external margin black, irregular, widest at the apex. Hind wings: outer margin black, with a narrow metallic green hair-line near the outer edge. Under side similar, but paler, and without the green hair-line. Palpi long. Rather similar in form to *Monethe molione* (Godman), but the apical spot is disconnected in that species. Expanse, 38 mm.

Hab. British Guiana. I have the pleasure of naming this species after Sir Harry Johnston, K.C.B.

SOME NEW OAHUAN (HAWAIIAN) HEMIPTERA.

By G. W. Kirkaldy.

The island of Oahu may be divided roughly into two parts, *viz.* the Forest Region, say, from 1500 ft. upwards, to which for the most part autochthonous insects are confined—and those, indeed, sparsely—and the Lowlands, where introduced plants flourish, and where autochthonous forms are the exception. Around the coast, during the greater part of the year, there is nothing but a dreary vista of algaroba (*Prosopis juliflora*), gluebush (*Mimosa*), and the hateful lantana (*Lantana camara*), all of them destructive to clothing and temper.

Some time, however, during the period which the people here are pleased to call "winter," but which would pass very well for summer in England—and, if I may judge from recent reports, would scarcely be distinguishable from the English summer of 1903—sometimes varying much as to exact time and duration; after the heavy rains of November, December, January, and even, as this year, February and March, a lowly investment of Malvaceæ, especially *Sida*, Linné, and other similar plants, springs up, and with it certain insects found only at such times and in such situations around the Oahuan coast. The spot most convenient for dwellers in Honolulu is the well-known Leahi, or Diamond Head, an extinct crater some six miles from the city.* Inside the crater (near the top of the rim only, for lantana and mimosa now fill the sides and floor), on the sloping sides exte-

* The highest point of Leahi is 762 ft. above sea-level, the floor of the crater being 300 or 400 ft. lower.

riorly and down to the shore, are patches and stretches of *Sida*, &c., where the lantana and mimosa permit them to grow. However, in this coast region one finds *Ithamar hawaiiensis*, *Opuna hawaiiensis*, &c., as well as some of the forms now described. Although all these coast forms are so far not known outside the Hawaiian Islands, it is possible that some may yet be found on the coast-line among the short-lived spring vegetation in some of the southern Polynesian Islands.

Collecting on the mountains often has to be restricted to the knife-like ridges, the sides being almost impassable; in a few, such as the ridge from the Pacific heights to Konahuanui, there is a rough trail. Occasionally one sees a pair of the glorious *Pyrameis tammeamea* coquetting around the top branches of a koa-tree, or in brushing through the tree-ferns one disturbs a nest of hornets (*Polistes hebræus.* Fabr.); but usually insects have to be closely looked for or beaten out of the trees. Sweeping is of no avail, as there are almost no autochthonous species feeding on low-lying plants, and, indeed, there are scarcely any low-lying autochthones on the mountains.

For the present, the reader may profitably consult "Mr. Blackburn's *résumé* of his Journeys and Collecting in the Archipelago" (1885, Sci. Trans. R. Dublin Soc. (ii.) iii. pp. 197–208); soon, however, there will appear the Introduction to the 'Fauna Hawaiiensis,' in which all these matters will be fully discussed.

The genera and species now described are (*=new) :—

Fam. Fulgoridæ, subf. Asiracinæ.
*Peregrinus** *maidis* (Ashmead).
*Megamelus leahi.**
*Aloha ipomoeæ.**
Fam. Tetigoniidæ subf. Jassinæ.
*Deltocephalus hospes.**
*Eutettix perkinsi.**
Fam. Miridæ subf. Mirinæ.
*Haltieus chrysolepis.**

It is hoped that all these will be described in detail, and figured in the 'Fauna Hawaiiensis.'

Peregrinus, gen. nov.

Belongs to the section with short first segment of antennæ, and with lateral keels of pronotum not outwardly deflected, but reaching posterior margin. Somewhat allied to *Megamelus*, Fieber, but distinguished by the more rounded head, much larger and differently formed pronotum, different tegminal venation, &c. Somewhat like *Eueides* (= *Euides*, Fieber, preoccupied), but distinguished by the different form of the keel of the pronotum.

Vertex seven-sided, formed much as in *Eueides*, central keel of front forked nearer to the base than to the apex, somewhat again as in *Eueides*, but a little more roundedly; lateral margins anterior to the eyes subparallel. Antennæ also very similar to *Eueides*, but the second segment a little more dilated apically. Pronotum subrotundately emarginate basally, lateral keels reaching to the base, a little arched outwardly; there is also an impressed dot on each side of the middle keel. Scutellum very large, nearly three times as long medianly as the not insignificant pronotum, the part within the keels produced posteriorly subacutely, this produced part being about one-third of the entire scutellar length; lateral keels straight, slightly diverging posteriorly, widely separated anteriorly from the middle keel. Posterior tibiæ longer than the femora, extending well beyond the apex of the abdomen; first segment of the tarsus much longer than the other two together.

Type, *P. maidis* (Ashmead).

Delphax maidis, Ashmead, 1890, 'Psyche,' v. 323, text figs.

Dicranotropis maidis, Van Duzee, 1897, Bull. Buffalo Soc. Nat. Sci. v. 240.

In his description, Ashmead has omitted to mention a characteristic dark brown elongate spot in the angle formed by the junction of the great claval vein and the interior margin of the tegmen.

Hab. North America: Florida and Texas; on corn and coarse grass. Hawaiian Islands: Hawaii, Oahu, and Kauai; on corn (introduced).

I am indebted to my friend Mr. Van Duzee for a specimen of this insect, which he had before him when writing his paper on the North American forms (cited above).

Descriptions and figures of the earlier stages of this and other forms will, it is hoped, appear shortly in another place.

Megamelus leahi, sp. n.

The short winged form only is known, and is distinguished from the other described species by the shape of the tegmina, which are longer and narrower, and rounded apically; the veins are strongly studded with setiferous granules.

Head, thorax, and legs pale greenish, with a slight bluish tinge; intercarinal areas on head, a broad band on each side of the central keel of pronotum and scutellum, three small spots on each side of the pronotum between the last mentioned and the lateral keels, and one on the scutellum, pale brownish green. Eyes brownish black. Clypeus apically more or less silvery, spotted with brownish red at the base; front also somewhat obscurely striped longitudinally with pale brownish green, and spotted apically with brownish red. The legs are also marked with pale brownish green, the apices of tibiæ, of tarsi, and of the spines brownish black. Tegmina semiopaque, milky, veins pale brownish, granules dark brownish. Abdomen above pale greenish brown (with a purple lustre towards the base), and with a median and

three lateral longitudinal silvery stripes, the median of these three not nearly reaching the base. Ovipositor in the female pale brownish. Tibial spur with eight strong spinelets. Long. 2½ mill.

Oahu: Leahi. On a yellow composite not yet determined. (Only inside the crater, or on top, not on the lower slopes. March–April, 1904—G. W. K.).

The above is the colouring in living examples; when dry the green often turns to pale yellow, and the whole colouring becomes more obscure.

Aloha,* gen. nov.

Belongs to the division with short antennæ, and straight entire pronotal keels.

Head narrower than the pronotum (lateral margins between the eyes subparallel), little prominent before the eyes, as seen from above, anterior margin roundly truncate; vertex shaped something like *Delphacodes*, Fieb.† (nec Melichar), but the middle keel generally almost obsolete (sometimes, however, strongly developed), with an impressed spot on each side. First segment of antennæ about two-thirds of the length of the second. Frons somewhat narrow, subparallel, with two median keels which are subparallel, but slightly rounded outwardly, obsolete on the arched part of the head. Clypeus tricarinate, median keel strongly developed. Rostrum reaching to posterior coxæ. Pronotum short, keels entire. First segment of posterior tarsi about twice as long as the other two together, tibial spur about two-thirds the length of the first segment of tarsi. Tegminal venation very similar to that of *Megamelus*.

Aloha ipomoeæ, sp. n.

♀. Flavo-testaceous above and beneath, exterior lateral margins spotted with blackish brown. Tegmina hyaline tinged with brownish, immaculate in the long-winged form, except that the apical angle of the lower claval area is dark brown; in the short-winged form there is a spot at the apex of the costal area; veins with setigerous blackish granulations.

♂. Similar to the female, but darker; abdomen blackish, apical margin (and lateral margins more or less) pale ochreous or flavous. Tegmina spotted with black. Long. 2½–3 mill.; expanse of tegmina, 8 mill.

Hab. Honolulu, from coast-line up to about 1000 ft.; on various species of *Ipomoea* (R. C. L. Perkins and G. W. K.; March, April, 1904). This species is doubtless autochthonous.

Deltocephalus hospes, sp. n.

In structure somewhat near to *D. signatifrons*, Van Duzee, but with different head pattern, &c.

* "Aloha," the Hawaiian salutation (lit. "love").

† The type of *Delphacodes*, Fieb., is *mulsanti*, Fieb. For Melichar's genus *Delphacodes* I propose the name *Pseudaræopus*, type *lethierryi* (Rey).

Fusco-testaceous; front transversely broadly striped (about eight) with dark brownish, the basal markings of these visible just at the apex of the vertex. Eyes purplish brown. Tegmina with colourless veins, the claval and some of the corial sparsely sown with dark brown, extreme apex of clavus dark brown, apex of tegmina obscurely fumate. *A characteristic dark brown spot at the base of the median ante-apical cell.* Legs pallid, with dark granules. Abdomen more or less dark. Vertex strong, somewhat flat, margin in front of the eyes straight; ocelli almost on a level with the disk of vertex before the upper margin of eye. Pronotum scarcely twice as broad as long, sides short, posterior angles strong, postero-lateral margin nearly parallel with scutellar margin of tegmina, which are long with appendices slightly overlapping; costal veins not reflexed, median ante-apical cell a little constricted, extending posteriorly clearly beyond the adjacent cells, and a little farther than the exterior discoid cell. Length, 3 mm.

Honolulu; attracted to light in the evening (probably from grasses), March, 1904 (R. C. L. Perkins). Possibly introduced.

Eutettix perkinsi, sp. n.

Not closely allied to any species known to me.

Head, pronotum, and scutellum pale clear yellow. Vertex with a tiny brownish dot on each side (near the intero-apical angles of the eyes as seen from above) joined together by a thin brownish line, at right angles to the longitudinal suture of the vertex; on each side of the last-named, in the middle of the subquadrilateral areas thus formed, is a larger brownish speck. Eyes greyish. Mesonotum with antero-lateral and apical margins black, concealed by the pronotum, part of which thus acquires a greenish tinge. Lateral margins of scutellum narrowly blackish, two dots on the disk the same colour. Tegmina opaque ivory white interiorly, milky subhyaline exteriorly; base of clavus smoky, bordered internally by dark brown; extreme apex of clavus dark brown, interior and apical parts (except the anti-apical areoles) smoky.* Beneath pale stramineous, claws brown. Vertex well rounded, between the eyes very delicately, longitudinally wrinkled and punctured. Lateral margin of vertex between the eyes slightly diverging outwardly and anteriorly. Venation rather obscure exteriorly, not reticulated. Ultimate segment about four times as long as the penultimate, posterior margin notched apically. Pygofers scarcely four times as long as the last segment, spines almost colourless. Long. 4 mill.

Leahi; on *Sida* (one of the Malvaceæ), March, 1904.

N.B.—In somewhat immature specimens the tegmina are only slightly smoky, the apical veins being more or less dark brownish (especially at the extero-lateral margins). In very immature examples the whole insect is pale yellowish, only the claws being dark.

* The effect of the tegminal colour and pattern is therefore smoky, with a large pale opaque spot in the centre (of the two tegmina shut together), and pale lateral margins.

HALTICUS CHRYSOLEPIS, sp. n.

Head, pronotum, and scutellum shining black, immaculate. Tegmina brownish black. Pronotum, scutellum, and tegmina sufficiently thickly covered with easily divested pale golden scale-like hairs. First and second segments of antennæ pallid, apex of second black, third and fourth dark; base of third tarsal segment black, posterior femora a little reddish. Abdomen black. Head as seen in front subequilaterally triangular. Clypeus as seen from the side scarcely wider at the apex than in the middle; labium narrow as seen from the side. Pronotum transversely aciculate. Long. 2¼ mill.

Honolulu; on grass and *Carex* (March, 1904, R. C. L. Perkins).

N.B.—*Calocoris canus*, Distant (1893), is usually quoted as a synonym of *H. uhleri*, Giard, but, I think, in mistake. Distant's species seems more allied to the *saltator*, Fourcroy, group. It has certainly nothing to do with *Calocoris*.

In July last (1903) I had the opportunity of a very brief survey, through the courtesy of Mr. Alex. Rodger, the curator, of F. B. White's collection of Hawaiian Hemiptera, contained in the Museum of Natural Sciences, Perth, Scotland.

Five types are lost, *viz.*:—

1. *Geotomus jucundus*, which is well known to be =*pygmalus*, Dallas.
2. *Triphleps persequens*, of which, however, I have seen a specimen answering to the description.

3 & 4. *Dilasia decolor* and *denigrata*. Both now placed as one species in *Lasiocheilus*.

5. *Lilia delecta*. Unknown to me.

Of the others:—

6. *Nabis lusciosus* is similar to the example figured on pl. v. f. 35, of my "Hemiptera" ('Fauna Hawaiiensis,' iii.).
7. *Nabis subrufus* is similar to fig. 37.

The other forms have been correctly interpreted.

NOTE ON THE ORTHOPTEROUS GENUS *CAPNOBOTES*.

BY T. D. A. COCKERELL.

DURING the last week of August, 1903, at Pecos, New Mexico, I became acquainted with the Decticid genus *Capnobotes*. The dry hillocks at Pecos are clothed with nut pines (*Pinus edulis*) and so-called cedars, species of *Sabina*. From the pines, at dusk, there proceeds a shrill cry, produced by the males of *Capnobotes*. The noise is loud, but pitched in so high a key that my companion, who was not at all deaf to ordinary sounds, could

hear nothing. The capture of the insects proved a matter of considerable difficulty, and although, from their cries, they were evidently numerous, I got only two. The attempt to find them in the daytime proved futile, and the cries only commenced just before darkness set in, leaving a very short time during which they could be seen, after they had been detected by the ear. It was almost impossible to climb into the small trees without making enough disturbance to cause the insects to become silent and take a leap for another branch; for this reason hunting them with a light was useless,—they would jump off into the darkness and be lost.

The Decticinæ of New Mexico, so far as previously known, numbered five genera and nine species. The discovery of *Capnobotes* at Pecos added a sixth genus and tenth species. In the 'Canadian Entomologist,' April, 1897, Scudder gives a table of the known species of *Capnobotes*, three in number. A fourth, found in Mexico, was added by Mr. Rehn in 1900. In Scudder's tables the Pecos species runs to *C. occidentalis* (Thomas), known from California, Nevada, and Utah. To confirm (or disprove) the identity, I asked Professor L. Bruner for measurements of *C. occidentalis* in his collection. He kindly gave the following, the average from four specimens:—Length of body, ♂ 26, ♀ 32; of pronotum, ♂ 6·5, ♀ 7; of tegmina, ♂ 41, ♀ 49; of hind femora, ♂ 25, ♀ 29; of ovipositor, 28 mm. This agrees with my specimens, which are evidently *occidentalis*. The male body, if stuffed with cotton when fresh, is about 30 mm. long. The male antennæ are from 51 to 53 mm. long. One of my examples* is sepia-brown in its body, markings of tegmina, &c., but the other has these parts all apple-green, the pronotum with two ochreous bands, edged outwardly on the hinder part by a narrow black stripe. The green form may be known as var. *viridis*.

In Dr. Howard's 'Insect Book,' Pl. xxxv, fig. 6, is a good figure of *Capnobotes fuliginosus* (Thomas). The Pecos insect is very similar, but smaller, with much less dark color on the hind wings.

Table of Capnobotes.

Tegmina short (Mexico)	*imperfectus*, Rehn.
Tegmina long	1.
1. Outer margin of anterior femora very faintly spined beneath; metazona scarcely elevated above the prozona; tegmina ♂ 41, ♀ 49 mm. . . .	2.
Outer margin of anterior femora distinctly spined beneath	3.
2. Coloured parts dark brown (California to New Mexico)	*occidentalis* (Thos.).
Coloured parts green (New Mexico)	*occidentalis* var. *viridis*, Ckll.

* Now in the British Museum.

3. Metazona abruptly elevated above the prozona; tegmina spotted and streaked, in ♀ as much as 52 mm. long (Arizona) . . . . . *fuliginosus* (Thos.).
Metazona gradually elevated above the prozona; tegmina nearly uniform in coloration (California) *brunneri*, Scudder.

Colorado Springs, Colorado, U.S.A.:
May 6th, 1904.

DESCRIPTIONS OF NEW LEPIDOPTERA FROM EQUATORIAL AFRICA.

By Emily Mary Sharpe.

Family Acræidæ.

Acræa melanosticta, sp. n.

Allied to *A. servona*, Godt., and *A. circeis*, Drury, but distinguished by the less transparent fore wing, and the smaller white spots.

Fore wing: Ground colour entirely smoky brown, relieved by two whitish transparent spots, one situated in the cell, and the second between the first and second median nervules. Near the apical area is an oblique band consisting of three internervular white spots. Hind wing smoky brown, with a somewhat broad border of ochraceous yellow crossing the central area. Under side: Fore wing smoky brown, with the white transparent spots strongly in evidence; costa yellow, with streaks of the same colour between the nervules on the apex and hind margin. Hind wing entirely ochraceous yellow, the nervules on the hind margin brownish black, with small internervular markings near the discal area; the base and central area showing a number of black spots, larger and more united than in the allied species. Expanse, 1·6 in.

Hab. Toro; November–December, 1900 (*H. B. Rattray*).

Family Nymphalidæ.

Antanartia amauroptera, sp. n.

Allied to *A. delius*, Drury, but differing in the ground colour of both wings, which is dark brown.

Fore wing: Ground colour dark brown, with a curved band of chestnut crossing from near the centre of the costal nervure to the vicinity of the posterior angle, and with a faint line of minute white spots visible near the apical area. Hind wing entirely dark brown, relieved near the inner margin with reddish brown hairs; the hind marginal border similar to that of *A. delius*, but with the characteristic rufous-yellow markings more chestnut-red in colour. Under side similar in markings to that of *A. delius*, but much darker; it may, in fact, be compared with that of *A. schœneia*, Trimen, as regards the

ground colour and markings. The band on the fore wing may be described as chestnut-brown. Expanse, 1·7 in.

Hab. Toro; November–December, 1900 (*H. B. Rattray*).

Besides the type above described, there are five more specimens in Major Rattray's collection, all varying somewhat as regards the chestnut band on the fore wing. One specimen resembles *A. delius* on both wings as to the reddish chestnut colour; a second specimen has the chestnut band visible from the costa to the median nervure; whilst a third melanistic variety has no red band in evidence. They were all collected in the same month, and in the same locality.

Kallima rattrayi, sp. n.

Allied to *K. rumia*, Westw., but the female has no white discal patch on the hind wing, and the oblique band on the fore wing is yellow instead of white.

♂. Very similar to *K. rumia* in colour and markings; the mauve band on the fore wing somewhat brighter in colour, the characteristic white spots being nearly obsolete. Under side similar to that of *K. rumia*. Expanse, 2·3 in.

♀. Fore wing: General colour light brown, the apical area somewhat darker, and relieved by two white spots near the apex; an oblique band of buff-coloured spots crossing the wing, and terminating above the first median nervule. Hind wing entirely light brown, the white patch being absent. Under side resembling that of *K. rumia*, but with light spots on the fore wing slightly smaller. Expanse, 2·6 in.

Hab. Toro; November–December, 1900 (*H. B. Rattray*).

Euphædra rattrayi, sp. n.

Allied to *E. zampa*, Westw., but distinguished by the chestnut patch near the base of the fore wing.

♂. Fore wing: Ground colour rather darker green than in *E. zampa*, with an oblique band near the apical area creamy white, broader than in the above-named species; near the base a deep chestnut-red patch, with a suffusion of the same colour extending between the nervules towards the hind margin. Hind wing with the central area reddish brown, deeper in colour on the subcostal nervules; hind margin bluish green, relieved by internervular white spots suffused with blue. Under side: General colour of both wings yellowish buff, tinged with green; the white bands and spots similar to those of *E. zampa*, with the three whitish spots rather more strongly indicated than in the latter species. Expanse, 2·7 in.

♀. Scarcely different from that of *E. zampa*, the oblique apical band being somewhat broader, the white spot near the posterior angle indicated by a faint bluish line. Under side somewhat more dingy in colour, the apical area having a greenish tint; all the other white spots and markings strongly pronounced, especially those at the end of the cell of the hind wing. The dark outlines of the white spots on the hind margin less strongly indicated. Expanse, 3·4 in.

Hab. Toro; November–December, 1900 (*H. B. Rattray*).

EUPHÆDRA CHRISTYI, sp. n.

Similar to *E. zaddachi*, Dewitz, but with no crimson on the hind wing.

♀. Fore wing resembling that of *E. zaddachi* as regards its dark ground colour, but with the two ochraceous bands slightly broader. Hind wing: The whole of the central area pale ochraceous yellow, with a greenish tinge near the base and towards the anal angle; the broad hind margin brownish black. Under side similar to that of *E. zaddachi*. On the hind wing a broad costal line of deep crimson extending from the base to as far as the submarginal row of internervular black spots; the central area creamy yellow. Expanse, 3·2 in.

Hab. Toro; November–December, 1900 (*H. B. Rattray*).

Dr. Christy also collected two specimens of this new species at Kibero, January 11th, 1903.

HARMA MARMORATA, sp. n.

Similar to *H. beckeri*, H.-Schæff., the male being somewhat paler in colour. The female is at once distinguished by the absence of the bright yellow spot on the hind wing.

♂. Fore wing: Central area pale creamy yellow; apex and hind margin deeper yellow; the dark brown submarginal spots and markings not so strongly indicated. Hind wing: Central area creamy yellow, the broad hind marginal border much lighter in colour, and having a suffusion of orange-yellow; the dark brown hastate marks being strongly pronounced. The under side does not differ from that of *H. beckeri*. Expanse, 2·7 in.

♀. Fore wing similar to that of *H. beckeri*, but with the white spots on the discal area more broken up, these spots thus forming two distinct rows of hastate markings, from the subcostal nervule as far as the first median nervule; the spots all tinged with greyish blue on their outer edge, nearly all the white spots being outlined with this colour; the characteristic white area about the centre of the inner margin being here represented by a creamy yellow patch; the blue colour at the base rather more deeply coloured than in *H. beckeri*. Hind wing: Central area of wing creamy yellow, with less blue at the base; hind marginal border slightly broader; the second row of white spots more hastate in shape, and lined on the outer edge with blue. The first row of white spots is also tinged with blue. The bright yellow patch towards the anal angle is absent. Under side similar to that of *H. beckeri*, with the same differences as on the upper side as regards the discal row of spots. The hind wing has a distinct transverse line of deep chestnut-brown from the costa to the anal angle. Expanse, 3·7 in.

Hab. Toro; November–December, 1900 (*H. B. Rattray*).

A "BUTTERFLY SUMMER" IN ASIA MINOR.

By Margaret E. Fountaine, F.E.S.

(Concluded from p. 159.)

Melitæa arduinna, Esp. (?).—This is a very difficult species to identify. I believe those I have from Broussa in the spring, and again in the autumn, are true *arduinna;* but Mrs. Nicholl has thrown many doubts upon their identity. I certainly did not see it at Amasia.

M. phœbe, Kn. — Generally distributed, but not so common at Broussa as at Amasia.

M. trivia, S.V.—At Broussa in May; and at Amasia a succession of broods throughout the summer. The females varied enormously; I have one from Broussa in May, and one from Amasia in June, both large and strongly marked; while two I have from Amasia in August are unlike these as any two *Melitæa* could well be; they are small, with very oblong wings, and the ground colour is light and even throughout, while the black markings, especially in one of them, are extremely sparse and scanty.

M. didyma, O.—As usual, presenting an interesting and pleasing variation. The males of the summer brood at Amasia decidedly inclined towards the var. *neera*, some much more so than others. The females varied from pale fulvous to a greenish grey.

M. athalia, Rott. (?).—One fine female from Tokat in July I have classed as belonging to this species, to which I have but little doubt that it does. I do not recollect observing any others.

Argynnis lathonia, L.—Generally distributed, and always typical.

A. aglaia, L.—At Amasia in June and July.

A. paphia, L.—Very common at Amasia; also Tokat, where I took a fine specimen of the var. *valezina*, and saw others.

A. pandora, S.V.—Common throughout the summer; also at Arndoutkeiny, near Constantinople.

Melanargia galatea var. *procida*, Hbst.—Not common at Amasia; much more so at Tokat; but none of the specimens presented at all an extreme form of *procida*.

M. larissa, H.G., and var. *hertha*, H.G.—First taken on the Upper Maidan, at Amasia, on June 8th, where it afterwards became common in all the localities round. Almost on the top of the Lokman, in July, I took a female of the var. *hertha*, in which the black tracery is extremely delicate and undefined. I did not see any others like it.

E. æthiops var. *melusina*, H.S.—In the pine forest at Tokat; a fine large form.

Satyrus hermione, L.—Common at Amasia and Tokat. I could not see that any of the specimens differed in any way from the type.

S. circe, F.—Also common at Amasia and Tokat.

S. briseis, L., and var. *pirata*, Esp.—Extremely common at Amasia from the end of June, throughout July. The specimens were larger and more brilliant than the European form, and var. *pirata* occurred with the type, but I was only able to secure an occasional specimen, as it was far from common.

S. semele var. *mersina*, Stgr.—Very common all round Amasia.

Not, in my opinion, a very distinct variety, but constant as far as it goes.

S. bischoffii, H.S.—This lovely *Satyrus* was by no means common; I only took it in one locality at Puelly. It did not appear till the end of June, and was soon over.

S. pelopea, Klug.—At Amasia at the end of June, and Tokat in July. It was larger and brighter than those I have from the Anti-Lebanon.

S. mniszechii, H.S.—This butterfly, which was formerly classed as a variety of *S. pelopea*, is now ranked as a distinct species by Staudinger, to which it certainly has every cause to lay claim. My first capture (a female) was on July 9th, near Amasia, where it soon became extremely common. It differs from *S. pelopea*, which did not appear till about a fortnight later, by the broad suffusion of fulvous on the fore wings in the female, and by the colour of the apex and the hind wings underneath being grey instead of the warm tone so characteristic in *pelopea*. *S. mniszechii* did not appear at all at Tokat.

S. anthelea, Hüb.—Fresh out in the Maidan, at Amasia, on May 30th, but though the males soon became extremely common everywhere, I failed to procure one single female! This butterfly struck me as coming very close to *S. amalthea*, but without females it is difficult to judge.

S. geyeri, H.S.—This insect literally swarmed on the wide, rock-strewn plateau at the top of the Lokman. I first took it on July 25th, when it was fresh out, and every succeeding visit I paid to this locality I found its numbers increasing more and more. I was also able to secure a good amount of females.

S. arethusa, S.V.—Flying with the preceding, but comparatively rare.

S. statilinus, Hufn.—This species was very common, but nearly over, at Broussa, in the end of August.

S. fatua, Frr.—Very like the preceding, only larger, and the under side of a more bluish grey tone. It abounded in all the hot valleys near Amasia, at the end of July and August. It was easily caught off the fruit which the peasants had spread in great quantities over the hot rocks to dry in the sun, and which seemed to be particularly attractive to *S. fatua*.

Parage roxelana, Cr.—Very common near Amasia in June and July. Specimens would sometimes even come into the house where I was staying.

P. climene, Esp.—Staudinger questions the existence of this butterfly at Amasia, but there it most certainly is, though I did not find it anywhere except on the Lokman, and just above the town on the way up to that mountain. It occurred towards the end of June, but was rather rare, and quickly over. I never saw a female.

P. mæra var. *adrasta*, Hüb.—Widely distributed.

P. megæra, L.—Common in all low localities. I could not make out that any of the specimens differed materially from the type.

P. egeria, L.—Common, like the preceding.

Epinephele lycaon, Rott.—On the lower slopes of mountains near Amasia in June. The males were very large and fine.

E. ianira, L.—Never failing to appear almost everywhere.

Cœnonympha leander, Esp.—Nearly over at Amasia at the end of May, and I watched in vain for a second brood.

C. pamphilus, L.—Common everywhere throughout the spring, summer and autumn. The late summer brood at Amasia produced a good form of var. *lyllus*.

Spilothyrus alceæ, Esp.—Fairly common at Amasia; some of the specimens were paler underneath than the type.

S. lavateræ, Esp.—Very common at Amasia throughout the summer.

Syrichthus nomas, Ld.—Not common; taken singly at Amasia in June.

S. sidæ, Esp.—One fine female near Broussa in May. Fairly common at Amasia in May and June. The specimens were much more brilliant underneath than those I have from the South of France.

S. alveus var. *cirsii*, Rbr.—Occurred at Amasia in July.

S. malvæ var. *taras*. Meig.—A very marked form of this variety occurred, not rarely, with the type, at Broussa in April; unluckily, most of the specimens were worn.

S. phlomidis, H.S.—This very pretty "skipper" was common all round Amasia throughout the summer.

S. orbifer, Hüb.—At Broussa and Amasia, not uncommon.

Nisoniades tages, L.—Fresh out at Broussa in April.

N. marloyi, B.—One specimen only taken on the Caraman, near Amasia, in June.

Hesperia thaumas, Hufn.—Not common at Broussa in May.

H. sylvanus, Esp.—Also at Broussa in May; not common.

H. comma, L.—On the top of the Lokman, in July.

H. hyrax, Ld.—I believe I overlooked this species, as I seem to have only one specimen which tallies with the description of it, from Amasia in June, where I think it was not uncommon. I can only plead the prolific abundance of so many interesting species at the same time as an excuse for this omission on my part. And I will conclude this article by once again sounding the praises of Amasia,—that wonderful locality, worthy only to be called "The Digue of Asia!"

7, Lansdown Place (East), Bath: February, 1904.

SUPPLEMENTARY LIST OF THE LEPIDOPTERA OF THE ISLAND OF CAPRI.

By C. Seymour Browne.

In continuing this list my forebodings approach fulfilment, like unto a certain apocryphal animal whose tail was greater than its body (and, in this case, not yet fully grown), as such appears to be this list; and so I must claim the indulgence of my better-versed entomological brethren.

My best thanks are due to Mr. Richard South and to Mr. Louis B. Prout for their kindness and patience in determining the greater part of the insects mentioned in this list.

This year I hope to have the assistance of a fellow-worker in further developing the resources of Capri. I should also be grateful for any hints as to what methods to adopt. It would also be of the greatest assistance if any readers would inform me of what works exist bearing on the Lepidoptera of this part of Italy, and also where a full reference to the lepidopterous work of the Costas' can be found.

Costa's *H. serraria* (3848), which Staudinger queries, has not yet come to hand, though I have seen a doubtful specimen in a Naples collection. I should be glad to hear of any specimens, and to receive a photograph of same. Costa gives this moth in one of his plates.

The correct naming of the Zygænidæ and Syntomidæ appears to be a difficult matter, and I should be glad to receive any specimens of these or of the Sesiidæ that would probably be found here. I think possibly some of specimens may be :—

4327*g*. *Zygæna scabiosæ* v. *neapolitana*, Calb.

4356*a*. *Z. transalpina* v. *sorrentina*, Stgr. Sorrento is only distant two miles.

4356*b*. *calabrica*, Calb.

Of 4356*c*, ab. *boisduvalii*, Costa, I have some specimens (yellow spots), taken on a mountain top above Napoli ; also, in the same district, the new var. found by Herr Fritz Zickert, which is without the yellow spot on hind wing.

4361. *Z. oxytropis*, B., found at Avellino, should also be taken here.

Additions to previous Lists.

Pieridæ.

38. *Aporia crataegi*, Linn. One specimen.

52. *Pieris napi*, Linn.

57. *P. daplidice*, Linn. Small form described by Zeller in his Italian Lepidoptera.

69. *Euchloë cardamines*, Linn. Very scarce.

69*a*. *E. cardamines*, Linn., var. *turritis*, O. Only one example, 1903.

81. *Leptidia sinapis*, Linn.

81*a*. *L. sinapis*, gen. vern. *lathyri*, Hb.

81*d*. *L. sinapis*, gen. æst. *diniensis*, B.

Nymphalidæ.

156. *Vanessa io*, Linn. Only one example, 1903.

392. *Pararge mæra*, Linn.

440. *Cœnonympha pamphilus*, Linn. Rare.

Lycænidæ.

512*b*. *Chrysophanus phlæas*, Linn., var. *eleus*, F.

638*b*. *Lycæna cyllarus*, Rott., var. *lugens*, Carad. About equally common with *L. cyllarus*.

Hesperidæ.

703. *Hesperia alveus*, Hb. Rare.

SPHINGIDÆ.

730. *Dilina tiliæ*, Linn. One undeveloped specimen for a pupa.

749. *Deilephila euphorbiæ*, Linn. Common.

749*b*. *D. euphorbiæ* var. *greutzenbergi*, Stgr. This is the moth that I erroneously alluded to as a var. of *D. livornica* on p. 307, 1903. Found on the higher grounds, *D. euphorbiæ* proper on the lower; fairly common.

NOTODONTIDÆ.

866. *Pygæra curtula*, Linn.

LYMANTRIDÆ.

944. *Ocneria rubea*, F.

LASIOCAMPIDÆ.

970*g*. *Lasiocampa quercus*, Linn., var. *sicula*, Stgr. I have not *quercus* proper; neither do I think it has been found at Naples.

(To be continued.)

CAPTURES AND FIELD REPORTS.

NOTE ON HALIAS PRASINANA.—From nine larvæ which I beat last August, I have so far reared eight imagines. Of these one female has the hind wings yellow. Barrett (vol. ii. p. 174) says female has white hind wings; my specimen seems to be more sparsely scaled on the hind wings than my males. I have had one pupa exposed in the cocoon all the winter, and, except when away, have looked at it every day. It never, as far as I can remember, presented the same side twice successively; thus the pupa turned in the cocoon every day. The under side of the pupa is originally bright green, and only turns to orange about March. The wing-cases become bright green three days before emergence.—H. V. PLUM; The College, Epsom.

DEILOPHILA LIVORNICA IN ENGLAND, 1904.—

Carlisle.—On May 17th last a fine specimen of the above was brought to me alive, it having been taken at rest on a barber's shop-window in Botchergate, Carlisle, about 9.45 p.m. on the evening of May 16th. It formed quite a centre of attraction to passers-by for some little time before being taken off. It is in good condition except a slight damage to right side, where its captor had grasped it with his fingers, and some of the scales rubbed off the abdomen during contact with the inevitable match-box. It is a male, and measures three and a quarter inches from tip to tip of the wings. I have never heard of any previous record of this insect being taken in or near Carlisle.—J. ED. SHWAYTES; 8, Clement Place, Blackwell Road, Carlisle, June 20th, 1904.

Devonshire.—A specimen of this moth was taken at Yelverton, near Plymouth, on May 19th. A cat was playing with it in my garden at about 6 a.m. Fortunately it was secured in perfect condition.—C. W. BRACKEN; Brentor View, Yelverton, S. Devon.

Dorsetshire.—A male specimen of this rare species was brought to me a few days ago from Warmwell, near Dorchester, by my son (Rev. R. J. Pickard-Cambridge). It was found, just after it had come out of the chrysalis state, by Mrs. Haig Thomas in the garden of her residence (Warmwell House), and kindly added by her to my collection.—O. Pickard-Cambridge; Bloxworth Rectory, June 1st, 1904.

Gloucestershire.—A fine example of this rare British species was caught at rest by a lady at Marsemore, near Gloucester, on May 23rd, 1904, and given to her nephew (boy collector). Unfortunately it is slightly rubbed in handling, otherwise it looks as though it had only just emerged from pupa stage.—A. Lionel Clarke; Stroud Road, Gloucester.

Hampshire.—I have pleasure in adding another capture to the one recorded from Bournemouth (*ante*, p. 168). On May 27th a neighbour brought me a moth he had caught in his shop the previous evening, no doubt attracted thither by the lights; and I was most agreeably surprised, on opening the box, to see a very good specimen of *D. livornica*. It is some thirty years ago since I have heard of a specimen in this immediate neighbourhood. I took one in June, 1874, and in 1876 another was taken near Fordingbridge, and about the same time my friend, the late Rev. H. G. W. Aubrey, took one in his garden at Hale, near Breamore. Since those dates, occurrences have been recorded from Winchester, New Forest, Christchurch, Lymington, and several other localities in Hants. A casual perusal of volumes of the 'Entomologist' for the last twenty years or more indicates that, although June is the principal month for the occurrence of this species amongst us, yet it has been met with from May to October, and once —at Crewkerne—in February; but some years it seems to be absent altogether. Although Manchester, Carlisle, Norwich, Isle of Man, and a few other northern and midland localities have their records, they are few in comparison with the southern counties from Cornwall to Kent. The latter county, however, otherwise so prolific in "good things" of a supposed continental origin, seems to lack its due proportion of records, whilst the adjoining county of Sussex has the largest number. That the species is migratory appears evident, from its not infrequent presence on board ships at sea. Are we indebted to migrants for most of those in our cabinets, whether "aliens or born in the land," as is the case with *Deiopeia pulchella*, *Colias edusa*, and others?—G. B. Corbin; Ringwood.

An apparently freshly emerged specimen of this splendid Sphinx was captured in this house on May 28th. It flew into a bedroom window, attracted, I think, more by the scent from a vase of azaleas than by the lamp. It is the first time it has been recorded in this parish (Milton).—Hugo Harpur Crewe; "Stanleys," near Brockenhurst, Hants.

Isle of Wight.—I have two examples of *D. livornica* that were captured here about the middle of last month. Both these specimens seem to have been attracted by light, one coming into a friend's house through the open window, and one was captured resting on a shop-window. In condition, one is fair, but the other is very rubbed,

though both were no doubt fresh enough when first captured.—Hubert F. Poole; Glen-Rest, Shanklin, June 13th, 1904.

Colias edusa in Cornwall.—Last August a friend of mine took *Colias edusa* in North Cornwall. It is a fine male, in good condition.—L. And. Riley; Manor House, Kingston, Taunton, May 31st, 1904.

Erratum.—Page 167, line 11, for "*Hadena*" read "*Acronycta*."

SOCIETIES.

Entomological Society of London.—*Wednesday, May 4th*, 1904.—Professor E. B. Poulton, M.A., D.Sc., F.R.S., President, in the chair.—Mr. W. J. Kaye exhibited a piece of a plant of *Eupatorium macrophyllum* from British Guiana. It was stated that the white flowers were very attractive to the *Lycorea*, *Melinæa*, and *Mechanitis* species of that region. Vast numbers were often to be seen congregated on one single bush. Species of *Heliconius* were also found on the same plant, but only occasionally, and it was significant that only those species that agreed closely in pattern and coloration with the *Ithomiinæ* were so found. He also exhibited a remarkable larva-like twig of birch, found on Oxshott Heath while he was searching for larvæ of *Geometra papilionaria*, and, on behalf of Mr. C. P. Pickett, a pupa of *Rumia cratægata*, the larva of which had spun up in an empty pupa-case of *Pieris brassicæ*. The latter was on the roof of a breeding-cage, and the Geometrid larva had completely crept inside to spin its cocoon.—Mr. J. E. Collin exhibited a specimen of *Corethra obscuripes*, v. d. Wulp (?=*C. fusca*, Staeg.), a little-known species of the genus, and new to the British list, which he had found in some numbers at Newmarket.—Mr. G. T. Porritt exhibited a living larva of *Agrotis ashworthii*, of which he had found considerable numbers on one of the mountains of Carnarvonshire during the last week in April.—Commander J. J. Walker, R.N., exhibited a gall sent him by Mr. Harold S. Mort, identified by Mr. Froggatt as *Brachyscelis duplex*, Schrader, and found at Wentworth Falls, Blue Mountains, N.S.W., where it was by no means common. Mr. Mort wrote that he thought at first it was made by joining two leaves, but noticed afterwards that it grew direct from the trunk of the tree (a Eucalyptus), while Mr. Froggatt had informed him that the whole of the gall, which resembled a large locust-bean, including the ears, was made by the insect.—Mr. G. H. Verrall exhibited three specimens, from the Hope Collection at Oxford, of *Neoitamus cothurnatus*, Meig., an Asilid not previously recorded as British. They were taken near Oxford by Mr. W. Holland.—The President exhibited a Longicorn beetle, together with a large Bracon from the same locality, captured near Malvern, Natal, by Mr. C. N. Barker, who said that the large yellow and black ichneumon, when on the wing, bore an extraordinary likeness to the Longicorn *Nitocris nigricornis*, though no one would suspect a similarity in the cabinet.—Mr. H. J. Turner exhibited living larvæ and cases of several species of the lepidopterous genus *Coleophora*, and contributed notes on *C. trog-*

lodytella, *C. lixella*, *C. laricella*, *C. hemerobiella*, *C. solitariella*, *C. pyrrhulipennella*, *C. conyzæ*, and *C. alcyonipennella*.—Dr. A. Jefferis Turner, M.D., communicated a paper entitled "A Classification of the Australian *Lymantriadæ*." — Major Neville Manders, R.A.M.C., communicated a paper entitled "Some Breeding Experiments on *Catopsilia pyranthe*, and Notes on the Migration of Butterflies in Ceylon."— The President read a communication from Professor E. A. Minchin, describing the attack made by a bird upon a species of *Elymnias*, and a part of a letter recently received from Mr. J. C. Kershaw, one of the Fellows of the Society, living at Macao, throwing light upon the struggle for life maintained by *Rhopalocampta benjamini*, a Hesperiid of that locality. A discussion on the bird enemies of Lepidoptera followed, in which Mr. F. Merrifield, Commander Walker, Mr. M. Burr, and other Fellows joined.

Wednesday, June 1*st*.—Professor E. B. Poulton, D.Sc. M.A., F.R.S., President, in the chair.—Mr. Arthur F. Bayne, Gerencia, Ferro Carril del Sud, Plaza Constitucion, Buenos Ayres; Dr. Simon Bengtsson, Ph.D., Lecturer at the University of Lund, Sweden; Mr. G. Bertram Kershaw, Ingleside, West Wickham, Kent; Mr. W. A. Nicholson, 36, Promenade, Portobello, N.B.; and the Rev. Thomas John Robert Armine Slipper, M.A., Tivetshall Rectory, Norwich, were elected Fellows of the Society.—After a few sympathetic words by the President, who announced the death of Mr. Robert McLachlan, F.R.S., Treasurer, and one of the oldest Fellows of the Society, it was unanimously resolved to express, on behalf of the Society, sincere sympathy with the family of the deceased in their bereavement. It was then announced that Mr. Albert Hugh Jones had been elected a member of the Council, and also elected to act as Treasurer in the place of the late gentleman.—Mr. E. B. Green exhibited various insects from Ceylon, including a carpenter bee (*Xylocopa fenestrata*, Fab.) and a large Asilid fly (*Hyperechia xylocopiformis*, Wlk.), which very closely mimics the bee; specimens of a Mycetophilid fly and cocoons from which they emerged, showing the beautiful structure, formed of an open network of white anastomosing threads; and examples of a Tineid moth and the remarkable larval cases.—Mr. H. St. J. Donisthorpe exhibited specimens of the rare *Tachys parvulus*, taken in the New Forest in May.—Mr. J. E. Collin exhibited specimens of *Mochlonyx velutinus*, Ruthé, a rare British Culicid, which he, in company with Messrs. Verrall and Wainwright, had found in numbers near Beaulieu in Hampshire, on May 22nd.—Mr. A. J. Chitty exhibited an Ophionine ichneumon, the head of which was covered with the pollen of some orchid, making the insect look as though it was attacked with fungus. — Mr. C. P. Pickett exhibited long series of *Angerona prunaria* and *Lycæna corydon*, showing a remarkable range of variation in both species.—The President exhibited specimens of *Paltothyreus tarsatus*, Fabr., an ant belonging to the family Poneridæ, recently received from Dr. S. Schönland, Curator of the Albany Museum, Grahamstown, who mentioned that he had noticed, about eight miles west of Palapye Road Station, an awful stench, which, however, passed off after a time. It turned out afterwards that it emanated from some ants of this species living in trees.—The President exhibited a cluster of the green eggs of

Vanessa urticæ fixed to the under side of a small leaf towards the summit of a nettle-stem. The cryptic resemblance of the eggs to their environment was very remarkable. He also read a note on the courtship and pairing of the species.—Dr. T. A. Chapman exhibited two very interesting Erebias caught by the President on the Guadarrama (near Madrid, Spain) on July 25th, 1902, at an elevation of probably about 6000 feet. Though taken together, and very much alike they proved to be of two species, viz. *E. evias* and *E. stygne*, both males. Dr. Chapman remarked that the same two species which he found last year in Spain, associated together and closely resembled each other, which is not their habit in Switzerland.—Mr. H. J. Turner exhibited several species of the lepidopterous genus *Coleophora*, and contributed notes on *C. laricella*, *C. albitarsella*, *C. bicolorella*, *C. lineolea*, *C. viminetella*, *C. nigricella*, *C. discordella*, and *C. ochrea*. Colonel Charles Swinhoe, M.A., F.L.S., read a paper on "Tropical African Geometridæ in the National Collection."—Mr. W. L. Distant communicated a paper entitled "Additions to a Knowledge of the Family Cicadidæ."—The President communicated a paper by Mr. G. F. Leigh, entitled "Synepigonic series of *Papilio cenea* (1902–3) and of *Hypolimnas misippus* (1904), together with Observations on the Life-history of the former," and exhibited specimens to illustrate the same. —Mr. Edward Saunders, F.R.S., communicated a paper on "Hymenoptera Aculeata from Majorca (1901) and Spain (1901–2)."—H. Rowland-Brown, *Hon. Sec.*

Birmingham Entomological Society.—*March* 21*st*, 1904.—Mr. G. T. Bethune-Baker, President, in the chair.—Rev. J. Harvey Bloom, Whitchurch Rectory, Stratford-on-Avon, was elected a member of the Society.—Mr. J. T. Fountain showed a series of *Agrotis fimbria*, bred from larvæ found at Marston Green in 1903; also *Phigalia pedaria* from Highbury, where he found four on one lamp, and none others.—Mr. Gilbert Smith, an aberration of *Arctia caia* bred some years ago; the two sides were unequal in size, and quite different in pattern.—Mr. W. H. Flint gave an account of the genus *Eupithecia*, its structure, allies, habits, and mode of capture, &c., with a detailed account of the species. He exhibited his collection of the same, amongst which the most interesting were *insignata* (*consignata*), of which he took seven specimens at Kingswood, Warwickshire, some years ago.

April 18*th*.—The President in the chair.—Mr. W. H. Flint exhibited a collection of the genus *Dianthœcia* and some of its allies. Amongst the more noteworthy species were *D. compta*, from East Ireland; *D. cæsia*, from the Isle of Man; *D. albimacula*, from Folkestone; *D. irregularis*, from Cambridge; *Calymnia pyralina*, from Kingswood; *C. diffinis*, from Marston Green; and a specimen of *Valeria oleagina* from an old collection.—Colbran J. Wainwright, *Hon. Sec.*

RECENT LITERATURE.

British Lepidoptera. By J. W. Tutt. Vol. iv. 8vo, pp. 535. London: Swan Sonnenschein & Co. 1904.

The fourth volume of 'British Lepidoptera' has just been issued, and, owing to the fact that it treats on a superfamily—the Sphingides—that has been studiously worked at and written upon by Messrs. Rothschild and Jordan in the 'Revision of the Lepidopterous Family Sphingidæ' only just recently, it is bound to be criticized in the light of a comparison. The author in the preface foresees this, and fears a "poor comparison." It will be for careful readers and workers to decide, and we think that perchance good results may accrue from a perusal of both. It is most unfortunate that we find, even though the strict rule of priority has been applied to the nomenclature (as in the case of Messrs. Rothschild and Jordan's work), that it is different from that work. Is this to mean that, do what we may, agreement is impossible? The present work, put beside the latter, will reveal the position we have arrived at in this matter.

From the Natural History point of view the present volume will take its place amongst the classics of entomological literature. Mr. Tutt is nothing unless thorough, and the complete overhauling he has given to the twelve remaining British hawk-moths will rank as one of his greatest biological achievements. It must indeed be gratifying to the author, and none the less to his readers, to find that the independent results of his studies of the larvæ and pupæ actually coincide to a large extent with the classification arrived at by Messrs. Rothschild and Jordan in their work, which is built up essentially on imaginal characters. One can compare such a case with two mathematicians independently solving a difficult problem. Both get the same result. It is no proof that either is right, but the probability is exceedingly strong. The searching enquiry that has been made concerning the species treated in vol. iv. should be read therefore with double interest, in view of this coincidence of opinions. It will be necessary for the reader to note that the classification of the Palæarctic Sphinges as given in the catalogue at the end of the book is not wholly in accordance with that given in the text. We take it that Mr. Tutt was maturing his opinions as he was writing; and, in fact, on page 244 we find a footnote that the only way out of a difficulty was to revise the terminology, although half-way through the book. The fact becomes clear that the whole of the manuscript should have been sent in a single instalment, and not in pieces, to the printer. It does seem a pity that one may read something in the first half of the book that is greatly modified in the second half. For instance, in the text the Eumorphinæ are a subfamily of Sphingidæ, but in the catalogue they are a subfamily of Eumorphidæ. Even in vol. iii. the raising of the Eumorphids to family rank was anticipated, but it has not actually come till the end of vol. iv. It is not too much to assert, however, that the portion of the book dealing with the Eumorphids—Eumorphines and Daphnidines—deserves the highest praise. We here have a very

critical review of all the characters offered, and as a result a classificatory scheme where previously no classification existed. The pages devoted to the Eumorphinæ will be read with great interest, as showing how the British species are dispersed through four distinct tribes. Each tribe is in turn fully diagnosed, and in many cases most minute details of the larval differences are given.

The work of Weissman on 'Studies in the Theory of Descent' is constantly under review, particularly that portion that deals with the development of larval markings. In the main there is a general agreement with the views there set forth, but occasionally criticisms are made that are worth considerable reflection. At page 263 the subfamily Sphinginæ is entered upon, which includes the four remaining British hawk-moths—*Hyloicus pinastri*, *Sphinx ligustri*, *Agrius convolvuli*, and *Manduca atropos*. Over these four species we have 238 pages of printed matter. The elaborateness of the life-histories accounts for much of this space. The description and habits of the larva of *Agrius convolvuli* runs into twenty-five pages, and represents the scale on which this side of the work has been done. We are glad also to have previous published errors rectified. A word must be said, too, of the altogether unprecedented description of the pupæ and the detailed measurements, which together sometimes occupy more than four pages for a single species. The last species is *Manduca atropos*, which occupies seventy-three pages. Of these the twenty pages devoted to the habits will come in for a large share of attention. A summary is given of the various opinions that have been given as to how the cry of the imago is produced. We should have thought that this was a little unnecessary, seeing that quite a number of first-rate workers have confirmed one another as to the real cause. Passerini, Moseley, Poulton, and Chapman all give the same reason, and there can hardly be any doubt now about the matter. There is an appendix, which runs to close on thirty pages, and contains a valuable life-history of *Daphnis nerii*, with an exceedingly good black and white plate. Altogether, the Sphingid specialist has cause to rejoice over such a valuable work, while for every entomologist there are pages of the deepest interest.

We feel compelled to add a word as to the printing and get-up of the book. This is not what it should be. The various headings are not in bold enough type, and there is not a sufficient diversity in these. Subfamily, tribe, and genus all have the same type, and do not help the eye much in finding anything in connection with these. Again, under *Manduca atropos* it is not at all easy to find where the habit of robbing beehives or the cry of the imago is described, as these come under the paragraph "Habits," which is twenty pages long. Such details as these would greatly serve to increase the facility with which the book could be used. We mention this matter fearlessly, as we feel that its modification is an easy matter, and one that would be bound to be appreciated by everybody. While vol. iv. was going through the press we heard ominous rumours as to Mr. Tutt's health. We sincerely wish him a new lease of life to continue his fine work.

W. J. K.

Agrestia Ligustia: Riviera Nature Notes. A Popular Account of the more conspicuous Plants and Animals of the Riviera and the Maritime Alps. Second edition. With Frontispiece, Thirty-one Plates and Ninety-three Illustrations in the text. London: Quaritch. 1903. 8vo, pp. xv, 402.

We are very pleased to welcome this new and much-enlarged edition of an extremely useful and attractive book, by an author who veils himself under the letters "C. C.," but who dedicates his book to Sir Thomas Hanbury, a view of whose mansion and garden at La Martola forms the frontispiece. The author informs us that he has lived in the district for twelve years (part of the time before the annexation of Nice to France, when the country was in a more primitive condition than at present), and he is therefore able to write of it from long personal knowledge.

A large portion of the book is devoted to trees and plants; but quadrupeds, birds, lizards, frogs, shells, insects, and spiders, have not been neglected; and some very useful appendices are added, such as, "Problems to Solve," "List of Butterflies" (including Sphinges and Zygænæ), "Books Useful for the Study of the Flora," and "Sights worth Seeing."

Although the book deals chiefly with natural history, it is written in a pleasant gossipy style, and contains frequent references to history, archæology, &c. We have no patience with persons who discourage any reference to non-technical subjects, even in popular scientific books.

We would strongly recommend anyone visiting the Riviera, either for health or pleasure, to take this book with them, for we are sure that they will find much in it that will greatly increase the interest of their visit, and much information that they will be very pleased to have with them on the spot.

W. F. K.

ROBERT McLACHLAN.

On May 23rd there passed from our midst a well-known figure in the entomological world in the person of Mr. Robert McLachlan. His health had been failing for some months before his death, which took place at his residence in Lewisham at the comparatively early age of sixty-seven.

From his father he inherited independent means, which enabled him to devote his whole life to the pursuit of natural history. From his presidential address to the Entomological Society of London in 1887, we learn that as a child his attention was turned to botany. As a youth he made a voyage in 1855–6 to Australia and the East, when, pursuing his earliest bent, he made a valuable collection of Australian plants. On returning to England, however, he left his first love, and took up with the study of entomology. In that branch of zoology his knowledge was general, though, as we learn from the 'Entomologists' Annual' for 1858, he commenced, as is usually the case, with the Lepidoptera. Soon, however, he found his life's work in rescuing from neglect and confusion the Neuroptera.

The groups constituting the order are most heterogeneous, with life-histories as varied as their appearance. Add to this that the order contains some of the more ancient insects, and it is safe to say that in clearing the path for future students, Mr. McLachlan did a good work indeed. In 1865 appeared a monograph of the British Trichoptera, which was followed in 1867 by one on the Psocidia; while the next year—1868—saw the Planipennia similarly treated. In 1870 (assisted by Rev. A. E. Eaton in the Ephemeridia) appeared a 'Catalogue of the British Neuroptera,' which, though many additions have since been made to the list, has been of great use to students of the Order. But Mr. McLachlan's *magnum opus* is the 'Monographic Revision and Synopsis of the Trichoptera of the European Fauna (1874–1884),' a work of the very first importance in zoological literature.

Besides these larger works, appeared articles and pamphlets innumerable in the transactions of learned societies, and in various periodicals, especially in the 'Entomologists' Monthly Magazine,' of which, from its start in 1864, he had been the editor. His connection with entomologists (neuropterists especially) was world-wide, and his collections of Neuroptera therefore are amongst the finest in the world.

Mr. McLachlan paid frequent visits to the Continent, and was honorary member of the entomological societies of many of the European States. Of the Entomological Society of London he had been a member for nearly half a century, having been Secretary and President, and holding the office of Treasurer at the time of his death. In 1877 he became a Fellow of the Royal Society. He was, in addition, Fellow of the Linnean Society, the Royal Horticultural Society, and the Zoological Society. He took a deep interest in the West Kent Natural History, Microscopical, and Photographic Society, which he joined in 1873, and of which he was President in 1892 and 1893.

With the death a year or two since of the venerable Baron de Selys Longchamps, Mr. McLachlan was left *facile princeps* amongst students of the Neuroptera, and we shall probably look around in vain for anyone capable, in the immediate future, of adequately filling his place.

W. J. L.

Obituary.—We are very sorry to hear that Mr. Edward E. G. J. Sparke, B.A., F.E.S., of 1, Christchurch Villas, Upper Tooting, S.W., died somewhat suddenly in the early part of last May. He was an enthusiastic collector, and close observer of the habits of insects, chiefly Lepidoptera. The Tuddenham fauna received a considerable share of his attention, but he was also well acquainted with the Lepidoptera of certain localities in Surrey that he particularly favoured. Although he did not contribute much to its literature, he possessed a wide knowledge of his subject, and this was always at the service of anyone who sought information from him. He was a genial companion, and by those who knew him personally will be greatly missed.

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DESCRIPTIONS OF SOME NEW SPECIES OF CHLAMYDÆ FROM SOUTH AMERICA.

By Martin Jacoby.

CHLAMYS TRIMACULATA, sp. n.

Flavous; the head and thorax spotted with purplish or black, posterior portion of the latter moderately raised, the elevation undivided; elytra with a single tubercle at the base, the latter, three spots at the middle, and the apex, deep purplish, the rest flavous, with brown punctures. the middle and sides with some short ridges. Length, 4 millim.

Head closely rugose-punctate, flavous, the middle with a more or less distinctly marked dark purplish band; antennæ fulvous, the terminal joints rather darker; thorax with the basal portion gradually raised into a rounded elevation, the back of which is bounded by a serrate ridge and perpendicularly deflexed, the entire surface is covered with small rugosities and reticulations, more or less of flavous colouration, the back of the elevation dark purplish to a greater or smaller degree, the anterior portion stained with some small purplish spots, placed transversely; elytra subquadrate, with a single conical tubercle at the middle of the basal margin, followed by an oblique ridge towards the suture, which below the middle runs parallel with the suture to some distance from the apex, another shorter ridge is placed still closer to the suture anteriorly, and joins the other one near the middle; smaller ridges occupy the posterior portion of the elytra at the sides; the latter are rather deeply sulcate below the shoulders, the basal and apical portion are reddish brown, as well as three elongate spots at the middle; of these two are placed near the suture, one below the other, and the third (the largest) at the side of them; the rest of the surface is pale yellowish, marked with dark brown punctures; pygidium, under side, and legs flavous, closely reticulate.

Hab. Jatahy, Prov. Goyaz, Brazil.

At first sight this species seems identical with *C. reticulata*, Klug, but in that species the thorax has two broad purplish bands, and another one at each side, and the elytra are provided with another tubercle near the suture at the middle, and a third near the apex, of which there is no trace in the two specimens of

the present species before me. Altogether, Lacordaire's description speaks of four tubercles on each elytron; in *C. trimaculata* there is only a single one, as mentioned above. (Collection M. Donckier and my own.)

CHLAMYS DONCKIERI, sp. n.

Black; the antennæ, labrum, and tarsi fulvous; thorax with a high conical elevation, sulcate at the top; elytra with a velvety black space below the scutellum, a tubercle near the suture below the middle, and two more elongate ones near the apex, an oblique ridge at the disc, and another below the shoulders. Length, 3 millim.

Head opaque, deep black, finely and remotely punctured; labrum and antennæ fulvous; thorax with the middle portion raised into a high conical tubercle, the top of which is deeply sulcate, the entire surface and the elevation closely punctured and reticulate, velvety black; elytra with a similarly coloured broad space below the scutellum, closely punctured, bounded at the sides by an oblique ridge from the middle of the base to the suture, at which place it forms a high transverse ridge, from the shoulder another ridge joins the first one before the middle; a third ridge is placed near the lateral margins, but becomes indistinct posteriorly; near the apex are two tubercles, one of elongate ridge-like shape near the suture, the other more conical in shape; pygidium strongly rugose-punctate, the suture finely serrate; tarsi fulvous.

Hab. Prov. Goyaz, Brazils.

The thoracic hump in this species is very pronounced, and slightly narrowed towards the top, and the elytral ridges are strongly raised at their commencement. The insect is no doubt closely allied to *C. hircina*, Lac., but differs in the highly raised elytral ridges and their tubercles; *C. minax*, Lac., has the thoracic elevation of different shape, and differently sculptured elytra; the same is the case with *C. thoracica*, Koll. (Coll. Donckier and my own.)

CHLAMYS SEMINIGRA, sp. n.

Obscure ferruginous; thorax finely punctured, the base with a regularly rounded elevation, feebly bicarinate; elytra with black punctures, a short transverse ridge before the middle, and five small tubercles below the latter; breast and the middle of the abdomen, as well as a small spot at the sides of the latter, black; legs fulvous, femora partly black. Length, 4 millim.

Head flat, pale ferruginous, with a small brown spot at the middle; antennæ of the same colour, the fourth and following joints strongly transverse; thorax with the basal portion gradually raised into a rounded elevation, the posterior portion of which shows two feeble oblique ridges; the entire surface is finely impressed with small brown punctures, and the middle portion is rugose, ferruginous, with a small obsolete dark spot anteriorly, and a short brown band at each side near the base; the elytra are punctured like the thorax, but more closely so, and have two rather distinct longitudinal ridges at the sides only—one in front of the shoulders which ends in a short transverse ridge before the middle, the second ridge is very short, and placed close to

the lateral margins at the middle ; at this place it is marked by a transverse tubercle ; opposite, near the suture, another tubercle is placed, three more occupy the posterior portion of the elytra, the interstices at that portion are rather strongly rugose ; the breast and the middle of the abdomen deep black, also the intermediate and posterior femora, with the middle portion of the latter colour ; rest of the under side flavous ; the first segment of the abdomen with another small black spot at each side ; pygidium finely rugose, flavous, the base with a small and obsolete spot at each side ; prosternum transverse at the anterior portion, strongly compressed posteriorly.

Hab. Prov. Goyaz, Brazils.

The colour of the under side, in connection with the nearly obsolete elytral ridges, will distinguish this species ; the prosternum is also of rather peculiar shape. (Coll. Donckier and my own.)

CHLAMYS SEMIBRUNEA, sp. n.

Subelongate, parallel, piceous, with pale fulvous ridges and spots ; legs and pygidium fulvous, with dark markings ; thorax with the basal elevation rounded, the sides of the latter with indistinct pale ridges, the rest deeply punctured with black ; elytra with a network of pale and short ridges, closely punctured, the apex with two obsolete tubercles. Length, $2\frac{1}{2}$ millim.

Head closely rugose, dark fulvous, the middle with a blackish mark ; antennæ with the lower three or four joints fulvous, the rest dark ; thorax with a moderately raised and round basal elevation, feebly canaliculate at the top, from which irregular pale fulvous and short ridges project sideways, which intermix and form a kind of network ; the elevation is well limited laterally by a semicircular groove, and entirely and strongly rugose, at the sides are two feebly raised callosities, and the entire surface is closely impressed with black punctures ; the anterior portion of the elevation is more or less marked with fulvous at the middle ; scutellum nearly black ; elytra deeply and closely punctured, the punctures black, interrupted by transverse irregular fulvous ridges, without the usual four longitudinal costæ, or of which perhaps only one can be distinguished from the middle of the base, and gradually approaching the suture, at the middle of which a short transverse ridge is placed ; another short semicircular ridge surrounds the scutellum below the base ; at the sides, longitudinal and transverse short ridges of pale colour join each other, and with the exception of two very obsolete tubercles near the apex, there are no others visible at the rest of the surface ; suture finely serrate throughout ; pygidium with two short ridges at the middle fulvous, with black punctures, the sides depressed ; breast and abdomen black ; legs fulvous, the femora and tibiæ with a blackish spot at the middle, prosternum gradually triangularly widened anteriorly.

Hab. Brazils (*C. Bruch*).

The almost entirely indistinct elytral costæ, the absence of most of the tubercles, and the sculpture of the thorax does not agree with any of the other small species described by Lacordaire. Two specimens are contained in my collection.

Chlamys fulvimana, sp. n.

Obscure æneous below; the head, antennæ, and the spotted legs fulvous, above black; thorax with a deeply divided basal elevation, the sides finely and closely punctured, the elevation strigose; elytra with nine tubercles, closely and strongly punctured; sides of the breast and the abdomen fulvous. Length, 5 millim.

Head finely punctured, fulvous, the vertex with a black central spot; antennæ fulvous; thorax finely and closely punctured, black, the sides with an elongate blunt callosity, the base strongly raised at each side, deeply divided above, and slightly carinate at the top of each division, the latter rugosely strigose; elytra constricted at the middle, strongly punctured, the anterior portion with five tubercles, a large one at the middle of the base, three small ones placed triangularly below the first tubercle, and one of strongly transverse shape near the suture at the middle; five more small tubercles are placed at the posterior portion of the elytra, at which place the interstices are more or less rugose or reticulate; the suture is finely serrate; pygidium finely rugose, carinate at the middle; sides of the breast, and to a less extent of the abdomen, as well as the legs, fulvous; the femora and tibiæ with an elongate black streak at the outer side; abdomen obscure æneous, finely punctured, the breast more strongly so.

Hab. Costa Rica.

I only know a single specimen of this well-marked species, which seems allied to *C. knochi*, Koll., but has a differently sculptured thorax, and coloured under side and legs. (My collection.)

Chlamys surinamensis, sp. n.

Bright cupreous; the labrum and antennæ fulvous; thorax entirely covered with fine confluent reticulations, the basal portion raised, sulcate at the top, the sides with a blunt tubercle; elytra sparingly punctured, with four acutely raised flexuose ridges at the outer disc, a short oblique ridge below the scutellum, and one near the suture below the middle. Length, 5 millim.

Head entirely covered with confluent longitudinal reticulations, cupreous, the epistome more finely and closely reticulate-rugose; labrum and antennæ fulvous; thorax with the posterior portion elevated, the elevation divided by a short but broad and very deep sulcus, the back of the raised portion suddenly perpendicularly deflexed, and limited by a transverse sulcus, the sides likewise raised into a broad blunt tubercle, the entire surface closely confluently reticulate; scutellum smooth, bright cupreous, its apex bisinuate; elytra broadly subquadrate, slightly narrowed posteriorly, with the following highly raised cupreous costæ or ridges: a short oblique one immediately below the scutellum from below the base to the suture; a second one from the middle of the base to the middle of the elytra, where it forms an acute angle, and is continued along the suture, or gradually approaching it towards the apex; at the latter place it turns upwards, and continues along the lateral margin in a flexuose line to the shoulder; a third ridge begins in front of the shoulder, and, after joining the second one at the middle, accompanies it for some distance,

where it breaks off; there is also another very short costa visible near the apex within the space surrounded by the second costa, the shoulders are tuberculate, or rather prominent and smooth, and a single smooth tubercle is placed near the scutellum; all the interstices show some single punctures of different sizes; pygidium cupreous, very finely punctured; prosternum compressed and narrow, except at the extreme base.

Hab. Surinam.

I know only a single specimen of this handsome and highly metallic species; the design of the elytra differs from any other with which I am acquainted, but comes somewhat near *C. smaragdina*, Lac.

CHLAMYS CENTROMACULATA, sp. n.

Short and subquadrate, flavous; the thorax with lateral and a central elongate black spot, the basal portion elevated into a crested hump; elytra with the anterior portion with black ridges and tubercles, the posterior one flavous, with elongate tubercles and ridges; pygidium and legs spotted with black. Length, $2\frac{1}{2}$ millim.

Head closely rugose, flavous; the vertex with a central black spot; another one is placed at the base of the antennæ, the latter with the fifth and following joints transverse, flavous, the terminal joints slightly darker; thorax with the basal portion gradually raised into an acute ridge at each side, which join at the back, and extend perpendicularly downwards in another ridge; these ridges are of black colour, as well as the sides of the elevation; an elongate black spot is placed at the middle of the elevation; the rest of the thorax is flavous, with several black spots anteriorly, as well as the punctures themselves, the interstices are slightly and irregularly convex, and the central black mark is bounded at each side by another small ridge; scutellum dark; elytra for the greater part flavous, impressed with deep dark brown punctures; a highly raised oblique flavous ridge runs from the shoulder towards the suture before the middle, the end of which is nearly black below the scutellum; it is joined at nearly right angles by a short costa, which finishes in a flavous tubercle near the suture below the middle, near the apex are two other larger flavous tubercles, the interstices are rather closely longitudinally costate and punctured, and a more prominent black tubercle is placed at the middle of the basal margin; the suture is finely serrate; pygidium with a longitudinal central groove, flavous, spotted with black anteriorly and posteriorly; under side with numerous black punctures; legs flavous; tibiæ with a blackish spot; prosternum carinate, triangularly dilated anteriorly.

Hab. Brazils (*C. Bruch*).

This insect has its probable most nearly allied form in *C. adspersata*, Koll., but neither Kollar nor Lacordaire give a sufficient detailed description. Anyhow, the thoracic spots, similar in the two specimens before me, are not mentioned, and many other differences in the sculpture leave no doubt as to the specific distinction of this *Chlamys*.

Chlamys constrictipennis, sp. n.

Subquadrate, black, opaque; the lower joints of the antennæ and the tarsi fulvous; thorax with an isolated raised basal portion, traversed by ridges, the sides tuberculate, minutely granulate and punctured; elytra constricted at the posterior half, bounded anteriorly by a high deeply sinuate oblique ridge, apical portion obsoletely tuberculate, remotely punctured. Length, 4 millim.

Head strongly punctured at the clypeus only, the upper portion nearly impunctate, finely coriaceous, deep black, opaque; the very deep indentations of the eyes with a slight greenish tint, anterior margin of the clypeus deeply concave; labrum and palpi fulvous; antennæ with the fifth and following joints gradually transversely dilated, the terminal five joints piceous, transversely subquadrate, the lower joints fulvous; thorax minutely granulate and remotely punctured, the basal portion raised into an isolated rounded elevation, with a transverse ridge at each side of the posterior portion at the top; from these ridges several smaller and more obsolete branches run downwards to the deflexed anterior part of the elevation, which is altogether surrounded by a groove; at the sides two larger and one small callosity are placed; scutellum with its posterior edge slightly concave, but entire; elytra with the anterior half widened, and bounded by a deeply indented and highly raised ridge, the space within with two small tubercles at the basal margin, placed obliquely one below the other, and a short oblique ridge near the suture; the posterior portion of the elytra with a transverse rather feeble ridge below the middle, followed by three or four transverse tubercles near the apex; pygidium carinate at the middle, impressed at the sides; under side and legs rather strongly foveolate-punctate; tarsi fulvous, pygidium triangularly widened anteriorly, strongly depressed in shape of a ridge at the posterior portion.

Hab. Peru.

This is a well-marked species, on account of the constricted posterior portion of the elytra, and the high ridge dividing the two parts; the terminal joints of the antennæ are not of triangular but subquadrate transverse shape.

(To be continued.)

DESCRIPTIONS OF NEW LYCÆNIDÆ FROM EQUATORIAL AFRICA.

By Emily Mary Sharpe.

Family Lycænidæ.

Oxylides feminina, sp. n.

Allied to *O. faunus*, Drury, but with more white on the hind wings of both sexes.

♂. Fore wing: The blue area somewhat lighter in colour than in *O. faunus*. Hind wing: The black line on the apex narrower; the

hind margin near the anal angle white, relieved by three dusky spots situated between the nervules, the middle spot being almost obsolete. Under side similar to that of *O. faunus*, but the yellow transverse band slightly narrower. Expanse, 1·1 in.

♀. Fore wing: Ground colour smoky brown, with a bluish grey patch near the centre extending from the inner margin to the discoidal cell. Hind wing: General colour smoky brown, relieved by a bluish grey patch near the base; a large white patch near the anal angle, extending to the discoidal nervule; this white area relieved by three dusky inter-nervular spots as in the male; the tails and cilia white. Under side: Similar to that of the male above described. Expanse, 1·1 in.

Hab. Entebbe, Uganda; May, 1900 (*H. B. Rattray*).

APHNÆUS RATTRAYI, sp. n.

Allied to *A orcas*, Drury, but distinguished from that species by the much darker colouring of the under side.

♂. Both wings similar to those of *A. orcas*, as regards colour and markings. Under side:—Fore wing: The yellow ground colour much more dingy than in *A. orcas*; the silver markings heavily encircled with deep crimson, a line of this colour being visible along the hind margin and terminating in a minute silver spot near the apex. Hind wing: Ground colour dingy yellow, the silver spots and bands surrounded with deep crimson; the crimson submarginal border relieved by two small silver spots. Expanse, 1·2 in.

Hab. Toro; November–December, 1900 (*H. B. Rattray*).

HYPOLYCÆNA UGANDÆ, sp. n.

Allied to *H. hatita*, Hewits., but differing in the lighter markings on the under side, which may be compared with those of *H. buxtoni*, Hewits.

♂. Fore wing: Similar to that of *H. hatita*, but with the blue area not quite so vivid in colour as in the above species. Hind wing blue, the whole of the inner margin greyish white; the white area on the anal angle more pronounced, with a second white spot above this anal marking. Under side: Both wings entirely white, the yellow transverse bands narrower and not so strongly pronounced; the principal band on the hind margin not united to the submarginal line on the anal angle as in *H. hatita*. Expanse, 1·2 in.

♀. Ground colour smoky brown, relieved on the inner margin by a suffusion of bluish grey. Hind wing: Smoky brown, with a bluish grey tinge near the base; the hind margin and discal area from below the discoidal nervule white, relieved by a thin smoky brown line and three dark spots, the central spot being the smallest. Under side: Does not differ from that of the male described above. Expanse, 1 in.

Hab. Entebbe, Uganda; October, 1900 (*H. B. Rattray*).

IOLAUS HEMICYANUS, sp. n.

Allied to *I. iasis*, Hewits., but distinguished from that species by the larger black area on the fore wing.

♂. Fore wing: Nearly half of the wing brownish black, the basal area brilliant blue. Hind wing: The apex with a larger portion of brownish black than in *I. iasis*, becoming stone-colour along the costa; the discoidal cell having the characteristic band, but without the tuft of hairs; the lower portion of the wing bright blue; the inner margin greyish. Under side: Ground colour of both wings white; the apical area of the fore wing dusky, enclosed by a transverse fuscous line from the costa to as far as the first median nervule; a similar line, somewhat fainter, near the hind margin; a slight fuscous line at the end of the discoidal cell; a similar fuscous line on the hind wing, followed by a faint submarginal line, the lower half becoming bright orange towards the anal angle; the usual ocelli visible, one on the lobe, and the second between the first and second median nervule. Expanse, 1·2 in.

Hab. Entebbe, Uganda; May, 1900 (*H. B. Rattray*).

Iolaus albomaculatus, sp. n.

Allied to *I. iasis*, Hewits., and its allies, but easily distinguished by the white patch on the fore wing.

♂. Fore wing: The costa and apical area black, becoming quite narrow on the posterior angle; the central area deep blue, relieved by a white patch situated above the middle of the discal area. Hind wing similar to that of *I. iasis*, the blue being somewhat more purple in tint. Under side: Does not differ from that of *I. iasis*. Expanse, 1·1 in.

Hab. Toro; November–December, 1900 (*H. B. Rattray*).

SUPPLEMENTARY LIST OF THE LEPIDOPTERA OF THE ISLAND OF CAPRI.

By C. Seymour Browne.

(Concluded from p. 188.)

Thyrididæ.

1059. *Thyris fenestrella*, Sc.

Noctuidæ.

1090. *Acronycta psi*, Linn.
1185. *Agrotis c-nigrum*, Linn.
1399. *A. ypsilon*, Rott.
1401. *A. trux*, Hb.
1402. *A. saucia*, Hb. (as well as var. *margaritosa*).
1405. *A. crassa*, Hb. A large form.
1527. *Dianthœcia luteago*, Schiff.
1542. *D. filigramma*, Esp.
1553. *D. carpophaga*, Bk.
1715*b* ?. *Hadena secalis*, Linn., ab. *leucostigma*, Esp. (Only one very damaged specimen taken.)

1763. *Aporophyla australis*, B.
1768. *Ammoconia senex*, H.-S.
1774. *Polia serpentina*, Tr. Scarce.
1778. *P. rufocincta*, H. G. Appeared in hundreds in December to light.
1825. *Dryobota protea*, Bkh.
1843. *Chloantha hyperici*, Fb.
1858. *Trigonophora flammea*, Esp.
1940. *Leucania sicula*, Tr. I had classed these under *scirpi*, but, Sir George Hampson having kindly pointed out to me the difference, I found all but one of my examples to be *sicula*, and am rather doubtful if I have *L. scirpi*, as my one specimen appears to be *cyperi*.
1940*a*. *L. sicula*, Fr., var. *fuscilinea*, Grael.
1940*b*. *L. sicula* ab. *cyperi*, B. Calb. calls this a var. of *scirpi*, and I am inclined to think that what I have called *scirpi* is this form.
1947. *L. putrescens*, Hb.
1966. *L. albipuncta*, F. Only one taken, which Mr. South has kindly named for me, and noticed some differences of markings.
1981 or 1982. *Stilbia* ——. One specimen damaged, which Mr. Prout, with many others, has kindly examined, and pronounces to be *anomala*, Hb., or possibly *faillæ*, Püng.
2066. *Tæniocampa pulverulenta*, Esp.
2070. *T. incerta*, Hufn.
2125. *Orthosia helvola*, Linn. (*rufina*, Esp.). Two examples taken at light in December.
2127. *O. pistacina*, F.
2127*b*. *O. pistacina* ab. *serina*, Esp.
2127*c*. *O. pistacina* ab. *rubreta*, Esp.
2127*d*. *O. pistacina* ab. *cærulescens*, Calb. Common with most of the aberrations from November well into January.
2186. *Xylocampa areola*, Esp.
2248. *Cucullia lactucæ*, Esp. One example, summer, 1903, and another, Jan. 12th, 1904—a fresh specimen; in March two or three more.
2281. *Eutelia adultrix*, Hb.
2394. *Thalpochares velox*, Hb. Three or four taken in 1903.
2426. *T. purpurina*, Hb.
2428. *T. ostrina*, Hb.
2429*a*. *T. parva*, Hb., ab. *rubefacta*, Mab.
2431. *T. paula*, Hb.
2433. *T. candidana*, F.
2662. *Catephia alchymista*, Schiff.
2715. *Catocala nymphagoga*, Esp. Only one in 1903.
2720. *Apopestes cataphanes*, Hb.

GEOMETRIDÆ.

2861. *Pseudoterpna coronillaria*, Hb. Scarce. (*P. pruinata*, see p. 308, 1903, was an error.)
2898. *Eucrostes herberia*, Hb. Only one taken, 1903.
2929. *Acidalia trilineata*, Sc.
2934. *A. ochrata*, Sc.

3006. *A. infirmaria*, Rbr.
3010. *A. obsoletaria*, Rbr.
3023. *A. elongaria*, Rbr.
3026. *A. trigeminata*, Hw.
3031. *A. politata*, Hb.
3043*a*. *A. degeneraria*, Hb., ab. *depravata*, Stgr.
3044. *A. rubraria*, Stgr.
3048*a*. *A. aversata*, Linn., ab. *spoliata*, Stgr.
3068. *A. submutata*, Tr.
3095. *A. ornata*, Sc.
3113. *Ephyra porata*, Fb. (Previously recorded, in error, as *E. punctaria*.)
3118. *E. subpunctaria*, Z.
3143*b*. *Sterrha sacraria*, Linn., ab. *atrifasciaria*, Stefan. I have two specimens of this, both showing very markedly the dots on fore wings, entirely wanting in my specimens of *sacraria*, which have only the bright crimson stripe.
3174. *Ortholitha bipunctaria*, Schiff.
3220. *Anaitis plagiata*, Linn.
3229. *Chesias spartiata*, Fuesl. The form occurring here has been described by Mr. Prout as var. *capriata* (*ante*, p. 60).
3294. *Lygris associata*, Bkh.
3311. *Larentia cupressata*, H. G.
3344*b*. *L. fluctuata*, Linn., ab. *neapolisata*, Mill.
3378. *L. fluviata*, Hb.
3419. *L. cupreata*, H.-S.
3459. *L. unifasciata*, Hw.
3608. *Tephroclystia semigraphata*, Brd.
3641. *T. phœniceata*, Rbr.
3646. *T. abbreviata*, Stph.
3658. *T. pumilata*, Hb.
3671. *Phibalapteryx vitalbata*, Hb.
3673. *P. corticata*, Tr.
3724. *Metrocampa honoraria*, Schiff.
? 3760. *Eurymene dolobraria*, Linn.
3830. *Zamacra flabellaria*, Heeger. Feb. 10th, 1904.
3830. *Z. flabellaria*, Heeger.
3917. *Pachycnemia hippocastanaria*, Hb.
3948*a*. *Gnophos variegata*, Dup., ab. (et v. ?) *cymbalariata*, Mill.
3956. *G. asperaria*, Hb.
3956*a*. *G. asperaria*, Hb., var. *pityata*, Rbr.
4077. *Aspilates ochearia*, Rossi.

NOLIDÆ.

4105. *Nola strigula*, Schiff.

CYMBIDÆ.

4126. *Sarrothripus revayana*, Sc.
4132. *Nycteola falsalis*, H.-S.
4141. *Hylophila prasinana*, Linn., is found on the lower parts of the island, *H. bicolorana* on the higher.

SYNTOMIDÆ.

4146*a*. *Syntomis phegea*, Linn., ab. *phegeus*, Esp. In the specimens of *phegea* found here the white spots are small in size.

4156*c*. *Dysauxes punctata*, Fb., var. *famula*, Frr. I have also a darker and a very faint form.

ARCTIIDÆ.

4168*b*. *Phragmatobia fuliginosa*, Linn., var. *fervida*, Stgr. I think the form here should be described as above.

4301. *Lithosia caniola*, Hb. Extremely common. I think my previous mention of *L. unita* was an error.

ZYGÆNIDÆ.

4351. *Zygæna stœchadis*, Bkh.

4352*c*. *Z. filipendulæ* var. *ochsenheimeri*, Z.

4356. *Z. transalpina*, Esp. Varying in the direction of the named vars., *i. e.* spots on fore wings reduced in size; black margins of hind wings beginning to widen.

PSYCHIDÆ.

4451. *Pachytelia villosella*, O.

4490. *Phalacropterix apiformis*, Rossi.

SESIIDÆ.

4627. *Sesia chrysidiformis*, Esp.

PYRALIDÆ.

41. *Crambus trabeatellus*, H.-S.

208. *Hypsotropa limbella*, Z.

232. *Homœosoma sinuella*, F.

Euzopherodes sp. Probably undescribed.

739. *Acrobasis glaucella*, Stgr.

835. *Pyralis obsoletalis*, Mn.

845. *Herculia glaucinalis*, Linn.

931. *Stenia punctalis*, Schiff.

978. *Scoparia angustea*, Steph.

1003. *Hellula undalis*, F.

1241. *Pyrausta cespitalis*, Schiff.

OTHER "MICROS."

1638. *Cheimatophila tortricella*, Hb.

2257. *Carpocapsa pomonella*, Linn.

3133. *Chimabache fagella*, F.

3206. *Depressaria subpropinquella*, Stt.

Acrolepia. Species.

ON SOME NEW GENERA AND SPECIES OF HYMENOPTERA.

By P. Cameron.

(Continued from p. 163.)

ICHNEUMONIDÆ.

Cœlojoppa cariniscutis, sp. nov.

Black, shining; the face, clypeus, the orbits, the basal half of the mandibles, palpi, a line on the pronotum, a slightly broader one on the lower edge of the propleuræ, an irregular mark, broader than long, on the mesonotum, the scutellums, the lower half of the mesopleuræ, the base of the mark curved upwards, the part under the hind wings, the apex of the metanotum all round, the line narrowed on the top and at the bottom reaching to the coxæ, the narrowed part of the petiole, the apex of the post-petiole, and of the other segments broadly, pale yellow. The four front legs pallid yellow, the femora fulvous above, the hinder legs dark fulvous, the coxæ and trochanters more yellowish in tint, and marked with black on the outer half at the apex; the tibiæ darker in tint. Wings clear hyaline, the stigma fuscous, the nervures darker. Petiole smooth and shining; a fovea at the base of the post-scutellum; the second and following segments closely punctured; the gastrocœli strongly striated, the apex testaceous. ♀. Length, 8 mm.

Hab. Darjeeling.

Spilojoppa, gen. nov.

Scutellum flat, broad, not keeled laterally. Areola large, almost twice longer than broad, of equal width throughout, open at the base; the lateral areæ are separated; there are no teeth on the apex. Head large, as broad as the thorax; the temples broad, the occiput roundly incised. Eyes large, parallel; the malar space small. Clypeus not separated, its apex transverse, its sides rounded. Labrum hidden. Mandibles with the upper tooth much larger than the lower. Antennæ stout, dilated and compressed beyond the middle. Petiole long, the post-petiole not much dilated, the second and third segments closely punctured, closely and finely longitudinally striated at the base. Gastrocœli large, deep; the last segment is fully larger than the sixth; the sheaths of the ovipositor largely project; the ventral keel extends to the apex of the fourth segment. Areolet five-angled, narrowed above; the disco-cubital nervure broken by a minute stump; the transverse median nervure is received distinctly beyond the transverse basal. Legs of moderate length; the apices of the tarsal joints spinose. The known species is black, largely marked with yellow, the legs rufous. The second to fifth abdominal segments project at the apices laterally.

Belongs to the Joppini, and is not unlike *Cœlojoppa* in form and coloration, but may be known from it by the flatter, not keeled scutellum, and by the much larger areola of equal width throughout. The latter is larger than usual.

Spilojoppa fulvipes, sp. nov.

Black; the face, clypeus, the eye-orbits—the outer more narrowly above—base of mandibles, palpi, the upper and lower edge of the prothorax—the lower line not reaching to the apex—tubercles, two lines on the central part of the mesonotum, the sides and the apex more narrowly of the scutellum—the black central line being gradually, roundly narrowed towards the base—the scutellar keels, post-scutellum, the areola, the apex of the metanotum, except on the posterior median area, the yellow extending on to the spiracular area and on to the pleuræ below, a large irregular mark on the lower part of the mesopleuræ, the mark being roundly dilated upwards at the apex, and extending narrowly near the apex on to the sternum, the tubercles, the apex of the mesopleuræ, a squarish mark behind the spiracles, and the apices of the first, fourth, and following segments, and two large marks on the apices of the second and third segments, pallid yellow. Legs bright fulvous, the four front coxæ and trochanters yellow, the hinder coxæ black, marked with yellow above; the hinder femora, &c., broken off in my example. Wings clear hyaline, the stigma dark testaceous, the nervures darker. ♀. Length, 12 mm.

Hab. Darjeeling.

APIDÆ.

Prosopis basimacula, sp. nov.

Black; the basal segment of the abdomen with a large irregular mark, commencing near the base and extending to the apex, where it extends to the sides, and having an irregular indentation on the inner side near the apex, brownish red; the apices of the third and fourth segments brownish, and covered with fulvous pubescence; the inner orbits from the base of the antennæ rufous, the red line continued to the base of the mandibles below. Legs black, the anterior tibiæ in front and the basal half of the hinder pair testaceous. Wings hyaline, the costal, radial, and cubital cellules smoky violaceous, the stigma and nervures black. ♀. Length, 8-9 mm.

Hab. Darjeeling.

First recurrent nervure received shortly beyond the transverse cubital, the second interstitial. Metanotal area coarsely rugosely reticulated. Front and vertex closely rugosely punctured; the face and clypeus bearing longish shallow clearly separated punctures. Malar space large, nearly as long as the third and fourth antennal joints united. Pro- and mesothorax closely and strongly, almost rugosely punctured; the apex of the pronotum is raised. Scutellum punctured like the mesonotum, the post-scutellum more closely rugosely punctured. The entire base of the metanotum is coarsely rugosely reticulated; the apex of the area and the rest of the metanotum closely rugose, the punctuation running into reticulations on the sides. The apex and lower part of the metapleuræ are closely rugose; the under side is bordered by a curved furrow, beneath which it is finely closely rugose. Abdomen finely, closely, and distinctly punctured.

This is larger than any of the recorded Indian species, with none of which can it be confounded. The face and the malar space are longer than usual.

ANDRENA INOA, sp. nov.

Black, the pubescence white, darker on the thorax, on the scutellums fulvous; the head closely and distinctly punctured; on the vertex the punctures are not so strong or so close as they are on the face, and it is also more shining. The metanotal area coarsely reticulated in the centre, the sides obliquely striated; the apical slope is irregularly reticulated, the striæ broken; its sides are keeled all round, and there is a stout keel in the centre, which commences shortly below the top. Legs piceous-black. Wings hyaline, the stigma testaceous, the nervures darker. ♂. Length, 9 mm.

Hab. Himalayas.

Head largely developed behind the eyes. Antennæ rather shorter than usual, with the joints not dilated below. Mandibles black, smooth, shining, and sparsely haired. Dorsal segments of abdomen closely and distinctly punctured; the middle ones slightly depressed at the apex. In the centre of the apical half of the penultimate ventral segment is a raised tubercle, covered with fulvous pubescence, broad and rounded at the base, and becoming gradually narrowed towards the apex; the last segment is closely punctured. In front the third cubital cellule is not much longer than the second; the third transverse cubital nervure is roundly curved, and is hardly obliquely sloped above as in most species of *Andrena*. The apex of the clypeus has a stout margin, clearly separated from the upper part; it is transverse, with the sides bent downwards.

Characteristic of this species is the keeled margin of the apex of the metanotum, with the stout keel in the centre. In Bingham's arrangement it would come in near *A. phœdra*, Cam.

HALICTUS HIMALAYENSIS, sp. nov.

Black, the pubescence white, the wings clear hyaline, the nervures and stigma black; the base of the median segment with curved, irregular, clearly separated striæ, the apex of the segment distinctly margined, the anal rima with the apical half piceous. ♀. Length, 7 mm.

Hab. Himalaya.

The vertex indistinctly, the front closely and distinctly punctured; its lower part with a narrow keel in the centre. Face sparsely punctured, its centre almost impunctate; the clypeus is more strongly, but not quite so closely punctured as the sides of the face; its apex fringed with long white hair. Mesonotum shining and impunctate. Metapleuræ opaque, shagreened. Abdomen smooth and shining; the apical fringes white, the segments without transverse furrows or depressions. The legs have a brownish tint; the calcaria pale testaceous; the outer spur on the hinder tibiæ stoutly spined. The second recurrent nervure is received near the base of the apical third of the cellule. The head is more elongate and narrower than usual; the eyes converge above. The basal area of the metanotum appears larger than usual; its striæ in the centre are irregular; laterally more regular and oblique.

(To be continued.)

NEW CULICIDÆ FROM THE FEDERATED MALAY STATES.

By Fred. V. Theobald, M.A.

(Continued from p. 165.)

Observations.—The two types sent by Dr. Leicester are not quite perfect, having been slightly damaged in transit. They were bred from larvæ taken in bamboo jungle on the Pahang Road, about five and three-quarter miles from Kuala Lumpur. The thoracic adornment is so very marked the species cannot well be mistaken, for in *M. tremula*, which it resembles, the golden scales of the mesothorax form but very indistinct lines, not clear narrow ones as in this species. Dr. Leicester's description of the scutellum must be modified, for the scales are certainly not of the usual spindle-shape, but flattened on the mid lobe, much smaller and more irregular than in *Stegomyia*, and with more rounded apices.—(F. V. T.)

Genus Leicesteria, nov. gen.

Head covered with flat scales, upright forked scales, and a row of spindle-shaped creamy ones around the eyes. Palpi in the female four-jointed, long, being fully one-half the length of the proboscis; in the male the palpi are longer than the proboscis and slender, no hair-tufts. Proboscis swollen apically. Mesothorax with narrow and broad-curved scales; scutellum with flat scales; prothoracic lobes with flat scales. Venation and wing scales much as in *Stegomyia*.

This genus comes near *Eretmapodites*, from which it differs in (1), having a narrow-scaled border around the eyes; (2), the great length of the palpi, in the female, the long palpi also separating it from the other allied genera (*Macleayia*, *Scutomyia*, &c.). A single species only is known, which is here described by Dr. Leicester.

Leicesteria longipalpis, Leicester, n. sp.

"Head black in the middle, creamy at the sides; palpi half the length of the proboscis, both black. Thorax yellowish brown, with bronze scales and a creamy line on each side as far as the base of the wings. Abdomen with apical white lateral spots. Legs unbanded.

"♀. Head black; the vertex, occiput and nape covered with broad flat black scales; along the orbital margin is a narrow row of spindle-shaped creamy scales; laterally, where the black scales end, is a band of creamy scales, and then black scales again; there are a moderate number of black upright forked scales confined to the nape. Antennæ with the basal joint pale dirty yellow; the inner face is rather thickly clad with small flat scales with a few dark ones interspersed; the basal half of second joint is similar in colour to the basal joint; the apical half and the succeeding joints of the antennæ

are black, covered with numerous short white hairs; verticillate hairs black; last joints of antennæ not elongated. Clypeus dark brown, a few narrow white scales on its anterior margin. *Palpi black-scaled, four-jointed; third joint very long—longer than all the other joints put together; fourth joint minute. The palpi in this species are unusually long, being fully half the length of the proboscis.* Proboscis thick, entirely black-scaled. Prothoracic lobes thickly clad with flat spatulate scales, white on the lower half, black above, and from the apex a tuft of stout dark brown bristles projects. Mesonotum yellowish-brown; running round the margin anteriorly and laterally as far as the wing bases is a creamy line, composed of broad-curved scales; the rest of the mesonotum is densely clad with long narrow-curved bronzy scales, which are specially dense and long over the roots of the wings, where they form dense tufts; the colour of these scales under a hand lens is metallic bronze, but under a two-thirds power many appear pale brown; in some lights they appear purple, as do the dark scales on the head and proboscis, indeed the scales on this mosquito show a play of colours on every part as the angle of the light changes. Pleuræ brownish, clothed with tufts of white elliptical scales. Scutellum clad with flat black scales, purple or rose-purple in a good light, on all the lobes, border-bristles brown. Wings clouded, covered with dark brown scales, the lateral linear with square ends, the median also rather narrow; fork-cells moderately long; the stem of first submarginal cell about two-thirds length of cell; the base of the cell nearer the base of the wing than that of second; the second posterior cell is a little broader than first submarginal; median and supernumerary cross-veins meeting at an angle; posterior cross-vein rather short, distant about twice its length from the median. Legs with coxæ pale; fore and mid coxæ with brown and white scales, the hind with only white scales; femora pale scaled beneath, though on the fore legs there are dark brown scales intermingled; the rest of the legs and the upper surface of femora clad with dark brown or purple scales, according to the direction of the light; there is no banding of the legs nor any suggestion of it. On the fore legs there are a few yellow scales at the apex of the tibiæ. The fore and mid ungues equal and uniserrate. Metanotum yellowish-brown. Halteres with pale stems and black and white scales on the knob. Abdomen covered with broad purple-brown scales; no dorsal banding, though the white lateral bands almost meet over the apices of the segments; laterally there are conspicuous white bands passing from beneath upwards and backwards; these bands are shaped something like the mesial vertical section of an arm-chair; the scales forming them are bluish-white (in the dried specimen they may change to a dirty yellow).

"♂. The lateral band of creamy scales on the head is broader than in the female. The vertical bristles are pale golden. Antennæ pale brown, two last joints black and elongated. Plumes long, dense and purple-brown. Proboscis distinctly enlarged for about one-third its length at the apex, black scaled. Palpi slender, longer than the proboscis, scaled entirely save for a few white scales about the centre of the first apparent joint with dark purple-brown scales. Fore and mid ungues unequal, the larger uniserrated. Length 4·5 mm."

"*Habitat.*—Kuala Lumpur."

Observations.—This species can easily be told by the great length of the female palpi. I know of nothing approaching it. The pale apical abdominal spots often spread out to form nearly complete bands. The type sent over does not show the pale scaled line up to the base of the wing on the mesothorax, as Dr. Leicester describes; probably the specimen has been slightly rubbed.—(F. V. T.)

(To be continued.)

NOTES AND OBSERVATIONS.

National Collection of British Lepidoptera.—Mr. William M. Christy, of Watergate, Emsworth, Hants, has presented a very useful assortment of Lepidoptera from the Woodforde Collection. All the specimens are in fine condition, and have full data attached. He has also given a nice series of *Boarmia consortaria*, reared from Sussex larvæ, and an exceedingly interesting series of *Melanippe galiata*, bred from ova deposited by a female specimen taken at Arundel. These latter have the ground colour unusually white, and the band is black.

Earwig attacked by Acari.—Near Ashtead, on July 9th, I took an immature earwig about 8 mm. long to which were attached six large *Acari* of a brilliant vermilion tint and about 1 mm. in length. The earwig was probably *Forficula auricularia*, but as the locality was suitable for *F. lesnëi*, and immature earwigs are not easily distinguished, it might possibly belong to the latter species.—W. J. Lucas; Kingston-on-Thames.

A New Form of Gnophæla.—The mountains and mountain-ranges of New Mexico are more or less isolated from one another by dry plains, and consequently present biotæ (=faunæ and floræ) largely comparable to those of islands. The "insular" races or species found are of various degrees of diversity, while, of course, in numerous instances, no obvious differences can be detected between specimens from different ranges. At Beulah, New Mexico, in the Canadian zone, the beautiful Pericopid moth *Gnophæla clappiana*, Holland, is very common. It goes north into Colorado practically unchanged. In the White Mountains of Southern New Mexico, on the Rio Ruidoso at about 7600 ft. altitude, on August 3rd, Prof. C. H. T. Townsend collected a male *Gnophæla* which is clearly different from the numerous examples of *clappiana* seen, and is, no doubt, one of the "insular" forms just mentioned. It differs from *clappiana* in having two small white spots below the large median spot of the anterior wings; three spots (separated only by black nervures) on the hind wings comparable to those of the subapical area of the anterior wings; a small round white spot in the cell of the hind wings; and the hind wings not so blue. Such forms, which are not subspecies because not connected with the type by intermediates (owing to the break in the distribution), and are hardly distinct enough to be accepted as species in the ordinary sense, I have thought to call idiomorphs. In this case, the Rio Ruidoso *Gnophæla* may stand as *G.* (*clappiana* id.) *ruidosensis*.—T. D. A. Cockerell; Colorado Springs, Colorado.

CAPTURES AND FIELD REPORTS.

Nothochrysa capitata (Neuroptera).—On June 5th last I took, on Esher Common, a specimen of *Nothochrysa capitata*, belonging to the sub-order *Planipennia* of the *Neuroptera* (Linn.). It was taken off a small rush growing in Black Pond, close to the margin, and appeared not long to have been out. I have a specimen taken by Major Robertson in Hants; and Mr. Hare took one, in 1893, at the Byfleet Canal. (See also *ante*, p. 85.) What other British specimens are in collections I do not know, but the insect appears to be a scarce one.—W. J. Lucas; Kingston-on-Thames.

Eurygaster maurus (Hemiptera).—A specimen of this "bug" was found on the occasion of the South London Entomological Society's Field Meeting at Byfleet Canal in 1903. It is one of the Pentatomidæ, or shield bugs, in which the scutellum reaches at least to the base of the membrane of the wings. In this species the scutellum covers the wings, reaching to end of abdomen. Saunders gives Woking, Headley Lane, and Reigate as Surrey localities.—R. A. R. Priske; Acton.

Plusia moneta in Essex.—About two dozen cocoons of *P. moneta* were found last June on *Delphinium*.—Rev. W. Claxton; Navestock Vicarage, Romford.

Plusia moneta at Reading.—On July 6th I netted *Plusia moneta* in my back garden, also *P. iota*, *P. chrysitis*, and *P. gamma*, and have taken three more of the first-named insect since that date.—W. E. Butler; Hayling House, Oxford Road, Reading, July 14th, 1904.

Deilephila livornica and Plusia moneta in Wales.—I had the pleasure of seeing last week a fine female specimen of *D. livornica*, which had been taken this year close to Monmouth; it was found clinging to a window-curtain. I also saw, at the same time, a beautiful *P. moneta*, taken two years ago about a mile from Monmouth and close to the River Wye. The two insects were in the collection of Mr. H. Green, of Monmouth. If I mistake not, *P. moneta* has not before been taken in that part of the country.—Charles E. Thornewill; Calverhall Vicarage, Whitchurch, Salop, July 4th, 1904.

Deilephila livornica in Kent.—A very fine specimen of above was taken at rest on a post very near to the ground early in the day, on June 12th, 1904. As I had not seen a living specimen before, I could not realize my good fortune. I think this species has not been previously taken near this locality—about four miles from Ashford, on the Canterbury road.—F. A. Parry; 13, Longport, Canterbury.

Clostera reclusa at Reading.—On June 22nd last I had the pleasure of finding larvæ of the above, the first time I have taken the species in this district.—W. E. Butler.

Acherontia atropos at Reading.—On June 28th last a fine specimen of the above was brought to me alive; it flew into a room at Wilton House School, no doubt attracted by light.—W. E. Butler.

Hadena atriplicis and Dicycla oo in Huntingdonshire.—Whilst collecting in Hunts recently, I was fortunate enough to take a fine

male specimen of *H. atriplicis* at sugar on June 28th. As this is such a rarity I have thought it worth recording. A few days later, in the same neighbourhood, a beautifully fresh *D. oo* was captured.—D. Dewar Stanley; R.S.O., Co. Durham.

Cychrus rostratus in Surrey.—On July 5th I secured a specimen of *Cychrus rostratus* floating half-dead in the baths, and on the 14th I took another example at rest on a reed at Cuttmill Ponds. It was stridulating loudly by rubbing the extremity of the abdomen against the under surface of the elytra. I do not know whether this beetle has been noticed in South-west Surrey before.—J. A. Croft; Charterhouse, Godalming.

SOCIETIES.

South London Entomological and Natural History Society.—*May 12th*, 1904.—Mr. A. Sich, F.E.S., President, in the chair.—Mr. Goulton exhibited another series of fine photographs of the larvæ of Lepidoptera, including those of *Aventia flexula*, *Hepialus humuli*, *Phibalapteryx lapidata*, *Enodia hyperanthus*, *Leucania pallens*, &c.—Mr. Ansorge, five specimens of *Dytiscus circumflexus*, taken from one small pond at Northwood.—Mr. Raynard, ova of *Pachnobia rubricosa* and *Saturnia pavonia*, from Wimbledon and the New Forest respectively, and the larvæ of *Noctua baja*.—Mr. Tonge, an album of photographs of ova recently taken by him. He noted that his magnification was uniformly twenty diameters. The chief species were, *Thais polyxena* var. *cassandra*, *Brephos notha*, *Tephrosia biundularia*, *T. cinctaria*, *Demas coryli*, and *Selenia illunaria*.—Mr. Turner, larvæ and cases of the following species of the genus *Coleophora*:—(1) *C. pyrrhulipennella*, a black, silken case on heather, from Mr. Main in the New Forest, and Mr. West at Shirley; (2) *C. alcyonipennella*, a very similar case, but not so compressed, on *Centaurea nigra*, from Ranmore; (3) *C. solitariella*, a slender, whitish, tubular case, on *Stellaria holostea*, from Mr. Sich, at Chiswick and also from Lewisham; (4) *C. hemerobiella*, a tubular, upright, dark brown case, on hawthorn, from Mr. Sich, Chiswick; (5) *C. albitarsella*, a compressed, blackish, hairy case, on marjoram, sent by Mr. Bankes, from Dorset; (6) *C. olivaceella*, a long, slender, brown case, on *S. holostea*, the rare but close companion of *C. solitariella*, from Lewisham; and (7) *C. lineolea*, a large, rough case, on *Ballota nigra*, from Lewisham.—Mr. Main, a very large species of "silver-fish," which came over from Java in a cargo of sugar.—Mr. McArthur, a nice series of finely marked *Agrotis cinerea*, from Brighton.—Mr. Barnett, *Plusia moneta*, from Welling, Kent.—Mr. Carpenter, a photograph of a pupa of *Euchloë cardamines*, and stated that the pupæ varied with the colour of the environment at the time of pupation; those on the green stems were green, those on the drab-coloured food were drab-coloured, and those on the zinc top of the cage were decidedly zinc-coloured.—Mr. Lucas gave a very interesting address, with lantern illustrations, on "British Orthoptera," and requested members to furnish him with any particulars of the occurrence of the various species.

May 26th.—The President in the chair.—The President referred in suitable terms to the loss Entomology had sustained by the death of Mr. McLachlan, F.R.S., a member of the Society for many years.

After similar expressions of regret from Mr. Rowland-Browne, as brother officer on the Council of the Entomological Society of London; from Dr. Chapman, as a personal friend for many years; and from Mr. Adkin, as near neighbour and friend, a vote of condolence with the relatives was passed.—Dr. Chapman exhibited (1) a few species of butterflies taken at Pont du Gard (S. France), including a fine specimen of *Chrysophanus gordius* and some *Syrichthus sidæ;* (2) a larva of *Thais polyxena* var. *cassandra*, suspended for pupation, showing the curious adjustment of the girth; and also a pupa of *Libythea celtis* showing how curiously the suspended pupa lies against the surface of attachment.—Mr. Carr, the larva of *Phorodesma bajularia*, in its covering made of the *débris* of the male flowers of the oak. — Mr. West (Greenwich), a short series of the rare coleopteron, *Asphyra punctata*, from Gloucester, to show the extreme sexual dimorphism. — Mr. Sich, the pupa of *Ocypus oleus*.—Mr. Turner, four species of the genus *Coleophora*, viz. cases and larvæ of (1) *C. viminetella*, from Chalfont, on sallow; (2) *C. badiipennella*, from Lewisham, on elm; (3) *C. ochrea*, sent from Dorset by Mr. Eustace Bankes, on *Helianthemum vulgare:* and (4) *C. ibipennella*, feeding on birch, and found by Mr. Sich at Ashtead during the Field Meeting. He also showed a pupa-case of *Adela viridella* protruding from its curious fiddle-shaped cocoon. — Mr. Main reported larvæ to be very scarce in the New Forest, and members generally considered the season late. — Mr. Rowland-Browne read a paper entitled "Collecting Butterflies in the Alps."

June 9th. — The President in the chair. — Dr. Chapman exhibited ova of *Coleophora laricella*, laid by a female specimen reared from larvæ obtained in the Isle of Purbeck. He stated they were upright eggs, with thirteen or fourteen very bold vertical ribs. He also showed the cocoon of *Thais polyxena*, which consisted of a few strands of silk attached to twigs.—Mr. Lucas, a number of grass stems attacked by a fungus, in which the larva of a Dipteron was feeding. Dr. Chapman explained the curious life-history of the latter as far as he knew it. Mr. Lucas also showed the ova of the large ladybird, *Halzia ocellata*, and specimens of parasites (Mymaridæ) on the ova of *Orgyia antiqua*. —Mr. West (Greenwich), the Capsid *Harpocera thoracica*, from Ranmore Common, and called attention to their knotted antennæ. — Mr. Carr, ova of *Acidalia remutaria*. — Mr. Turner, cases and larvæ of *Coleophora bicolorella*, a very local species, from Chatham, and read notes on its life-history.—A discussion took place as to the season, and several members gave notes on spring collecting. It was generally considered that the season was late, and that insects were scarce, although a few species were exceptionally abundant locally.

June 23rd.—Mr. E. Step, F.L.S., Vice-President, in the chair.—Mr. Carr exhibited a double-sized cocoon of *Lasiocampa quercus*. It was of a dirty cream colour, instead of a rich brown — Mr. Ashby, examples of *Callidium alni* and *Orsodacna cerasi*, two rare species of Coleoptera taken by him at Bookham during the Field Meeting on June 4th. — Dr. Chapman, larvæ of *Agdistes bennettii*, sent by Mr. Ovenden from Rochester, together with ova of the same species.—Mr. South, living larvæ of *Nyssia lapponaria* feeding on birch. The species was noted as being extremely local, but apparently not scarce, in its two known localities in Scotland.—Hy. J. Turner (*Hon. Rep. Sec.*).

Lancashire and Cheshire Entomological Society.—By the kind invitation of Major Ronald Ross, C.B., F.R.S., Professor of Tropical Medicine, University of Liverpool, Hon. Member of the Society, a meeting was held in the Johnstone Laboratory, Liverpool University, on Monday, May 16th. The following were elected members of the Society:—Corresponding members: Professors J. Hudson Beare, B.Sc., F.R.S.E., F.E.S., and Edward B. Poulton, M.A., D.Sc., F.R.S., F.L.S., F.E.S.; Drs. C. R. Billups and Geo. E. J. Crallan, M.A., L.S.A.; and Messrs. Geo. T. Bethune-Baker, F.L.S., F.Z.S.; Chas. Capper; A. J. Chitty, M.A., F.E.S.; H. St. J. K. Donisthorpe, F.Z.S., F.E.S.; W. H. Harwood; J. H. Keys; W. J. Lucas, B.A., F.E.S.; B. G. Nevinson, M.A., F.E.S.; E. G. B. Nevinson, F.Z.S., F.E.S.; E. A. Newbery; and Edward Saunders, F.R.S., F.L.S., F.E.S. Ordinary members: Messrs. W. P. Blackburne-Maze, and H. Berkley Score, F.R.G.S., F.R.Hist.S. The following donation to the Library was made by Major Ross, "The Hybernation of English Mosquitoes," by H. E. Annett, M.D., and J. Everett Dutton, M.B. Light refreshments, kindly provided by Major Ross, having been partaken of, a tour of the extensive laboratory, with its attendant menagerie, was made, after which Professor Ross, Dr. Stevens, and the staff of the Liverpool School of Tropical Medicine, gave demonstrations "On Mosquitoes and other Flies in connection with Tropical Diseases." Amongst the many interesting exhibits described were preparations of serum for protection from diseases; tubes of various bacteria; models of an Indian village, and a larger district to show the natural distribution of the typical breeding-grounds of malarial mosquitoes; a microscopic exhibition of malaria germs in various stages of growth; live Trypanosomata of the sleeping sickness and tsetse-fly diseases; specimens of the tsetse-fly (*Glossinia morsitans*), &c.; a series of microscopic preparations, showing the characteristic differences in appearance and structure existing between the malarial and harmless gnats, &c. At 9.30 an adjournment was made to the lecture-theatre, where Major Ross gave a most instructive and interesting lecture on the connection between malaria and mosquitoes, copiously illustrated by lantern slides. He began with a series of maps, showing the relative prevalence of malaria in various parts of the world, and then gave statistics from India, from which it appears that forty per cent. of the native children are infected with malaria at one year old, and sixty per cent. at two years; after that the percentage gradually decreases, until complete immunity ensues, and the parasite is rarely found in adult natives. This parasite is a minute jelly-like speck resembling an *Amoeba*, and lives inside the corpuscles of the blood. Bursting, it throws out spores—usually nine in number—into the blood at regular intervals, together with a minute speck of poison; this causes a rise in temperature, and the profuse perspiration which follows carries the poison off. The regular recurrence of this process causes the regularity of the periods at which malarial fever comes on, the different varieties of fever—quartan, tertian, blackwater, &c.—being due to different species of parasites. It is, however, necessary that the parasite should be transmitted from one human being to another by an insect, a female gnat or mosquito, for it is only the female that bites. A day or two after the insect has sucked the blood of an infected

person, the parasites have travelled into its tissues, and, after taking about nine days to mature, burst, scattering thread-like spores into the mosquito's blood. These threads work their way into the fly's salivary glands, and remain there until they have an opportunity of passing, together with the saliva, into human blood, when the mosquito perpetrates her next bite. The species of *Anopheles* are by no means all harmful; those that cause malaria can be always distinguished by the black spots along the anterior nervures of the wings, the usual species being *A. cortalis* and *A. funestus*. Their eggs are canoe-shaped. The larvæ breed in shallow pools of stagnant water, floating flat upon the surface, and feed on Confervæ. They have no breathing-tube, and can thus be easily distinguished from the larvæ of our commoner gnats which belong to the genera *Culex* and *Stegomyia*, and hang head downwards in the water, with a long breathing-tube projected upwards to the surface. The larvæ of the latter insects breed in tubs, pots, and other vessels lying close to houses. Since the pools were drained and filled up at Ismalia, a town of six thousand inhabitants, the cases of malaria have fallen from two thousand to two hundred per annum, and these are nearly all relapses, as only ten actually fresh cases were reported last year!—E. J. B. Sopp and J. R. le B. Tomlin, *Hon. Secretaries.*

Manchester Entomological Society.—*April 6th*, 1904.—At the Manchester Museum, Owens College; the President, Dr. W. E. Hoyle, presided.—Mr. A. J. Wilson read a paper entitled "Insects found in North-West Derbyshire and the Surrounding District." The locality referred to includes a part of Lancashire and Cheshire. With the rapid advance of bricks and mortar, many of the haunts well known years ago cannot now be visited; but there are still good and satisfactory results to be obtained near such places as Glossop, Hayfield, Marple, Sale, &c. Mr. Wilson illustrated his paper with specimens from four orders of insects, to be taken in the above-named district. The following exhibits were shown by the members:—Mr. B. H. Crabtree, *Polia chi* (Toxal) var. *olivacea* (Durham), var. *suffusa* (Rotherham); specimen of *Blatta americana* taken in Ancoats (Manchester).—Mr. G. Kearey, *Pedaria pilosaria*, from Staley Brushes (Feb. 27th, 1904); specimens showing the mode in which *Sesia bembeciformis* hybernates in its second winter.—Mr. C. F. Johnson, living larvæ of *Epunda lichenea*.—Mr. Geo. O. Day, living larvæ of *Pericallia syringaria*, and imagines of *Zonosoma pendularia* var. *subroseata*, *Z. annulata* var. *obsoleta*, and other species of the genus.—Mr. W. W. Kinsey, living larvæ of *Cleora lichenaria*, on lichen, from Wigtownshire.—Mr. R. Tait, jun., insects from Derbyshire localities, and included *Metrocampa margaritaria*, *Abraxas sylvata* (*ulmata*), *Bryophila perla* (dark form), *Triphæna subsequa*, *Plusia pulchrina*, *P. iota*, *Xylophasia scolopacina*.

May 4th.—The President in the chair. Mr. W. Warren Kinsey read a paper entitled "Collecting the Larvæ of Common British Lepidoptera." Mr. Kinsey stated that most of his work of larvæ-collecting had been done within the city of Manchester and the immediate neighbourhood, and he considered that the commonest larvæ there were those of *Odontopera bidentata*, *Orgyia antiqua*, *Hadena pisi*, *Acronycta megacephala*, and *Nænia typica*. Although the larvæ of *N. typica* were

frequently ichneumoned in the autumn, he had not found any treated thus when feeding in the spring. Larvæ, too, of *O. bidentata* were occasionally ichneumoned in the autumn, but he had never known the larvæ of *Amphidasys betularia* to suffer in like manner, although he had collected and taken them for years. The following exhibits were shown by the members:—Mr. G. Keary, *D. sulphurella*, bred from fungus obtained at Cheetham, near Manchester; Mr. J. Ray Hardy, specimens of *Psalidognathus friendi* from South America, showing the remarkable difference in size during the dry and wet seasons.—Robert J. Wigelsworth, *Hon. Secretary*.

Entomological Club.—A meeting was held on July 14th last, at 27 Hereford Square, S.W., the residence of Mr. Arthur J. Chitty, host and chairman of the evening. Twenty-one sat down to supper, including fourteen visitors and the following members of the Club:—Professor Poulton, Messrs. Adkin, Donisthorpe, Hall, Porritt, and Verrall.

RECENT LITERATURE.

Eleanor Ormerod, LL.D., Economic Entomologist, Autobiography and Correspondence. Edited by Robert Wallace. Pp. 348. London: John Murray. 1904.

When, in 1852, Miss Ormerod commenced the study of insects, making beetles her first objects of observation, Entomology was by few taken seriously, and the economic side of the subject was scarcely thought of. It seems to have been in 1868 that Miss Ormerod took up what was practically pioneer work in this phase of insect life, and from that time almost up to her death her intense energy was centred upon it. There are still some who think that the hosts of living things which make up the greater part of the animal kingdom—the insects, that is—are not worthy of serious study. Consequently, we meet occasionally with some one who would belittle the work of the economic entomologist. The honours and distinctions heaped on Miss Ormerod by Universities and other Learned Societies, as related by Mr. Wallace in the delightful work before us, enable us to assess the opinion of such detractors at its proper value.

Miss Ormerod's delightfully fresh autobiography is followed by a biographical sketch by the Editor, the rest of the volume being occupied with correspondence. At first sight the last division seems disproportionate in length to the other two; but we think the reader will certainly agree with us in finding it by no means too long, especially as by this means we are introduced to very many of the beautiful insect pictures that add so much value to Miss Ormerod's "Annual Reports." The work is, in fact, abundantly illustrated with thirty full-page plates, and eighty-two illustrations in the text.

In the United States and some other countries the State Entomologists are recognized servants of the Government. In our own country —unfortunately, we think—we seem to be behind in this respect. Perhaps it may be thought that agriculture here is in such parlous state as to be almost beyond hope; but, if this were the case, Science might just possibly help to redeem it. Economic Entomology, however, concerns the allotment-holder and the kitchen-gardener, not to mention

the fisherman, &c. If Mr. Wallace's book, and afterwards Miss Ormerod's "Annual Reports," were to be read very generally, all industries that are affected by insects would, we doubt not, be benefited materially.

W. J. L.

The Honey Bee: its Natural History, Anatomy, and Physiology. By T. W. Cowan, F.L.S., &c. Second Edition. Pp. 220. London: Houlston & Sons. 1904.

In November, 1890, appeared the first edition of this work, which was reviewed in these pages in the volume for 1891. We have now the pleasing duty of noticing a second edition. Mr. Cowan's name is a sufficient guarantee of the usefulness of the work before us, and the text at once reveals the thoroughness with which the Honey-bee has been treated from every point of view—a thoroughness which is enhanced by the numerous excellent illustrations scattered throughout the book. The new edition will no doubt have as wide a circulation as had its predecessor.

W. J. L.

Transactions of the City of London Entomological and Natural History Society for the Year 1903. 8vo, pp. 46. The London Institution, Finsbury Circus, E.C. 1904.

The Reports of Meetings (20 pp.) furnish interesting and instructive reading. The Presidential Address (Mr. A. W. Mera) deals largely with Entomology from the field-worker's point of view. There is an excellent paper by Mr. Louis B. Prout on "Variation in *Sciadion* (*Gnophos*) *obscurata*," which everyone should make a point of seeing. Mr. T. H. Hamling contributes "Notes on Breeding *Gonodontis bidentata* ab. *nigra*"; and Mr. A. F. Bayne gives an account of some collecting at Tacuarembo, in Uruguay.

The Lepidoptera of the British Islands. By Charles G. Barrett, F.E.S. Vol. IX. Heterocera. Geometrina—Pyralidina. 8vo, pp. 454. London: Lovell Reeve & Co., Ltd. 1904.

In this volume the remaining genera of the Larentidæ (*Mesotype*, *Eubolia*, *Collix*, *Eupithecia*) and the family Œnochromidæ (*Aplasta*, *Tanagra*) are treated in the first 160 pages; the remainder of the book being occupied by a large instalment of the Pyralidina. This group the author, so far, divides as follows:—Sect. 1. Pyralites. Fam. 1. Pyraustidæ; Fam. 2. Pyralidæ; Fam. 3. Hydrocampidæ; Fam. 4. Endotrichidæ; Fam. 5. Scopariidæ. Sect. 2. Pterophoridæ. Sect. 3. Orneodidæ. Sect. 4. Phycitidæ. We note that *Botys* is retained in the Pyraustidæ, and that nineteen species are placed under it, all of which, with the exception of *hyalinalis*, are referred by Hampson and Rebel to *Pyrausta* and *Pionea*, and by Meyrick to *Pyrausta* and *Phlyctænia*. The three British species, *sticicalis*, L., *verticalis*, L., and *palealis*, Schiff., have recently been placed in *Loxostege*, Hb., and also in *Phlyctænodes*, Hb. So, until their rightful position is definitely ascertained, there may be no particular harm in retaining them in *Spilodes;* but we think that exception will be taken to *urticalis*, Schiff., and *verticalis*, Schiff. (*ruralis*, Scop.), being included with them.

Back Row.—Prof. R. Meldola, Mr. H. St. J. Donisthorpe, Mr. J. E. Collin, Mr. M. Jacoby, Mr. A. J. Chitty, Mr. H. Rowland-Brown, Mr. W. M. Geldart.

Front Row.—Commander J. J. Walker, Miss Poulton, Prof. E. B. Poulton, Mr. A. H. Jones, Mr. Hamilton Druce.

THE ENTOMOLOGIST

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VISIT OF THE ENTOMOLOGICAL SOCIETY AND ENTOMOLOGICAL CLUB TO OXFORD.

(PLATE VIII.)

A large gathering of the Members of the Entomological Society and the Entomological Club accepted the kind invitation of the Hope Professor of Zoology to Oxford on July 2nd and 3rd and 4th. Among those who were entertained at dinner by Professor E. B. Poulton at Jesus College, were Dr. F. A. Dixey, Mr. A. J. Chitty, Mr. J. E. Collin, Mr. Hamilton Druce, Mr. A. H. Jones, Mr. W. J. Lucas, and Mr. H. Rowland-Brown, representing the Council; Mr. Roland Trimen, Mr. G. H. Verrall, and Professor R. Meldola, past-Presidents, with Commander J. J. Walker, Mr. M. Jacoby, Mr. W. M. Geldart, and Mr. H. St. J. Donisthorpe representing the Fellows of the Society. Professor Poulton, replying to a cordial vote of thanks to him proposed by Mr. Trimen, laid stress on the value of these gatherings as tending to promote the interests of entomological science, and said that it was especially notable that he should have beside him three Fellows who had filled the Presidential chair. On Saturday and Sunday the Fellows and Members were further entertained in the Museum, where great progress has been made in the arrangement of the several collections, and in the afternoon a picnic up the Cherwell was organized; not a few of the party having already taken the opportunity to investigate the fauna of the neighbourhood, under the direction of Mr. A. H. Hamm, of the Museum, and others. The expedition was as great a success as ever: but for some reason the river, usually alive with dragonflies, yielded not a solitary specimen. The coleopterists, however, who landed at a certain fungus-haunted tree, gave a good account of *Mycetophagus multipunctus*, and now that Commander Walker has come to anchor permanently in Oxford, we may look for bountiful additions to the rather meagre entomological lists of the county at present in existence. The

gathering finally adjourned to the beautiful Fellows' garden of Wadham College, and later, in Dr. Dixey's rooms, separated, after a meeting which will be remembered with exceptional pleasure by all those who were privileged to attend.

H. R.-B.

BUTTERFLY HUNTING IN THE SOUTH TYROL.

By H. Rowland-Brown, M.A., F.E.S.

Whether the season or the localities be to blame, there is no doubt that my entomological experiences in search of butterflies this year have proved disappointing. My expectations of the neighbourhood of Vienna had been raised by articles which have appeared in this magazine, and a study of local lists. But here, at all events, being alone, I can only think that I failed to hit out the right spots in the places named, since three several expeditions proved utter failures, so far as local species are concerned.

On the footpath leading up to the Kahlenberg from Nussdorf I met with *Heteropterus morpheus* rather unexpectedly in a patch of lucerne, otherwise productive of nothing more than *Lycæna baton;* a day at Weidlingbach, besides the commoner butterflies, yielded only a few *L. damon* and *Chrysophanus virgaureæ;* while Mödling, of which I had anticipated great things, furnished forth no more than *Satyrus hermione*, a few ordinary fritillaries, and a single example of *Pieris rapæ* var. *flavescens*, found here in some quantities by Miss Fountaine in 1898. The park at Schönbrunn I did not thoroughly explore, but *Neptis lucilla* was nowhere visible. Had I extended my observations to the Heterocera, I could have made a good bag in the Prater from the electric lamps, but it requires some nerve to collect in the brilliantly lighted restaurant garden, where, in the tropical weather I experienced from July 6th to 11th, the entire city dines and drinks the long summer evenings until far into the small hours.

Leaving on the 11th, I joined Mr. F. C. Lemann, Mr. A. H. Jones, and Mr. Hamilton Druce at Brenner the next day, but unfortunately my arrival in the mountains was signalled by a change in the weather; a high wind was blowing, and soon after midday our particular alp was shrouded in misty rain. This was especially disappointing, as a former visit had convinced me that it was a really fine hunting-ground for the higher alpine species, and especially the interesting and, in my experience, rare little *Melitæa asteria*, which occurs just above the tree limit. I secured two or three specimens, mostly from hawkweed flowers; but it was distinctly rare, and when I returned three weeks later

to the same spot but a single female rewarded a morning's search. The hills on the left-hand side of the railway looking towards Brennerbad are the best collecting-ground hereabouts, and especially fertile in Erebidæ. On this occasion I took or observed *E. epiphron* var. *cassiope*, *E. manto*, with ab. *cæcilia*, Hb., *E. lappona* (a small and poor form), *E. goante*, *E. tyndarus*, *E. gorge* var. *triopes* (the invariable Tyrolese form), and, in the fir-woods, *E. euryale* and *E. ligea;* while, on July 27th and 28th, I found *E. pronoe*, and *E. mnestra* (one). *L. pheretes* (females) was the best of the "blues" present, a genus, by the way, very sparsely represented, in my experience, throughout the eastern granitic and dolomitic alps. On the day previous some members of our party had taken *Argynnis thore*, in the old locality by the Brenner See, and this, with *A. amathusia*, *A. pales*, *A. niobe*, and *A. aglaia*, very plentifully, constituted all the Argynnidæ seen by me in the pass. The next day we adjourned to Mendel *viâ* Botzen, to find that this once delightful and remote village had been "discovered" by means of a funicular railway, and the whole place invaded by crowds of tourists. We were, however, rather fortunate than otherwise in failing to secure adequate accommodation at the bigger hotels, for we finally decided upon the little Hotel Adler, where the manners of Herr Spitko were as welcome and excellent as the cleanliness of his rooms and the quality of his wine. Frankly, I cannot recommend the Mendel Pass as it now is to the entomologist who looks for large hauls. Alpine species there are none, or next to none. The mountains are thickly girdled with green fir-forest; the few higher points are close cropped by cattle to their summits, and there is everywhere a dearth of water. With these drawbacks, however, the views of the distant Brenta and the towering Ortler ranges are beautiful in the extreme, while there is at least one good, if limited, piece of collecting-ground. The zizgags which scale the cliffs of Mendel are extremely well-wooded with a variety of trees—willows, poplars, and mountain ash—not usual in this class of road. We found *Pararge achine*, just going over, in some numbers, amongst the copses; *Vanessa antiopa*, recently emerged and not uncommon; *Apatura iris* (a few, mostly worn, with immense females); *Satyrus hermione* (fresh), and one *S. circe; Parnassius apollo; Papilio podalirius* (frequent), and *P. machaon, Argynnis paphia, A. aglaia, A. niobe*, and an occasional *A. ino;* and of Lycænidæ, *L. escheri, L. meleager* (one taken by Mr. Druce), *L. arion* (much worn), *L. hylas:* and at the bottom of the zigzags, quite close to the Matschacher Hof, *L. argiades*, a fresh brood, with ab. *coretas*, and an occasional *L. orion*. The only two Erebias were *E. ceto* (scarce), and *E. nerine*, which is *par excellence* the Mendel "ringlet." On the warm stone escarpments of the roadside, wherever the attractive *Sedum telephium* grew, the males were collected in countless numbers, the females always

rare, and chiefly to be found among the grasses. A beautiful insect, with the iridescent shining glow upon its wings; I do not consider, however, the Mendel specimens as fine as those which I took in 1900 near Bormio, the western extremity of its flight.

A walk upon Monte Roën (6735 ft.) next day, though bringing us to a respectable height, added only *Lycæna optilete* (1), *Chrysophanus hippothoë* var. *eurybia* (males), *Colias phicomone*, and *Erebia stygne* to the bag, and one very fine *A. thore*, which I was fortunate enough to secure on the descent, among swarms of *A. amathusia*, with *L. corydon*, the commonest insect about. *Epinephele lycaon* was also fairly common on the roadside, with a complement of the usual Hesperiidæ, though all sorts of *Hesperia*, unlike Switzerland, were notably few and far between; indeed, *H. carthami* and one or two *H.* var. *alveus* represented the group.

From Mendel we drove to Madonna di Campiglio (4970 ft.) on the 20th, a long hot journey enlivened by swarms of *P. podalirius*, and as we began the woodland ascent from Dimaro, innumerable freshly-emerged *Erebia æthiops*. Otherwise the roadside proved hardly more productive than at Mendel, and the same may be said for such of the nearer alps and fir-woods as we investigated in the neighbourhood. Our chief object in visiting Campiglio was to obtain the local variety of *Erebia glacialis* var. *alecto*, which for some time, and until finally distinguished by Calberla, I think, was supposed to be the *E. melas* of the Pyrenees. The known locality is at a considerable elevation around the Austrian Alpine Club shelter hut on the way to the Brenta, but it probably occurs on all the mountains of this particular range where conditions are favourable. I came across no specimens, however, approximating to the usual alpine form of *Alecto*, though some were certainly nearer to those taken by me on the spurs of the Ortler above Trafoi four years ago. We can hardly be reckoned fortunate in the choice of the three days on which we climbed that stony barren path, for, although we did find this characteristic butterfly, which merits a distinctive varietal name quite as much as many less marked departures from the type, on two occasions it poured with rain soon after we were on the *débris* where it occurs, and on the third it clouded over almost as soon as the nets were unfurled. The difficulty of securing specimens, however, added not a little to the excitement of the chase, conducted on an almost perpendicular and moving slope of loose stones, among the crevices of which *alecto* disappeared like magic with the failure of the sun, and often escaped from under the gauze itself. A modest series of about a score, of which by no means all were perfect, rewarded three days' hard work; I should have said hard labour had I not grateful recollections of the hut, in which we found a welcome shelter, as well as food and bottled beer. Whilst flying, the

metallic flush of the wings is somewhat difficult to distinguish. In certain lights in the cabinet it resembles as nearly as possible the purple glow of *Apatura iris*. Lower down we took a very nicely marked form of *Erebia pronoe*, but again the uplands were almost destitute of butterfly life. Nor did a walk to Pinzolo on a brilliant midsummer day add largely to our experiences, though here, for the first time, we encountered *C. dorilis*, and *Satyrus cordula*, similar rather in size and marking to my Cevennes forms, and wholly inferior to the splendid specimens taken last year about this time at St. Martin-Vésubie and Digne.

On the 28th we again drove from Campiglio, where we had been most comfortably housed at the Hôtel Dolomiten, to St. Michele on the railway to Botzen, where my friends stayed for a day's collecting, and found *L. orion* now in profusion, while I returned to Brenner, thence returning by Innsbruck and Bâle to London.

Taken as a whole, the trip, from the entomological point of view, was decidedly not a success, though, counting single captures, the number of species met with makes up a respectable total. Subjoined is a list of those butterflies which were either observed by me or by members of the party, and, unless otherwise stated, it may be assumed that they occurred in all localities visited except Vienna :—

Papilionidæ : *Papilio podalirius* (not at Brenner), *P. machaon*, *Parnassius apollo*. Pieridæ : *Pieris cratægi*, *P. brassicæ*, *P. rapæ*, *P. napi* var. *bryoniæ* (Brenner), and var. *flavescens* (Mödling only), *P. callidice?* (Campiglio), *Leptidia sinapis*, with an occasional ab. *diniensis ; Colias phicomone*, *C. hyale*, *C. edusa*, and ab. *helice*, rarely. Lycænidæ : *Thecla spini*, *T. ilicis*, *T. acaciæ* (1), *Zephyrus quercus*, all at Mendel; *Chrysophanus virgaureæ* (not at Brenner), *C. hippothoë* var. *eurybia*, *C. dorilis* (Campiglio), *P. phlæas*, *Lampides telicanus* (one taken at Brenner by Mr. Lemann—rather remarkable at such an elevation, 5000 ft.); *Lycæna argiades* (Mendel only), *L. ægon*, *L. optilete* (1, Monte Roën), *L. orion* (Mendel and Botzen), *L. baton* (Vienna and Mendel), *L. pheretes*, *L. astrarche* and ab. *allous*, *L. icarus* (very scarce), *L. escheri* (Mendel), *L. corydon*, *L. hylas*, *L. meleager* (1), *L. damon* (Vienna), *L. minimus*, *L. semiargus*, *L. arion* (Mendel); *Cyaniris argiolus* (Mendel). Apaturidæ : *A. iris* (Mendel), *A. ilia* (Botzen). Nymphalidæ : *Limenitis camilla*, *L. sibylla ; Polygonia c-album*, *Vanessa polychloros*, *V. urticæ*, *V. io*, *V. antiopa*, *V. atalanta*, *V. cardui ; M. phœbe*, *M. didyma*, *M. dictynna* (Mendel), *M. athalia*, *M. parthenie*, *M. asteria* (Brenner only), *A. euphrosyne*, *A. pales* and ab. *napæa*, *A. dia*, *A. amathusia*, *A. thore* (Monte Roën and Brenner), *A. ino*, *A. latonia*, *A. aglaia*, *A. niobe* (with ? ab. *pelopia* at Campiglio), *A. paphia*, and one var. *valesina* (Mendel). Satyridæ : *Melanargia galatea ; Erebia epiphron* var. *cassiope*, *E.*

melampus (Monte Roën), *E. mnestra* (Brenner), *E. manto* and ab. *cœcilia* (Brenner), *E. ceto*, *E. stygne*, *E. nerine* (Mendel), *E. glacialis* var. *alecto* (Campiglio), *E. lappona*, *E. tyndarus*, *E. gorge* var. *triopes*, *E. goante* (very rare), *E. pronoe*, *E. æthiops*, *E. ligea*, *E. euryale*; *Satyrus hermione*, *S. circe?* (Mendel), *S. semele*, *S. actæa* var. *cordula*; *Pararge mæra*, *P. megæra*, *P. egeria*, *P. achine* (Mendel only); *Epinephele lycaon*, *E. jurtina* (*E. tithonus* appeared to be entirely absent); *Aphantopus hyperanthus*; *Cœnonympha arcania* and var. *satyrion*, *C. pamphilus*; *Hesperia carthami*, *H. fritillum* var. *alveus*, *H. sao*, *Thanaos tages*, *Adopœa thaumas*, *A. lineola*, *Augiades sylvanus*, *A. comma*, and *Heteropterus morpheus* (Vienna only).

A LIST OF THE COCCIDÆ OF THE HAWAIIAN ISLANDS (HEMIPTERA).

By G. W. Kirkaldy.
(Bureau of Agriculture, Honolulu.)

This supersedes my list in the 'Fauna Hawaiiensis.' The nomenclature is almost exactly that of Mrs. Fernald's Catalogue.

Sub-fam. Coccinæ (Monophlebinæ).

1. Icerya purchasi, Maskell.—Formerly destructive, but since the introduction of the ladybirds, *Vedalia cardinalis*, *Novius koebeli*, and *Rhodolia* spp., it is of little importance, only occurring sporadically.

Sub-fam. Ortheziinæ.

2. Orthezia insignis, Douglas.—For a report on this, see Koebele [7].* It has so often been stated that Prof. Koebele was responsible for the introduction of this pest into the Islands for the purpose of controlling Lantana, that it seems necessary to declare again that not only is the above statement untrue, the scale having slipped into Maui some years ago, but that it was in direct violation of the earnest warnings of Prof. Koebele, that it was introduced on the windward side of Oahu and on the Kona side of Hawaii, and with the mistaken idea of exterminating the Lantana.

Sub-fam. Kerminæ.

3. Eriococcus araucariæ, Maskell.—On *Araucaria*, alligator pear, fig, and guava, but now controlled by the ladybirds, *Cryptolæmus montrouzieri* and *Sticholotis punctatus*.

4. Trechococrys longispinus (Riley).—Formerly very destructive to coffee and samang, but practically wiped out by the ladybirds, *Cryptolæmus montrouzieri* and *Cryptogonus orbicularis*.

* The numbers in brackets refer to the brief bibliography at the end.

5 T. ALBIZZIÆ (Maskell).—In the early nineties, terribly destructive to all kinds of citrus, but wiped out by *Cryptolæmus montrouzieri.*

6. T. CALCEOLARIÆ (Maskell).—Formerly causing considerable destruction to sugar-cane, but of little importance now, being controlled by *Cryptolæmus montrouzieri* and *Scymnus debilis.*

7. T. CITRI (Risso).—On orange and coffee, but of little importance.

8. T. FILAMENTOSUS (Cockerell).—Introduced from Japan in the early nineties on citrus, from which it soon spread to coffee and other shrubs and trees. The citrus and coffee were so infested by it that their destruction in the near future seemed imminent; nevertheless it has been practically exterminated by *Cryptolæmus montrouzieri.*

9. T. BROMELIÆ (Bouché).— A consignment of pine-apples was recently inspected, slightly infested with this, but was fumigated and the mealy-bugs destroyed. It is possible, however, that it may have been introduced before systematic inspection was inaugurated. *T. bromeliæ* is also known from India, South Africa, and Massachusetts (under glass), on *Hibiscus, Canna,* and mulberry,

10. T. NIPÆ (Maskell).—The cause of considerable destruction to alligator pears, guava, &c., but largely preyed upon by *Cryptolæmus montrouzieri.* [10.]

11. T. VIRGATUS (Cockerell).—Leguminous trees were in some instances entirely destroyed in former years, but the scale has been rendered unimportant by *Cryptolæmus.**

12. ASTEROLECANIUM PUSTULANS (Cockerell).— This is the *Planchonia* sp., formerly recorded by Prof. Koebele on *Jacaranda mimosifolia, Prosopis dulcis,* oleander, fig-tree, &c. It is controlled by a Chalcid parasite.

Sub-fam. CALYMMATINÆ (=COCCINÆ).

13. CHAETOCOCCUS BAMBUSÆ (Maskell). [=*kermicus*]. — On bamboo. I have not seen it in the Islands.

14. PULVINARIA MAMMEÆ, Maskell.—Controlled by *Cryptolæmus montrouzieri, Vedalia cardinalis,* and *Hyperaspis* sp.

15. P. PSIDII (Maskell).—Prof. Koebele writes (5, pp. 107–8): "I myself must confess that nowhere have I ever seen a landscape so completely blackened by the fungoid growth, caused by the honey exudation of the *Pulvinaria* scale in which this grows [in the coffee districts], as that of North Kona on my visit in February, 1894. On my recent trip to the same place, all these

* The last eight species are listed as *Pseudococcus* by Mrs. Fernald, and were formerly known as *Dactylopius;* both these names are synonymous, and apply only to the cochineal insect of Mexico (*Dactylopius mexicanus, Coccus cacti* of many authors).

had changed, and the districts, to me, had the appearance of another country, all owing to the presence of the *Cryptolæmus* beetle that devours the eggs of the scale." *Rhyzobius ventralis* also assists in the control."*

16. Cercplastes rubens (Maskell).—Kept in check by four Chalcid flies.

17. C. ceriferus (Anderson).—Of no importance.

18. C. floridensis (Comstock).—Of no importance; kept in check by a Chalcid.

19. Calymmata acuminatum (Signoret).—Always badly parasitised by spp. of Chalcids.†

20. C. hesperidum (Linné).—On citrus, apparently now very rare. I have seen one or two oranges from Japan slightly infested.

21. C. longulum (Douglas).—One of the commonest species, but is kept in check to a certain extent by *Rhyzobius ventralis*, a ladybird.

22. Eulecanium mori (Signoret).—Of little importance.

23. Saissetia hemisphæricum (Signoret).—Always kept in check by *Cryptolæmus* and by internal parasites.

24. S. nigrum (Nietner).

25. S. oleæ (Bernard).

26. Eucalymnatus tessellatum (Signoret).

27. E. perforatum (Newstead).

These last four are of little importance.

Sub-fam. Diaspinæ.

28. Chrysomphalus aurantii (Maskell).—Imported from Japan, but kept in check by the ladybird *Platynaspis nigra*.

29. Aspidiotus cydoniæ, Comstock. [=*greenii*].—Of little importance; there is a well-marked variety—*tecta*, Maskell—apparently found so far only in these Islands.

30. A. persearum, Cockerell.—Of no importance.

31. A. perniciosus, Comstock.—This pest, so terrible on the mainland, is of no importance here, the conditions being apparently unsuitable. I have seen a few examples on imported Californian fruit.

32. A. similimus, var. translucens, Fernald.—Of no importance.

33. A. rapax, Comstock.—Prof. Koebele notes that it was formerly in such numbers on apple, pear, and peach trees imported from America, that some of the trees had died. Not now seen.

34. A. hederæ (Vallot).—I have no recent information of this.

35. Morganella maskelli (Cockerell).—Of no importance.

* Prof. Koebele mentions two other species of *Pulvinaria*, but they are unnamed, and I have no further information.

† *Coccus* is used for this by Mrs. Fernald (2), but applies properly to *cacti*, Linné.

Kept in check by a Chalcid parasite and by a ladybird, *Platynaspis nigra*.

36. PSEUDAONIDIA DUPLEX (Cockerell).—Repeatedly introduced from Japan, but apparently not established. I have recently seen it on camellia plants from Japan.

37. AULACASPIS ROSÆ (Bouché).—Very common on rose trees all around Honolulu.

38. A. PENTAGONA (Tozzetti). [*Howardia prunicola* and *Diaspis patelliformis*].—Of little importance.

39. DIASPIS BOISDUVALII (Signoret).—Of little importance.

40. D. BROMELIÆ (Kerner).—Collected by Dr. Reh, of Hamburg, in 1902 [9] in Honolulu, and recently discussed by Mr. Van Dine [11].

41. HOWARDIA BICLAVIS, Comstock.—Always badly parasitised.

42. PHENACASPIS EUGENIÆ (Maskell).—Kept in check by *Rhyzobius* sp. Often occurring in numbers on oleander leaves, but apparently doing little harm to the tree.

43. FIORINIA FIORINIÆ (Boisduval).—Kept in check by *Rhyzobius* sp.

44. ISCHNASPIS LONGIROSTRIS (Signoret).—Near Honolulu on palms. If this scale has been previously recorded from these Islands, the notice must have been published in the daily press. "The most easily recognized of scales, appearing as a short black line on the leaf it infests" (Cockerell, 1897, Bull. Bot. Dep. Jamaica (N. S.) iv. p. 150).

45. PARLATORIA PROTEUS (ruricola). 46. P. PERGANDII, Comstock.

47. P. ZIZYPHUS (Lucas).

48. LEPIDOSAPHES PINNÆFORMIS (Bouché).

49. L. PALLIDA (Maskell). 50. L. ULMI (Linné).

These last six are apparently of little importance.

51. L. GLOVERII (Packard).—Does not seem of much importance.

52. L. BECKII (Newman). [*citricola*].—On various species of *Citrus* over all the Islands, but the damage is more apparent than real, in some places at least, as this species is almost always badly parasitised, and is also preyed on by the ladybird, *Platynaspis nigra*. It occurs sparingly on citrus fruits imported from the mainland. Occurred in large numbers with *L. gloverii* and *Calymmata longulum*, on citrus fruits from China and Japan. Thus, instead of the former widespread havoc caused by the scale-bugs, and especially by the mealy-bugs, we have now only three, or at most four, species that can be considered really destructive, except sporadically; so much so, that unless one secures examples of many of the species when they do appear for a short time, one has to wait often many months for their reappearance.

53. L. CROTONIS (Cockerell).—Honolulu, on *Croton*. Previously recorded only from Jamaica.

List of Works on Hawaiian Scales.

1. T. D. A. Cockerell: "A Check-list of the Coccidæ" [Bull. Illinois St. Lab. Nat. Hist. iv. pp. 318–39 (1896)].

2. Mrs. M. E. Fernald: "A Catalogue of the Coccidæ of the World" [Bull. Mass. Agr. Coll. Exp. Sta., No. 88, pp. 1–360 (1903)].

3. G. W. Kirkaldy: "Hemiptera" [Fauna Hawaiiensis iii.; Coccidæ on pp. 102–12 (1902)]. (On page 174 is a Bibliography of some earlier writings).

3*a*. G. W. Kirkaldy: "A Preliminary List of the Insects of Economic Importance recorded from the Hawaiian Islands" [Hawaiian Forester i. pp. 152–9 (June, 1904)].

4. Albert Koebele: "Report of Entomologist" [Bienn. Rep. Minister Int. Provis. Gov. Hawaiian Isl. 1894, pp. 98–104 (1894)].

5. Albert Koebele: "Rep. Entom." [Rep. Int. Republic Hawaii for biennial period ending 1897, pp. 105–37 (1898)].

6. Albert Koebele: "Report" [Rep. Comm. Agr. for 1900, pp. 36–52 (1901)].

7. Albert Koebele: "Rep. on Lantana Scale" [Rep. Comr. Agr. for biennial period ending 1902, pp. 54–65 (1903)].

8. Joseph Marsden: "Rep. Commr. Agric." [Rep. Int. Repub. Hawaii for 1894, pp. 31–8 (1895)].

9. L. Reh: "Zur Naturgeschichte Mittel- und nordeuropäischer Schildläuse" [Allg. Zeitschr. für Entom. ix. p. 30 (1904)].

10. D. L. Van Dine: "The 'Mealy Bug,' or 'Pear Blight' of the Alligator Pear" [Press. Bull. U. S. Federal (Hawaiian) Exp. Sta. No. 8 (1903)].

11. D. L. Van Dine: "The Pine-apple Scale (*Diaspis bromeliæ*, Kerner") [Hawaiian Forester, i. pp. 111–4 (1904)].

RECENT LITERATURE ON BELGIAN FOREST INSECTS.

By G. W. Kirkaldy.

My good friend Mr. G. Severin, of the Brussels Museum, has been so kind as to send me copies of a number of his memoirs on the forest insects of Belgium, published in the 'Bulletin de la Société centrale forestière de Belgique.' These memoirs are economic in purport, and are occupied by a recital of the life-history of the insects in question, and are illustrated by coloured plates of the insect in various stages, its habitat, &c., as well as by text-figures. The Belgian fauna is so interesting to British entomologists, that an enumeration of these memoirs—published in a bulletin not readily accessible in Britain—will doubtless be acceptable to the readers of the 'Entomologist.'

1. "Projet de règlement sur les insectes nuisibles aux forêts résineuses, 1898, pp. 609–56."

2. "Projet de règlement sur les insectes nuisibles. Rapport

de la 2e Commission (Campine)," 1899, pp. 290–4. (There seems also to be another edition of 11 pp.).

3. "Le genre Retinia" [Lepidoptera], 1901, pp. 598, &c., and 674, &c. Four coloured plates and seven text-figures. Deals with *Retinia buoliana* and *turionana*.

4. "Les ravages de certaines chenilles en 1901," 1902, pp. 9–22, three text-figures. Deals with the ravages of *Pieris brassicæ*, *Euproctis chrysorrhœa*, *Lymantria dispar*, *Malacosoma neustria*.

5. "Le *Dendroctonus micans* en Belgique," 1902, pp. 72–83 [by G. Severin and O. Brichet].

6. "L'invasion de l'Hylésine géante," 1902, pp. 145–52; one text-map. Deals with the beetle *Dendroctonus micans*.

7. "Le genre Lophyrus, Latreille," 1902, pp. 619–40; two coloured plates and five text-figures. Deals with the sawflies, *Lophyrus pini*, *rufus*, and *pallidus*. The plates represent *pini*.

8. "Le genre Hylobius, Schönherr," 1902, pp. 689–712; two coloured plates and four text-figures. Deals with the Curculionids, *Hylobius abietis*, *pinastri*, and *piceus*. The plates represent *abietis*.

9. "Le genre Myelophilus," 1902, pp. 754–69; three coloured plates and four text-figures. Deals with the beetles, *Myelophilus piniperda* and *minor*.

10. "Le genre Pissodes, Germar," 1902, pp. 775–801; two coloured plates and fifteen text-figures. Deals with seven beetles of this genus.

11. "Le rôle de l'entomologie en Sylviculture," 1903, pp. 152–62.

12. Le *Dendroctonus micans*," 1903, pp. 244–63.

13. "Psilura monacha," Linné, 1903, pp. 736–61; two coloured plates and six text-figures. Deals with the ravages of the nun-moth.

Honolulu: April 10th, 1904.

NEW RECORDS OF BEES.

By T. D. A. Cockerell.

Sphecodes arroyanus, n. sp.

♀. Length about 9 mm.; head, thorax and legs black, abdomen bright chestnut red, the apical half of the fifth segment clouded with blackish; head very broad, broader than thorax; mandibles black, reddish at extreme tip, notched within; clypeus strongly and confluently punctured; front dull, densely punctured; antennæ black, flagellum very faintly brownish beneath towards tip; scape long and curved; fourth joint about as long as third, fifth longer; mesothorax shining, with very strong rather close punctures, median groove very

faint, parapsidal grooves distinct; disc of scutellum sparsely punctured; enclosure of metathorax semilunar, distinctly margined, coarsely and irregularly cancellate all over; tegulæ testaceous, darker basally; wings rather pale fuliginous, stigma black, nervures very dark brown; second submarginal cell slightly narrowed above; abdomen broad but rather parallel-sided; first segment with few scattered punctures; second with very minute close punctures basally, but the middle portion with very sparse punctures; third segment similar, with the minutely punctured area larger; fourth nearly uniformly punctured, except the broad margin, which is impunctate on segments one to four; fifth with a dense apical fringe of white hair; apical plate rather narrow, truncate.

Hab. Arroyo Pecos, Las Vegas, New Mexico, June 7th (*Wilmatte P. Cockerell*). Differs from *S. arvensis* by the very sparsely punctured disc of second abdominal segment; from *S. sophiæ* by its larger size and dusky wings; from *S. arvensiformis* by the well-defined metathoracic enclosure, and narrower thorax and abdomen; from *S. clematidis* by the dark nervures, less black at apex of abdomen, and rather larger size.

Sphecodes sophiæ, Ckll.

Colorado City, Colorado, at flowers of *Prunus*, two females; Manitou, Colo., April 28th, at female flowers of *Salix*, two females (*T. & W. Ckll.*). New to Colorado. The specimens exhibit a good deal of variation, but with the available material I cannot distinguish more than one species. *S. minor*, Rob., is closely allied to *S. sophiæ*, but has darker wings, and appears to be less punctured. It is possible that the two may prove geographical races of a single species, when material has been collected all across the country. In this case, *minor* will be the name for the species, as it has at least six months' priority, both having been published in 1898.

Proteraner leptanthi, n. sp.

♂. Length about 9 mm.; head, thorax, and legs black; abdomen dark red, first segment black at base, and with a large black spot on disc, apex broadly rounded. Mandibles and antennæ entirely black, fourth joint much longer than 2 + 3; mesothorax dull, very strongly and closely punctured; enclosure of metathorax without a raised rim, but distinctly defined, with about fourteen very strong longitudinal ridges; tegulæ shining piceous; wings smoky at tips, stigma and nervures piceous; second submarginal cell narrowed at least half to marginal; abdomen rather broad, strongly punctured all over.

Hab. Manitou, Colorado, at flowers of *Ribes leptanthum*, April 28th, 1904 (*T. & W. Ckll.*). Allied to *P. ranunculi*, but distinguished by the perfectly black antennæ, strongly punctured abdomen, &c. Six specimens were taken. On May 11th my wife took one in Cheyenne Cañon.

Proteraner rhois, n. sp.

♂. Length about 8 mm.; like *P. leptanthi*, but with a considerably narrower, lighter-coloured abdomen, with the basal half of the first segment black; enclosure of metathorax typically irregularly cancellate, not well defined (but in one Manitou specimen longitudinally ridged); tegulæ with a distinct narrow whitish margin; abdomen well punctured throughout.

Hab. Type from Rio Ruidoso, White Mts., New Mexico, at flowers of *Rhus glabra*, July 21st (*C. H. T. Townsend*). Also from Manitou, Colo., at flowers of *Ribes leptanthum*, one April 28th and one May 10th (*W. P. Ckll.*). Very distinct in appearance, by the narrow, lighter red abdomen, but with no other important character. The sculpture of the metathorax, distinct enough in the type specimens of *rhois* and *leptanthi*, is quite variable. The Rio Ruidoso locality has an altitude of about 6500 ft.; Manitou about 6600 ft.

Prosopis mesillæ, Ckll.

Colorado City, Colo., May 10th, at flowers of *Prunus*, one male (*T. & W. Ckll.*).

Andrena mariæ, Robertson, var. *α*.

Colorado Springs, Colo., at *Salix*, April 22nd; one female (*W. P. Cockerell*). Abdomen darker; raised lines of metathoracic enclosure fewer. The species is new to Colorado.

Andrena salicinella, Ckll., var. *α*.

Colorado Springs, Colo., at *Salix*, April 22nd; both sexes (*W. P. Cockerell*). Under side of male flagellum orange (dark ferruginous in type). The species is new to Colorado.

Andrena birtwelli, Ckll., var. *α*.

Colorado Springs. Colo., April 22nd; both sexes (*W. P. Cockerell*). Sides of face in female with much black hair. The species is new to Colorado.

Andrena prunorum, Ckll.

Colorado Springs, Colo., April 19th, at flowers of *Cymopterus acaulis*; males (*W. P. Cockerell*).

Andrena prunorum var. *gillettei*, Ckll.

Colorado Springs, Colo., April 19th, at flowers of *Cymopterus acaulis*; one male; and April 20th to 22nd, both sexes at *Salix* (*W. P. Cockerell*); Manitou, Colo., April 28th, at flowers of *Prunus pennsylvanica*; one female (*T. & W. Ckll.*).

Nomada fragilis, Cresson.

Manitou, Colo., April 28th, at flowers of *Ribes leptanthum*; one male (*T. & W. Ckll.*). In life the eyes are pale yellowish green, suffused with reddish at the top.

Bombus juxtus, Cresson.

Manitou, Colo., April 28th, at flowers of *Ribes leptanthum;* one female (*T. & W. Ckll.*). The second abdominal segment has a small red patch, not mentioned in descriptions. A female from Beulah, N. M., shows the same character.

Bombus sonorus, Say.

San Pedro, California, July 8th, &c.; common (*Ckll.*). New to California. On July 20th I found them freely visiting *Datura meteloides* at 6.30 a.m.; they hunt for nectar, but are compelled to crawl up the stamens to fly away, as they cannot well climb up the smooth inner surface of the corolla. On July 10th I found *B. sonorus* freely visiting the flowers of cultivated *Cæsalpinia gilliesi*. On July 9th I saw them visiting flowers of *Abronia umbellata*, Lam., but remaining on them only a moment, and surely not getting anything. The *Abronia* is adapted to Lepidoptera.

Xylocopa varipuncta, Patton.

Los Angeles, Calif., July 22nd (*Ckll.*). At 7.20 a.m. I found a female visiting *Datura meteloides* for pollen; it hovered a good while around the flower, and then alighted on the stamens.

Spinoliella meliloti (Ckll.).

This was described from a single specimen. A second one, agreeing with the type, was taken by Martin D. Cockerell at Mesilla Park, New Mexico, May 20th.

Dianthidium sticticum (Fabr.).

Mr. Vachal sends me an example of *Anthidium sticticum* from Provence. I find that it belongs to *Dianthidium*.

Anthophora euops, Ckll.

Colorado Springs, Colo., April 25th, at flowers of *Ribes longiflorum;* female (*W. P. Cockerell*); Manitou, Colo., April 28th, at flowers of *Ribes leptanthum;* three males, one female (*T. & W. Ckll.*). New to Colorado. The female, not before known, is like the male, but has the face black; the eyes are green, as in the male. On May 10th my wife took males at Colorado City, at flowers of *Thermopsis arenosa* and *Ribes longiflorum*.

Emphoropsis salviarum (Ckll.).

Blue River, Arizona; one female (*Dr. A. Davidson*). Only known previously from New Mexico. At the same place Dr. Davidson collected a large example of *Anthophora urbana* var. *alamosana* (Ckll.), also new to Arizona. The two insects, although of different genera, are extraordinarily alike; aside from the venation, the *Emphoropsis* may be distinguished by the much less yellow tint of the thoracic hair, the much higher

clypeus, and the middle of the first ventral abdominal segment being covered with white hair which slants backwards, whereas in the *Anthophora* this region has only a transverse band of erect hair.

Synhalonia californica (Cresson).

This was described as a *Melissodes*. From the description I thought it must be a *Synhalonia*, and Mr. Viereck has kindly examined Cresson's type and finds this to be the case. It seems allied to *S. nevadensis*, but is a trifle larger, the pubescence is paler, the clypeus is yellow (yellowish white in *nevadensis*), and the basal joint of posterior tarsi has an apical tooth. This refers to the male, the only sex known. *S. californica*, Fowler, needs a new name, unless it is the female of *S. edwardsii*.

Centris bicolorella, n. n.

Centris smithii, Friese, Termétz. Füz. xxiii. (1899), p. 43 (not *C. smithii*, Cresson, Trans. Amer. Ent. Soc. vii. (1879), p. 229). Bolivia and Chile.

Centris atripes, Mocsary.

Beeville, Texas, Aug. 29th, on plant No. 86 (*C. H. T. Townsend*). New to the United States. *C. foxi*, Friese, is very closely allied, but apparently distinct.

Dialictus, Robertson.

The species of this genus have been described under various genera, and one species (*Hemihalictus lustrans*) has been wrongly referred to *Dialictus* by Crawford. The genus appears to include the following:—

Dialictus anomalus (Robertson). Illinois.

Dialictus occidentalis, Crawford. New Mexico.

Dialictus theodori, Crawford. New Mexico.

Dialictus parvus (*Panurgus parvus*, Cresson). Cuba.

Dialictus subcyaneus (*Dufourea subcyanea*, Ashmead). Lesser Antilles.

Dialictus halictoides (*Panurgus halictoides*, Fox). Lower California.

Greeleyella, n. g. (Panurginæ).

A genus related to *Hypomacrotera*, having the following distinctive characters:—

(1.) Marginal cell shorter and more obliquely truncate than in *Hypomacrotera*, but much longer than in *Macroteropsis*. It is rather suggestive of that of *Exomalopsis*, which is otherwise a very different bee.

(2.) The first recurrent nervure meets the first transverse cubital, as in *Macroteropsis*.

(3.) The basal nervure is almost straight (like that in *Andrena*), and it meets the transverso-medial. (In *Hypomacrotera* the basal falls far short of the transverso-medial).

(4.) There is no sign of the oval pit at the base of the metathorax, which is found in *Hypomacrotera*.

(5.) The labrum has very large punctures and numerous stout bristles below the strong transverse ridge.

(6.) The mandibles are simple, and the maxillary palpi quite ordinary, 6-jointed. Type *G. beardsleyi*.

Greeleyella beardsleyi, n. sp.

♀. Length nearly 9 mm.; black, the pubescence pale ochraceous or dirty yellowish white, nowhere clear white; head brown, facial quadrangle much broader than long; mandibles black, labrum broadly rounded, the apex truncate; clypeus shining, very sparsely punctured; vertex with punctures of two sizes; flagellum dark brown above, ferruginous beneath; third antennal joint comparatively short; disc of mesothorax nude, very shiny, with sparse punctures of two sizes; metathorax truncate, with a narrow dull roughened basal area; tegulæ shining, reddish testaceous, dark in front; wings clear, faintly dusky in apical field; stigma and nervures reddish testaceous; marginal cell obliquely truncate, with an appended nervure; second submarginal cell narrowed more than half to marginal; *first recurrent nervure meeting first transverso-cubital*; second recurrent joining second submarginal a little before its end; femora black, with a reddish apical spot beneath; tibiæ and tarsi very dark reddish (anterior tibiæ pale in front), with pale orange hair; all the claws very deeply cleft; abdomen broad, shining, hind margins of segments testaceous; first segment impunctate, the others with scattered very minute punctures; apical fimbria pale reddish ochreous; ventral segments with a small ferruginous cloud in the middle.

Hab. Collected by Professor Beardsley, of the Colorado Normal School, at Greeley, Colorado, June 3rd, 1900. The insect looks not unlike *Panurginus perlævis*, which, however, has a quite different venation.

NEW CULICIDÆ FROM THE FEDERATED MALAY STATES.

By Fred. V. Theobald, M.A.

(Continued from p. 213.)

Genus Orthopodomyia, nov. gen.

Head clothed with narrow-curved and forked upright scales; flat ones are at the sides. Palpi 5-jointed in the female; long, as long as half the proboscis; in the male 4-jointed, three-fourths the length of the proboscis. Thorax with narrow-curved scales on the prothoracic lobes, mesothorax, and scutellum. Wings spotted.

Allied to *Finlaya*, but differs in the squamose structure of the head and scutellum. The female palpi are noticeably

very long. The hind legs, when the insect is resting, are held straight out, close together and quite close to the surface upon which the fly rests, an abnormal attitude in the Culicinæ.

ORTHOPODOMYIA ALBIPES, Leicester, n. sp.

"A medium-sized species much speckled with yellow and grey, and with the last three hind tarsi with conspicuous creamy yellow, others with narrow, basal bands. Wings with four prominent white costal spots and three small ones at the base. Proboscis with two white bands. Palpi of female more than half as long as the proboscis.

"♀. Head broad transversely, set close to the thorax, dark grey, in a poor light almost black, densely clad with white narrow-curved scales and upright forked scales which are white in front and dark brown behind; the fork-scales are very numerous, broad-topped, the free forked edge with numerous serrations; there is a small patch of broad, white flat scales, laterally on either side, very difficult to see; there are two vertical bristles, dark brown in colour, projecting forwards, and three or four post-orbitals. Antennæ with the basal joint brown, the inner and upper faces rather densely clad with creamy spindle-shaped scales; the second joint is a dirty white at either end and black in the middle; the verticillate hairs are inserted about the middle, and are very short except on the inner face; there is a tuft of long creamy yellow scales on the inner face; other hairs are inserted near the base, and there is a whorl of short stiff bristles inserted at the end of the joint; the succeeding joints are black at the apices and at the insertion of the verticillate hairs, and dirty white between their immediate bases; at the apex of each joint except the last there is a whorl of short stiff hairs. Clypeus naked, dark brown. Palpi 5-jointed; first joint short, swollen and constricted in the middle; second joint longer, linear; third about as long as the first two, rather swollen at the apex; fourth joint about one-third the length of third; fifth joint minute, but quite distinct. The whole palp is about two-thirds the length of the proboscis, but when dry it shrinks to about half the length of the proboscis; it is black scaled except for some white scales on the upper surface of the first joint, a ring of white scales at the apex of the second, third and fourth joints, and white scales over the whole of the fifth joint. Proboscis long, black scaled over the first half, then there is a band of creamy scales extending about twice as far on the under surface as it does above; beyond this above are black scales, and white and black again at the immediate apex. The labellæ are creamy yellow. Prothoracic lobes black, not prominent, covered with white narrow-curved scales above and with broader almost spindle-shaped white scales below. Metanotum dark grey, almost black, covered with narrow-curved scales, black, tawny and white in colour, arranged in a sort of pattern. The anterior margin is covered with white scales, followed laterally by tawny scales; dorsally in the centre is a line of white scales running about half way across the metanotum and ending opposite a diamond-shaped patch of tawny scales edged with a few black scales

set in a bare space which appears as a black margin; flanking the median line of white scales on either side is a line of tawny scales, and outside this line is a patch of white scales anteriorly and a bare space having the appearance of a black spot owing to the dark colour of the metanotum; the posterior part of the thorax is chiefly occupied with a diamond-shaped patch of tawny scales edged with a few black scales and a bare space; outside this are white and tawny scales arranged somewhat irregularly. The arrangement of the scales varies considerably. Another specimen I have seen shows a central line of white, black and tawny scales from the front backwards, and flanking this is a bare line, and then a large patch of purple-black scales. In a dry specimen the scales have a very ragged appearance, and, being twisted this way and that, have not the same appearance of a definite arrangement as in a fresh specimen. Scutellum dingy yellow, clouded with black; all three lobes clad with rather long white narrow-curved scales. Scutellar bristles brown. Wings covered with black and white, broad spatulate in some specimens, almost spindle-shaped scales in others. Costa black scaled with white spots; the first spot close to the base and involving the base of all the long veins; the second involves the costal, sub-costal and first long vein; the third involves the veins as far as the fourth long vein. The fourth passes on to the base of the first fork-cell, and the fifth spot is very narrow and involves the lower branch of first fork-cell; there is a spot on the wing field at the base of the second long vein, and another on the upper branch of the fifth vein near its base, and one at its apex and another spot at the base of the second fork-cell. Supernumerary and mid cross-veins form an obtuse angle towards the base. Posterior cross-vein distant about four times its length from the mid cross-veins. Pleuræ dark brown, thickly covered with broad flat white scales. Legs with the fore coxæ pale, with creamy scales in the front legs, and hind and mid dark brown, with a few white scales; femoræ clad with purple scales freely mottled with golden; on the fore legs is a ring of golden scales a little before the apex which does not include the upper face; on the mid and hind legs the scales at the apices of the femora are elongated, and give an ill-marked feathered appearance to the legs; the tibiæ are mottled purple and golden, and at the apices of all the tibiæ is a band of creamy yellow scales; the base of the metatarsus and first two tarsal joints on the fore and mid legs are banded with creamy scales; in the hind legs the base of the metatarsus and first tarsal joint are banded, and the last three tarsal joints are creamy white. Ungues equal and simple on all the legs. Abdomen covered with purple-brown scales; each segment bears on the dorsum two spots of white scales placed on either side of the middle line and rather nearer the apex than the base; laterally there is a basal patch of white, apically a band of white scales. Some specimens bear numerous golden hairs on the apex of the segments dorsally; ventrally each segment is basally banded, and some of the segments have a median white spot.

"♂. Head brown; the narrow-curved scales form a dense tuft between the eyes and a more definite margin to them than in the female. There are more white upright forked scales, the brown comprising

about three or four rows on the nape. Antennæ with the basal joint dark brown, sparsely clad with small flat white scales; succeeding joints white, with black bands at the insertion of the verticillate hairs; last two joints much elongated; first five joints with numerous linear silky white scales with blunt rounded ends; verticillate hairs pale ochre-yellow. Palpi four-jointed, about three-fourths the length of the proboscis; there are a few white scales on the upper surface immediately in front of the clypeus, a ring of white scales at the middle of the second joint, another ring at the apex of third joint, and the fourth joint is completely white scaled; the rest scaled with dark brown scales; the first joint is very short, second joint is very long and in the middle shows a false joint, the third joint is about one-third the length of the second, and the fourth joint is short and always carried bent down towards the proboscis. Proboscis scaled dark brown for about half its length, then there is an incomplete ring of creamy yellow scales, followed by a band of dark brown scales; the apical fourth is swollen and scaled with creamy yellow scales. Thorax as in the female. Wings with an additional costal spot of white scales between the basal and second spots. Legs with more pale scales on the tibiæ; the banding of fore and mid legs is rather more evident; fore and mid ungues unequal, larger uniserrate. Abdomen with a distinct basal white band to the hinder segment in addition to the dorsal white spots. Length of female, 5 mm.; of male, 5·3 mm.

"*Habitat.*—Kuala Lumpur (in jungle five miles away).

"*Time of capture.*—April."

Observations.—Described by Doctor Leicester from specimens bred from larvæ taken in bamboo jungle. It is a very distinct species, told at once by the last three hind tarsi being white. It resembles the *Finlayas*, and can only be separated from them by scale examination.—(F. V. T.)

(To be continued.)

NOTES AND OBSERVATIONS.

Nothochrysa capitata.—I do not consider *N. capitata* quite so rare an insect as my friend Mr. Lucas's note (*ante*, p. 214), would lead one to infer; but perhaps it occurs more frequently in Yorkshire than in the southern counties. I have Yorkshire specimens in my cabinet from Castle Howard, Doncaster, Huddersfield, Selby, Skipwith, and York, I also have it from Lincolnshire. Still it seems never to be common anywhere, and I have only on one occasion taken as many as three on the same day. The other British species of the genus, *N. fulviceps*, is apparently much rarer.—Geo. T. Porritt; Huddersfield, Aug. 17th, 1904.

Note on the Dragonfly Æschna cyanea.—The nymphs refused food a few days before emergence, and became very restless. They

appeared to keep the extremity of the abdomen at the surface of the water, and produced a lot of air-bubbles. One I saw making great efforts to climb up the side of a vessel in which it was confined; but as it continually slipped back, I guided it with the point of a pencil to a stick which was fixed in the middle of the basin. It immediately commenced to climb, went to the top of the stick, and apparently would have gone higher if it could. In the case of the one I watched, a distinct sound was produced when the thorax split. One day I tried to feed a dragonfly; but as it would not take the flies, I took it up carefully and put the fly to its mouth, when it at once began to feed greedily, and ate three, one after the other. It appeared to have quite matured its colours, but I am afraid feeding it made it too vigorous, for it afterwards terminated the experiment by contriving to make its escape.—R. A. R. Priske; 66, Chaucer Road, Acton, W.

Vitality of Blaps mortisaga, Linn.—I received, on July 21st last, a living specimen of this beetle, which had been found in a box belonging to a young lady, who returned to Scotland from Egypt three months previously. The position in which the beetle was found convinced her that it had been packed up in Egypt. It had, in that event, subsisted for more than three months without sustenance or air, *Blaps* is a common Egyptian genus, and *mortisaga* is found as far east as the Caucasus.—Henry H. Brown; Cupar-Fife.

Saturnia carpini on Lythrum salicaria.—On Aug. 14th I found a large larva of *S. carpini* in the New Forest, at rest in the early morning on *L. salicaria*, the purple loosestrife. The spray was plucked, and the larva carried home upon it. Afterwards it fed readily on the foliage of this plant, which, I believe, is not one of its usual food-plants. On this large specimen, no doubt a female, the tubercles were orange in colour. On a smaller one, found the same day, and which at once commenced to spin up, the tubercles were pink. This second is no doubt a male. Was the difference in colour of tubercles due to sex or age, or chance variation?—W. J. Lucas.

British Orthoptera.—Could any of our readers kindly supply lists of the Orthoptera of Orkney, Shetland, Hebrides, Scilly, or any other outlying, or less known parts of the British Isles?—W. J. Lucas; 28, Knight's Park, Kingston-on-Thames.

Limenitis camilla ab.—I took a black variety of *L. camilla* near Barbigin, Fontainebleau, on August 12th last. The specimen is a female.—Walter Dannatt; Donnington, 75, Vanbrugh Park, Blackheath, S.E.

Variety of Gonepteryx rhamni.—Mr. Lucas sends a beautifully coloured drawing of *Gonepteryx rhamni* with the fore wings clouded with orange as in *cleopatra*. Concerning this he writes:—"It was reared from one of several larvæ taken in the New Forest by Mr. Weir, on June 26th last. To all intents and purposes this specimen is clearly *cleopatra*, but all the other examples bred with it were normal. I attribute the variation to the fact that the larvæ were, till July 11th, kept in an extremely hot shed. On the date last mentioned they were

removed from the shed because of the heat. It does not seem certain whether this specimen had pupated by that date or not. This occurrence raises a very interesting question as to the relationships of *G. rhamni* and *cleopatra*."

CAPTURES AND FIELD REPORTS.

Callidium violaceum at Esher.—Mr. Lucas has sent me a specimen of the above beetle, taken at Esher Station, Surrey, on June 12th, 1904. I do not think it is common in this district,—E. C. Ansorge; 12, Addison Road, Bedford Park, W.

Deronectes latus in the New Forest.—I took one specimen of this species among the shingle of a clear stream near Brockenhurst, New Forest, on May 22nd, 1904. I should like to know whether anyone else has taken it in the South of England. I have seen no records of it from this part of England.—E. C. Ansorge.

Pyrameis cardui at Dovercourt.—A few fresh examples have been seen here in the lucerne fields, but no hybernated specimens were noticed in the spring or early summer, nor did I observe any larvæ, though I fully expected to have done so, after the swarms of the perfect insect that occurred here last autumn. What became of them? Did they pass on? If they had remained to hybernate here it is not likely that all would have perished during the winter, which was not a severe one.—Gervase F. Mathew; Dovercourt, Essex.

Sphinx convolvuli at Dovercourt.—A male was brought to me yesterday. It had been confined in a box that was much too small for it, and in consequence was in poor condition.—Gervase Mathew; Dovercourt, Essex.

Colias edusa in Cambs.—I saw single specimens of *C. edusa* on Aug. 5th, 8th, and 10th of this year, flying in various parts of the country round Cambridge. They are the first I have seen in the county since 1901.—S. L. Orford Young; Aug. 15th, 1904.

Colias edusa in Essex.—The first, a fresh-looking male, was seen here on July 29th, when one of my boys covered it with his net, but let it escape, and it then passed me at a furious rate, and we saw it no more. The wind had been blowing fresh from the east and south-east for several days previously. On Aug. 4th we caught two, a male and female, in a lucerne field, and saw one or two more. The female was confined in a breeding-cage, with a piece of lucerne, some syrup on a sponge, and placed in the sun. On the morning of the 7th she was found dead, but had deposited forty-two eggs on the muslin, twenty-eight on lucerne, and three on the wire framework of the muslin hood; seventy-three in all. The eggs were placed upon some growing plants of white clover, began to hatch on the 10th, and on the 16th the more advanced larvæ had already effected their first change. On the 9th a female was seen, and three males were captured, but no more have

been noticed since, so I am inclined to think that these few were immigrants blown across the North Sea during the strong easterly winds that prevailed between the 24th and 28th of July.—Gervase F. Mathew; Dovercourt, Essex, Aug. 18th, 1904.

Chœrocampa nerii at Eastbourne.—A very fine example of *C. nerii* was caught, resting on a bathing-machine, in the early morning of July 14th last, at the Wish Tower, Eastbourne. It was brought to me alive, and is now in my collection.—S. A. Chartres; 17, Mayfield Place, Eastbourne, July 30th, 1904.

Thecla w-album in Glamorganshire.—We took several specimens of *T. w-album* near Cardiff last month, but found it very local.—B. Ansaldo and T. Shelley; King's Road, Cardiff, August, 1904.

Sphinx convolvuli in Norfolk.—It may interest some of your readers to know that specimens of *S. convolvuli* are now to be taken in Norfolk. I have seen as many as four of an evening, hovering over flowers of tobacco. I should like to know if these are hybernated or recently emerged examples. Some of them seem quite fresh, but others much worn. We often find pupæ of this species when taking up the potatoes in October.—W. E. N. Baker; "The Chase," Tilney All Saints, King's Lynn.

Orthotænia branderiana, L. (= Eucosma branderiana, Meyr. = Olethreutes branderiana, Rebel) in Surrey.—On June 25th last, Mr. A. J. Scollick very kindly gave me a couple of Tortrices that he had beaten from a hedgerow in the Esher district on the previous day; these I found to be *O. branderiana*, a species which I believe has not hitherto been recorded from Surrey. Subsequent visits to the locality by Mr. Scollick and myself resulted in the capture of four other specimens. I may mention that I had collected among the aspens in the district almost every year since 1895, but had not seen the species there, in any stage, until this year.—R. South; 96, Drakefield Road, Upper Tooting, S.W.

Collecting in the New Forest in June.—I arrived at Brockenhurst on June 4th, but for the first week was rather hampered with a north-east wind, which did not improve matters as far as insects were concerned, so I turned my attention to beating, and secured from oaks the following larvæ:—*Himera pennaria*, *Tæniocampa miniosa*, *Liparis monacha*, *Hybernia defoliaria*, *Cosmia trapezina*, *Nola strigula*, *Liparis auriflua*, *Scopelosoma satellitia*, *Petasia cassinea*, and *Phigalia pilosaria*; also, feeding on the lichens of oak-trees, a few larvæ of *Cleora glabraria*; and whilst beating I turned out a few imagines of *Hylophia prasinana*. Sugaring again this year was very poor as far as my experience went, the only good nights being on the 16th and 17th, the last two days of my stay, when I took *Boarmia consortaria*, *Aplecta herbida*, *Erastria fuscula*, *Thyatira batis*, *Euplexia lucipara*, *Tephrosia extersaria*, *Grammesia trilinea*. Most of the evenings I devoted to larvæ-searching by means of an acetylene lamp and dusking over the heath. Of larvæ I took, feeding on heather, fair numbers of *Agrotis agathina*, *Noctua neglecta*, *Selidosema plumaria*, *Eubolia plumbaria*, and a few

Satyrus semele, and of insects *Nemoria viridata*, *Hadena contigua*, *H. pisi*, *Phibalapteryx lignata*, and some dozens of *Scodiona belgiaria* (males), a few found at rest, flat on the ground, in the daytime, in which position they resembled a piece of stone remarkably well. At night they rested on the top of grass-stems; and as there was a lot of cotton-grass (*Eriophorum polystachyon*) growing about the spot, it was very difficult to distinguish between the two, so much did they resemble one another. A friend of mine, Mr. W. G. Gould, who was down with me at the time, took some interesting flashlight photographs of *S. belgiaria* at rest; also of larvæ of *Agrotis agathina*, *Noctua neglecta*, *Eubolia plumbaria* feeding, and various other interesting natural history objects. By means of light in the glades of the forest I captured *Melanthia ocellata*, *Melanippe rivata*, *Eurymene dolabraria*, *M. montanata*, *Coremia unidentata*, *Grammesia trilinea*, *Spilosoma menthastri*, *S. lubricipeda*, *S. mendica* (female, from which I obtained some hundred or so ova, from which larvæ are now feeding well on plum), *Noctua plecta*, *N. xanthographa*, *Notodonta camelina*, *Larentia pectinitaria*, *Coryeia taminata*, *Cidaria truncata*, *C. corylata*, *Orgyia pudibunda*, *Metrocampa margaritaria*, and *Euplexia lucipara*. In the daytime there seemed to be very little about flying in the glades. I took good series of *Pararge egeria*, *Argynnis euphrosyne*, *Venilia maculata*, *Fidonia piniaria* (male and female), *Bombyx rubi*, and *Hesperia malvæ*: also, flying over some of the heaths, *Spilosoma fuliginosa* and *Anarta myrtilli*. Attracted by the flowers of rhododendrons, short series of *Macroglossa fuciformis* and *Euclidia mi*. On June 17th I went to Ringwood, and took *Emydia cribrum*, *Lithosia mesomella* and *Aspilates strigillaria*. *E. cribrum* was evidently just coming out, as there were very few to be seen; but those taken were in perfect condition.—Lawrence S. Hodson; Maisonnette, Palmer's Green, N., Aug. 3rd, 1904.

Deilephila livornica at Bournemouth.—It may interest the readers of the 'Entomologist' to know that I had the good fortune to capture three specimens of this rare hawk-moth, flying over rhododendrons and azaleas in our public gardens in Bournemouth, on 28th and 29th of May last, and about the same time Mrs. Jackson, of "Malvern," Crescent Road, also captured three. All six specimens were as good as bred. Dr. Crallan is breeding a number of larvæ obtained from eggs laid by a female that was brought to him. Major Robertson and Mr. Hooker also had a specimen each brought to them.—W. McRae; Bournemouth.

Colias edusa in Hants and Dorset.—Mr. H. E. Annett saw one between Brockenhurst and Southampton on Aug. 1st, and Mr. W. McRae saw one near Christchurch the same day. About Aug. 16th Mr. E. P. Reynolds saw some half a dozen near Swanage, but succeeded in capturing only one worn female. On Aug. 20th I captured a beautifully fresh female near Hinchelsea in the New Forest.—W. J. Lucas.

Plusia moneta in Worcestershire.—With regard to the increasing distribution of *P. moneta*, it may be of some interest to note that I captured a fresh specimen of this moth in my garden near Worcester, on the evening of July 4th, flying over valerian at dusk. I believe this is the first time that the species has been recorded from this district. —H. A. McNaught; 2, Chatley Villas, Claines, Worcester, Aug. 23rd.

Sphinx convolvuli in London.—A very nice example of this species was found at rest on a window-sill at the Victoria and Albert Museum, South Kensington, on Aug. 23rd last. The specimen will be added to the National Collection of British Lepidoptera.

Sphinx convolvuli in Hants.—I found a fine fresh female *S. convolvuli* on a paling at Totland Bay, at precisely the same spot where I found a similar specimen on Sept. 10th, 1901. The date of the present capture was Aug. 19th.—G. E. J. Crallan; Bodorgan Manor, Bournemouth, Aug, 25th, 1904.

Notes from New Zealand.—Some account of the season 1903–4 in New Zealand may be of interest. Beginning at the end of last season, I went to Napier during April and May, and there obtained one or two *Vanessa itea* identical with specimens which I took at Freemantle, Western Australia; *Chrysophanus boldenarum*, a pretty little "copper" delicately suffused with purple, was most abundant on the beach, and also a few miles up country along the river beds. This was much lighter than specimens which I have seen from the South Island, some of which are nearly black. I did no night-work, and the only moths I took were our old friend *Heliothis armigera*, and a new species which Mr. G. B. Hudson has kindly named for me *Orthosia pallida*. I then returned to Wellington, where, winter having fairly set in, there was nothing doing until the end of November. About this time the two coppers, *Chrysophanus salustius* and *C. enysii*, were abundant on the flowers of the water-cress. About the same time I obtained one or two *Hepialus virescens* at light. On New-year's Day I took a damaged example of the rare *Porina enysii* in the Botanical Gardens. *Vanessa gonerilla* was early and abundant, my first example being taken Dec. 6th, and another on the 7th; this insect was not out in the 1902–3 season until the end of January. Owing to the weather being unfavourable when I visited the locality, and also to the fact that a fire had destroyed a large portion of its old haunts, I was unable to again obtain *Dodonidea helmsi*, only seeing one or two. This fire is particularly unfortunate, as, once destroyed, the New Zealand bush never re-grows. It will be of interest to English collectors to know that *Sphinx convolvuli* was common throughout both Islands; this moth is usually confined to the extreme north of the North Island. In addition to this, several examples of a fine *Chærocampa*, not previously recorded in New Zealand, were taken in different parts of the Colony, probably immigrants from Australia. In Coleoptera the only notes I have are: an example of the local *Lasiorhynchus barbicornis*, Jan. 4th, 1903; *Æmona hirta* and *Æ. simplicollis*, Dec. 8th, 1903; *Trichosternus antarcticus*, Jan. 24th, 1094; *Odontria xantrosticta*, which is a curious little woolly beetle, was common in March and April at light, and lying dead on gravel-paths of a morning. The common ti-tree beetle, and the tiger *Cicindella tuberculata*, were abundant throughout the summer. The summer was very long and warm, which probably accounted for the immigrants. I omitted to state that several examples of *Deiopeia pulchella* were also taken; these latter, and two of the Chœrocampas, by Mr. O'Connor, at Titahi Bay.—Hubert W. Simmonds.

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LIFE-HISTORY OF *LYCÆNA ARGIADES*.

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

SINCE the discovery of this species in Dorsetshire, in 1885, several works on British butterflies have been issued, but there appears to be no description published of either the egg or pupa, and the descriptions given of the larva in the various books are obviously copied from Dr. Lang's 'Butterflies of Europe,' where it states that the larva is "pale green, with a darker dorsal stripe, dark lateral streaks, *and light brown and white spots*."

By the kindness of Dr. Chapman and Mr. Hugh Main in supplying me with eggs of this interesting species, I have been enabled to work out its life-history; therefore have now pleasure in giving complete descriptions of its various stages. The butterflies were captured in the South of France in July last by Dr. Chapman, who sent them direct to Mr. Hugh Main; he in turn kindly sent me some of the ova he obtained from them, which I received on July 25th, with a note saying they had been laid the day before. They were deposited in a cluster at the base of the leaves of *Lotus corniculatus*, also a few single eggs in other parts of the plant. Undoubtedly, in a wild state, they are laid singly, and never in clusters, on account of the cannibalistic habits of the larvæ.

The egg is very small, being exactly the same size in diameter as the egg of *L. minima*, i. e. $\frac{1}{56}$ in., and $\frac{1}{112}$ in. high; it resembles the egg of *L. icarus* in shape. It is circular and compressed, of a clear pale greenish-blue colour, but varies both in extent of the ground colour and in the structure of the reticulations, which are white, resembling frosted glass, and cover the whole surface in an irregular network pattern; in some the pattern is almost like ordinary network, forming squares, and others have the cells triangular, but all are irregular, and some have the juncture of the reticulations much more prominent than others. The upper surface is very slightly sunken, being almost

flat, with a somewhat irregularly formed micropyle, which is darker, and without the frosted appearance which covers the whole of the surface excepting the base; the reticulations on the depressed portion of the crown are simple, being without the raised knobs at the junctures; those surrounding the side are prominent, but diminish on nearing the base; the cells between the reticulations have a fine granular surface.

All the eggs hatched on July 30th, remaining six days in the egg-state. The larva makes its exit by eating the crown, as well as a portion of the side of the egg-shell.

Directly after emergence the larva is exceedingly small, being only $\frac{1}{40}$ in. long; it is similar to other young Lycænidæ larvæ in having a slight medio-dorsal furrow and sloping sides, and furnished with rows of long white serrated hairs, four dorsal and three lateral on each segment; those on the dorsal surface are in pairs on each side of the furrow, both curve backwards, the anterior one being very long; below these are two spiracular-like disks outlined with dark olive, and below a pair of small dark tubercles bearing a club-shaped hair, excepting on the 6th, 7th, and 8th segments, which only have hairs on the posterior ones; the subspiracular row of hairs consist of three long ones on each segment, projecting laterally, each having a dark base; along the ventral surface are similar serrated hairs, and shorter ones on the claspers; the head is greenish olive and black, and the body of a pale ochreous yellow in shadow, and pale grey in high light; to the naked eye it appears wholly whitish; the entire surface is sprinkled with black points. They are very active when first hatched, crawling rapidly for such small creatures, and feed on various parts of the plant. I found one feeding with its anterior half buried into the end of a stem which had been cut off.

First moult, Aug. 3rd, the first stage only lasting four days. Shortly before first moult it measures only $\frac{1}{16}$ in. long.

During the early stages these larvæ, like the other Lycænidæ, require the greatest attention to distinguish their changes, on account of their very small size and similarity of stages, and unless most carefully watched under a lens it is practically impossible to detect their moults.

After first moult—six days old—it measures $\frac{1}{12}$ in. long, the body is considerably humped dorsally from the 2nd to 9th segments, the 1st, 10th, 11th, and 12th being rather compressed, and a decided lateral ridge; the surface is finely granulated, and studded all over with serrated hairs of various lengths; those along the dorsal and lateral regions are longest and curved; all are whitish (excepting those on the subdorsal surface, which are dusky), with bulbous bases, from which rise thorn-like spikes, each base forming a star; there are also numerous disks scattered over the body. The general colour is a pale yellow, with

a medio-dorsal longitudinal brownish stripe, oblique brownish side stripes, and a rust-coloured subspiracular line, bordered laterally by whitish; the head is shining black, and beset with a few fine whitish hairs. Other forms occur, having a generally pale greenish ground colour, with slightly darker markings.

Second moult, Aug. 7th. After second moult—nine days old—it is $\frac{1}{5}$ in. long; very similar to previous stage, but on the 10th segment is a rudimentary gland, or one of indistinct formation, surrounded by minute star-like processes, and a fringe of delicate white spines or bristles, each bearing a tuft of spine-like hairs, extremely fine, similar in construction to those bordering the gland of *L. arion* larva. Both forms now more closely resemble each other, the brownish marked form assuming a generally green colouring, with only a faint pinkish lateral line. In this stage they greedily feed on the seeds of *Medicago lupulina*, eating through the capsule, and devouring the contents, but appear to feed mostly at night.

Third moult, Aug. 12th. After third moult—eighteen days old—it is $\frac{1}{4}$ in. long, the ground colour is a beautiful clear green, with a darker green medio-dorsal furrow, and three longitudinal rows of oblique dull green side markings, and a waved dull green lateral band bordered below by a pale line, and faint dull brownish-pink streaks; the whole surface is thickly sprinkled with serrated hairs of different lengths, those bordering the dorsal furrow are the longest, they vary from white to ochreous brown, and have similar swollen star-like bases, which vary in form and colour—some are brownish, others white, resembling little glass petals. As in the previous stage, numerous disks are scattered over the surface; the spiracles are prominent, and outlined with brown. In this stage they feed as much by day as by night, but are much slower between the moulting, occupying eleven days from the third to fourth moults. The gland on the 10th segment is now more distinct, but surrounded with similar processes and bristles.

Fourth and last moult, Aug. 23rd. After fourth moult, and fully grown, it measures $\frac{3}{8}$ in. long. It is of the usual onisciform shape, with slightly flattened sides, and with only a very shallow dorsal furrow, bordered each side by a fringe of spinous bristles, slightly serrated, and varying in length; the whole surface is densely studded with shorter but similarly formed bristles, which vary much in length and colour from white to pale brown, each, including the longest dorsal ones, have wonderfully formed bases (similar but more pronounced than in the previous stages), composed of a bulb-centred star, the points rising from the base; some are wholly white, others olive-green; there are also numerous shining whitish-green disks outlined, or set in black rings more or less starred, of various sizes, and scattered over the whole surface; the spiracles are whitish, outlined with brown,

and the inner edge dentated. The gland on the 10th segment is similar to that in the previous stage, being a small elongated transverse fissure, and fringed with fine white bristles as described. Although so similar in formation to the gland of *L. arion*, I have been unable to detect any liquid exuding from it when touched; also it appears less sensitive to irritation. On the 11th segment is a subdorsal, partly retractile, whitish tubercle. The ground colour is pale green, with a darker green mediodorsal stripe, and oblique side stripes of a fainter green; in some specimens the lateral ridge is tinged below with pinkish brown; the head is black and shining, and is hidden under the overlapping 1st segment, except when extruded while feeding and crawling.

During the last stage I supplied the larvæ with both the common white and red clover-blossoms, which they greedily devoured. One larva completely ate up the whole of the petals of a red blossom in two days; it appeared to be feeding continually both day and night the whole time. They also readily feed on the flowers, seeds, and leaves of *Lotus corniculatus*.

During their earlier stages the larvæ are decidedly cannibalistic. I noticed one larva after the first moult feeding on a newly-hatched larva, which it seized as it emerged from the egg; but during the last two stages I did not find them attacking each other, which agrees with the cannibalism of *L. arion* larvæ.

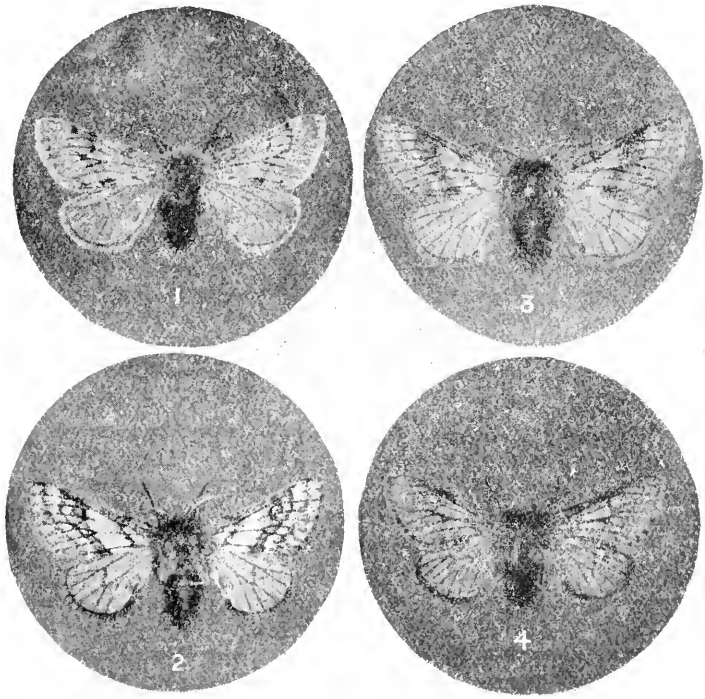
The pupa is attached to the food-plant by the cremastral hooks to a pad of silk and a girdle round the body; all mine were attached to the centre of the leaves, and the general resemblance, both in form and colour, between a decaying *Lotus* leaf and the pupa is very similar. The pupa measures $\frac{1}{3}$ in. long, of fairly uniform thickness, the head is truncated in front, the thorax slightly swollen dorsally, the abdomen rises at the base, and falls away in a gentle curve to the anal extremity, which is bluntly terminated. The entire surface is a pale green, and very finely reticulated; the wing-cases are rather whiter green than the rest of the body, with whitish neuration, and irregularly sprinkled with minute black specks; a medio-dorsal line composed of a series of black marks and specks runs the entire length, and forms a well-defined line over the head and thorax, but becomes broken up into a series of spots on a darker ground stripe along the abdomen; a super-spiracular series of small black dots, one on each of the 3rd, 4th, 5th, 6th segments, and a large somewhat oval black blotch on the 1st abdominal segment; and two others, one at the base of the wing on the meso-thorax, another on the meta-thorax, also a small spot on the pro-thorax; all these and a few other tiny specks sparingly sprinkled over the body are black. The whole surface, excepting the wings, is sprinkled with slightly curved moderately long white serrated hairs, each with a swollen base; near the base of the wings are a few fine white bristles,

terminating in a cluster of much finer bristles; the spiracles are whitish and prominent. It remains from about ten to fourteen days in the pupal state, according to temperature.

The first imago emerged on Sept. 6th, the last on Sept. 18th, 1904.

VARIATIONS OF *NYSSIA LAPPONARIA*.

By E. A. Cockayne.



On looking over the males of *Nyssia lapponaria* which I captured or bred at the beginning of the year, I find that, far from being extremely constant, they show a considerable range of variation. As a whole they appear to be paler than those captured by Mr. Christy, though I have only been able to compare them myself with the one in the Hope Collection at Oxford. This corresponds to my darkest specimens, which form a small proportion of the whole number.

These darker individuals have three very distinct blackish lines and a broad marginal band on the primaries, separated into two

parts by an extremely thin wavy line of the pale grey ground colour. Far more numerous are specimens in which the three lines are all distinct, but thinner, and with the outer half of the marginal band either absent or much reduced, and most visible at the nervures. In a considerable number, about one-fifth, of the specimens the second line is absent, except just at the dorsum. The two very pale forms mentioned in the 'Entomologist,' June, 1904, may be regarded as an extreme form of this. The first and third lines are very thin, and the second almost entirely obsolete (fig. 1). Both parts of the marginal band are merely represented by a slight deepening of the ground colour.

With regard to the relative positions of the lines, the first is very regular, varying only slightly in its distance from the base; the second and third are liable to considerable alteration. As a rule they pass on either side of the discal cell, and as they approach the dorsum become united by a group of black scales lying between them. It is not unusual to find this taking place earlier, and causing coalescence just beyond the discal cell. In one specimen the whole space between the two lines from costa to dorsum is filled with black scales, and a black band passes across the centre of the wing. The marginal band in this male is, however, poorly developed (fig. 2). The second and third lines vary in distance from the discal cell. In two specimens the second line passes through this, and in another between it and the termen. The second and third lines are thus more nearly parallel, though remaining quite distinct (fig. 3).

With regard to the marginal band, its distance from the third line is not regular, and its width must therefore vary correspondingly. Of its two halves the outer is more liable to become faint. In fact, in only one have I seen the reverse. In this specimen the inner half gradually fades away as it approaches the costa. In these paler forms the fringes also are lighter. The secondaries show traces of two lines close together at the dorsum, separated by a fine line of ground colour, and there is an additional sign of the outer of these at the discal spot. In a bred male the second or outer of these is visible fairly clearly right across the wing, and the inner can also be traced, though very faint. As in the primaries, they pass on either side of the discal spot, enclosing it between them.

The ground colour of all my captured specimens is pale cold grey, or, in the specimen described in the June number, dark grey (fig. 4). In my few bred specimens I find that in every case except one it is a clear cream colour, giving a richer appearance, especially to the secondaries. This cannot be due to fading in the wild ones, as they were freshly emerged. Possibly the food of the larva may have some effect, the bred ones feeding on birch, and in one case *Calluna vulgaris*, and the captured specimens on *Erica* or *Myrica*.

ODONATA, &c., IN THE NORFOLK BROADS.

By Geo. T. Porritt, F.L.S., F.E.S.

From June 20th to July 2nd last, in company with a lepidopterist friend, Mr. Arthur Whitaker, of Worsbrough Bridge, Barnsley, I made another visit to the Norfolk Broads, making (as in the previous year, see E. M. M., October, 1903, pp. 251–2) Stalham headquarters. My principal object was to fill up my series of the local, and until last year very rare, *Æschna isosceles*, and also, if possible, to turn up *Agrion armatum*, a couple of specimens of which had been taken in the neighbourhood the previous year by Mr. Balfour Browne. In my efforts for the former I was perfectly successful, but a close search for *armatum* was a complete failure, for no trace of it could I find. The first *isosceles* was taken on June 22nd, or nine days earlier than in 1903, and from then to the 29th, including two captured by Mr. Whitaker, I managed to secure eleven. The nine I captured were all netted from a boat, and most of them, as may be imagined, took a good deal of stalking, in which Mr. Whitaker's assistance was invaluable. But, contrary to my last year's experience, a specimen was now and again seen on the drier ground. One was netted by my friend under very interesting circumstances. He had gone down to sugar on the evening of June 24th, and when almost dark noticed a large dragonfly hawking for insects, just in the same way that *Æ. grandis* has long been known to do, but a characteristic which was not known to be shared by any other British dragonfly. It proved to be an *Æ. isosceles*, thus making a second species which is not averse to somewhat nocturnal habits. Of the beautiful *Libellula fulva*, which in 1903 was quite abundant, we probably did not see more than half a dozen specimens on this visit, and only one male was captured. *Orthetrum cancellatum* was plentiful, chiefly on the drier ground, and *Erythromma naias* was still more abundant; it settled in numbers on the floating leaves of the water-lilies. The pretty *Agrion pulchellum* was in profusion. The other species included *Libellula quadrimaculata*, *Brachytron pratense*, *Pyrrhosoma nymphula*, *Lestes sponsa*, and *Ischnura elegans*, all more or less common except *L. sponsa*, which we had never before seen out so early as June, and which would no doubt be abundant enough later.

The Trichoptera included *Phryganea grandis*, *P. varia*, *Leptocerus senilis*, *L. aterrimus*, *Erotesis baltica*, *Mystacides longicornis*, *M. nigra*, *Triænodes bicolor*, *Limnophilus xanthodes*, *L. luridus*, *L. rhombicus*, *L. sparsus*, &c.

Of Orthoptera, we took *Tettix bipunctata* and *Xiphidium dorsale*.

Mr. Whitaker worked hard among the Lepidoptera, but unfortunately both "light" and "sugar" were almost useless, and when such is the case in the Broads collecting is almost necessarily a failure. *Papilio machaon* was still out in numbers, but was "on its last legs," most of the specimens being tattered or worn; its eggs and young larvæ were, however, found freely, proving that it must have been abundant before our arrival. *Argynnis selene*, too, was plentiful; this species seems equally at home in wood, on mountain, or on fen. The moths included *Dicranura furcula*, *Chærocampa elpenor* not uncommon at *Iris* flowers, *Nudaria senex*, *Apamea unanimis*, *Dianthœcia cucubali*, *Plusia festucæ*, *Abrostola urticæ*, *Hydrœcia unca* abundant, *Acronycta leporina*, the specimens considerably darker than we expected to find them so far south, *Acidalia immutata* abundant, *Timandra amataria* common, *Collix sparsata*, *Lobophora sexalisata*, *Hyria auroraria* just getting well out as we came away, *Phibalapteryx lignata* abundant, *Hydrocampa stratiotalis*, *Herminia cribralis* abundant, *Schœnobius mucronellus*, *Chilo phragmetellus* abundant, *Nemophora metaxella* and many others.

Edgerton, Huddersfield: Sept. 9th, 1904.

ON A DARK FORM OF *ISCHNURA ELEGANS* (Female).

By F. W. and H. Campion.

On various occasions during the present season and the last we have noted the occurrence in Epping Forest of a dark form of *Ischnura elegans* (female), which, from the circumstance of its appearing in two different years, we are inclined to regard as a permanent form. We possess six specimens in all; the dates of the several captures being August 23rd and September 1st, 1903, and July 3rd, 17th, and 24th, and September 4th, 1904. The specimen of July 24th last was at the time of capture paired with a normally-coloured male; at the same time we took another pair of the same description, but the female escaped from the net. All these insects are characterized by the total absence (with the exception to be mentioned herein) of the blue colour which ordinarily imparts such a handsome appearance to the individuals of both sexes. The blue of the spots behind the eyes and the blue colour on the thorax observable in the typical females are in our aberrant specimens replaced by an olive-green colour. In normal *I. elegans* the eighth abdominal segment is light blue in both sexes; in the dark females the colour may be described as dark dust-colour or dark biscuit-brown; the remaining segments are black or green-black. The specimen

taken on July 17th, 1904, however, exhibited a distinct trace of blue on the *ventral* surface of segment eight.

Apart from any other points of difference already indicated, our specimens are readily distinguishable from individuals of the typical form, whether in the mature or the immature state, by the dark-brown or blackish colour of the eighth segment. They are separable from the orange variety of the female (to which Stephens gave the name *rufescens*) by the substitution in the former of olive-green for the bright orange of the thorax characteristic of that variety; the first and second segments of the abdomen, instead of being orange, as in var. *rufescens*, exhibit, in our specimens, black or green-black markings of the usual form upon a ground-colour of olive-green.

We are convinced that most, if not all, of the insects under consideration are fully matured; but, as doubts have been suggested as to their maturity, we may say that our conviction is based upon the following considerations:—

(1) We have taken no less than two of them in copulation or connected *per collum*, and we have never known a dragonfly to pair with the opposite sex until full maturity has been attained.

(2) The immature coloration of such species as we are best acquainted with is lighter, not darker, than the mature coloration. Now, the colour of segment eight in the individuals before us is much deeper in tone than the normal blue colour. The colour which usually precedes blue in dragonflies is well seen in immature males of *Agrion puella* and *Enallagma cyathigerum*.

(3) Only a few examples of the dark form are met with. If that form represents a constant phase in the colour-development of the female, it ought to occur very frequently, for the species is quite a common one with us, and we keep it under close observation.

(4) In spite of the circumstance that, quite at the end of the season, other collectors have obtained specimens of *I. elegans* with the immature colouring, we are of opinion that some weight should be attached to the facts that none of our examples have been taken prior to July 3rd, and that one of them occurred so late as September 4th; indeed, the last-named (the dark female of September 4th this year) was the sole representative of the species we had come across since August 7th.

(5) Most of our specimens present, when newly taken, a distinctly dusty appearance, somewhat resembling the bloom upon a black plum; we have sometimes observed the same appearance in specimens of other species taken late in the season.

(6) The wings retain no trace of the high gloss of immature wings.

We think it likely that this form may be a reversion to the ancestral type. The coloration of the normal female approximates to that of the male much more closely than is usual

among British Agrioninæ, and the striking contrast subsisting between our primitive females and the males brings this species into line with other members of the subfamily, and especially with the allied species, *I. pumilio*.

Walthamstow: September 9th, 1904.

BIBLIOGRAPHICAL AND NOMENCLATORIAL NOTES ON THE HEMIPTERA. No. 2.*

By G. W. Kirkaldy.

With great regret I feel it advisable to relinquish the suggestive and characteristic ordinal name "Rhynchota" for the prior "Hemiptera." I am by no means convinced of the necessity or advisability of enforcing priority in names above family rank; indeed in some cases it would appear inexpedient, if not impossible, to do so; but in such a case as the above, where a prior term has been in frequent, though partial, usage, it seems better to adopt it.

Hemiptera is a Linnean term, comprising in 1758 not only the "bugs" but also the Dermaptera (later called Orthoptera); Geoffroy in 1762 restricted "Hemiptera" to the bugs, placing the remainder of the old Linnean assemblage among the Coleoptera.

The following shows the synonymy according to priority; I would be sorry, however, to have to adopt "Siphonata" instead of "Homoptera."

Order: Hemiptera, Linné, 1758 (part); Geoffroy, 1762. type *Cimex*.
= *Rhyngota*, Fabricius, 1775 = *Rhynchota*, Burmeister, 1835.

Suborder 1: Heteroptera, Latreille, 1802, type *Cimex*.
= *Dermaptera*, Retzius, 1783 (nec De Geer, 1773).
= *Hemiptera*, Westwood, 1838.

2. Siphonata, Retzius, 1783, type *Cicada*.
= *Homoptera*, Latreille, 1802.

I have recently been led to look into the nomenclature of the Sternorrhynchous forms, &c., and find that these researches do not altogether confirm the changes of recent years; in particular it is to be regretted that Mrs. Fernald, in her recently published 'Catalogue of the Coccidæ,'†—a work for which, as a whole, one can find nothing to say but admiring thankfulness for the labour devoted to it during so many years,—it is to be regretted that the typical genus *Coccus* has been grievously misapplied.

* See 'Entomologist,' xxxiii. pp. 238–43. (1900).
† Bul. Hatch, Exp. Sta. Mass. Agr. Coll., 88, pp. 1–360. (1903).

The genera *Aphis*, *Chermes*, and *Psylla* also, in most recent works, are evidently incorrectly determined. *Aphis* was founded by Linné in 1758, and continued undivided till 1801, when Lamarck fixed *ulmi*, Linn., Geoffr., Fab., as the type. This, however, is not *Lachnus ulmi* (Linné), as the addition of "Geoffroy, Ins. i. p. 494, t. 10, f. 3," shows, but is the so-called "*Tetraneura ulmi*, De Geer,"* and therefore, not being a Linnean species, cannot affect the type-fixation. The next year Latreille selected *sambuci*, Linné, as the type, this being available.

Chermes has by some been included in the Coccidæ, by others in the Aphidæ, and by others in the Psyllidæ; the latter is the correct position, and the family should be known as Chermidæ.†

Founded in 1758, the genus was turned aside by Geoffroy in 1762,‡ to include part of *Coccus* (because "Kermes" was the Oriental name for certain Coccidæ!) and *Psylla* formed instead. The latter is therefore a pure synonym of *Chermes*, Linn., the type being *ficus*, Linn., Lam., 1801.

Coccus was divided by Geoffroy in 1762 (see footnote), and although, owing to the local faunistic nature of the work, the type cannot be definitely fixed, he certainly must be considered to restrict it to those forms which are characterized as "*Fœmina insecti formam servans.*" The species he removes to *Chermes*, Geoffr., nec Linn., are characterized "*Fœmina folliculi formam inducns*"; it is from this group that Mrs. Fernald has unfortunately chosen the type of *Coccus* (Canad. Entom. xxxiv. 232).§

As the type of *Coccus*, Lamarck (1801) selected "*Coccus mexicanus*, Lam. = *Coccus cacti coccinelliferi* Lin., *Coccus cacti*, Fabr., Ent. (= *Dactylopius coccus*, Costa, which it must supersede, the cochenille insect becoming *Dactylopius mexicanus*

* The correct name is *Tetraneura gallarum-ulmi* (De Geer).

† I do not think it is necessary to form this name as Chermetidæ. Most entomologists appear to believe that the stem of all words modelled on the third declension of Latin nouns must end in *t* or *d*; hence *Tingitidæ*, instead of *Tingidæ*; *Gerrididæ*, instead of *Gerridæ*; *Chermetidæ*, instead of *Chermidæ*; *Aphididæ*, instead of *Aphidæ*, &c.

‡ A great deal of unnecessary trouble has been caused by the dispute as to the validity of Geoffroy's names. But even if Geoffroy, 1762, be denied, Müller, 1764 (except *Tetigonia*), or Geoffroy in Fourcroy, 1785, must be accepted. I do not know one single Hemipterous genus that is at all vitally affected; for *Tetigonia* one simply has to write 1785 instead of 1762, and, for the rest, "Müller, 1764," instead of "Geoffroy, 1762."

§ As regards the definite fixation of the type of *Coccus*, Geoffroy is excluded, first because he specifies no type, and secondly because his work is not a "Histoire abrégée des Insectes," but a "Histoire abrégée des Insectes qui se trouvent aux environs de Paris;" therefore, apart from types specially noted, or species of genera thereon erected, has no more value for our present purposes than a mere list of captures, the inclusion of certain species being due simply to the faunistic nature of the work. This applies also to Schranck, Scopoli, and other authors, often cited in the type-fixation of genera. "Historical" type-fixation can come into force from 1794 (as regards Hemiptera) when Fabricius instituted the type-system.

(Lam.)), but this is not available, the species being non-Linnean. In fact, I cannot find that the type of *Coccus* has ever been fixed, or that any species but the true Linnean *cacti* is available.

In a recent publication ("Homopteren aus Nordostafrika gesammelt von Oscar Neumann" (Zool. Jahrb., Abth. für Syst., xix. pp. 761–82, pl. 44 (1903)), Dr. A. Jacobi criticises my usage of *Tetigonia*, Geoffroy (p. 779), and proposes a new name—*Tettigoniella*. I regret that I cannot accept this. It is true that the name "*Tetigonia*" is very near the dermapterous genus *Tettigonia*, Linné, but not more so than, say, *Chrysocoris* (Hemiptera) and *Chrysocorys* (Lepidoptera), both of which are generally accepted. Geoffroy nowhere refers to Linné's genus, and indeed mentions that he has used the word for the "procigales" because other authors have employed it for these insects. As to the validity of the Geoffroyan genera, there is not the unanimity for their rejection that Dr. Jacobi supposes; in Hemiptera I mention the names of Champion (also a coleopterist!), Cockerell, Mrs. Fernald, Horváth, E. Saunders, and Stål, among those who accept them; and in fact—especially when genera like *Cylindrostethus* and the other extra-European genera founded by Fieber in the 'Europäischen Hemiptera,' and the Latreillean genera of the 'Précis' (1796), openly erected without any species, are universally accepted—I fail to see how they can be rejected. In the case of *Tetigonia* it was omitted by Müller (1764), but again maintained by Geoffroy in Fourcroy's 'Entomologia Parisiensis' (1785). Thirty-three species are included therein under *Cicada* (pp. 184–93), but on p. 193 he differentiates *Tetigonia* with two ocelli from *Cicada* with three, and adds in a footnote to the latter, "Adduntur hic caracteres *Cicadæ veræ* Gallo-provincialis, nostræ Cicadæ *Tetigonia* vocatæ oppositi."

The following synonymy will summarize the above:—

1. Aphis, Linné, 1758; type *sambuci*, Linn., Latreille, 1802.
2. Chermes, Linné, 1758 = *Psylla*, Geoffr., 1762 = *Homotoma*, Guérin, type *ficus*, Linn., Lamarck, 1801.
3. Coccus, Linn., 1758 = *Llavcia*, Signoret, 1875; type *cacti*, Linn., Kirkaldy, 1904.
4. Calymmata, Costa, 1828 = || *Chermes*, Geoffroy, 1762, nec Linné; = || *Coccus*, Fernald, 1903, nec Linné.
5. Dactylopius mexicanus (Lamarck) = *Coccus mexicanus*, Lam., 1801 = *Coccus cacti*, auctt. = *Dactylopius coccus*, Costa, Fernald.
6. Tetigonia, Geoffroy, 1762 = *Tettigoniella*, Jacobi, 1903; type *viridis* (Linné), Latr.

A few other notes on Mrs. Fernald's Catalogue are as follows:—

P. 18. To *Drosicha* add *Drosycha*, Signoret (5), v. 351 (1875).

N.B.—This is a synonym of *Monophleba*, Latr., as will be noted shortly by Prof. Cockerell.

P. 31. To *Callipappus* add *Gallipappus*, Sign., 1869, Ann. S. Ent. France (4), ix. 103.

P. 46. To *Opisthoscelis* add *Ophistoscelis*, Sign., *op. cit.* 100.

P. 57. For *Amorphococus* read *Amorphococcus*.

P. 82. The first citation of *Dactylopius tomentosus* is *Coccus tomentosus*, Lamarck, 1801, Syst. Anim. sans vertèbres, p. 299. N.B.—Lamarck himself gives this as a synonym of *Coccus sylvestris*, Thiéry de Menonville, Traité de la Culture du Nopal, &c., p. 347 (1787), a work unknown to me.

P. 98. To *Calceolariæ*, Mask., add var. *minor*, Mask., Tr. N.Z., Inst. xxix. 322.

P. 146. To *Ericerus* add *Eurycerus*, Tozzetti, 1867, Mem. Soc. Ital. iii. no. iii., 19.

P. 158. To *Chelonicoccus* add *Chelinococcus*, Signoret, 1869, Ann. S. Ent. France (4), ix. 104.

P. 166. For "*perforatus*" (line 13) read "*Coccus perforatum*, Kirkaldy," &c.

P. 167. For *Coccus* use Calymmata (see above).

P. 180, no. 906. Read Eulecanium curtisi, n. n. = ‖*Coccus aceris*, Curtis nec Fabricius.

P. 209. Rhizobium, Tozzetti, 1867, is "described", though very scantily, and must replace *Lecanopsis*. The type, though not specified, can be nothing but *rhizophila* (Signoret).

P. 244. Replace "*Leucaspis*, Targ.," by the following :—

> Leucodiaspis, Signoret, 1869, Ann. Soc. Ent. France (4), ix. 99; type *signoreti*.
>
> = ‖ *Leucaspis*, Sign., 1870, *op. cit.* x. 100.*

P. 314. *Major*, Cockerell nec Maskell.

P. 318. *Parlatoria*, Sign., 1869, *op. cit.*, ix. 99; types *zyzyphus* (sic!) and *proteus*.

N.B.—The genus *Encarsia* was listed under Coccidæ in error in the Zool. Record for 1895!

P. 256, line 29. "*Ohia*" is a species of *Metrosideros*.

P. 277, line 11 from bottom. After "Full." read "Trans. Ent. S. London, 1897, p."

P. 304. Lepidosaphes cockerelliana, n. n. for *Mytilaspis albus*, Cockerell, nec Maskell, 1896.

I regret that I cannot admit any names taken from Tozzetti's Catalogue of 1868,† this work being to me of academic interest only, consisting as it does of a confused series of names, without descriptions or intelligible references. The correct references to the following genera appear to me to be as follows :—

* *Leucaspis* is preoccupied by Burmeister, 1835, Arch. für Naturg. i. pt. 2, p. 47.

† Mrs. Fernald cites "1869," but it is quoted in part of Signoret's "Essai," published in the volume for 1868.

P. 49. *Asterolecanium*, Signoret, 1869, Ann. S. Ent. France (4), ix. 101.

P. 59. *Pollinia*, Sign., l. c.

P. 246. *Fiorinia*, Sign., l. c., 99; type *arecæ* (Bdv.), Sign. = *fioriniæ* (Tozz.).

P. 295. *Targionia*, Sign., l. c., 100

P. 301. *Aonidia*, Sign., l. c., 99; type *aonidum* = *lauri*.

P. 304. *Mytilaspis*, Sign., l. c., 99 (syn. of *Lepidosaphes*).

P. 128. *Pulvinaria*, Tozzetti, 1867, Mem. Soc. Ital. iii., no. iii. 30.

The subfamily nomenclature of the Coccidæ seems to be as follows:—

P. 15 (1). Coccinæ = *Monophlebinæ*, Fernald.

P. 28 (2). *Margarodinæ*.

P. 33 (3). *Ortheziinæ*.

P. 38 (4). *Phenacolcachiinæ*.

P. 38 (5). *Conchaspinæ*

P. 39 (6). Kerminæ = *Dactylopiinæ*, Fernald.

P. 123 (7). *Tachardiinæ*.

P. 127 (8). Calymmatinæ = *Coccinæ*, Fernald.

P. 213 (9). *Diaspinæ*.

P.S.—*Pseudococcus* was founded by Westwood in 1839 (?). (Introduction, ii. 447), type *cacti*, (nec Linn.); it is therefore a pure synonym of *Dactylopius*, Costa; for *Pseudococcus*, Fernald (p. 96), *Trechocorys*, Curtis, must be used, type *adonidum* (nec Linn.) = *longispinus* (Riley).

Honolulu.

NEW RHYNCHOTA-CRYPTOCERATA.

By W. L. Distant.

Fam. Naucoridæ.

Subfam. Naucorinæ.

Macrocoris transvaalensis, sp. n.

Head and pronotum ochraceous, punctured with piceous, the pronotum with two central piceous lines, which join a subbasal transverse piceous line, behind which the piceous punctures are absent; scutellum black; hemelytra piceous, apex of clavus and anterior lateral margin of corium ochraceous; connexivum ochraceous, with piceous spots at the incisures; body beneath and legs ochraceous, lateral areas of the mesosternum more or less piceous; head shorter than its breadth between eyes, which are anteriorly somewhat convergent; lateral margins of the pronotum broadly convex; scutellum finely granulose; anterior femora more or less strongly fuscously punctate. Long. 10 millim., lat. post. pronot. angl. 5½ millim.

Hab. Transvaal; Lydenburg Distr.

Differs from *M. flavicollis*, Sign., by the much narrower head,

the more convex lateral pronotal margins, spotted connexivum, &c.; from *M. convexus*, Montand., it is distinguished by the head between the eyes being broader than long.

THURSELINUS, gen. nov.

Body ovate, moderately convex; head very large, almost as long as pronotum, rather more than one-third broader between eyes than long; eyes elongate, much narrowed, and slightly converging anteriorly; labrum rounded, reaching base of second joint of rostrum; pronotum scarcely broader than base of hemelytra, only slightly narrowed anteriorly, its anterior angles not reaching the middle of eyes; scutellum short, about twice as broad at base as long; hemelytra complete; mesonotum medially carinately longitudinally elevated; anterior femora ampliated, inwardly notched towards base.

Differs from *Macrocoris* by the much larger and broader head; anterior angles of pronotum not reaching the middle of eyes; shorter and broader scutellum, &c.

Thurselinus greeni, sp. n.

Ochraceous; scutellum brownish ochraceous; eyes black; basal area of pronotum with some longitudinal piceous lines; body beneath and legs uniformly ochraceous; membrane clouded with pale fuscous; head almost as long as pronotum, its anterior margin convex, with a somewhat flattened central basal space; pronotum transversely striate near anterior margin, very finely and obscurely punctate, the lateral margins slightly rounded, a little narrowed anteriorly, but almost subparallel; scutellum very finely granulose, broadly subtriangular; connexivum piceous at segmental incisures. Long. 6 millim.

Hab. Ceylon; Keshewa (E. E. Green).

ON SOME NEW GENERA AND SPECIES OF HYMENOPTERA.

By P. Cameron.

(Concluded from p. 210.)

VESPIDÆ.

ODYNERUS CAMICRUS, sp. nov.

Black; the base of the abdomen with two sutures at the base, the space between them laterally depressed, smooth, shining, and marked with stout keels; the under side of the scape, the clypeus, a mark, longer than broad, and with the lower half much narrowed above the antennæ, the inner half of the eye incision, a large triangular mark on the sides of the pronotum, the tegulæ, post-scutellum, and a line on the first and second abdominal segments, yellow. Legs black, the knees, the four front tibiæ anteriorly, and the tarsi, testaceous. Wings hyaline, the radial cellule smoky, the base hyaline. ♂. Length, 7 mm.

Hab. Darjeeling.

The apical two joints of the antennæ are rufous below, and the last also at the sides. Front and vertex closely rugosely punctured, and sparsely covered with silvery pubescence. Clypeus longer than broad, above broadly rounded, the apex shortly stoutly bidentate; the space between the teeth shallow. Pro- and mesothorax rugosely punctured, the top of the pro- smooth, above margined. Metanotum rugose in the middle at the base, the sides reticulated; the apex smooth; the sides stoutly margined; the metapleuræ, on the upper half, irregularly, rather weakly reticulated. Apical half of first abdominal segment punctured and covered with a fulvous pile, the rest impunctate; the second, third, and the base of the fourth segments closely punctured; the other segments impunctate. The band on the first segment is only on the top; on the second it goes all round. The head and thorax are thickly covered with white pubescence; the base of the mesopleuræ below the middle is impunctate, and there is at the top of the smooth part a short deep oblique furrow; the pro- smooth at the base, the smooth part behind having a distinct border; the apex of the metanotum is deeply roundly hollowed; the apex of the pronotum is very little developed in front of the mesonotum, and is transverse; the apex of the scutellum is almost crenulated. There is a small mark behind the eye.

Cannot well be confounded with any of the Oriental species of the section *Ancistrocerus*.

FOSSORES.

Crabro trichiosomus, sp. nov.

Black; a narrow line on the scape of the antennæ, a broad interrupted line on the pronotum, two irregular transverse marks on the second, third, and fourth abdominal segments—the marks becoming smaller successively—yellow; the head, thorax, and base of abdomen thickly covered with long white, the rest of the abdomen with shorter white pubescence. Legs black, the hinder calcaria large, broad, and yellow. Metanotal area coarsely punctured and deeply furrowed in the middle. Wings hyaline, the nervures and stigma black. ♀. Length, 7 mm.

Hab. Himalayas.

Front and vertex closely and distinctly punctured, the latter more strongly than the front. Front, face, and clypeus covered with silvery pubescence; the face keeled in the middle, the apex of the clypeus broadly rounded. Mesonotum and scutellum closely and distinctly punctured; the post-scutellum is more shining and less strongly punctured. Metanotum deeply depressed at the base; the depression with some stout striæ; the basal area has the punctures larger and more irregular on the sides; the apical slope is coarsely, closely transversely striated. The upper part of the propleuræ is obliquely, the lower longitudinally striated, its apex stoutly keeled. Mesopleuræ punctured, but not strongly or closely; the meta- closely, strongly obliquely striated. Abdomen closely punctured, the second, third, and fourth segments depressed at the base and apex; the first slightly, but distinctly longer than the width at the apex; the pygidium closely, but not strongly, punctured. The apical abscissa of the radius is obliquely bent.

This species will form a new section in Bingham's "B" and *c*, defined by the metanotal area being punctured.

CRABRO AGYCUS, sp. nov.

Black; the base of the median segment with three areæ, the central being narrower than the others; the scape of the antennæ, the mandibles above, a broad line on the pronotum, the scutellar tubercles, a large mark on the sides of the scutellum at the base, broadest on the outer side, and with a semicircular small incision in the middle, the post-scutellum, a line on the first abdominal segment, narrowed in the middle, a small mark on the second laterally, and large broad ones on the third to fifth segments, the tubercles, a small mark behind them, and a larger longer mark, narrowed below, behind that, lemon-yellow. Legs yellow; all the coxæ and trochanters, the basal half of the fore femora above and the lower part, the greater part of the middle femora below, the hinder, except on the top, the four hinder tibiæ in front, and at the top and bottom behind, black; the tarsi infuscated towards the apex. Wings hyaline, the stigma fuscous, the nervures darker. ♀. Length, 8 mm.

Hab. Himalayas.

Front and vertex smooth and shining; the front covered with golden pubescence; the vertex sparsely pilose; the face and clypeus covered with silvery pubescence. Mandibles smooth and shining; the two apical teeth stout, clearly separated. Metanotal areæ smooth; the central is of almost equal width; the inner lateral become roundly narrowed towards the apex; the outer lateral of almost equal width; the sides of the apical slope are bordered by keels. Pleuræ smooth and shining; the tubercles large, projecting. The mesopleural furrow is obscurely crenulated. Pygidium keeled laterally, and bearing large punctures. The hinder tibiæ become gradually thicker towards the apex, and bear some stout spines; their metatarsus not thickened.

This species may be known from the recorded Indian species by the five clearly defined areæ on the base of the median segment.

BEMBEX MEGADONTA, sp. nov.

♂. Black; the apical two-thirds of the clypeus, labrum, mandibles, except at the apex, the outer eye-orbits narrowly, the apex of the pronotum broadly, the edges of the propleuræ all round, the lower narrowly, the sides of the metanotum, the apical half of the metapleuræ, and the apices of the scutellum and post-scutellum, pale yellow. Abdomen pale yellow; a broad black band on the base of the first segment, narrowed and roundly incised at the apex, a broad band on its apex, roundly narrowed laterally, two spots broader than long on the base of the second, an irregular band on its apex, a band on the base of the third with two dilatations in the middle, a narrow band on its apex, dilated in the centre; similar bands on the fourth segment, the basal half of the fifth, the band with a shallow incision on the apex, and the whole of the apical two segments, black; the ventral segments black, their sides at the apex irregularly marked with yellow. Legs yellow, all the coxæ, a broad line on the top of the first pair of

femora above, the four posterior broadly above and below to near the apex, a line on the centre of the fore tibiæ before and behind, and on the four posterior, black. Wings hyaline; the costa and basal nervures testaceous, the others darker. ♂. Length, 17 mm.

Hab. Darjeeling.

Head and thorax thickly covered with white longish pubescence; the first transverse cubital nervure is largely dilated backwards below; on the second ventral segment is a large tooth, which commences near the base and extends to the apex; it is roundly broadly curved, and becomes narrowed towards the apex below; the apical part is also roundly curved; the sixth segment is broadly raised in the middle; this raised part becomes narrowed towards the apex, which is rounded, and has there an oblique slope. The last segment is punctured, except in the centre, where there is a smooth shining band; it becomes gradually narrowed towards the apex, the sides being only indistinctly curved. The basal joint of the front tarsi is stout, and is longer than the three following united; the spines are long, pale, and moderately stout; the middle femora are irregularly toothed; the teeth are more numerous on the basal half. Eyes almost parallel, only very slightly divergent below. Front keeled. The yellow bands on the abdomen are sulphur-yellow on the base, paler on the apex.

In Bingham's arrangement the species would come, in his table, close to *B. pinguis* and *B. fossoria*. Characteristic is the very large tooth on the second ventral segment.

NOTES AND OBSERVATIONS.

The Tubercles of Saturnia carpini. — Referring to Mr. Lucas's note respecting the colour of the tubercles in larvæ of *S. carpini* (*ante*, p. 240), I may mention that a half-grown larva of this species was brought to me about six weeks ago, having bright crimson tubercles. After having kept it a week or so, it changed its skin, and also the colour of its tubercles, which were dull orange from then up to the time of its death, which occurred when quite full-grown.—G. F. Lyle; Brockenhurst, Sept. 12th, 1904.

Larvæ of Arctia caia swarming in the Scilly Islands. — During my stay in the Scilly Islands from the middle of May to the middle of June last, all the larger islands were teeming with thousands of the larvæ of *A. caia*. They swarmed in such myriads that no vegetation escaped them—they fed on any green stuff available from stonecrop to shrubs of various kinds. Bracken seemed in great demand, also various other ferns, &c. Every path and roadway was dotted all over with their crushed bodies.—F. W. Frohawk.

Aporia cratægi ab.—During last July I found the headquarters of a batch of imagos of *Aporia cratægi*, and captured twenty specimens. There were no varieties, but one of them turned out to be a little bit of a freak, for the hind margins of each wing had two curves instead of one. At first I thought it was a crippled specimen, but it proved

to be quite perfect, though it has an odd appearance.—J. P. Barrett; St. John's Villas, Margate, Sept. 11th, 1904.

Gynandrous Example of Lycæna (Polyommatus) ægon. — On July 12th I took a fine gynandrous specimen of *L.* (*P.*) *ægon* near Canterbury, the left side being male and the right side female.—F. A. Small; 95, Westgate, Canterbury.

Lycæna ægon, var. corsica, in Norway. — In may be worth mentioning that, on July 4th last, whilst collecting on the eastern coast of the Christiania Fjord, I took three specimens of this interesting female form of *L. ægon*. I seem to remember that the same, or a very similar, form was taken two or three years ago in the north of England. It would appear, therefore, that M. Bellier de Chavigneric was a little premature in naming it var. *corsica*. — R. S. Standen; Lindfield, Sussex, Sept. 6th, 1904.

Ennychia cingulata "assembling." — On August 20th last Lieut. Jacobs and myself were collecting at Box Hill, and had taken during the day a few *E. cingulata*, including a female. About seven in the evening we sat down to rest and to examine our captures—amongst them the female *E. cingulata*, which was pinned in the box. We were surprised to see in a few minutes numbers of male *E. cingulata* flying around the box. We could have taken a hundred or more, but secured a good series each.—Percy Richards; "Wellesley," 11, Queen's Road, Kingston Hill, Aug. 23rd, 1904.

The Variation of Epinephele tithonus.— It may be interesting to note that while looking over *E. tithonus* on the downs a few miles from Portsmouth, it was observed that a large proportion of the specimens possessed an additional black spot on the upper surface of the hind wings. This peculiarity was noticed in both males and females, and varied from a mere speck in some specimens to a well-defined spot in others; and in one instance at least this extra spot was white-centred.—G. M. Russell; 3, Homefield Road, Chiswick.

Polia chi var. olivacea and Aplecta nebulosa var. robsoni.—During a visit to Bishop Auckland, Durham, last year (August 28th to September 8th), walls, &c., were examined, as opportunity offered, for *Polia chi*. Judging by results, however, the species seemed to be scarce, and only eight specimens were noticed, two of these being var. *olivacea*. One of the latter was a female, and furnished about one hundred and twenty eggs. A few larvæ hatched on March 28th, 1904, and others continued to come out until April 9th, when there were altogether some ninety larvæ feeding on dock and dandelion. The remaining ova dried up. At the time the latest larvæ hatched the earliest were about $\frac{3}{4}$ in. long. During May there appeared to be some sort of sickness among the larvæ, and a good many died. Sallow and groundsel were then substituted for the previous food, and the result was marked improvement in the condition of the larvæ. The number finally reaching the pupa state was not ascertained, but forty-three fine examples of *olivacea* emerged between July 10th and 22nd. As no other imago had appeared, on August 1st, the earth was turned out, and on examination ten or a dozen dead pupæ were observed. It is to be regretted that, owing to the various causes adverted to, only

about a third of the batch attained the perfect state. The male parentage was unknown, but, as all the offspring exactly resembled the female parent, it may reasonably be assumed that the male was also of the form *olivacea*. Ova were also obtained from a typical female, but these unfortunately proved infertile. On April 9th, fifty larvæ of *Aplecta nebulosa* were received from Mr. Thompson, of Chester, who informed me that they were from ova deposited by a black female. They were supplied with dock, dandelion, and primrose, but seemed to feed chiefly on the first-named plant. The majority of the larvæ pupated, and on June 21st three moths appeared, all of the black form (var. *robsoni*); these were followed by one black and two darkish grey specimens on the 23rd. Eighteen other examples emerged during the remainder of the month, and two early in July; all these being of the darkish grey form. Fourteen dead pupæ were subsequently found in the breeding-cage. — Richard South; 96, Drakefield Road, Upper Tooting, S.W.

Some Noteworthy Occurrences in 1904. — Imagines of *Smerinthus populi* were pretty common in this district during late May and early June this year. On July 20th I captured a fine female in the garden, and on the same date three full-grown larvæ were feeding on a sallow-bush in the same place. Several larvæ of the species were noted on the sallow-bush on August 17th; these ranged in size from quite small to half-grown. On July 23rd I attended the Field Meeting of the South London Entomological and Natural History Society at Byfleet, where I found a specimen of *Acronycta leporina*. It was resting at the foot of a birch-tree, and apparently had recently emerged. The same day, and at the same place, Mr. Carr beat out some half-grown larvæ of the species. At Oxshott, on August 6th, I found a beautifully fresh male specimen of *Lophopteryx camelina* at rest on a tree-trunk, and on July 30th there was a nearly full-grown larva on the sallow-bush previously mentioned. On July 17th a worn female *Timandra amataria* was netted at Oxshott, and a few ova deposited by her were shaken out into an uncovered plant-frame in which a number of weeds luxuriated. On August 19th a small but very fresh male specimen of the species was found in the frame, resting among the weeds.—Richard South.

Papilio (Iphiclides) podalirius as a British Insect. — Although I do not for a moment consider that *P.* (*I.*) *podalirius* is to-day a British insect, I think perhaps readers of the 'Entomologist' would like to know that there are at least two specimens in different collections which have been caught in England since the time of Haworth. Newman figures it in his 'British Butterflies,' remarking that it was "recorded as British by Haworth, but no British specimen is known." Two British examples, however, have lately come under my notice; one in an old Somersetshire collection, taken near Bridgwater about 1833; and the other, now in my possession, captured at Marlborough in 1870 by a boy at the College. This specimen is, unfortunately, somewhat damaged, which rather points to its being an immigrant; but the Bridgwater specimen is in excellent condition, and is, I think, undoubtedly British, although its progenitors may have been of continental origin. If any reader of the 'Entomologist' knows of any other British examples, I should be very pleased to hear from him. — T. Gristock Brande; Southampton, Sept. 21st, 1904.

CAPTURES AND FIELD REPORTS.

Deilephila livornica in Kent.—On Sept. 5th a friend brought me a living specimen of *Deilephila livornica*, taken on the Prince of Wales Pier at Dover. It was at rest on the railway metals; one wing was damaged at the tip—evidently it had been run over by the train that morning, otherwise it is a very good specimen. — F. P. Abbott; 8, Beaconsfield Road, Dover, Sept. 9th, 1904.

Deilephila livornica, Sphinx convolvuli, &c., in South Wales.—On Sept. 11th a splendid specimen of *Deilephila livornica* was discovered at rest upon the turf of a small headland here. The insect is in excellent condition, but for slight rubbing on the upper part of the thorax. As I had only seen dried specimens before, my delight may well be imagined on being presented with a living local specimen of this hawk-moth. It appears to be a male, and measures 3·4 inches from tip to tip of its wings. It was caught by Mr. Bedingfield, of Broad Street, Barry, and added by him to my collection. Sphinges seem well represented here, as I have secured two specimens of female *Sphinx convolvuli* during August, and *Smerinthus ocellatus* in June; while several of the commoner smaller sphinges have been seen by me, but not caught. Larvæ of *S. populi* were freely found on poplars, but all were ichneumoned. — G. J. Randell; "Rushbank," Barry, Glamorgan.

Sphinx convolvuli in Berkshire.—On August 25th last I had the pleasure of finding a fine specimen of *S. convolvuli* quietly resting on my front door-step. I have never met with the species here before, though the alleged food-plant of the larva is much too abundant.—W. H. Warner; Fyfield, near Abingdon, Berks.

Sphinx convolvuli and Leucania albipuncta in Devonshire.—It may interest the readers of the 'Entomologist' to know that I took a fine specimen of *Leucania albipuncta* on Aug. 29th at sugar near here; and I learn that others, as well as specimens of *Sphinx convolvuli*, have been taken lately in this district.— E. D. Morgan; 8, Luscombe Terrace, Dawlish, Devon.

Sphinx convolvuli in Derbyshire. — On September 5th I had a specimen of the above brought me in very fair condition, which had been found by a friend of mine here—Little Eaton. This makes the third I have seen this season, taken in this district—one at Langley Mill, one at Bakewell, and now this one—and all of them males.—John Hill; Little Eaton.

Sphinx convolvuli in Essex. — Specimens of this species have occurred sparingly in different parts of the country during the past few weeks. One was brought me to-day which was found at rest on a window-sill at Rayleigh, Essex, Sept. 17th.—F. W. Frohawk.

Sphinx convolvuli in Hampshire.—On September 11th last a fine specimen of *Sphinx convolvuli* was taken near Sway, New Forest. — E. Awdry Dobrée; Udney Hall, Teddington, Sept. 13th, 1904.

Sphinx convolvuli in Lancashire. — On September 10th I took a fine perfect specimen of *S. convolvuli*. It was at rest on the summer-

house door in our garden, exposed to the full blaze of the afternoon sun. It was excessively sluggish, and I transferred it to the killing bottle without the slightest difficulty.—Harold S. Leigh; Brentwood, Worsley, near Manchester.

Sphinx convolvuli in Moray.—Mr. W. Taylor, Lhanbryde, has sent me a fine specimen of this moth, taken at Lossiemouth, in Elginshire, about Sept. 12th last.—Henry H. Brown; Cupar-Fife.

Sphinx convolvuli in South Yorkshire.—On August 26th a fine example of this species was captured on some linen left on a clothes-line all night in a garden at Wincobank, a suburb of Sheffield. It was securely impaled on two large common pins; the wings also were slightly rubbed in the handling before it was given to me.—W. Brooks; Thundercliffe Grange, near Rotherham, Sept. 10th, 1904.

Sphinx convolvuli, &c., in Surrey.—A fine specimen of *Sphinx convolvuli* was taken recently on *Nicotiana affinis*, and one or two have been seen since. The larva of *Smerinthus ocellatus* has been very plentiful here this autumn. Eight or nine were taken on a small shrub of *Salix alba*, and single specimens seen frequently during first week in September.—Wm. Delves, Jun.; Horeham Road, Sussex.

Sphinx convolvuli in Wales. — On August 17th last I took two specimens of *S. convolvuli* at Fairbourne, Merionethshire. On the following evening I saw six more, all hovering over the flowers of *Nicotiana*. Unfortunately they were all rather worn. Although I saw a few specimens late in the evening, they were most frequent about 7 p.m. — N. G. Hadden; "St. Elmo," Avenue Road, Malvern, Sept. 18th, 1904.

Sphinx convolvuli at Walmer.—A fine specimen of the above was brought to me to-day. It appears to be freshly emerged, though rubbed from handling. Another was taken by a friend in Deal.—R. A. Jackson; Chavily Farm, near Hollingbourne.

Colias edusa in Cornwall.—On Sept. 17th I took a female *Colias edusa* on some sandhills near the sea. It was in perfect condition, and there had been a gale blowing for three days from the west, and the wind was blowing very strongly when I took the specimen. It must have been bred near the place where I found it, as it could not have flown far against the heavy wind. The locality was about ten miles north of Newquay. — L. A. M. Riley; St. Petroc Minor, St. Issey, Cornwall.

Colias edusa var. helice, &c., in Devon.—Whilst collecting at Dawlish, South Devon, on Aug. 12th, I caught sight of a *Colias edusa* perched on an oak-leaf in a lane, and to my surprise, on netting it, I found it to be a magnificent specimen of the var. *helice*. On searching a good many clover-fields, I could not see any other example of the species, although a small boy at Teignmouth told me he had taken a few *C. edusa* and one specimen of *helice* in a clover-field near that town. During my four days' visit I also obtained five *Callimorpha hera*, including two of the yellow variety (*lutescens*), in grand condition, and a nice set of *Bryophila glandifera*. — H. O. Wells; 42, the Avenue, Gipsy Hill, London, S.E., Aug. 30th, 1904.

Colias edusa in Essex.—During August I visited acres of lucerne and clover, but found *edusa* very scarce, seeing only one specimen on Aug. 9th near Wickford, and three apparently freshly emerged specimens on Sept. 1st. One was seen at Waterford on Aug. 23rd, and I have heard of a few others having been seen in the southern counties. F. W. Frohawk.

Colias edusa in Hampshire.—I saw about half a dozen examples of *C. edusa* flying along the undercliff at Barton-on-Sea. They were frequently noticed settling on the gravel of the cliff, and when in this position were most difficult to distinguish from their surroundings.—G. F. Lyle; Brockenhurst, Sept. 12th.

Colias edusa and C. hyale in Kent. — On Sept. 3rd, at Chatham, I came upon some *C. edusa* in a clover-field, and took nine specimens in fine condition; yesterday I visited the same field, expecting to find more *C. edusa*, but not one was to be found. I took, however, twenty-nine *C. hyale*, all quite good. I have never before found the two species on the same ground.—F. A. Parry; Longport, Canterbury.

Colias edusa, C. hyale, Sphinx convolvuli, &c., in Kent.—Autumn butterflies have not turned up here in any numbers. *C. edusa* was captured as early as Aug. 4th, and several specimens were seen. On the 4th inst. I noticed six specimens here. Only one *C. hyale* has been observed, and that was flying on the beach. Worn specimens of *Pyrameis cardui* have been seen from March till July, when their successors appeared, only in small numbers. I have just had *Sphinx convolvuli* brought to me—a wreck. *Macroglossa stellatarum* is rather plentiful.—T. P. Barrett; St. John's Villas, Margate, Sept. 11th.

Colias edusa in South Wales. — Four male specimens of this butterfly were captured by me in the same field here on Aug. 27th last. Several others were seen. On Sept. 17th I saw flitting rapidly past me on a steep declivity in this neighbourhood a splendid example of *C. edusa*. It disappeared over some bushes ahead of me. About half-a-mile further on, while about 40 ft. on the side, I perceived below me, flying very swiftly before the wind, either the same insect or another, and, following it from my vantage ground, saw it very suddenly settle about 200 yards from where I first noticed it. Hurriedly approaching, I found it egg-laying on birds'-foot trefoil (*Lotus corniculatus*). Before I could net it, I saw it fly about three yards away and deposit another egg. I then quickly effected its capture, and conveyed it home with the eggs it had laid. At ten o'clock this morning (Sept. 18th) I watched the butterfly being aroused from its slumber on a growing plant of trefoil, on which I had placed it overnight and covered with gauze. Its first movement was to wipe its palpi (!) several times with its fore feet, and then, after ineffectual attempts to escape, it fell among the trefoil and immediately laid an egg by arching its abdomen up highly, with wings hanging downwards. At 11 o'clock ten eggs were laid. At 5 p.m. it fed greedily of honey on the gauze, and laid fifteen eggs immediately afterwards. Altogether I can count about fifty eggs, all laid to-day, and each laid singly, with one exception, when two were laid side by side. Is not this proof of the double-broodedness of *C. edusa* as a Welsh native, and not a blown-

over specimen? The spot where the capture was made is very sheltered for about a mile, and always warm, facing direct south across the Bristol Channel. As the insect is alive, well, and vigorous, I hope to obtain more eggs.—G. J. Randell; "Rushbank," Barry, Glamorgan.

Colias edusa in Sussex. — This butterfly was plentiful during August at Bognor, and I took about a dozen specimens of each sex in splendid condition.—M. Jacoby; 1, The Mansions, Hillfield Road, West Hampstead.

Colias hyale in Wiltshire.—I saw a specimen of this insect on Salisbury Plain on Aug. 21st. — N. Manders (Major, R.A.M.C.); Netheravon, Salisbury.

Heliothis peltigera at Bognor.—I captured a specimen of this moth at dusk flying over wild flowers. It is the first record of the species at that locality, according to Mr. Guermonprez, the resident naturalist there.—M. Jacoby; 1, The Mansions, Hillfield Road, West Hampstead.

Vanessa antiopa in Kent.—One specimen captured at Dymchurch while fluttering outside a window of a bungalow on July 26th, as recorded by Mr. J. S. Mackintosh in the 'Field' of Aug. 6th.—F. W. Frohawk.

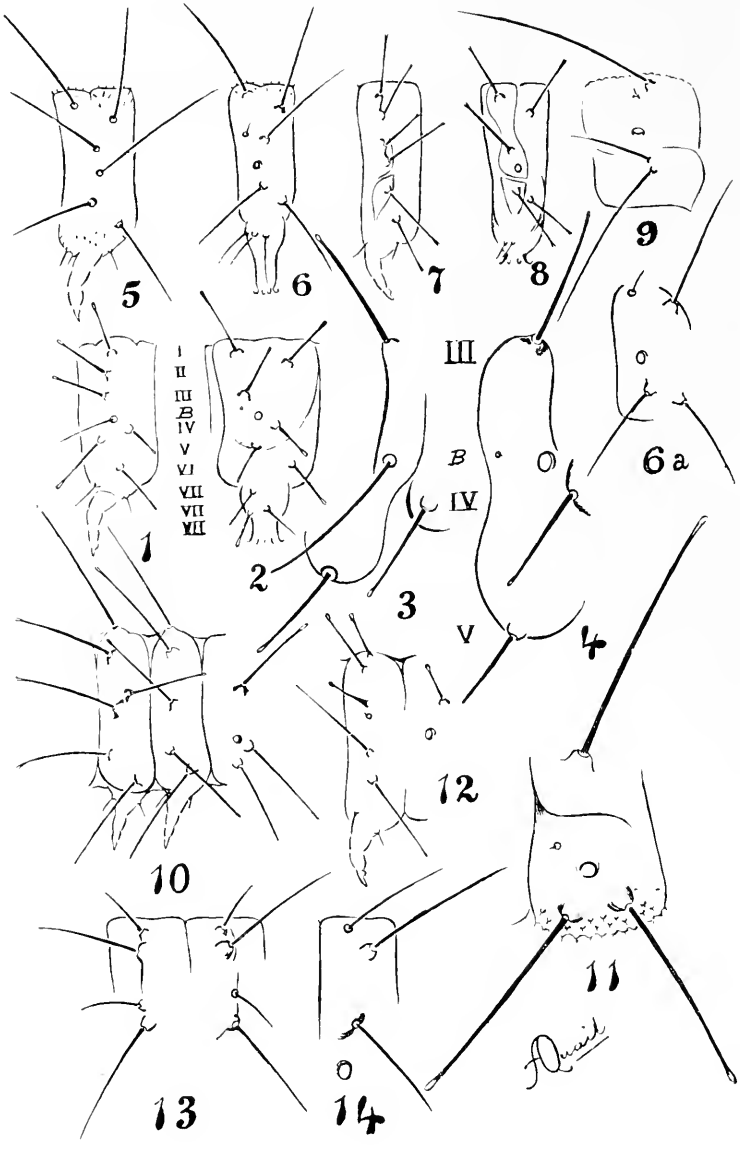
Lygris (Cidaria) reticulata in Westmoreland. — I have much pleasure in recording the capture of a specimen of *C. reticulata* near Lake Windermere, Westmoreland. The specimen (a female) was taken on July 30th, and measures $1\frac{3}{16}$ in. (30 millim.) in expanse.—Paul Corder; 13, Albion Road, South Hampstead, N.W., Sept. 4th.

Stauropus fagi in Northamptonshire.—I captured a specimen of *S. fagi* in Northants this year.—H. Turner; Earl's Barton, Northants, Sept. 7th, 1904.

Notes from the New Forest.—*Sarrothripus undulanus* (*revayana*): While beating oaks and beech for larvæ yesterday, in one of the large enclosures in the New Forest, if I had had my net with me, I might have captured two or three dozen of this species without much difficulty. I did not see *Peronea cristana*. Larvæ this year seem plentiful as compared with last season. Among the larvæ obtained were ten *Notodonta trimacula* (*dodonea*), and four *Stauropus fagi*, with many commoner things.—W. McRae; Bournemouth, Aug. 28th, 1904.

Abundance of Catocala nupta.—While motoring along the York Road on Sept. 13th and 14th, I was struck by the abundance of *C. nupta*. I only saw those at rest on telegraph-poles, and between London and Peterborough I must have seen dozens, and these all on the south side of the poles. In many places there were two or three quite close together. Had I been able to examine the northern side of the poles, also trees, palings, &c., the number would doubtless have been greatly increased.—B. Harvey-Jellie; Hartlepool.

Larvæ feeding on Castanea vulgaris.—On Aug. 30th last I beat out larvæ of the following species of Lepidoptera from sweet chestnut: *Dasychira pudibunda*, *Hylophila prasinana*, *Lophopteryx camelina*, *Acronycta psi*, *Moma orion*, *Amphidasys betularia*, and *Tephrosia extersaria*.—G. F. Lyle; Brockenhurst.



TUBERCLES OF LEPIDOPTEROUS LARVÆ.

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ON THE TUBERCLES OF THORAX AND ABDOMEN IN FIRST LARVAL STAGE OF LEPIDOPTERA.

BY AMBROSE QUAIL, F.E.S.

(PLATE IX.)

THIS is an interesting subject to which for some years I wished to pay attention, but paucity of material and time prevented. Larvæ of Lepidoptera have certain tubercles placed on the segments in approximately definite positions, and the single seta-tubercles of the first larval stage which prevails in many groups appears to be a primitive condition. Some have only single seta-tubercles in all stages (larval)—Hepialidæ, Cossidæ, Noctuæ, Geometræ, &c. Sometimes the first larval stage only has single seta-tubercles—Pieridæ, Sphingidæ, &c.; often in later stages with multisetiferous tubercles—Nymphalidæ, Arctiadæ (*Nystemera*), &c. More rarely in the first larval stage some tubercles have more than one seta—Liparidæ (*Porthesia*), Lachneidæ (*Lasiocampa*), &c.

Dr. Dyar established the value of the larval tubercular arrangement as an aid to classification of Lepidoptera, and gave us a system of identification numbers for the abdominal tubercles based on the adult larval stage; this is in general use. In duplicate the abdominal segments have the tubercles numbered from the anterior one near the medio-dorsal line downwards i to viii (fig. 2); the last being ventral, and vii including more than one seta on the base of abdominal feet; *tubercle vi* is not usually present in the first larval stage.

One *must* study the *first larval stage* when the condition and arrangement of the tubercles is most primitive; conclusions based on later larval stages when the tubercles are slightly, but nevertheless, specialized may only mislead.

The prothoracic tubercles exceed in number, and their arrangement differs widely from, the other thoracic tubercles.

The meso- and post-thoracic tubercles approximate in number, differing in arrangement from the abdominal tubercles, are not usually treated as homologous with them. This probably is due to the earlier opinion of Dr. Dyar, who did not consider them to be so, and gave a different set of identification numbers. Later authors, using Dyar's work as a foundation, repeat the formula. Apparently this has been done in the 'Catalogue Lep. Phalænæ,' vol. i., thus: meso- and post-thorax adult characters, "a subdorsal tubercle i with two hairs (i A + i B); ii with two hairs often separate (ii A + ii B); iii, iv, v in line iv and v conjoined; vi subspiracular with one or two hairs. . . . In first stage . . . tubercles iii and iv of thorax and vi of abdomen absent."

Dr. Dyar now admits* the thoracic and abdominal tubercles are homologous, but because it is *fourth* in sequence makes ii B of thorax = iv of abdomen. I submit the homologue of ii B of thorax is a minute anterior supraspiracular tubercle of abdomen, called by me iii B; that Dyar's iii of thorax = a subspiracular tubercle of abdomen; and so on. As stated by my friend Mr. Bacot (*ante*, p. 94), my iii B "is of very general, if not universal, occurrence on the abdominal segments of lepidopterous larvæ"; but I persist in my opinion, and after examination of more material in the first larval stage, the conclusion is more irresistible that it is correct.

When the system of numbering the abdominal tubercles originated, the minute tubercle (iii B) was overlooked, or considered of no importance; but in *Melanchra*, second stage (figs. 3 and 4), the positions, by actual measurement, of the fourth thoracic (ii B) and my iii B are identical in longitudinal line. Furthermore, ii B, equally with iii B, is invariably above the spiracular line (figs. 5, 6, 7, 8, 10, 12, 13, 14). Indeed, the positions of larval tubercles are not absolutely fixed in the Lepidoptera, the characteristic dorsal trapezoidal pattern of the abdomen, formed by i and ii thus $\begin{smallmatrix} & .ii \\ i: & \\ i\cdot & \\ & \cdot ii \end{smallmatrix}$, is subject to modification; and in Psychidæ the pattern is reversed, thus $\begin{smallmatrix} i. & \\ & .ii \\ & \cdot ii \\ i\cdot & \end{smallmatrix}$. Hepialidæ (fig. 5) first larval stage has the trapezoidal pattern on meso- and post-thorax; my notes give *Pterophorus* also. But the corresponding tubercles of the thoracic segments are usually one above the other, but in longitudinal line with i and ii respectively of abdomen—Cossidæ (fig. 7), Pieridæ, Tineidæ, &c.

In Hepialidæ, tubercle iii B has a longer seta than usual (fig. 6*a*), and in later stages the tubercle is normal in size and seta. The various positions of iii B may here be pointed out, as shown in Hepialidæ (fig. 6*a*), Tineidæ (fig. 9), and Rhopalocera (fig. 11). iii B is always minute, so far as my observations go, and often extremely difficult to detect (except in Hepialidæ).

* 'Entomologists' Record,' vol. xiii. p. 40.

Although the meso- and post-thoracic segments of the first larval stage are usually duplicates—Hepialidæ, Cossidæ, Noctuæ, Pyralidæ. Some evidence of the identity of ii B of thorax with iii B of abdomen may be observed in Rhopalocera (*Pieris*, *Terias*); the former is present on mesothorax, but absent, or minute, on post-thorax; while in *Plutella* (fig. 12) the *fourth* tubercle of the mesothorax is normal, but marvellously reduced on the post-thorax to a minute tubercle similar to iii B of abdomen, affording what appears to be a complete gradation.

I have attempted to show in the foregoing, that in the first larval stage, above the line of spiracles, there are four separate normal tubercles on the meso- and post-thoracic segments, which are identical with three normal and one minute tubercles on the abdominal segments—this is clearly shown in the illustrations of *Zeuzera* * (figs. 7–8) larvæ kindly sent me by Mr. Littler, of Tasmania—and should be known by the same identification numbers, thus i, ii, iii, iii B—the latter is necessary to prevent confusion; the two tubercles below the line of spiracles are unquestionably iv and v. Usually, if not invariably, the anterior subspiracular tubercles of both thorax and abdomen are higher than the post-subspiracular in the first larval stage, curiously in later stages among Noctuæ (figs. 1–2) the posterior subspiracular is the highest.

I commend anyone to a study of the Lycænidæ first larval stage. It does not come within the scope of the present paper, as the tubercles, though with single seta only, are more numerous than our more usual and accepted primitive form; but the first abdominal segment has a tubercular arrangement like that of the meso- and post-thoracic (*Lampides*), an alteration taking place on second abdominal segment among the subspiracular tubercles—clearly thoracic and abdominal tubercles are homologous.

Explanation of Plate IX.

FIG.

1. *Melanchra mutans*, Second larval stage, mesothorax, × 80. (Identification numbers of tubercles.)
2. *M. mutans*, Second stage, third abdominal segment, × 80.
3, 4. ,, ,, ,, showing exact position of tubercles iii, iii B, iv, v, and spiracle, × 300, on post-thorax and first abdominal segment.
5. *Porina despecta*, First stage, mesothorax, × 200.
6. ,, ,, ,, ,, third abdominal segment.
6*a*. ,, ,, ,, ,, tubercles iii, iii B, iv, v, × 300.

* The number and position of tubercles appear to be the important characters; specialization of setæ is apparently of no general value, and I was in error in attaching importance to certain setæ of *Cossus* (*ante*, p. 94), as the setæ of *Zeuzera* seem to be all that form.

FIG.
7. *Zeuzera eucalypti*, First stage, mesothorax, × 200.
8. ,, ,, ,, ,, third abdominal segment.
9. *Tinea pellionella*, First stage, tubercles iii, iii B, iv, v, × 300.
10. *Pieris rapæ*, First stage, meso-, post-thorax, and iii, iv, v, first abdominal, × 200.
11. *P. brassicæ*, First stage, exact position of tubercles iii, iii B, iv, v, and spiracle, × 300.
12. *Plutella cruciferarum*, First stage, post-thorax and position of spiracle, and iii on first abdominal segment, × 300.
13, 14. *Nesarcha hybreadalis*, First stage, tubercles above line of spiracles, on meso-, post-thorax and first abdominal, × 300.

All figures with anterior direction to the left.

PARARGE ACHINE ON THE MENDEL.

By the Rev. F. E. Lowe, M.A., F.E.S.

On several occasions I have been over most of the ground mentioned by Mr. Rowland-Brown in his account of "Butterfly Hunting in S. Tyrol" (*ante*, p. 222). In the main I agree with him that Brenner and Mendel are disappointing. But if insects are not so abundant they are often finer, or show interesting differences when compared with Swiss specimens. The one before me now is *P. achine*. Of a long series, beautifully fresh, taken on the Mendel, July 4th, 1903, I find a uniform difference from any of my other specimens. I have the species from Aigle, Liestal, Waldenberg, Freibourg in B., &c. All these, on the under side of the secondaries, have a broad white irregular band, in which are placed the ringed eye-spots, very much after the manner of *C. arcania*. And such, I suppose, is the type form. But the examples from Mendel have *no* white band, but the eye-spots (perhaps, on the average, larger than in the type) stand in the ground colour, which is, if anything, darker towards the border than in the centre. The white band is represented only by an interrupted faint white streak on the *inner* side of the eye-spots. This, since all mine are alike in their peculiarity, looks like a *local* race, which might be dignified with a varietal name—say "Mendelensis." It would be interesting to know whether Mr. Rowland-Brown's Mendel specimens show the same features. Perhaps, as unfortunately he found it just going over, he did not think it worth taking. An earlier visit would, of course, have given Mendel a better place as regards number of species, notably two nice things—viz., *Libythea celtis* and *Lycæna amandus*. Brenner, as a hunting-ground, appears to suffer from chronic bad weather. In 1902 I stayed at the Hôtel Post from 17th to 25th July, and it rained almost without ceasing. In June, 1901, I had only slightly pleasanter impressions, looking at things with an entomologist's eyes.

St. Stephen's Vicarage, Guernsey.

A PRELIMINARY LIST OF THE LEPIDOPTERA OF MALTA.

By Thomas Bainbrigge Fletcher, R.N., F.E.S.

The Maltese group of islands consists of the main island of Malta and the smaller one of Gozo, separated by a narrow channel some three miles in breadth, in which lie two small islets, Conino and Cominotto, whilst off the southern shore of Malta is an isolated rock called Filfala. The area of the whole is some 116 square miles.

The group is situated in latitude 36° north and longitude 14½° east, on a submarine bank which connects Sicily with Africa, and which here divides the Mediterranean into an eastern and a western basin. The distance from Sicily is about sixty miles, and from the nearest part of Africa some two hundred. In former days, there is little reason to doubt, this bank must have formed a land connection between what are now Africa and Sicily, and the Maltese Islands are the insignificant remnants of land, now submerged, which must then have nourished an extensive flora, and have been the home of many remarkable mammals, birds, and reptiles, whose remains have been discovered in the rock-fissures and caves of Malta.

At the present time the flora much resembles that of Sicily. The indigenous mammalia include the hedgehog, rabbit, and weasel. Large numbers of migratory birds visit the islands on their passage across the Mediterranean, but only some half-dozen species remain throughout the year. The reptiles include two snakes (*Coronella austriaca* and *Callopeltis leopardina*), and three or four lizards, the commonest of which (*Lacerta muralis*) is to be seen everywhere, running over the fields and clambering about the walls.

A noteworthy feature is the low elevation and flatness of the islands. Although the land rises considerably in the western parts, the highest point in the group is only some 800 ft. above sea level. The country is, however, traversed in many districts by deep and narrow valleys, which have apparently been scooped out of the rock by torrential rains. These valleys, locally called "wieds," are the principal home of the native vegetation, and therefore form the best collecting-ground for the biologist.

Owing to the flatness of the land and the scantiness of the soil, the fields are enclosed by high walls of sandstone in order to protect the crops from the strong winds which often prevail in the winter months. On first approaching from the sea the whole country seems nothing but rock, since these walls are seen rising one above another, and to trudge along a high road is

a most depressing performance, for the route, as a rule, lies between two stone walls the whole way. But, looking down from a hill-top, the whole appearance of the country is changed, for the prospect embraces innumerable little fields, each one cultivated to the utmost foot in the endeavour to support the enormous population of the islands. Yet only some three-fourths of the whole area is under cultivation, the remainder consisting of expanses of bare rock, or of such barren soil as to render agriculture impracticable. Cotton, potatoes, oranges, and cereals appear to be the most important products, but immense quantities of vegetables and fruit are also grown, and no account of Maltese agriculture would be complete without mention of the clover-like "sulla" (*Hedysarum coronarium*), whose dark purple flower tinges the fields in March and provides rich store of nectar for numberless insects.

In Valletta and its suburbs there are several small public gardens, the most important of which are the two contiguous gardens, called Maglio and Argotti, at Floriana. These are usually gay with flowers throughout the year, and prove a great attraction to many species of Lepidoptera, such as *P. atalanta* and the Sphingids. There is a larger garden in the country at San Antonio, but this is principally devoted to orange-culture.

A short railway running from Valletta to the ancient capital, Notabile, will be found of service in order to reach various collecting-places in the centre of the island. As already indicated, the most suitable localities are to be found in the various wieds, the best of which is that running from the back of the Marsa out to Boschetto. Within the narrow confines of this valley will be found nearly every indigenous species of plant and insect.

The climate of Malta may be divided roughly into a wet and a dry season, the former extending from mid-November to mid-February, and the latter comprising the remainder of the year. From May to September rain is rare, and the rainfall is mainly limited to passing showers during the remaining months of the dry season. The average annual rainfall is about 19 inches. Frost and snow are very rare phenomena, the winter temperature seldom falling below 40° F., whilst in summer it seldom rises above 90° F. The average annual temperature is 64·5° F.

The average temperature from March to May is 60·8° F.; June to August is 72·6° F.; September to November is 68·4° F.; December to February is 54·4° F. The diurnal variation of temperature is much greater in the country than in the towns. Few regions are less liable to calms than Malta, especially by day. A calm of twenty-four hours' duration has, perhaps, never been experienced there in the memory of man. In the winter a very strong north-east wind (locally called "Gregale"), sometimes blows for two or three days at a time, and it is chiefly to

guard against this wind that it is found necessary to enclose the fields with walls.

From February to May is the period during which the entomologist in Malta will find most occupation. At this time the ground is carpeted with greenery; the fields are full of the early crops of beans and cereals and the dark scarlet-flowered "sulla," and are brilliant with poppies, buttercups, narcissi, asphodel, and other wild flowers; even the rocky sides of the wieds are gay with clumps of the Mediterranean heath sprouting from cracks and crannies in the bare rock.

After about the end of May the vegetation begins to get withered up, and in some places dies away altogether, leaving a bare, dusty, glaring surface of rock which looks, as if it never had supported, nor ever again could bring forth, even the most hardy of weeds. But with the first rains, at about the end of September, vegetation makes a sudden reappearance, and previously dusty wastes soon become green with grass, and especially with a species of *Oxalis*, which springs up everywhere with marvellous rapidity, and which has a remarkably lush and verdant appearance.

With regard to this drying-up of the herbage in the summer months, it seems at present a mystery what becomes of some of the larvæ at this period of the year. The wild fennel, for instance, absolutely disappears so far as green leaves are concerned. It must, therefore, be supposed that the imagines do not oviposit until the autumn, or that the ova do not hatch out until vivified by the autumn rains. In this connection, it is a notable fact that my pupæ of *Diloba cæruleocephala*, which pupated at the beginning of April, did not emerge until December, and then only when damped; in Central Europe, of course, this species emerges in August. In this case, however, it is desirable to have an observation on the period of emergence in a state of nature, as the time may have been affected by the conditions inseparable with confinement.

Some evidence as to the manner in which species modify their habits in response to the environment produced by the long spell of dry weather is afforded by the length of time during which most species (and presumably specimens) are on the wing. The life of an individual *Epinephele jurtina* (*ianira*), for example, appears to average about six months, as compared with less than half that period in England. This is, doubtless, of value to the economy of the species, as it is important that the eggs should not be deposited until the autumn, when the young larvæ may feed on the fresh vegetation brought forth by the early autumnal rains. Any such modification in length of life, of course, would be of value only to species whose pabulum (*e. g.*, grasses) is not available as food during the dry weather. Cabbages, for instance, do not dry up very

much, so we find *Pieris brassicæ* with three or four broods as compared with the two broods in England.

At present our knowledge of the Lepidoptera of Malta is very incomplete, the list of local forms only including a little over a hundred species; but new ones are constantly turning up, and it is safe to say that the list when properly worked out will not be far short of two hundred indigenous species. Considering the size of the islands, this seems a fair average for the Palæarctic Region as a whole; but, taking into consideration their southerly position and proximity to both Europe and Africa, the number seems a small one. This is probably due to two main causes—firstly, to the flatness of the country, whereby only one fauna can find a foothold (cp. Sicily and Corsica with their rich yield of mountain species); and, secondly, to the comparative scarcity of vegetation, a large proportion of the islands being practically a barren waste.

The published information on the Lepidopterology of Malta is most disappointingly scanty. Of the thousands of naval and military officers and visitors who have resided in the island during the British occupation, scarcely one seems to have taken any interest whatever in the local fauna, and by the native inhabitants very little appears to have been accomplished. If these brief notes help to arouse any interest in the subject, their purpose will have been served.

In his 'Notes of a Naturalist in the Nile Valley and Malta' (1870), Professor Leith Adams gave us a most interesting book on the Natural History and Archæology of Malta; in it occur long lists of fossils and birds and fish, but he contented himself with a few casual and almost useless notes on the insects.

Dr. Gavino Gulia published, in 1858, a book entitled 'Corso Elementare di Entomologia Maltese, data nel Palazzo di St. Antonio,' but it is quite valueless so far as relates to information concerning indigenous species, owing to the inaccuracy of the determinations. Indeed, it only seems to have been intended as a popular introduction to entomology in general.

In 'Nature' of January 2nd, 1890, is a short article by Mr. Fraser on Maltese butterflies; in this he mentions some half-dozen species by their English names, and notes their small proportions as compared with Continental examples, an observation, by the way, which is quite inaccurate; amongst others he names the "Tortoiseshells" as flying about the garden of his hotel at Sliema. These, however, must have been *Pyrameis cardui* (or less probably *P. atalanta*), which are often so torn and bleached by exposure to wind and weather as to render them almost unrecognizable.

(To be continued.)

"UNDESCRIBED RHYNCHOTA."

By W. L. Distant.

Fam. Lygæidæ.

Subfam. Heterogastrinæ.

In 1874 Scott founded the genus *Chauliops*, for the reception of a Japanese Lygæid. This species I have also received from Ceylon, collected by that indefatigable economic entomologist Mr. E. E. Green, and I have figured it in my second volume on the 'Rhynchota of British India' (p. 36, fig. 24). I have now to add a West African species, which I have just discovered in some specimens collected for me by my late friend D. G. Rutherford, some years ago.

Chauliops rutherfordi, sp. n.

Pale brownish or brownish luteous; pronotum with two discal longitudinal fasciæ widened anteriorly, and a spot near each lateral posterior angle piceous; scutellum, excluding basal lateral margins, piceous; corium with an inner discal series of very coarse dark punctures, and with its apical margin piceous; membrane dark fuscous; antennæ pale luteous, first and fourth joints pale castaneous; femora castaneous, their bases luteous; tibiæ and tarsi luteous, bases of the tibiæ castaneous; scutellum strongly attenuated posteriorly, its lateral margins concavely sinuate, its apical half longitudinally sulcate. Long. 2½ millim,

Hab. Old Calabar (D. G. Rutherford).

This species, in general appearance, is closely allied to the eastern *C. fallax*, Scott, but is structurally separated by the totally different shape of the scutellum.

Fam. Phymatidæ.

Glossopelta dudgeoni, sp. n.

Black; anterior lateral margins of pronotum, connexivum, a longitudinal spot on each side of head beneath, rostrum, sternum—excluding lateral angles, abdomen and legs, stramineous; head granulose, area of the ocelli and the eyes castaneous; antennæ with the first joint robust, granulose, almost as long as second and third joints together, second and third joints short, more slender than the other joints, subequal in length and attenuated at their bases, fourth joint incrassate, pyriform, with its base castaneous, and longer than second and third together; pronotum with the anterior lobe finely and sparingly granulose, the posterior lobe very coarsely punctate, with two ventral discal ridges commencing on posterior margin of anterior lobe, anterior lateral margins strongly crenulate, posterior angles produced, their apices broadly concavely truncate; scutellum very finely densely and obscurely punctate, and with a central longitudinal raised line; connexivum broadly and convexly produced to second segment and then sinuately narrowed to its apex. Long. 10. Exp. pronot. angl. 4. millim.

Hab. Brit. India; Kangra Valley—4500 ft. (G. C. Dudgeon).

Allied to *G. truncata*, Dist. by the truncate posterior angles to the pronotum, but these in *G. dudgeoni* are more produced and outwardly concavely sinuate; the scutellum is less sinuate near base, and the colour is also of a very distinctive character.

Fam. Henicocephalidæ.

Henicocephalus pugnatorius, sp. n.

Ochraceous; hemelytra a little more opaque, incomplete, its apical area fuscous, and only reaching to about half the length of abdomen; head with the anteocular area slightly shorter than the postocular, transversely constricted behind eyes, transversely carinate between antennal bases, antennæ somewhat longly and finely pilose, second and third joints longest, almost subequal, the second slightly longer; middle and posterior lobes of pronotum about equally wide, middle and anterior lobes with a central longitudinal incision, base of posterior lobe concave; scutellum with a subobsolete central longitudinal carination on each side of which at base is a small foveation; hemelytra with prominent longitudinal veins; rostrum clothed with fine long hairs or setæ, almost reaching eyes; body long and slender; anterior and posterior femora somewhat strongly incrassate. Long. 4 milllm.

Hab. Cape Colony; Hex River Valley.

Mr. Mally, who forwarded specimens of this species, contributed also some observations on the pugnacious character of the males (*cf.* 'Zoologist,' 1903, p. 466). Dr. Bergroth (Wien. Ent. Zeit. xxii. p. 254), who has recently described a species from Port Elizabeth, tells me, on a comparison with a specimen of *H. pugnatorius* I sent him, that the two species are quite distinct.

Fam. Nepidæ.

Cercotmetus fumosus, sp. n.

Uniformly somewhat dark fuscous; head with a pointed tubercle between the eyes; hemelytra not reaching the apex of the fifth abdominal segment, the coriaceous portion with some amount of brownish ochraceous pubescence; abdominal appendages mutilated in type; abdomen beneath strongly keeled, the keel continued on sternum as far as anterior coxæ; prosternum with two long deep furrows; intermediate and posterior tibiæ and tarsi inwardly moderately prominently pilose; pronotum as long as intermediate femora.

By the last character this species is to be distinguished from *C. asiaticus*, in which the intermediate femora are longer than the pronotum; from *C. pilipes*, Dall., it is separated by the much less longly pilose inner margins of the intermediate and posterior tibiæ, and the darker colour; the central carination of the body beneath only reaches the anterior margin of the metasternum, which also separates it from *C. compositus*, Montand. Length excl. abdom. append. 47 millim.

Hab. Ceylon (Green—Brit. Mus.).

BIBLIOGRAPHICAL AND NOMENCLATORIAL NOTES ON THE HEMIPTERA.—No. 3.

By G. W. Kirkaldy.

Although we have recently been favoured with Waterhouse's 'Index Zoologicus,' how much we are still in need of a thorough revision of generic names is evident by the following list of names not included in either Scudder or Waterhouse. I have added various notes which appear to me likely to be of use, and also a list of seventy-seven names, which must be employed instead of the same number previously used, which were preoccupied. It is remarkable that a considerable proportion of these come from the subfamily Membracinæ (sometimes raised to family rank), which has quite recently been monographed either wholly or in great part; the authors, however, did not, apparently, deem it necessary at the same time to revise the nomenclature.

I have completed a "Nomenclator Hemipterorum," which may possibly be published at an early date.

(A). Necessary New Names.

Fam. Aphidæ.

Panaphis = *Ptychodes*, Buckton, 1881; *Dryaphis* = *Dryobius*, Koch, 1855–7; *Hamadryaphis* = *Kessleria*, Lichtenstein, 1886; *Dryopeia* = *Endeis*, Koch, 1855; *Hyadaphis* = *Siphocoryne Passerini*, 1863 (not 1860) (type *xylostei*).

Fam. Tetigoniidæ.

Alchisme = *Triquetra*, Fairmaire, 1846; *Mysolis* = *Norsia*, Walker, 1869; *Thrasymedes* = *Phacusa*, Stål, 1864; *Gelastogonia* = *Oxygonia*, Fairmaire, 1846 (subg.); *Boëthoos* = *Parmula*, Fairmaire; *Eteoneus* = *Anomus*, Fairmaire; *Kronides* = *Argante*, Stål, 1867; *Sundarion* = *Pyranthe*, Stål, 1867; *Zanophara* = *Daunus*, Stål, 1866; *Gelastophara* = *Hypselotropis*, Stål, 1869; *Hesperophara* = *Leptophara*, Stål, 1869; *Dioclophara* = *Lucilla*, Stål, 1867.

Fam. Fulgoridæ.

Kareol = *Anagnia*, Stål, 1861; *Colgorma* = *Temora*, Kirkaldy, 1901; **Proutista* = *Assamia*, Buckton, 1896; *Xosophara* = *Rhinortha*, Walker, 1851 (subg.); **Southia* = *Paulia*, Stål, 1860; *Florichisme* = *Pœcilostola*, Stål, 1870; *Micromasoria* = *Cona*, White, 1879; *Bergias* = *Bergia*, Scott, 1881; *Hesperophantia* = *Carthæa*, Stål, 1861; *Thanatophantia* = *Alisea*, Stål,

* I have much pleasure in thus remembering my friends, Mr. R. South and Mr. L. B. Prout, who have given me much assistance in clearing up several nomenclatorial points.

1871; *Gelastophantia* = *Cyarda*, Stål, 1866; *Xosias* = *Eteocles*, Stål, 1866; *Amfortas* = *Gastrinia*, Stål, 1859; *Gelastyra* = *Cibyra*, Stål, 1861; *Thanatophara* = *Clonia*, Walker, 1858.

Fam. Cicadidæ.

Xosopsaltria = *Pydna*, Stål, 1861.

Fam. Chermidæ.

Trichochermes = *Trichopsylla*, Thomson, 1877.

Fam. Miridæ.

Metriorrhynchomiris = *Metriorrhynchus*, Reuter, 1875 (subg.); *Zanchisme* = *Schizonotus*, Reuter, 1892; *Kalania* = *Baracus*, Kirkaldy, 1902; *Bertsa* = *Berta*, Kirkaldy, 1902; *Reuterista* = *Brachybasis*, Reuter, 1900; *Ragnar* = *Melanocoris*, Champion; *Poronotellus* = *Poronotus*, Reuter, 1871.

Fam. Reduvidæ.

Westermannias = *Westermannia*, Dohrn., 1860; *Isachisme* = *Algol*, Kirkaldy, 1901; *Peregrinator* = *Microleptes*, Stål (subg.); *Mestor* = *Lamus*, Stål, 1859; *Brontostoma* = *Mindarus*, Stål, 1859.

Fam. Tingidæ.

Phyllochisme = *Physatochila*, Leth. & Sev., 1896; *Mæcenas* = *Tingis*, Leth. & Sev., 1896; *Gelchossa* = *Leptostyla*, Stål, 1873.

Fam. Pyrrhocoridæ.

Antillocoris = *Pygæus*, Uhler, 1894; *Botocudo* = *Salacia*, Stål, 1874 (subg.); *Probergrothius* = *Odontopus*, Laporte, 1832; *Peggichisme* = *Davila*, Distant, 1893; *Polychisme* = *Imbrius*, Stål, 1874.

Fam. Lygæidæ.

Althos = *Margus*, Dallas, 1852; *Nanichisme* = *Nesiotes*, Stål, 1873 (subg.); *Dersagrena* = *Dalcera*, Sign., 1863; *Elachisme* = *Elathea*, Stål, 1867; *Ouranion* = *Bardistus*, Dallas, 1852; *Marichisme* = *Phidippus*, Stål, 1876; *Hæckelia* = *Microphyllia*, Stål, 1870.

Fam. Cimicidæ.

Damellera = *Damelia*, Distant, 1899; *Montandoneus* = *Gabonia*, Montandon, 1894; *Atelias* = *Actius*, Distant, 1900; *Texas* = *Melanostoma*, Stål, 1872; *Grimgerda* = *Macrothyreus*, Fieber, 1852; *Meiuthias* = *Ilerda*, Stål, 1869; *Bergthora* = *Cryptoporus*, Uhler, 1877 (subg.); *Xosa* = *Anubis*, Stål, 1864; *Acanthidiellum* = *Acanthidium*, Montv., 1864; *Stictocoris* = *Stictonotus*, Stål (subg.); *Liodermion* = *Lioderma*, Uhler, 1871 (subg.); *Gueriniellus* = *Platycoris*, Guérin, 1838; *Burma* = *Paramecus*, Fieber, 1852; *Eupododus* = *Pododus*, Am. Serv. 1843; *Ochisme* = *Trachyops*, Dallas, 1851; *Dolichisme* = *Tetrisia*, Walker, 1867.

(B.) Observations on the above Names and other Notes.

Fam. Lygæidæ.

Cletus, Stål = *Peniscomus*, Sign., 1861 (Ann. Soc. Ent. France, p. 66).

Fam. Tingidæ.

Champion has restricted (Tr. Ent. Soc, London, 1898, p. 58) *Stephanitis*, Stål, to *mitrata*, Stål, without providing a proper name for the remaining Palæarctic species. The type of *Tingis* is *cardui*.

Lethierry and Severin admit (1896, Cat. Gén. Hém. iii.) as separate genera, *Monanthia*, *Phillontochila* (sic !), *Tropidochila* (sic !), and *Physatochila* (sic !); the three latter were founded by Fieber as subgenera of the first, which was not, at the same time, also subgeneric. It is obvious that three genera only can result from these four names, and that one must sink as homotypical with *Monanthia*; this will be *Physatocheila*, which contains the type of *Monanthia*; the synonymy will be:—

Monanthia, Lep. Serv., 1825; *techii*, 1832 = *Physatocheila*, Fieber, 1844.

Onchochila, Stål, 1874.

= subg. (*Phyllochisme*, Kirkaldy = || *Physatochila*, Leth. & Sev.

Tingis, Fabr., 1903, t. *cardui* (L.), Fabr.

= *Phyllontocheila*) Fieber, 1844; *Macrothyreus*, Westwood, 1841.

= || *Macrocephalus*, Swederus, 1797.

Fam. Aradidæ.

Aradus, Fab. = || *Stenopterus*, Sign., 1865.

Fam. Cimicidæ.

Erga, Walker, 1868 = || *Axona*, Stål, 1870; *Lelia*, Walker, 1867 = || *Prionochilus*, Dallas, 1850; *Eurysaspis*, Sign., 1851 = *Euryaspis*, Stål, 1876; *Eurus*, Dallas = || *Eurys*, Leth. & Sev.; *Eysarcoris fabricii*, n. n. = || *Cimex melanocephalus*, F. nec. L.

(C.) Additions to Scudder and Waterhouse.*

Acantischium, Am. Serv., 1843; † *Aphidioides*, Motschulsky, 1856; † *Aphioides*, Rondani, 1847; *Brysocrypta*, Westwood, 1840; *Dakulosphaira*, Shimer, 1866; *Diaphorina*, Loew, 1879; *Ascra*, Say, 1832; *Dysepicritus*, Reuter, 1885; *Dimorphella*, Reuter, 1885; *Forda*, Heyden, 1837; *Eurysthethus*, Mayr, 1865; *Embolophora*, Stål, 1853; *Euhadrocerus*, Reuter, 1885.

Gonionotus, *Acotropis*, *Cyllocoris*, *Physodera*, *Melanocoris*, *Psammocoris*, *Myrmedonobia*, *Tropidostethus*, *Ceratoleptus*, *Myr-*

* Not recently seen.

† Full particulars will be given in 'Nomenclator Hemipterorum.'

mecocoris, *Eusarcocoris*, *Tropidocoris*, *Rhaphidogaster*, *Elasmatostethus*, *Platypus*, *Systolonotus*, *Stethotomus*, *Tmetostethus*, *Piestostethus*, *Piestodorus*, *Harma*, *Aparyphe*, *Cephalotenes*, *Cephalotonus*, *Embolimus*, *Piosomus*—Marshall, 1868. (These are all "emended" spellings properly proposed). ‖ *Arytæna*, *Cybus*, *Dicranoneura*, Douglas & Scott, 1876; *Dikraneura*, Hardy, 1850; **Pendulinus*, Vieillot, 1816 (Aves); *Ancylopus*, Flor., 1860; *Clinocoris*, Fallén, 1829; *Corixidea*, Reuter 1891 (incorrectly cited Corixidæ! by Leth. & Sev.); *Mesocerus*, Reuter, 1888; *Kermaphis*, Maskell, 1866; * *Loewia*, Lichtenstein, 1886 (not *Lowia*?); *Trama*, Heyden, 1837; *Sacchiphantes*, Ruricola, 1844; *Hoplobates*, Leth. & Sev., 1896; *Phlœophthiridium*, *Rhizophthiridium*, Vander Hoeven; * *Pineus*, Shimer, 1869; *Stictosynechia*, *Orthosolenia*, *Wollastoniella*, Reuter, 1885; *Physatocheila*, *Tropidocheila*, Fieber, 1844; *Stroggylocephalus*, Flor., 1861; *Peniscomus*, Signoret.

(D.) Notes on Scudder's 'Nomenclator Zoologicus.'

P. 2, for *Acanthocephalus*, Lap., read *Acanthocephala*.
P. 43, for *Brachysteles*, Fieb., 1861, read Muls. Reg., 1852.
P. 148, for *Hetorotoma* read *Heterotoma*.
P. 186, for *Magoura* read *Megoura*.
P. 95, *Diæretus*, Forst., is *Hym.*, not *Hem.*
P. 337, *Xylococoris*, 1871, not 1879; *Xerobia*, *Hem.*, not *Orth.*
P. 246, for *Phyllopsis*, Löw, read *Psyllopsis*.
P. 278, *Rhizaphis*, 1877. N.B.—In the Zool. Rec. v. p. 394 (for 1868), there is cited "*Phylloxera vastatrix* (nuper *Rhizaphis*, Planch."), but I cannot trace any such prior usage.
P. 243, for *Phlegmatoptera* read *Plegmatoptera*.
P. 250, delete *Plagiostylus*.
P. 272, delete *Pycnos*.
P. 312, delete *Telesnemia*.
P. 8, *Ætalion*, 1810, not 1816.
P. 11, *Aleyrodes*, 1795, not 1807.
P. 179, *Livia*, 1798, not 1809.
P. 160, for *Ilburina* read *Ilburnia*.

(E.) Notes on Waterhouse's 'Index Zoologicus.'

P. 99, *Darthula*, Kirkaldy, not *Dartrula* (nor, as in Zool. Record, *Darrhula*).
P. 1, *Abricta* not *Abrieta*.
P. 2, *Acanonicus*, 1842, not 1852.
P 120, *Elatiptus* not valid (mononymic).
P. 3, *Acantholybas*, not *Acanyholybas*.
P. 76, *Cicadatra*, *Cicadetta*, Kolenati, 1857. Amyot's names are not valid.
P. 136. Signoret spelt his genus, "*Eurysaspis*," and this

* In the English translation these are spelt without the second "h."

was not altered to *Euryaspis* till 1876 (Stål). The Acarid genus *Euryaspis* is therefore not preoccupied.

P. 158, for *Handlirschiella* read *Handhirschiella*.

P. 176, for *Hygyops*, Am. Serv., read " Stål, 1866."

P. 208, for *Macrocephalus*, Swederus, 1887, read 1787.

P. 216, for *Melampsalla* read *Melampsalta*.

P. 276, for *Penthirus* read *Penthicus*.

P. 341, for *Semiotoscles* read *Semiotoscelis*.

P. 358, for *Stronachlachar* read *Sronachlachar*.

P. 372, for *Thaumatopsaltria* read *Thaumastopsaltria*.

P. 378, for *Tongorina* read *Tongorma*.

P. 287, &c., for *Phyllontochila*, *Campylostira*, and *Orthostira*, read *Phyllontocheila*, *Campylosteira*, and *Orthosteira*.

Pp. 371 and 376. *Tettigia*, Am., and *Tibicina*, Am., are not valid.

P. 371, for *Thalasia* read *Thlasia*.

P. 260, delete *Pachygrontha*, Reuter, 1881. This was due to a double misapprehension in the ' Zoological Record.'

NOTES AND OBSERVATIONS.

Argynnis euphrosyne, var.—I received from a correspondent a very fine variety of this species, taken by him in the New Forest this season. It somewhat resembled that figured in Entom. xxvii. p. 1, fig. 1; but in my specimen the black area of hind wings is rather more extended, and the discoidal spots are larger, one on each wing being quite a blotch. The insect is a male in first-class condition, and was sent to me unset soon after capture.—E. Sabine; Erith.

Epinephele jurtina ab. anommata (Verity). — I have a specimen of *Epinephele jurtina* (*janira*), male, which agrees with the form described by Mr. Verity (*ante*, p. 56) as a new aberration. I captured the specimen near Brockenhurst on June 23rd, 1904. The usual apical pupilled spot is absent from the fore wings, and there is only a slight indication of the tawny patch usually present. On the under side of the hind wing there are only minute black specks in place of the usual spots.—Philip J. Barraud; Bushey Heath.

Spring Dragonflies from the South of France. — I have received from Dr. T. A. Chapman a small collection of dragonflies made by him in the spring, in the South of France. From Hyères (March 20th till April 17th) there are one female *Brachytron pratense;* one female *Pyrrhosoma nymphula;* seven *Ischnura elegans*, one male only; and eighteen *Sympycna fusca*, five males and thirteen females. All except the last are British species, which in early seasons do not appear with us till the latter part of April, seldom so early; in fact, I have no record of *I. elegans* till May 17th. At Draguignan, from May 3rd till May 8th were taken one male *Gomphus simillimus;* three *Libellula depressa*, one teneral male and two females; and one female *Cordulegaster*

annulatus, rather immature. Of these *G. simillimus* is the only species not found in Britain. Perhaps the most interesting of all is *Sympycna fusca*, an agrionid about as large as our *Agrion puella*, but brown in colour. It is the only dragonfly that is known to hybernate in the imaginal condition, though perhaps *Sympetrum scoticum* may sometimes do so on the Continent; it does not, however, do so here. — W. J. Lucas; Kingston-on-Thames.

Alleged Occurrence of Papilio podalirius at Marlborough.— Referring to Mr. Brande's note on this on p. 264, I may say that I was at Marlborough College as a boy from 1868 to 1873, and had charge of the Entomological Section of the Natural History Society during most of that time; whose records I still supervise. No report of any such capture was made to me or the officials of the Society at the time, nor does any record of it appear in our Reports, published annually, and giving all captures of Lepidoptera every year in an unbroken succession from 1865. So striking a capture could not have been unnoticed, and would not have been concealed. I have no doubt the supposed record is erroneous, and due to some confusion of memory in the mind of the owner, after the lapse of years. — E. Meyrick; Thornhanger, Marlborough, Oct. 5th, 1904.

Erebia glacialis var. nicholli, Obth., and Lampides tilicanus, Lang.—In my note on "Butterfly Hunting in the South Tyrol" (p. 224), I remarked that the form of *Erebia glacialis* taken by me on the Groste Pass, above Campighi, merited a distinctive varietal name. Mr. Hamilton Druce has since drawn my attention to a note published by Mr. Charles Oberthur in the 'Entomologist's Monthly Magazine' for 1896, p. 3, where the butterfly—then thought to be a form of *E. melas*—was given by him the name of var. *nicholli*. Notwithstanding the later identification with *E. glacialis*, the validity of this name is of course unaffected, and our captures should therefore have been designated accordingly. I may add that Mr. Lemann tells me he took both *Lampides tilicanus* and *Lycæna orion* in some numbers at Botzen during the last days of July. I have myself observed *tilicanus* at St. Martin-Vésubie, in the Alpes-Maritimes, at about 3200 ft.; and Mr. F. B. Norris records a single specimen at 6000 ft., above Boscolungo, in the Apennines (Entom. xxiv. 228); so that, while not precisely an alpine species, it must be regarded as occurring on the high mountain regions as well as on the lower lands, therein resembling its congener, *L. bæticus*, which in some localities—for example, the Pyrenees—ranges from sea-level up to 8000 ft., as noted by Mr. H. J. Elwes on the Pic du Midi (Trans. Ent. Soc. 1887, p. 391), though I am unable to trace a similar distribution in the Swiss alpine regions.— H. Rowland-Brown; Oxhey Grove, Harrow Weald, Oct. 13th, 1904.

British Specimens of Hydrotæa wanted.—I propose to publish as soon as possible an account of the British species of *Hydrotæa* (Diptera —Fam. Anthomyiidæ), and would be grateful if readers of this magazine would send me for examination any specimens belonging to this genus which are in their possession. All help in this way will be fully acknowledged, and the material returned, *labelled with specific names*, as soon as practicable.—Percy H. Grimshaw; Royal Scottish Museum, Edinburgh.

Chrysophanus phlœas and var. Schmidtii at Erith. — This species has been decidedly scarce this season; but I obtained a few ova from females of the first brood, and reared some sixty imagines—all very normal. From some of these and some captured females I got a much larger supply of ova, and during the month of August had many hundreds of larvæ feeding; but the chilly September weather checked the growth of many of them, so that only two hundred reached the perfect state. Among these imagines is a small series of golden forms, nine in all, which are a striking contrast to the type. I should mention that my son took a very fair male *schmidtii* in one of his expeditions after females of the second brood for ova, and obtained several of this latter sex at the same spot, and most probably *the* one that had paired with said *schmidtii*—hence, I think, these golden forms. Amongst other abnormal forms I bred a large female of the ordinary type, but minus the left fore wing, and with the left hind wing suffused very much after the style of *C. dispar*. The remainder of the larvæ—some hundreds—are many of them half-fed and more, but, I fear, will not get through the coming winter. I judge so from past experience, although I have once got a very small percentage through all right.—E. Sabine; Erith.

Aberrations of Dragonflies.—With reference to the article by Messrs. F. W. and H. Campion (*ante*, p. 252), I may say that during the second half of July this year I saw a number of olive-coloured females of *Ischnura elegans* at Wicken. A corresponding variety of a more abundant species, I think (*Enallagma cyathigerum*), was also very common; in fact, in thirty-five couples which I saw attached *per collum*, twenty of the females were of the greenish variety. I also saw several green females of *I. elegans* in copulation. I tried to get both species to lay eggs, in the hope of breeding from them, but was unsuccessful. Should anyone be successful in breeding from one of these varieties, valuable results might be obtained on the question of heredity in its relation to sex.—Leonard Doncaster; Zoological Laboratory, Cambridge, Oct. 7th, 1904.

CAPTURES AND FIELD REPORTS.

Colias edusa at Erith.—This species has put in an appearance in and around this neighbourhood this autumn, but not in any numbers. The only female netted kindly deposited a few ova, which duly hatched out, and the larvæ fed up on growing white clover, and I have half a dozen pupæ dating from 8th inst. I suppose they will emerge this season. The rest of the larvæ seem to have disappeared save one half-grown specimen.—E. Sabine; Erith, Oct. 20th, 1904.

Colias edusa in Cornwall.—On Aug. 24th I noticed a freshly-emerged male of *Eurymus croceus* (*Colias edusa*) at Donnderry, a small seaside resort midway between Rame Head and Looe.—Thos. Bainbrigge Fletcher; Sept. 25th, 1904.

Colias edusa in Hampshire. — I have seen a few specimens of *C. edusa*, and have heard of others having been observed in this neigh-

bourhood—perhaps a dozen specimens in all.—A. Druitt; Christchurch, October, 1904.

Colias edusa and Cirrhœdia xerampelina at Bromley, Kent.—On Sept. 11th I saw a male specimen of *Colias edusa* flying in a lane between Bromley and Grove Park, and when sugaring at Bromley on Sept. 1st, I took a very worn *Cirrhœdia xerampelina*. The occurrence of these insects so near to London this year is perhaps interesting.—B. W. Adkin; Trenoweth, Hope Park, Bromley, Kent.

Sphinx convolvuli in Surrey.—I took a fine pair of this insect hovering over *Nicotiana affinis* shortly after dark on Sept. 21st.—A. B. Thompson; Garlands, Red Hill, Sept. 26th, 1904.

Sphinx convolvuli at Chichester.—*Sphinx convolvuli* has not been uncommon in this locality during the autumn. The first specimen recorded in my diary was taken on Aug. 6th. The moths continued appearing throughout that month till the beginning of October.—Joseph Anderson.

Sphinx convolvuli and Laphygma exigua near Tunbridge Wells. The only specimen of *S. convolvuli* I have seen this year was brought to me at the end of August—a fine male example in very good condition; the largest of that sex I have ever had. The expanse of wings is 4½ in. I also have the pleasure to report the capture of a perfect specimen of *L. exigua* at Southborough on Sept. 23rd, 1903. It is the first I have taken, and I was very much surprised, as I always thought it was a coast insect.—M. M. Phipps; Woodside View, Victoria Road, Southborough, Kent.

Sphinx convolvuli and Colias edusa in Devonshire.—A specimen of *S. convolvuli* was taken by my brother off a telegraph-post here on Aug. 25th, and another example was brought to me in a tin by some lads, who found it in some allotment-grounds in this neighbourhood. *Colias edusa* was taken by us on three occasions in August this year (one female and three males).—S. L. & J. Walker; 3, Goodwin Terrace, Bronshill Road, Torquay, Oct. 13th, 1904.

Sphinx convolvuli in Selkirkshire.—A specimen of this insect was taken in good condition on a wall in Galashiels on Aug. 18th.—B. Weddell; Selkirk.

Captures at Sugar at Chichester.—Sugar has not been very productive here this season. Amongst my captures may be mentioned *Acronycta aceris*, *A. psi*, *Cucullia verbasci*, *Calymnia trapezina* (one very pale), *Cosmia diffinis*, and *Miana strigilis*—a meagre list, season after season showing little signs of improvement in this mode of collecting. Joseph Anderson.

Cleora glabraria, &c., in Dorsetshire.—In July this year I took a very good specimen of *Cleora glabraria* at Carne Wood, near Weymouth, and have reason to believe that this is a new locality for this species. I was beating in one of the footpaths when I captured it, and I have seen no other specimens taken around Weymouth. In the same month I here took four very fresh specimens of *Argynnis paphia*

var. *valesina*. As the New Forest is a favourite locality for both insects, this would lead one to suppose that Carne Wood originally formed part of that large forest, though they are distant from each other about forty miles. — W. A. Bogue ; Spring Cottage, Shepton Mallet, Somerset, Oct. 2nd, 1904.

Heliothis peltigera at Deal.—I caught a female *H. peltigera* on the sand-hills at Deal at dusk on June 17th. It was so much worn that I was not quite sure of its identity at the time. However, the moth deposited several eggs, and I reared the larvæ on wild convolvulus till the end of July. The moths came out during the last week in August and the first week in September.—W. S. Pearce ; St. Mogue's, Romsey, Hants, Oct. 11th, 1904.

Acherontia atropos in Kent.—On Sept. 29th a good specimen of this insect flew towards the light in a greengrocer's shop in the centre of Margate, and was captured without injury. As I have not yet heard of any larvæ or pupæ having been found in the neighbourhood during the present autumn, I am inclined to think it is an "immigrant."—J. P. Barrett ; St. John's Villas, Margate.

Trichoptilus paludum in Surrey.—On one of our entomological excursions together to Claygate last August, Mr. Arthur J. Scollick netted a "plume-moth" which we both failed to recognize at the time. This I have since identified as a specimen of *T. paludum*, one of the least generally known of the British Pterophoridæ, and an addition, I believe, to the Surrey list. Meyrick ('Handbook,' p. 431) gives Surrey to Dorset, Cambridge, York, as the range of the species in this country. Barrett ('British Lepidoptera,' ix. p. 397) omits Surrey, and mentions Sussex, in addition to the other counties noted by Meyrick.—Richard South.

Orobena (Evergestis) straminàlis in Surrey. — I had not met with *O. straminalis* since 1879, when I netted a fine series in August whilst exploring a small, but very dense and somewhat boggy, wood about two miles north-east of Ventnor, in the Isle of Wight. It was therefore with great pleasure that I found this pretty little Pyrale in the Esher district on July 16th last. Only one specimen was seen, but this was so fresh that it had probably emerged from pupa on the day of capture. No further example was detected, although a close search was made at the time, and on several visits to the locality later in the month. The only other Surrey localities that I have any knowledge of are Haslemere and Redhill, given by Goss in 'Victoria History of the Counties of England,' vol. i.—Richard South.

Lepidoptera at Christchurch, Hants.—I have used a moth-trap on favourable evenings throughout the summer. The insects taken have not been large in number. On Aug. 7th the captures included one specimen each of *Diasemia literata* and *Ebulea stachydalis*. Later in the month one *Macaria alternata* was taken. Is this species double-brooded, or was the specimen a belated one? On Sept. 10th one *Camptogramma fluviata* and one *Acidalia imitaria* were taken. This seems a late date for the latter, several of which were attracted in July. On Sept. 28th one specimen of *Galleria melonella* flew in. Leech gives

the time of appearance as July and August.—A. Druitt; Christchurch, October, 1904.

[*Macraria alternata* and *Acidalia imitaria* are not perhaps normally double-brooded in this country, but in favourable summers, such as that experienced this year, a few imagines of these species (and of others), representing a second generation, seem to be developed.—Ed.]

Deilephila livornica and Sphinx convolvuli in Hampshire.—On May 28th I received a post-card from Major Robertson as follows: "Look out for Livornica on your rhododendrons"; and on the same evening, at 8.30, I saw a specimen darting from tree to tree in my garden at Christchurch. On the following evening it appeared at 8.20, on the 30th and 31st at 8.30, on June 2nd at 8.45, and on June 3rd at 8.20, after which date the specimen was not again seen. The specimen seen was probably the same on each of these six evenings, for I failed to catch it, and more than one specimen was not seen on any evening. It showed a preference for deep-coloured blossoms, and in its flight seemed to hover but the fraction of a second over any one bloom, darting from plant to plant with a rapidity which made its capture impossible. It seemed to be fully aware of my hostile intentions, and did not once come within reach of my net. I soaked pieces of sponge in amyl acetate, and placed them in blooms easy of access, but, although the scent was noticeable at some yards distance, *livornica* took no notice whatever of the bait. It is very possible that this specimen had visited my garden on evenings prior to May 28th, for specimens had been taken at Bournemouth, six miles from here, on May 22nd. *Sphinx convolvuli* has been plentiful in this neighbourhood throughout September and the early part of October, but none of the specimens taken by me can be described as being in grand condition. *S. convolvuli* can fly fairly briskly, but its flight is slow when compared with that of *D. livornica*. —A. Druitt; Christchurch, October, 1904.

Sirex juvencus in Selkirkshire.—A good specimen of this insect was brought to me by a little girl on Sept. 30th. She had found it on the public road near her cottage. *S. gigas* is not uncommon, several being brought to me every summer, but this is the first *S. juvencus* I can guarantee taken here. It was alive when I received it.—B. Weddell; Heath Park, Selkirk.

Late Appearance of Ourapteryx sambucata.—Yesterday my son took a specimen of this moth in the playground of his school in this town. It was somewhat dwarfed, but in perfect condition, and evidently freshly emerged. Is not this very late? — H. Huggins, Jun.; 13, Clarence Place, Gravesend, Oct. 22nd, 1904.

Notes on Sphingidæ in Wales. — In addition to the *Deilephila livornica* and *Sphinx convolvuli* I took this month, and previously reported (*ante*, p. 265), a fine pupa and pupating larva of *S. convolvuli* were turned out of the ground by the spade of one of my friends here. The larva unfortunately was badly wounded by the spade, and could not possibly live, while the pupa, though bruised slightly, is vigorous and lively. These insects, found in potato-land where field bindweed

grows freely, are interesting, as another link in the chain of evidence that we may call *S. convolvuli* a native of Wales, and of Barry in Glamorganshire. On the same small plant (lady's-bedstraw) I found, on Sept. 13th, a larva of *Macroglossa stellatarum*, and another larva of *Hemaris* (*Macroglossa*) *fuciformis*. The latter differed from Mr. Lucas's description of the larva of *H. fuciformis* in having the red patches around the spiracles developed into one continuous streak. It is now pupating under a web of rough loose threads under bedstraw. Shortly before spinning its web it ate a little hedge-convolvulus.—R. Randell; "Rushbank," Barry, Glamorganshire, Sept. 18th, 1904.

Collecting in the New Forest.—On Aug. 3rd I arrived, with a young friend, at Brockenhurst for a fortnight's collecting, and put up with Mr. E. Morris, whose courtesy in pointing out the best localities and in providing comfortable accommodation at an extremely reasonable rate added not a little to the pleasure of a first visit to the New Forest. Seven evenings were devoted to sugaring, when the following insects were taken:—*Calligenia miniata*, *Thyatira derasa* and *T. batis*, *Hydræcia nictitans*, *Xylophasia hepatica*, *Cerigo cytherea*, *Apamea oculea*, *Agrotis exclamationis*, *Noctua plecta*, *N. baja*, *Amphipyra pyramidea*, *Mania typica*, *M. maura*, *Calymnia trapezina*, *Dianthœcia capsincola*, *Euplexia lucipara*, *Phlogophora meticulosa*, *Gonoptera libatrix*, *Plusia iota*, and *Catocala sponsa*: and the acetylene lamp attracted, or enabled us to take, the following:—*Porthesia similis*, *Psilura monacha*, *Odonestis potatoria*, *Zanclognatha grisealis*, *Epione apiciaria*, *Selene illunaria*, *Crocallis elinguaria*, *Ennomos tiliaria*, *Boarmia rhomboidaria*, *Ephyra porata*, *E. omicronaria*, *Acidalia bisetata*, *A. aversata*, *Ligdia adustata*, *Eupithecia nanata*, *E. absinthiata*, *Melanthia ocellata*, *Cidaria russata*, and *C. testata*. On the evening of Aug. 4th, after a heavy and prolonged thunderstorm during the afternoon, searching among the heather yielded larvæ of *Macrothylacia* (*Bombyx*) *rubi*, *Saturnia carpini*, *Hadena pisi*, and *Anartia myrtilli*; and imagines of *Agrotis porphyrea*, *Gnophos obscuraria*, *Pseudoterpna cytisaria*, and *Selidosema plumaria*: in addition to many of those mentioned above. On Aug. 5th a number of pupæ and a few full-fed larvæ of *Nonagria typhæ* were taken from the stems of "bulrushes," and the imagines emerged at intervals during the next fortnight. Many Rhopalocera were observed on this day, including *Gonepteryx rhamni*, *Argynnis paphia* and *ralesina* (both very much worn), *Vanessa cardui*, *Limenitis sibylla* (worn), *Apatura iris*, and *Pararge egeria*; and on other days we noticed *Argynnis adippe*, *Vanessa io*, *V. atalanta*, *Pararge megæra*, *Satyrus semele*, *Thecla quercus*, *Lycæna ægon*, and *L. argiolus*, *Gonepteryx rhamni* being very plentiful, and in splendid condition. *Eubolia palumbaria*, *Cidaria testata*, and other small geometers were also taken. Several days were devoted to larva-beating, with excellent results, notably on Aug. 9th, with Mr. Morris, and on Aug. 15th, with Mr. W. J. Cross. Larvæ of these species were taken or observed:—*Macroglossa fuciformis*, *Hylophila prasinana*, *Lithosia aureola*, *Gnophria rubricollis*, *Euchelia jacobææ*, *Dasychira pudibunda*, *Orgyia antiqua*, *Drepana lacertula*, *D. falcula*, *Stauropus fagi*, *Lophopteryx camelina*, *Notodonta dromedarius*, *N. ziczac*, *N. chaonia*, *N. dodonea*, *Phalera bucephala*, *Thyatira batis*, *Moma orion*, *Acronycta psi*, *A. alni*, *Amphidasys betularia*, *Cleora lichenaria*, *Boarmia roboraria*,

B. consortaria, *Tephrosia extersaria*, and other geometers. On the evening of Aug. 15th, when examining the sugar, I found a very large pupa of *Psilura monacha* spun up in the bark of an oak-tree, and a very fine female emerged from it on Aug. 24th. The larva of *Acronycta alni* was nearly full-grown when taken, and went down to pupate on Aug. 17th. Mr. W. J. Cross had a larva of *Stauropus fagi* pupating on Aug. 14th, but at the time of writing mine is only about half-grown, though to all appearance perfectly healthy. The larvæ of *Moma orion* were very plentiful, and seemed to be widely distributed, but *Catocala sponsa* was scarce, and *C. promissa* entirely absent during our visit. With regard to *Argynnis paphia*, which was swarming in every glade, it was noticeable that not a single specimen was worth taking, some being literally in tatters, and that the var. *valesina* occurred in some numbers.—F. A. Oldaker; Parsonage House, Dorking, Sept. 5th.

SOCIETIES.

Entomological Society of London.—*Wednesday, October 5th*, 1904. Professor E. B. Poulton, M.A., D.Sc., F.R.S., President, in the chair. The Rev. W. Beresford Watson, of St. Martin's Vicarage, Barbados, West Indies, was elected a Fellow of the Society.—Mr. G. H. Verrall exhibited specimens of (*a*) *Callicera yerburyi*, Verr., a Syrphid new to science, taken this year in Scotland by Col. J. W. Yerbury, and (*b*) *C. ænea*, F., the other British species of the genus, together with three European species of *Callicera* from the collections of Bigot and Kowarz, *C. macquatii*, *C. spinolæ*, and *C. porrii*, Rand.—Mr. H. St. J. Donisthorpe, *Tetropium fuscum*, L. (male and female), and eight specimens of *Abdera 4-fasciata*, Curt., all taken by him at Market Bosworth, Leicestershire, in July, 1904.—The Rev. F. D. Morice, cells constructed by two wasps, *Polistes gallicus* and *Eumenes coarctatus*, found by him in the Balearic Islands.—Mr. A. J. Chitty, specimens of the earwig *Apterygida media* (*albipennis*), taken at Huntingfield and Charing, Kent, this year.—Mr. W. J. Lucas, a living specimen of *Labidura riparia*, male, from the shore near Christchurch, Hants, kept alive for more than a month, and fed upon fruit, meat, &c.; also a lantern-slide, depicting the threatening attitude assumed by this earwig when disturbed.—Professor T. Hudson Beare, on behalf of Mr. C. J. C. Poole, who was present as a visitor, specimens of *Aulonium sulcatum*, Oliv., a species of Coleoptera new to the British fauna.—Mr. W. Dannatt, a specimen of *Papilio homerus* from the Blue Mountains, Jamaica, together with coloured drawings of the larva painted by Lady Blake, and lent him by Mrs. E. M. Swainson, of Baltimore, U.S.A., who had bred the species. He also exhibited three new butterflies figured and described by him in the 'Entomologist,' viz. *Chloripe godmani*, from Venezuela, *Delias hempeli*, from Gilolo, *Monethe johnstoni*, from British Guiana.—Dr. T. A. Chapman, for Mr. Hugh Main, a unique teratological specimen of *Arctia caia*, bred this year. The insect had a threefold hind wing on the left side. Immediately below the costa the wing divided into three layers, each of which was apparently a normal wing so far as form, colour

and markings went, but which, when the insect was alive, were so closely applied to each other as to look like one normal wing, till by blowing between them, or in some other way, they were separated. —Mr. F. Merrifield, some pod-like galls found on a terebinthine shrub in the limestone region of Auvergne.—Mr. Norman H. Joy, the black variety of *Bledius taurus*, Germ., taken at Wells, Norfolk, August, 1904; *Bledius femoralis*, Gyll, from Wokingham, Berks,—a species that has not been taken in the British Isles for over fifty years; *Polydrusus sericeus*, Schall., from Hampshire; *Neuraphes carinatus*, Mul., from Bradfield, near Reading; a small form of *Dyschirius politus*, Dej., taken by Canon Fowler at Bridlington, and himself at Wokingham; and a *Rhizotrogus* (? species) taken in some numbers flying by day near Streatley, Berks, August, 1904.—Dr. F. A. Dixey, some preparations of the scent of male Pierine butterflies, and read a note descriptive of the same.—Mr. H. Turner, living examples of the larva of *Phorodesma smaragdaria*, which he had met with in some numbers on the Essex marshes while searching for Coleophorid larvæ. He also contributed notes on the life-histories, and exhibited living larvæ and cases of several Coleophorids, including *C. vibicella*, a species only recorded from a few English localities. Mr. Gilbert J. Arrow read a paper on "Sound Production in the Lamellicorn Beetles." Professor Christopher Aurivillius, F.M.Z.S., communicated a paper on "New Species of African *Striphnapterygidæ*, *Notodontidæ*, and *Chrysapalonidæ* in the British Museum." Mr. A. H. Swinton communicated a paper on "The Droughts and Weather, and Insect Increase and Migration." Mr. E. Ernest Green communicated a paper on "Some New Mosquitoes from Ceylon," by Frederick V. Theobald, M.A.—H. Rowland-Brown, *Hon. Sec.*

South London Entomological and Natural History Society.—*July* 14*th*, 1904.—Mr. E. Step, F.L.S., Vice-President, in the chair.—Mr. Stonell exhibited two series of *Triphæna fimbria*, one of light forms and the other of dark forms, bred in two successive years from New Forest larvæ; and a series of *Lælia cænosa* from various old collections. —Mr. Enock, on behalf of Mr. Newman, living hybrid larvæ from male *Notodonta ziczac* and female *N. dromedarius*, with typical larvæ for comparison.—Mr. Priske, examples of the Coleoptera *Apoderus coryli*, *Rhynchites æquatus*, and *Otiorrhynchus sulcatus*, all from High Wycombe.

July 28*th*.—Mr. E. Step, F.L.S., Vice-President, in the chair.—Mr. Percy Richards, of Kingston Hill, was elected a member.—Mr. Enock, for Mr. Newman, exhibited a cocoon of *Eutricha quercifolia*, in situ.—Mr. Edwards, specimens of *Volucella bombylans* and *V. pellucens* from Leatherhead, taken at the Field Meeting on July 9th.—Mr. West (Greenwich), a large number of insects collected at Great Yarmouth from June 13th to 25th, comprising eighty-four species of Coleoptera, eighteen species of Hemiptera, and three species of Tenthredinidæ. Among the Coleoptera were *Donacia dentipes*, *D. thalassina*, *D. simplex*, *D. vulgaris*, *D. sericea*, *Galeruca calmariensis*, *Polydrusus confusus*, and *Scirtes hemisphæricus*. Among the Hemiptera were *Plagiognathus pulicarius*, *P. saltitans*, and the rare *Pœcilocytus vulneratus*, a species recently added to the British list.

August 11th.—Mr. E. Step, F.L.S., Vice-President, in the chair.—Mr. Ashby exhibited a specimen of one of our rarest weevils, *Liparus germanus*, taken at Folkestone in July.—Mr. West reported that from July 10th to 23rd he had paid a very successful visit to the New Forest, obtaining *Strangalia quadrifasciata*, *Telephorus testaceus*, *Phyllobrotica quadrimaculata*, and *Orchestes iota*, the most notable of the Coleoptera; *Picromerus bidens*, *Monanthia dumetorum*, and *M. humuli* among the Heteroptera; and the very rare homopteron, *Oliarus leporinus*.—Mr. Main, pupæ and small larvæ of *Everes argiades*, from ova deposited by a female sent by Dr. Chapman from the South of France. The larvæ were boring the seed-pods of *Lotus corniculatus*.—Mr. Priske, a specimen of *Cicadetta montana* from the New Forest, and a specimen of *Dicranura bifida*, which had just emerged from a this year's larva.—Mr. Carr, a dead larva of *Smerinthus ocellatus*, from which parasites had emerged in 1883, and which retained its normal green colouration.—Mr. Adkin and several other members noted the unusual abundance of *Mania maura* this year.—Mr. Edwards, a long series of variations of the polymorphic *Papilio*, *P. memnon*, and called attention to the forms and their distribution.

August 25th.—Mr. Hugh Main, B.Sc., F.L.S., Vice-President, in the chair.—Mr. Barnett, a short series of *Strenia clathrata*, showing stages in the darkening of the transverse bands, and also of *Ematurga atomaria*, with considerably suffused markings. He also showed larvæ of *Smerinthus populi*, which were feeding on white poplar, and which assimilated wonderfully to the colour of the food-plant. Mr. Main, a curiously spotted cockroach, obtained from a ship which had brought sugar from Java.—Mr. West, two rare species of Hemiptera from Darenth—*Corizus capitatus*, obtained by sweeping *Hypericum*, and *Aneurus lævis*, under oak-bark.—Mr. Tutt and Dr. Chapman made a few remarks upon their continental rambles in July and August.—Hy. J. Turner, *Hon. Report Sec.*

Manchester Entomological Society.—In the Manchester Museum, Owens College, on September 7th, before a large gathering presided over by Dr. W. E. Hoyle, the proceedings took the form of an exhibit meeting.—Mr. Geo. O. Day exhibited a box of Lepidoptera collected in Vancouver Island, B.C., mostly taken during May, 1904.—Mr. H. S. Slade, specimens of *Leucoma salicis* from larvæ taken at Urmston (Lancs), also *Abraxas grossulariata* from the same locality; specimens of *Polia chi* taken at Glossop.—Mr. L. Krah, lepidoptera from Bex, Canton Vaud, Switzerland, and included *A. cratægi*, *P. egeria*, *E. ianira*, *M. galatea*, *P. mæra*, *A. cardamines*, *L. amanda*, &c.—Mr. R. Tait, Jun., *Agrotis ravida* taken at Monkswood, Hunts; specimens of *Aplecta advena*, *Acronycta ligustri*, *Mamestra anceps*, *Angerona prunaria*, *Xylophasia hepatica*; *Dianthœcia conspersa*, including ochreous form, bred from Welsh larvæ; *Agrotis ashworthii*, a fine series, bred this year from hybernated larvæ.—Mr. C. Oldham, specimen of *Prionia coriarius* from Chelford (Cheshire), July 27th, 1904.—Mr. G. Kearey, ova, pupæ, and perfect insect of *Orgyia antiqua*, and illustrations pointing out the difference of the situation selected by the sexes for pupation.—Messrs. A. Binns and W. Buckley also exhibited Lepidoptera.—Robert J. Wigelsworth, *Hon. Sec.*

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DESCRIPTION OF SOME NEW SPECIES OF PHYTOPHAGOUS COLEOPTERA.

By Martin Jacoby.

Chlamys semicristata, sp. n.

Pale fulvous, with closely-placed black punctures; thoracic elevations rounded, the top with a circular and two short oblique ridges, the sides with others of transverse shape; elytra with about ten isolated tubercles and the usual longitudinal costæ. Length 3 millim.

Head pale fulvous, sparingly punctured with black; anterior edge of the clypeus black; antennæ flavous; thorax punctured, like the head, with a gradually-raised posterior round elevation, the top of which is furnished by two oblique ridges; in front of these another short ridge includes a semicircular space when viewed sideways, while three others extend down the sides of the elevation for a short space; the rest of the surface is unevenly reticulate and punctured; the basal lobe is divided into two points; scutellum short, piceous; elytra with closely-placed black punctures and the following pointed tubercles:—three at the base, placed triangularly; a larger one near the suture at the middle; two smaller ones opposite, nearer the lateral margin and connected by a transverse ridge; the posterior portion has three tubercles placed transversely, and three or four others near the apex more or less connected by ridges; longitudinally these tubercles are likewise connected by the usual four costæ; pygidium rugose, carinate at the middle; breast foveolate-punctate; abdomen with black punctures; legs with a small dark spot at the femora; prosternum gradually narrowed and posteriorly.

Hab. Venezuela.

Chlamys balyi, sp. n.

Obscure fulvous, more or less spotted with black or black with fulvous spots; thorax with a moderate rounded elevation, the top with two feeble ridges closely and deeply punctured, the sides subtuberculate; elytra deeply punctured, with feebly-raised tubercles and longitudinal ridges, the largest tubercle near the suture below the middle. Length 1 line.

Head flat, fulvous, with black punctures or entirely black with a fulvous spot at the middle; antennæ fulvous, the fifth and following joints transverse; thorax with the middle portion raised into a regularly-rounded elevation, which is surrounded at the base by a distinct sulcus; the top of the elevation has two feeble short ridges, and at the sides several small blunt tubercles are placed; the entire surface is closely impressed with black punctures, but the amount of fulvous is very variable; elytra punctured like the thorax, generally black, with the tubercles and ridges generally of fulvous colour; of the first-named, two are placed near the suture, one before, the other below the middle; the ridges are confined to the sides, and the one from the middle of the base to the suture is interrupted by some short transverse raised tubercles before the middle; the posterior portions of the elytra are reticulate, and have a few small tubercles; the pygidium is carinate at the middle, and to a less extent at the sides; the legs are black, spotted with fulvous, or the anterior ones only are of the latter colour; prosternum strongly triangularly widened at the anterior half, suddenly reduced to a ridge below the middle.

Hab. Mexico.

I am afraid it will not be easy to distinguish this small species from its numerous congeners, on account of its variability in regard to coloration, and it is so closely allied to so many others that it is difficult to name its nearest ally; it may, however, be compared perhaps best with *C. signaticollis*, Lac., which is of very nearly similar coloration, but differs in the ridges at the sides of the thorax; this part in the present species has the outer sides very closely punctured, and the punctures are only here and there interrupted by feeble callosities; at the top of the elevation two short narrow ridges are seen, which do not extend to the anterior margin, the elytra are punctured like the thorax, and all their tubercles and ridges are small or not strongly indicated; a more highly raised and somewhat elongate tubercle, however, is placed near the suture, at some distance from the apex. This species was not known to me during the publication of the Biolog. Centr. Amer. dealing with the Phytophaga, but I have since received five specimens.

Sagra humeralis, sp. n.

Short, oblong, purplish black, the shoulders golden cupreous, the thorax and elytra very finely granulate-punctate.

Mas. The posterior femora strongly ovately widened, with three small teeth, their tibiæ with a long spur-like tooth at the middle. Length 11 millim.

Head very closely and finely punctured throughout, opaque, the oblique anterior grooves very shallow; antennæ scarcely extending to the middle of the elytra, purplish black, the basal joint subquadrate, the second small, the third and following joints very gradually lengthened, terminal joint elongate, subcylindrical, its apex conical; thorax scarcely one half broader than long, the anterior angles strongly thickened and produced outwards, the surface finely and closely punc-

tured, opaque, scutellum shining, black; elytra without basal depression, opaque, the punctuation nearly obsolete, very fine near the base and the suture, purplish black, a subquadrate spot surrounding the shoulders only, golden cupreous; under side and legs nearly black, the intermediate femora widened below the middle, their tibiæ strongly curved; posterior femora short and thick, their lower margin furnished with three small teeth near the apex, the basal portion deeply and broadly sulcate and furnished with short and dense pubescence; posterior tibiæ curved at the base only, provided with a long spur at the middle of the outer edge, the lower portion broadly sulcate, obsoletely toothed on the inner side, the apex produced and pointed.

Hab. Mouy-Tsi, Tonkin.

Of this remarkable species, so different in its coloration from any of its allies, I received a single male specimen from M. Donckier, in Paris. It is no doubt allied to *S. peteli*, Lac., from Java, which has likewise a long tibial spur; the general colour of the present insect might almost be described as black, but the golden humeral spot is highly characteristic.

MOUHOTINA SALOMONENSIS, sp. n.

Fulvous, the intermediate joints of the antennæ and the tarsi black; thorax subquadrate, scarcely perceptibly punctured; elytra punctate-striate at the base only, metallic purplish, a large patch at the base and the sides near the shoulders, more or less fulvous. Length 10–11 millim.

Broad and robust, the head impunctate, with a fovea between the eyes, fulvous, the latter broadly emarginate; mandibles black; antennæ very slender, extending below the middle of the elytra, the lower four joints and the apical two fulvous, the rest black, third and fourth joint equal, elongate, the following joints scarcely longer: thorax one half broader than long, the sides perfectly straight, the angles pointed, the surface with a few very fine punctures, fulvous; elytra wider at the base than the thorax, with a deep depression below the base, the shoulders very prominent, the basal portion with short rows of fine punctures, the posterior portion nearly impunctate, purplish or violaceous, the base more or less fulvous round the scutellum and at the sides, the latter with one or two purplish spots on the shoulders, more or less connected with the posterior dark portion; under side and legs fulvous, the tarsi blackish, the intermediate and posterior tibiæ deeply emarginate near the apex, the posterior femora with a small tooth, claws bifid, prosternum very broad, subquadrate, the anterior margin of the thoracic episternum convex.

Hab. Florida; Solomon Islands.

Of this well-marked large species I possess four specimens, somewhat variable in regard to the amount of the purplish portion of the elytra; the insect is allied to *M. rufum*, Clark (sub *Nodostoma*), but both species are not typical of the genus; this latter has for the type a small species described by Baly, having the general appearance of one belonging to *Typophorus*, and in which the anterior and posterior femora are dentate and

the claws appendiculate. The present species and the one described by Clark are large insects in which the claws are much more bifid than appendiculate, but possessing otherwise the structural characters of the genus, for which reason I have included this insect in it.

LUPERODES LATERALIS, sp. n.

Flavous; the breast black; thorax transverse, impunctate; elytra with feeble longitudinal sulci, very obsoletely punctured, flavous, the base and the sides with a deep black band. Length 6 millim.

Of broadly oblong shape, the head impunctate, flavous, deeply transversely grooved above the eyes, the latter large, frontal elevations feebly indicated; carina short, but distinct; antennæ long and slender, flavous, the apex of the intermediate joints slightly blackish; the second, third and fourth joints gradually elongate, terminal joints more slender and elongate; thorax about one half broader than long, the sides rounded at the middle, the angles slightly prominent, posterior margin rounded, the disc entirely impunctate, flavous, scutellum black; elytra slightly wider at the base than the thorax, rather broad, the disc with feeble longitudinal sulci, the latter impressed with rows of fine punctures (absent in one specimen) of the same colour as the head and thorax, the base with a narrow transverse black band which joins the marginal one at the shoulders, the latter band wider than the basal one and rather suddenly dilated at the middle; the breast, the intermediate and the posterior femora likewise black, the rest of the under side and legs flavous; the metatarsus of the posterior legs very long and slender; anterior cotyloid cavities open; elytral epipleuræ broad, black.

Hab. Solomon Islands.

Of this very distinct species two specimens are contained in my collection, but the precise name of the island of the group they were obtained at I do not know.

A VISIT TO FRESHWATER, JUNE AND JULY, 1904.

By JAMES DOUGLAS.

MUCH has from time to time been written about the Isle of Wight as a happy hunting-ground for the entomologist, but it may yet be that an up-to-date account of the possibilities of the neighbourhood of Freshwater will be of interest.

Arriving about the middle of June and putting up with William Rogers, himself a wide traveller for Lepidoptera, and son of one well known some years ago in the entomological world for his expeditions to South Africa and other places, I was fortunate in being able to acquire much useful information.

Next day I started for a locality, not yet generally known, for *Melitæa cinxia*, where I found a nice colony well established, and,

the season being late, I netted a good series in remarkably fine condition—most of the females being allowed to go. In the same locality later on I found *Acontia luctuosa* sparingly, but this species seems to have disappeared from the immediate neighbourhood of Freshwater, where it was formerly plentiful. *Lycæna alsus* swarmed almost everywhere during the whole of my visit.

Towards the end of June I visited the reputed haunts of *Acidalia emutaria*, but either it was a bad year or it has been cleared out, for two specimens only rewarded more than a week of wearisome evening tramps in the moist and odoriferous swamps of the Yar. N.B.—Don't forget your fishing-boots.

During this time sugaring in the woods yielded *Acronycta tridens*, *Leucania pallens*, *L. comma*, *Xylophasia rurea*, *X. lithoxylea*, *X. sublustris*, *X. polyodon*, *X. hepatica*, *Mamestra anceps*, *Apamea gemina*, *Miana strigilis* (in endless variety), *M. furuncula*, *Grammesia trigrammica*, *Agrotis segetum*, *A. exclamationis*, *Noctua triangulum*, *N. festiva*, *Euplexia lucipara*, *Hadena dentina*, *Cidaria truncata*, &c.

On June 26th one of my boys brought in a specimen of *Setina irrorella* from the downs; so, fired by the glowing accounts which appeared some years ago in one of the entomological papers, I got Rogers to call me one morning before four o'clock, and away we rowed for the desired spot, some miles along the cliffs. It was absolutely calm, and nothing could exceed the beauty of the morning and the scene; but, alas! after a rough scramble up the cliffs, a thorough search of the locality revealed not a single *irrorella*. For some reason or other it has entirely ceased to frequent the spot; whether some change in the set of the tide has caused the lichens on which it feeds to fail, or whether having been so recklessly hunted it has been exterminated, I am not able to say; possibly the former, as I was told that no one had visited this particular spot for at least five years.

However, I subsequently became well acquainted with *S. irrorella* and its habits in other localities along the cliffs, and came to the conclusion that it is not the early bird that catches the worm—*irrorella*. It emerges from 6 to 7 a.m. onwards, and the newly emerged imagines do not, so far as I know, fly that morning, but sit quietly on the short grass stems; consequently a visit from 8 to 9 a.m., by which time their wings are dry, results in the boxing of absolutely perfect and unfaded specimens, while those taken on the wing are imagines of the previous day and are generally somewhat faded and worn. I was fortunate in taking several well-marked specimens of the IVI variety, and others showing part of the letters—mostly males, as usual—for, though I made a most exhaustive search, I only found one female which showed any tendency towards this variety.

Cultivation is responsible for the disappearance of many insects, and it is the cause of the practical disappearance of *Cucullia verbasci*, the mulleins which used to be so plentiful along the foot of the downs having been entirely destroyed in the operation of making and plashing the hedges and ditches.

At the beginning of July I started sugaring on the downs, and at once commenced taking *Agrotis corticea* and *A. lunigera* in abundance. *A. exclamationis*, which was one of the earliest arrivals each evening, was a nuisance, but I got some good varieties, as also of *Noctua festiva*. *A. lunigera* was exceedingly plentiful, and during about ten days I took some four hundred specimens, about half of which were worth setting, many being in perfect condition. I found it a most uneasy insect when boxed, quickly breaking the cilia and otherwise damaging itself, so much so that I ultimately adopted, with success, a course which I should recommend to all who wish to take this species in grand condition. I took out two good sized killing bottles—one of which I used for boxing, the other as a reserve; and, after capturing and stupifying a few insects, I transferred them to the reserve bottle, and so on. By this means, and with a little care in carrying home the full killing bottles to prevent friction, the insects were kept in perfect condition.

Amongst other things which came to sugar here were *Thyatira derasa*, *Acronycta megacephala*, *Leucania conigera*, *L. lithargyria*, *L. comma*, *Axylia putris*, *X. rurea*, *X. sublustris*, *Dipterygia pinastri*, *Apamea oculea*, *Miana strigilis*, *M. fasciuncula*, *Caradrina morpheus*, *C. taraxaci*, *Rusina tenebrosa*, *Agrotis cinerea* (worn), *Noctua plecta*, *Hadena dentina*, *Erastria fasciana*, *Acidalia aversata*, *Eubolia palumbaria*.

Sugaring along the foot of the downs did not pay. *A. lucernea* was late; I did not meet with it, but just before I left a friend took a specimen at the flowers of valerian.

Day visits to the woods produced *Melanargia galatea* (plentiful), *Limenitis sibylla*, *Argynnis paphia*, &c.; the downs, *Hipparchia semele*, *Iodis vernaria*, *Eubolia palumbaria*, *E. lineolata*, &c.

Strenia clathrata swarmed at Totland in the afternoons in early July, but, owing to the fresh breeze and the very rough ground, was very difficult to net. I found the best way was to wait until the sun was getting low, and then slowly walk through the thick herbage, placing the net at once over anything observed to be stirring, being careful not to disturb the insects, as in that case they dropped to the ground and were lost, the markings on the wings simulating the crossed stems of grasses to perfection. Another common species at Totland about the second week in July was *Eubolia bipunctaria*, which occurred on the cliffs under the fort, and was somewhat difficult to follow and net. It also occurred on the military road at Freshwater, together with *Gnophos obscurata*.

A visit to the haunts of *Acidalia humiliata* was fruitless; perhaps I lacked the necessary patience and perseverance.

The morning I left, *Bryophila perla* and *B. muralis* put in an appearance, and I obtained a good green specimen of the latter.

On the whole I had a very satisfactory visit, considering that it was not entirely an entomological one, and that there were other claimants to make imperious demands on my time and attention.

ON THE PRESENT CONDITION OF ENTOMOLOGY IN THE HAWAIIAN ISLANDS.

By G. W. Kirkaldy.

The Hawaiian Archipelago, consisting of a series of tiny specks in the lonely waste of the North Pacific, is far in advance, not only proportionately, but almost actually, of any other country or territory in the world, as regards the number of professional entomologists it supports. There are three institutions, all centred at Honolulu, which have an Entomological Division or Department, viz., the Hawaiian Sugar Planters' Association, the Territorial Bureau of Agriculture and Forestry, and the Federal Agricultural Experiment Station.

The Hawaiian Sugar Planters' Association has a staff of five entomologists, shortly to be increased to six. Of these, two remain principally at Honolulu, to investigate the material which is constantly pouring in from outside and to supervise the breeding-up and distribution of predaceous and parasitic insects; two are constantly travelling around Australia, the South Pacific, America, &c., searching for beneficial insects; while two will visit, in rotation, the various sugar-plantations, report upon conditions, and send in material for investigations. This work, however, is not altogether specialized, but is, more or less, interchangeable. The five are Albert Koebele, R. C. L. Perkins, G. W. Kirkaldy, F. W. Terry, and Otto Swezly. This division will very shortly commence publication of the results of its researches.

The Territorial Bureau is largely concerned with the Inspection of the Plants and Fruits which arrive in the islands by almost every steamer. The present head of the Entomological Division is Alexander Craw, lately of San Francisco; he has one assistant. The Federal Station has also one entomologist, D. L. Van Dine, who has recently meritoriously devoted his attention to mosquito extermination. There are thus now eight professional entomologists, shortly to be increased to at least nine.

THE DRAGONFLIES OF EPPING FOREST IN 1904.

By F. W. & H. Campion.

Our work during 1904, although prosecuted with unabated vigour, has added no fresh species to our list, but it has yielded several interesting variations from the typical forms. The species taken by us, mentioned in the order in which we made the first captures, are as follows:—

(1) *Pyrrhosoma nymphula*.—Our work began on May 1st with the taking of *P. nymphula*, immature. This species emerged earlier and remained on the wing longer than in any previous year within our experience, for we continued to take single specimens as late as August 1st. On June 5th we obtained a male which was resting on a bush, and which was in the act of preying upon a tiny moth; we subsequently identified the moth, so far as its damaged condition left it determinable, as *Laspeyresia* (*Grapholita*) *ulicetana*.

(2) *Agrion puella*.—We took this species abundantly between May 15th and August 7th. A female taken on July 10th exhibited on each of segments three, four, five, and six a pair of conspicuous light-green markings at the basal end in the middle line. On the same date we obtained a male with a round black spot within the curve of the U on the second segment.

(3) *Ischnura elegans*.—The range of date of our captures of individuals of the typical form was from June 5th to August 7th. Between July 3rd and September 4th we took four specimens of the dark form of the female, of which a detailed account has already appeared (*ante*, pp. 252–254).

(4) *Enallagma cyathigerum* was taken constantly from July 10th to September 4th. On the first-named date we procured two specimens of the blue form of the female, and another specimen was taken on July 17th. The variation from the normal female consists in the fact that on both thorax and abdomen the ground colour, instead of being yellow or greyish-green, is blue —blue as pronounced as that seen in the male. The markings on the abdomen are black, not bronze. All our specimens were procured at some ponds near Loughton, and one of them at least was taken connected *per collum* with a male. The blue colour fades away very rapidly, but we have preserved the colour of the latest specimen to a considerable extent by treatment with methylated spirit, in the manner recommended by Mr. S. W. Kemp (see Entom. xxxvi. 34–35). On July 31st we obtained two interesting mature males, one with the stem of the goblet-shaped marking on segment two attenuated to a mere thread, and the other with segments one and two chocolate-brown, and with some chocolate on thorax and between segments three and four.

(5) *Lestes sponsa* was fairly plentiful in certain localities. Our first specimens were taken on July 10th, and our last on August 21st.

(6) *Sympetrum striolatum* was not so common as usual; our captures ranged from July 17th to September 24th.

(7) *Libellula depressa*.—Although this active species had been on the wing for about six weeks, we were unable to obtain an example until July 24th. Our specimen was a male, and the yellow lateral spots on the dorsal surface were confined to segments three and four, instead of being extended to segments five and six, as in the typical form.

(8) *Æschna cyanea* fell to our net on several occasions between August 13th and October 9th.

(9) *Æ. grandis* we found to be scarcer than usual; we collected only one specimen (August 28th).

We have again to report the apparent absence of *Sympetrum sanguineum*, at one time tolerably abundant near Chingford. This year *Æschna mixta* seems to have disappeared entirely from our locality. Another species remarkable for its seeming total absence was *Anax imperator*, a specimen or two of which may usually be seen, in the proper season, hawking over a certain pond in the neighbourhood of Loughton.

33, Maude Terrace, Walthamstow, Essex:
November 3rd, 1904.

NOTES ON A MONTH'S COLLECTING IN NORMANDY.

By G. Meade-Waldo, F.E.S.

This year I spent a month (July 5th to August 5th) in a charming out-of-the-world village called Gacé, in the Department of Orne; it is what the guide-book for Normandy calls a "petite ville industrielle," though what Gacé has for industries I never found out. The chief crop was hay, generally combined with an orchard. The crop of apples this year was enormous. The house where I was staying had a large overgrown garden, and in this the greater part of my moth-collecting took place. Of flower-border plants there were practically none, but the wild flowers were well represented.

Among Rhopalocera, I noticed very little, except the ordinary "whites" and commoner Vanessids. *V. cgea* was, however, tolerably common, and easily to be caught when feeding on my "sugar" of the previous evening.

A visit to the Forêt d'Evroults, distant about seven kilometres, ensured the capture of *Limenitis sibylla*, *Thecla ilicis*, and *Cœnonympha arcania*; while towards the end of the month

Limenitis populi was fairly numerous, but very difficult to catch. I caught a worn female, however, sitting on a damp heap of mud, and from her got several ova, which, to my great disappointment, dried up instead of hatching. Hardly any Lycænidæ were noticed at all. *Colias edusa* and *C. hyale* had just made their appearance at the time I left for England.

For moths I employed three methods at various times—dusking with a lantern and net, "sugaring," and light from my bedroom window; all these were attended with a certain amount of success. By means of a light in my window I obtained the following:—*Lithosia lurideola*, *Œnestis* (*Gnophria*) *quadra* (male and female), *Arctia caja*, *Phragmatobia* (*Spilosoma*) *fuliginosa*, *Zeuzera pyrina* (male), *Porthesia chrysorrhœa* (*auriflua*), *Malacosoma* (*Bombyx*) *neustria*, *Odonestis potatoria*, *Pterostoma palpina*, *Thyatira batis*, *Acronycta strigosa* (were quite common, but unfortunately had begun to wear), *Xylophasia hepatica*, *Mamestra persicariæ*, *Apamea oculea* (*didyma*) (in many varieties), *Miana bicoloria*, *Hadena oleracea*, *Habrostola tripartita* (*urticæ*), *H. triplasia*, *Plusia chrysitis*, *P. gamma*, *P. iota*, *P. v-aureum*, *Charicleа marginata*. And of the Geometræ, *Uropteryx sambucaria* (very abundant for a few nights only), *Rumia luteolata*, *Selenia bilunaria* (*juliaria*), *Boarmia gemmaria*, *Geometra papilionaria*, *G. vernaria*, *Hemithea strigata*, *Angerona prunaria* (*corylaria*), *Acidalia ornata*, *Abraxas grossulariata*, *Hypsipetes sordidata* (*elutata*), *Scotosia dubitata*, *Cidaria dotata*, *C. fulvata*, *C. prunata* (*ribesiaria*), *Eubolia mensuraria*.

Sugaring, as is always the case, was very uncertain, but on the whole I was fortunate in my choice of nights, and got the following species:— *Thyatira derasa*, *Cymatophora octogesima* (*ocularis*)—these I got only on one tree (a large poplar), probably their food-plant; *Acronycta psi*, *A. megacephala*, *A. rumicis*, *Leucania impura*, *L. pallens*, *L. lithargyria*, *Axylia putris*, *Xylophasia sublustris*, *X. monoglypha*, *Cerigo matura* (*cytherea*) (very dark specimens), *Mamestra brassicæ*, *Caradrina ambigua*, *Noctua plecta*, *N. ditrapezium*, *N. stigmatica* (*rhomboidea*), *Triphæna ianthina*, *T. comes*, *T. pronuba*, *Amphipyra pyramidea*, *A. tragopogonis*, *Mania maura* (I once counted six on the aforementioned poplar), *M. typica*, *Calymnia trapezina*, *C. pyralina* (in plenty), *C. affinis*, *Euplexia lucipara*, *Aplecta nebulosa*, *Hadena oleracea*, *H. dentina*, *Gonoptera libatrix*, and *Catocala nupta*.

While after butterflies during the daytime, I got *Lasiocampa quercus* (males), and saw those of *Saturnia carpini*; I also got *Acontia luctuosa*, in bright sunshine, and *Callimorpha hera*.

Of larvæ or pupæ I saw nothing, with the exception of a pupa of *G. libatrix* in some willow-leaves, and some pupæ of *P. rapæ*, but I did not spend much time searching. Frequently, of course, the same species turned up at sugar and light, but in

much the greater number of cases one only got them at one or the other.

The weather left nothing to be desired, the first three weeks being cloudlessly fine, and the last week was varied by a most terrific thunderstorm, during which the church-tower in the village was struck by lightning.

Stonewall Park, Edenbridge, Kent.

CURRENT NOTES.

By G. W. Kirkaldy.

(Continued from p. 161.)

1. H. A. Ballou: "Insects attacking Cotton in the West Indies" (W. I. Bulletin, iv. pp. 268–86, text-figs. 1–4 (1903)).

2. T. D. A. Cockerell: "A Summary of the Coccidæ" ('American Naturalist,' xxxvii. pp. 800–6, Nov. 1903, publ. Jan. 1904 ?). [Rhynchota].

3. F. H. Chittenden: "A Brief Account of the principal Insect Enemies of the Sugar-beet" (Bull. U. S. Dep. Agr. Entom. 43, pp. 1–71, text-figs. 1–65 (1903)).

4. F. M. Webster: "Some Insects attacking the Stems of growing Wheat, Rye, Barley, and Oats" (*op. cit.* 42, pp. 1–62, text-figs. 1–15 (1903)).

5. E. P. Felt: "Insects affecting Forest-trees" (7th Rep. Forest, Fish, and Game Com., New York, pp. 479–534, pls. 1–16, and 26 text-figs. (1903)).

6. T. D. A. Cockerell: "South-Western Geographical Names" (Ent. News, xv. p. 24 (1904)).

7. "The Insect World," vol. viii. no. 1 (1904).

8. J. H. Fabre: "Souvenirs Entomologiques" (8me série). (Paris) pp. 1–379 (a few text-figs.). [1903 ?].

9. E. E. Green: "On the Nesting Habits of *Trypoxylon intrudens* and *Stigmus niger*" [Hym.] (*Spolia zeylanica*, i, pt. 3, [sep. pp. 1–3], text-figs. 1 and 2 (1903)).

10. Mrs. Maria E. Fernald: "A Catalogue of the Coccidæ of the World" (Hatch. Exper. Sta. Massachusetts Agr. Coll. Bull. 88, pp. 1–360 (1903)).

Ballou's (1) report on the insect pests of cotton in the West Indies, although necessarily largely a compilation, will be useful since the revival of cotton-growing in the Islands. Two of the worst mainland pests, viz., *Heliothis armiger* (cotton-boll worm) and *Anthonomus grandis* (Mexican cotton-boll weevil), are absent, but the remainder (except the Leafblister mite—*Phytoptus* sp.—which is apparently distinctive) is the same as or closely related

to the pests of the mainland cotton-growing districts. The presence of *Dysdercus discolor*, Walker (or as it is termed "*annulliger* (sic!) Ubler), is very interesting, forming the fourth known cotton pest in this genus, the others being *suturellus* from the mainland, *andreæ* in company with *discolor* and *cingulatus* from the Orient.

Cockerell (2) has summarized Mrs. Fernald's recent Catalogue of the Coccidæ. The same author (6) notes two grave errors in geographical names. "Arrayo," a name universally used in the south-west of North America for a dry watercourse, occupied by water only after heavy storms, has come into use in recent entomological literature as the name of a town, and finally metamorphosed into "Arrogo, New Mexico." "Baja" has become the name of a supposed place in California, whereas it simply means "lower," *i. e.* "Baja California" = Lower California, in Mexico.

The first attempt to manufacture beet-sugar in the United States was made in 1830 (3), but there were only three factories in operation sixty years later; in 1902, however, there were forty-two, and these are steadily increasing. Estimates made in the U. S. Dep. of Agriculture place the world's production of sugar in 1902 at nearly ten million tons, of which nearly six millions were manufactured from sugar-beets. Some 150 species of insects are noted as using beets for food, and, while comparatively innocuous so far, will probably become more injurious each successive season. In a similar bulletin of the U. S. Division of Entomology, various Diptera, especially species of *Isosoma*, destructive to cereals, are fully dealt with (4).

The Seventh Report of the Forest and Fish Commission of New York contains an account of the insects affecting forest trees, prepared in the sumptuous manner now expected from that State (5). Species affecting the pine, to the number of some forty, receive the most attention, and are considered at more or less length, the Scolytidæ in particular, with their associated insects. The other trees discussed are the balsam, spruce, arbor-vitæ, and oaks. The account is illustrated by three beautifully coloured plates of insects affecting hard-pine, white pine, and oak, by five photographs of injured trees or forests, and ten plain plates, principally representing Scolytid work.

With January, 1904, the 'Insect World' commenced its eighth volume (7) under a slightly altered title, 'The Insect World: a Monthly Magazine devoted to the useful application and scientific study of Entomology,' edited by Yasushi Nawa, Director of Nawa Entomological Laboratory, Gifu, Japan; with this, the insect accompanying the title is also changed, the new-comer being the remarkable moth, *Epipyrops nawai*, Dyar. K. Nagano's descriptions, in English, of imago and larva of

Japanese Sphingidæ are continued, the present number describing *Ampelophaga rubiginosa*, Brem. et Grey.

J. H. Fabre has published recently (8) the 8th series of his "Entomological Souvenirs." Of these there are twenty-three, four being devoted to *Aphidæ*, three to *Bruchus*, three to *Halictus*, two to *Vespa*, and one each to *Cetonia*, *Pentatomas*, *Reduvius personatus*, *Lucilia*, *Sarcophaga*, *Dermestes*, &c., *Trox*, *Volucella*, *Epeira fasciata*, *Lycosa narbonensis*, and the geometry of insects.

The observations are made with precision, and apparently, so far as they go, a great deal of exactitude; but the author, as in previous series, displays great ignorance of previous literature, and his interpretation of the facts is often fantastic. The fifth essay, "Les Pentatomes," is reprinted from a Belgian periodical (it is possible that some of the other essays are reprinted, like the above, without acknowledgment), and has been criticized at some length already.* In the fourth essay he attempts to overthrow the opinion held since Linnæus, that the lava of *Reduvius personatus* preys on the bed-bug, and declares such occurrences to be entirely fortuitous. Fabre says: "Son régime est tout autre que ne le dit Linné et que *ne le répètent* les compilateurs"; on the contrary, Amyot and Serville (1843, "Histoire Naturelle des Insectes—Hémiptères," p. 338), among others, say: "*nous pouvons assurer* qu'elle fait particulièrement la guerre à l'Acanthie des lits; ainsi que l'ont attesté Linné, De Geer et Fabricius." Unfortunately *Reduvius personatus* does not occur in the Hawaiian Isles; perhaps some one who can observe it in nature, and who has a readier command of the literature than I now have, will make renewed observations on the subject.

In a new periodical (9), E. E. Green discusses the nesting habits of two Sinhalese wasps.

Mrs. Fernald's valuable Catalogue of Coccidæ (10), which has been a quarter of a century in making, enumerates 1449 recent species, with from one to more than a hundred references each, with localities and food-plants. Besides these there are noted sixty-six uncertain species, and thirteen described as Coccidæ which belong to other families, orders, or even classes. The labour involved in such a Catalogue is very great, how much so can be appreciated only by those engaged on similar work. Mrs. Fernald is to be congratulated on having completed her undertaking, and coccidologists are to be congratulated also on now having their labours so materially lightened.

* See 'Entomologist,' 1903, pp. 113–120.

(To be continued.)

DESCRIPTIONS OF A NEW GENUS AND SOME NEW SPECIES OF EAST INDIAN HYMENOPTERA.

By P. Cameron.

BRACONIDÆ.

AGATHIDINÆ.

Lisitheria, gen. nov.

First cubital, prædiscoidal and third discoidal cellules not separated; the recurrent nervure only indicated on the lower side. The præbrachial and the pobrachial cellules not separated; the transverse median nervure interstitial. Malar space short, but distinct. Parapsidal furrows distinct. Post-scutellum keeled. Metanotum with an elongated area in the centre. Mesopleuræ without a rugulose furrow. Maxillary palpi five-jointed. The radius in the hind wings is faint, but distinct; the cubitus is almost obliterated, there is a distinctly closed cellule at the base of the anal. Areolet broadly rounded at the top, the cubital nervures clearly separated. Parapsidal furrows deep. Anterior claws cleft.

The head is not rostriform, as it is in the *Agathidini*, but there is a clear malar space, the eyes being distinctly separated from the base of the mandibles. Palpi longish; the joints not dilated. Antennal scape about three times longer than wide. The pobrachial nervure in the hind wing is entirely obliterated, as is also the transverse pobrachial; the pobrachial, anal and discoidal cellules are obliterated. The long spur of the hinder tibiæ extends beyond the middle of the metatarsus. Abdomen without furrows or depressions; its ovipositor short, hardly projecting. The eyes are large. Labrum projecting; its apex rounded.

Lisitheria nigricornis, sp. nov.

Luteous, shining, smooth, the thorax punctured; the metanotum more closely than the rest; the antennæ black, the scape for the greater part rufous, the flagellum closely covered with a pale pile; the hinder tarsi fuscous; the wings clear hyaline, iridescent, the stigma fuscous; the nervures darker. ♀. Length, 6–7 mm.

Hab. Deesa (Nurse).

Antennæ longer than the body, slender. Face closely and distinctly punctured; the clypeus almost impunctate; immediately below the antennæ are two longish, rounded tubercles. The ocellar region and the middle of the occiput above are blackish. There are two stout keels on the scutellar depressions. The keels forming the central area on the metanotum are stout, oblique, and are united on the top; they are more distinct on the upper than on the lower half; there is a distinct keel below the spiracles. Legs thickly covered with white pubescence.

ICHNEUMONIDÆ.

Haliphera flavomaculata, sp. nov.

Black; the inner orbits broadly below to the clypeal foveæ, narrowly above to the top of the eyes, a curved mark on the outer half

above, half of it below the eyes, the palpi, the edge of the pronotum, the scutellum, a line on the middle of the median segment, half on the areola, half on the posterior median area, a curved, narrow line on the under side of the propleuræ, the tubercles, a large mark shortly below the middle of the mesopleuræ, obliquely truncated in front, rounded behind, an irregular mark on the apex of the metapleuræ—rounded above, straight below and at the base and apex—touching the keel, the apex of the petiole, widest in the centre, behind the stigma, a line on the sides of the apex of the second segment, obliquely narrowed on the inner side, a smaller square mark on the apex of the third and the middle of the seventh segment, lemon-yellow. Legs black; the apices of the four front coxæ, the four front trochanters, and a large mark on the hinder coxæ above, lemon-yellow; the fore tibiæ almost entirely, the middle on the basal half, the hinder to beyond the middle, and the greater part of the tarsi, yellowish. On the hinder femora in the middle above is a short lemon-yellow line. Wings hyaline, with a slight fuscous tinge; the stigma and nervures testaceous. ♀. Length, 12–13 mm.

Hab. Darjeeling.

The middle of the antennæ has a broad white band, the apex brownish. Face closely and distinctly punctured, and sparsely covered with short pale pubescence; the clypeus is more sparsely and strongly punctured. Mesonotum closely and uniformly punctured, as is also the scutellum, which is covered with pale pubescence. The base of the median segment is closely rugosely punctured; the posterior median area closely transversely striated; the lateral basal areæ are coarsely transversely striated at the apex; the lateral apical areæ bear some stout, irregular transverse keels. Pleuræ closely and irregularly punctured; the meta- below closely and distinctly striated.

The three known species of *Haliphera* may be separated as follows:—

1 (2). The centre of the metanotum not marked with yellow, its sides largely yellow; the second and third abdominal segments broadly banded with yellow . . . . . *fuscitarsis.*

2 (1). The centre of the metanotum marked with yellow, its sides immaculate; the second and third abdominal segments marked with yellow on the sides only.

3 (4). The mark on the centre of the metanotum large, the centre of the hinder femora yellow . *maculipes.*

4 (3). The mark on the centre of the metanotum small, the hinder femora entirely black . . . *flavomaculata.*

OXYURA.

Epyris albopilosus, sp. nov.

Black; a rufous band behind the mandibular teeth, the four posterior trochanters testaceous, the wings fuscous hyaline, with a violaceous tinge, the stigma and nervures black. ♂. Length nearly 10 mm.

Hab. Darjeeling.

Antennæ thickly covered with pale pubescence, the scape with long silvery hair; the basal half of the flagellum sparsely with long pale hairs. Front and vertex, except behind the ocelli, closely covered with large, round punctures. Apex of clypeus smooth and shining; the raised central part finely, closely longitudinally striated. The lower half of the mandibles covered sparsely with large deep punctures; beneath with long white hair. The base of the pronotum in part rufous, and irregularly transversely striated; the apex closely punctured. Mesonotum coarsely, but not closely punctured; the furrows complete. The sides and apex of the scutellum strongly punctured, the base in the centre smooth. Post-scutellum keeled laterally, and with an irregular V-shaped area in the centre. Metanotum at the base irregularly reticulated on the sides, the centre irregularly transversely striated, with two lateral keels in the centre, originating from the base and a shorter one, not issuing from the base; the apical slope closely, strongly irregularly reticulated. Propleuræ irregularly striated in the centre; the meso- closely covered with large, round, clearly separated punctures; the metanotum closely and strongly striated; the striæ less strong and interrupted near the base; the upper part with a distinct bordering keel, with a similar keel below it; the space between bears some irregular striæ. The cubital, transverse cubital, and recurrent nervures are clearly indicated in white. Femora sparsely, the tibiæ and tarsi thickly covered with white hair.

The head is fully one-third longer than wide, keeled between the bases of the antennæ, the top of the keel being smooth and dilated. Mandibles large, four-dentate, the apical being the longer and sharper and the basal broader and more rounded than the middle ones. Scutellum flat. Prothorax shorter than the head. Apex of median segment rounded. Mesopleuræ with a wide, crenulated furrow near the apex. The radial cellule is long and narrow; the radius has an oblique slope at the base, and extends close to the apex of the wing; the transverse median nervure has a straight, oblique slope, and is received distinctly beyond the transverse basal, the third basal cellule being completely closed in front; the second discoidal cellule is clearly indicated.

DIPLOPTERA.

Odynerus rhipheus, sp. nov.

Black; a broad mark on the pronotum extending to the middle and a line on the apex of the second and third abdominal segments, red; the wings dark fuscous-violaceous, the nervures and stigma black; the basal slope of the first abdominal segment smooth, irregularly margined above. ♀. Length, 8 mm.

Hab. Darjeeling.

Front and vertex closely, strongly punctured and sparsely covered with a white pile; there is a small yellow spot in the eye incision and two on the top of the antennal keel. Upper half of clypeus closely and strongly punctured, the lower more sparsely punctured and with the punctures longer; the apex shortly toothed laterally, the space between smooth and rounded at the apex. Apex of pronotum broadly, bluntly rounded, the sides of the basal part margined laterally. Pro- and mesothorax closely rugosely punctured; the post-scutellum stoutly

rugosely punctured; its apex with an oblique slope, opaque, and closely, finely rugose. Base of metanotum irregularly rugose, the rest alutaceous. Pro- and mesopleuræ closely, finely, but distinctly punctured; the meta- alutaceous. First and second segments of the abdomen closely and distinctly punctured; the first with a not very distinct suture on the top of the basal slope; the second is smooth and depressed at the base; the third to fifth segments are minutely punctured, the apical two smooth; the second ventral segment is obliquely produced downwards at the base. The second cubital cellule is much narrowed at the top, being not one-fourth of the length of the third.

A species not unlike *O. sikhimensis*, but is smaller and more slenderly built; that has the post-scutellum not so prominently raised; the second cubital cellule longer compared with the third above; the keel on the base of the first abdominal segment is much more prominent, the base of the mesopleuræ is not smooth and shining, and it wants the wide-curved crenulated furrow.

ODYNERUS TYTIDES, sp. nov.

Black; a line on the scape of the antennæ beneath, a large mark on either side of the top of the clypeus, a line along the lower margin of the eye incision, a trilobate mark above the base of the antennæ, a mark, longer than broad, behind the top of the eyes, the top of the pronotum, the mark narrowed in the middle, tegulæ, two marks, almost united on the base of the scutellum, a mark on the pleuræ below the tegulæ, the apex of the first abdominal segment above, of the second all round, a narrow indistinct line on the third, the apices of the fourth and fifth, of the sixth narrowly and the whole of the seventh, red. Legs black, the apices of the four front femora, the four front tibiæ except in the middle behind, the base of their tarsi and the hinder tibiæ in front rufous. Wings fuscous-violaceous, the nervures and stigma black. ♀. Length, 10-11 mm.

Hab. Darjeeling.

Head and thorax closely and distinctly punctured, except on the metanotum, the base of the mesopleuræ, and the lower part of the metanotum at the base. The upper part of the clypeus with large, longish, clearly separated punctures, the lower part with the punctures smaller, rounder, and closer together; its apex with a shallow incision, its sides not forming teeth. Pronotum transverse. Base of scutellum rugosely punctured, the apex closely, strongly longitudinally striated. Post-scutellum strongly rugosely punctured, raised, its sides slightly raised above into blunt teeth, the apex with a steep oblique slope. Metapleuræ closely, irregularly striated, above almost reticulated, at the base above is a space with clearly separated, fine striations; the lower part at the apex laterally projecting into a longish tooth. The first and second abdominal segments are closely, distinctly, but not very strongly punctured, as are also the third, fourth, fifth; the last is impunctate. The second cubital cellule is narrowed at the top, being there less than the length of the space bounded by the first transverse cubital and the first recurrent nervures.

The male is similarly coloured; the tibiæ and tarsi are of a

brighter, more uniform testaceous colour; the clypeus is deeply incised in the middle at the apex; the sides of the incision forming stout teeth; there is a yellow spot on the sides of the post-scutellum.

Comes near to *O. sikhimensis*, Bingh. *O. prudens*, Nurse, may be known from it by the sides of the post-scutellum not being raised into blunt teeth.

(To be continued.)

SOME TASMANIAN CASE-BEARING LEPIDOPTERA.

By Frank M. Littler, F.E.S., M.A.O.U.

The study of the life-history of case-bearing lepidopterous larvæ is always a subject of interest to entomologists, as there is so much mystery attaching to them. One never knows what unexpected trait is next going to be brought to light. For some time past I have been closely investigating the habits of two species — one a Psychidæ, and the other one of the Tineidæ. Other species have been less studied, owing to paucity of material; these will be touched on in due course.

It is my intention to give an account of my investigations as far as they go, in the hope they will be of some little interest to my fellow-entomologists. To say that I was surprised at some of the unexpected phases observed is no exaggeration.

Clania lewinii, Westw.

♂. 25–28 mm. Head, thorax, and antennæ blackish; face white; thorax with two white moderate longitudinal stripes; patagia white, abdomen black; legs black. Fore wings elongate, moderate; costa nearly straight; termen oblique, semi-hyaline, finely irrorated with black scales, especially on margins; cell almost clear transparent. Hind wings with termen rounded, very faintly sinuate beyond middle; colour as in fore wings; a few blackish hairs towards base.

♀. 12–14 mm. Rich cream colour, with the exception of the head and thoracic segments, which are brown. Quite naked, except for a slight pilose fringe of yellowish-white hair on the anal segments, which has the appearance of a tonsure in miniature. The legs, save for the first pair, are rudimentary, and they are but apologies, quite powerless for locomotion. The mouth-parts are very indistinct, and appear coalesced. Eyes absent, merely dark marks where they should be.

That it should be sightless, and without power of locomotion, is not surprising, seeing that it never leaves the case, even for a short time. When the maggot-like imago is taken from its case, and turned on its back on, say, a table, it has a curious method of righting itself. Commencing at the anal extremity, the contents of the body are seemingly forced up towards the head in a

diminutive wave-like manner, which turns it over on to its face again. The body then regains its normal size. I have found, after repeated experiments, that the wave-like motion will propel the body forward 1 mm. on a smooth surface.

This species is the most plentiful of any case-builder moth in Tasmania. The larvæ feed on various species of eucalyptus and acacia, also sweet-brier, and occasionally other plants. I have lately been studying the habits and development of this species, and have been both surprised and delighted at what I saw.

For some time entomologists could not agree as to whether the members of the family Psychidæ did really lay eggs, or whether the young hatched from within the body of the parent. Prof. McCoy, in Decade IV. of 'Prodromus of the Zoology of Victoria,' says :—". . . Immense numbers of young are brought forth, not in the egg-state, as hitherto supposed for all moths, but as exceedingly minute perfect larvæ. In confirmation of this unexpected discovery, I may mention that no eggs are ever found in the cases of the species observed in this colony, and the myriads of young produced by each female may be observed emerging in a continuous stream as minute larvæ, under circumstances which render it impossible to suppose that eggs could have been deposited."

Entomological science has advanced much since the above quotation was penned, and we have learned that the females of the Psychidæ really do lay eggs; but the manner of laying them, and the behaviour of the females after the operation, is not so well known to the bulk of entomologists. Before proceeding to the actual egg-laying, let me say that the females of the particular species under discussion are enclosed in brown pupa-cases tapering at the anterior end, but rounded at the other extremity. They are fixed midway in the case. The segments are distinctly marked. *When the females are ready to copulate the bottoms of the pupa-cases drop off.* Copulation then takes place; the males have to insert at least two-thirds of their abdomens into the outside cases in order to reach the females. The abdomens of the males are capable of great extension. *After copulation the females wriggle out of their close-fitting prisons, turn head downwards, and wriggle back again, so that their heads just project beyond the posterior extremity of the pupa-cases.* Egg-laying then commences, and continues until one-fourth to one-third of the cases are filled. The eggs are bright yellow and round; with them is packed a little short yellow fluff from round the ovipositor of the females. By the time egg-laying is finished, *the females are but shadows of their former selves; they then drop out of the pupa-cases, and fall to the bottom of the "cases" or "sacks," and there shrivel and die.* In a few days they are mere tiny scraps of brown dried skin. The number of eggs laid varies from two hundred to five hundred. Several writers on the

Psychidæ mention the fact that the females lay eggs, but omit to give any details as to the *modus operandi*. In a Bulletin (No. 6) issued in 1899 by the Cape of Good Hope Department of Agriculture is an illustration of a "sack" of a bag-worm, cut open to show the female within depositing her eggs. The female is depicted out of her pupa-case, depositing her eggs in the bottom of the sack. This is either a mistake, or else the species illustrated has totally different habits to the one I am at present discussing—*Oeceticus ignobilis*, or *Metura elongata*, found on the mainland of Australia.

Although I have had several hundred pupa-cases full of eggs in my possession from time to time, I have never noted the number of days the eggs took to hatch. The bulk commenced to emerge on February 2nd. The young, as they hatch from the eggs, find their way out of the cases by the posterior opening. They let themselves down by means of long threads, and soon spread all over the tree or shrub. They are then 1·5 mm. long, and of a dark chocolate colour, especially the head and thorax, which are nearly black. The posterior extremity of the body is carried erect. In a few hours the first "case" is formed. Mr. G. V. Hudson, when speaking of *Oeceticus omnivorus* in his fine work, 'New Zealand Moths and Butterflies,' says that not for three days is the first case formed. This is quite contrary to my experience with other Psychidæ. But, to return. The first case is constructed of very fine scales of bark and lichen from the boughs of the trees, and fastened together with silk. This case is the same length as the larvæ, *viz.* 1·5 mm., and shaped like a miniature inverted earthenware crucible as used by metallurgists. I say "inverted," because the case is always carried over the back on the posterior segments until it becomes too heavy; it then hangs downwards. It was not until sixty-three days after the first case was formed by bred specimens that it got too heavy to carry upright.

In the 'Cambridge Natural History,' vol. ii. p. 393, it is stated that Psychidæ larvæ are thought by some to make a first meal on the body of their parent. This is most certainly not the case with this or any other species of the family whose habits I have investigated. I have had many opportunities of watching a larva in captivity construct its first case. To give a typical example: The case was made out of grains of cork, and took two hours to complete. First, a mass of cork-grains, loosely fastened together with silk, was formed; through the centre of this mass the caterpillar thrust its head, then worked, by means of its mandibles, the mass into the form of a narrow closely woven band, round what might for the sake of convenience be called its neck. Slowly fragment after fragment of cork was gnawed off, and fastened by means of silk to the front edge of the broadening band, which was gradually being pushed down and round the

body. At the expiration of one hour and three-quarters the case was finished, all but drawing the posterior aperture closer, by means of the anal claspers, and finishing off the edge of the anterior opening. Until the posterior opening was drawn together the case was cylindrical. Afterwards it approximated to a miniature crucible rather than a cone. As the larvæ grow they first add to their cases fragments of leaves, and then, as their mandibles acquire greater strength, short lengths of sticks. The operation of enlarging the case by the addition of more sticks is a very curious and interesting one, and one but seldom witnessed. In the 'Entomologist' of August last year I described the process as witnessed by me, but, to make this article complete, and at the risk of being tedious, I will redescribe what occurred. First, the edge of the mouth of the case was tightly attached with silk to the twig from which a portion was to be cut. The caterpillar then protruded itself half out of its case, and commenced nibbling round the twig. In a very short time it was severed. I should have before remarked that the top of the twig and several leaves were bitten off before cutting a piece the required length (about one inch). As soon as the portion was severed it was grasped by the caterpillar in its legs, which acted in the capacity of hands, and then given a coating of silk. This occupied two or three minutes. It was marvellous to watch the ease with which the piece was handled, being turned over and over, backwards and forwards, without a seeming effort. It was nearly always grasped in the middle. After the coating process was finished the caterpillar retreated inside its case, laying the twig lengthwise across the mouth. It then bit an opening about a quarter of an inch from the top, came half-way out through the opening thus formed, and pulled down the piece of twig. It was then lightly fastened by one end near the top of the case. The caterpillar then proceeded to fasten it securely for half its length among the other bits of twigs already there. This done, it retreated into its case, and fastened up the rent made in the fabric, at the same time securely attaching the top of the twig. Unfortunately, I never witnessed the lower portion being fastened down, but should imagine the process was the same. Next day it was impossible to distinguish this twig from the others. Its thickness was that, say, of a two inch wire-nail.

I have not yet ascertained the exact length of time the larvæ take to come to maturity, nor how long the males remain in the pupal condition. I have had several opportunities of timing the latter, but, owing to press of other work, it has been neglected. However, I hope to complete my observations this coming summer. The males nearly always emerge during the night; after drying their wings they either fly off to find a mate, or, if there are female "cases" on the same tree, they copulate without delay. The same thing occurs when there are cases of both

sexes in a breeding-cage. The males are very swift flyers, and soon dash themselves to pieces in a breeding-cage. When ready to emerge, the pupæ work their way, with the aid of the short sharp spines on some of the rings, half out of the bottoms of the cases; the moths, on hatching, crawl on to the cases and dry their wings. In many of the cases one, two, and sometimes three extra long pieces of stick project beyond the bottom of the cases. Some writers have advanced the opinion that these sticks are placed designedly in order to help the males emerge. Out of curiosity I examined the cases in one of my breeding-cages, with the following result: 227 cases, 127 males, 100 females; 45 of the former had projecting ends, and 24 of the latter. This result seems to indicate that whether the cases have projecting ends or no is just a matter of chance.

I have watched many males emerge, and always found they had no difficulty in leaving the pupa-case, and crawling on to the "case" when there were no projecting ends. Before turning to pupæ the male larvæ turn upside down inside the cases, so say the majority of writers on the subject. This may be quite correct, but I have made one or two observations of my own on the subject. One of the two species of Braconid flies that infest this species of case-moth always emerges from the upper end of the case, coming through a hole in the head of the male pupæ standing upright in the cases. It may be that being parasitised prevented the larvæ turning before pupating, but it did not prevent them from turning to externally perfect pupæ. *It seems quite possible, and very probable, that it is the pupæ that reverse, and then only when ready to emerge.* The other species of Braconid fly always emerges from the lower end of the cases, killing the larvæ before it pupates. A third parasitic fly is a true *Musca;* it also kills the larvæ, but emerges from the upper end. Sparrows may often be seen tearing open the cases and devouring the larvæ. Out of 256 cases examined, twenty-nine were struck by one of the three species of parasitic flies.

[Note by Dr. T. A. Chapman:—The observations in italics on pp. 311, 314 are so contrary to those made on so very many other Psychids, that it would be extremely valuable if Mr. Littler would repeat these observations with every care. Though actual observation has been made on very few species, as to the actual occurrences whilst they are taking place, the fact that female Psychid cases of very many species show the eggs to be laid in the undamaged female pupa-case (no bottom dropped off), and the absence of any trace of the female herself shows that she dropped out of the mouth of the case, strongly support the idea that the mass of species have very similar habits in this respect. The habits of insects are so various and unexpected that it is impossible to say what habits might not occur, but one would like

to see the pupa-case with the bottom dropped off—especially one would like to see the female reversed in her pupa-case—and one would like to see her dried remains in the attached end of the case at the anal extremity of the pupa-case. The infertile female often dies in her pupa-case, but when she has laid her eggs she is at the free end of the case, and almost invariably drops out. Clear evidence that *C. lewinii* has the habit described would be most interesting.]

(To be continued.)

A PRELIMINARY LIST OF THE LEPIDOPTERA OF MALTA.

By Thomas Bainbrigge Fletcher, R.N., F.E.S.

(Continued from p. 276.)

A local magazine, the 'Mediterranean Naturalist,' which was unfortunately but short-lived, contains several notes on Lepidoptera. An article entitled "Notes on the Lepidoptera of Malta"—Medn. Nat., vol. i., pp. 85 and 106 (1891),—by Alfred Caruana-Gatto, contains the first really useful information on the subject.

The only other published information which I have been able to find is comprised in two papers on Mediterranean Lepidoptera by Messrs. Gervase F. Mathew and Philip de la Garde ('Entomologist,' vol. xxxi. p. 80, and vol. xxxii. p. 8). On these papers I have drawn freely, as there are many species mentioned therein which I personally have not met with in Malta.

Mr. Prout has also lately published in the 'Entomologist' a few remarks on some Geometrids collected by Mr. Mathew in Malta (Entom. xxxvi. 204).

The numbers preceding each species are those in Staudinger's 'Catalog,' 3rd edition. I have followed the order therein given, except that I have commenced the butterflies with the Nymphalidæ.

152. *Pyrameis* (*Vanessa*) *atalanta*, Linn. Maltese name, *farfett-talhorriek*.—Common throughout the year, especially in gardens, &c. A new brood is on the wing at the end of May, and specimens of this brood probably survive until the following March.

154. *P. cardui*, Linn.—Abundant everywhere throughout the year.

157. *Aglais* (*Vanessa*) *urticæ*, Linn. — Mr. Gervase F. Mathew informs me (*in litt.*) that he noticed one specimen on March 23rd, 1892. It must, however, be a rare species in Malta, and is probably only a casual immigrant.

385. *Pararge egeria* Linn. — The ordinary South European form occurs commonly in Malta, but is local, confining itself to gardens and valleys. Gneina, Boschetto, Intahleb, Ghirgenti, Wied-el-Kbir, Wied

Kratal, and Wied Kurda may be mentioned as localities. It is fond of flitting about in the shade of carob trees, and is found from March to October.

390. *Satyrus* (*Pararge*) *megæra*, Linn. — Very common, The first brood appears at the beginning of March, the second at the beginning of June, and a third in the late autumn; but probably the broods so overlap that it may be said to be continuous-brooded throughout the year, fresh specimens being met with in any month. The individuals disclosed in March are fairly typical, but those emerging from June onwards are var. *tigelius*, Bon.

392. *S.* (*Pararge*) *mæra*, Linn.—"On Jan. 3rd, 1897, I have a note in my journal that I saw *L. mæra* in a ravine beyond Zeitun, but, as I did not catch it, I did not include it in my list" (Gervase F. Mathew, *in litt.*, April 13th, 1904). I have never met with this species in Malta, nor heard of its occurrence, except as noted above.

402. *Epinephele jurtina*, Linn. (*E. ianira*, Linn. var. *hispulla*, Hb.).—Maltese specimens all belong to the form *hispulla*, and are much larger than typical English examples. The species is abundant in wieds all over the island from the end of April to the end of September, there being practically no variation according to date of emergence. In the males the ocellation on the under side of the hind wings varies from nil to five. The females represent a very extreme form of *hispulla*, the fulvous marking extending over practically the whole of the fore wing. Aberrations with the apical spot bipupilled are of frequent occurrence.

440. *Cœnonympha pamphilus*, Linn.—Abundant. I have met with this species as early as February 27th, and as late as November 14th. The specimens taken from February to early June seem fairly typical, the form *marginata* occurring frequently, and the form *thyrsides* occasionally. From June onwards the specimens are mostly referable to var. æst. *lyllus*. It is, however, often very difficult to decide to what form any particular example is to be referred, as it frequently combines the characters of two, or even of three, forms.

529. *Polyommatus bœticus*, Linn. Maltese name, *farfett ikhal*; Italian, *azzurrina*. — Not uncommon from March onwards. I have generally taken it in the wieds in company with *L. icarus*. Mr. Caruana-Gatto notes its especial preference for flowers of *Duranta plumerii* and *Phaseolus caracalla*.

589. *Lycæna astrarche*, Bergst.—Common throughout the whole of the warm season. Freshly-emerged specimens are met with at the beginning of March, in May, and at the end of September. Maltese examples are large. Mathew states that they are typical, but here I must disagree. Those taken from March to May are referable to gen. vern. merid. *ornata*, Stdgr., whilst specimens emerging from June onwards fall under gen. æst. merid. *calida*, Bell.

604. *L. icarus*, Rott.—Abundant from the beginning of March until the autumn. Freshly-emerged specimens are found from the beginning of March to the middle of April, and again from the middle of May until the middle of June; I do not know of any autumn brood. Spring (March to May) specimens are fairly typical, although the blue of the male is generally of a more brilliant hue than in North European examples, and in the female the blue markings are very restricted. The aberration *melanotoxa* is not uncommon. The form *celina*, Aust.,

occurs in the vernal broods of the male as an occasional aberration, but all the summer (June onwards) examples are referable to this form. Substituting the name *rufina*, Oberth., for *celina*, the same remarks apply to the female also, and (at least in the case of these Maltese specimens) it seems to me that we have two names for the two sexes of the same emergence, and that they should both be united under the name *celina*.

512. *Chrysophanus* (*Polyommatus*) *phlæas*, Linn. — Abundant, and occurs throughout the year, though of course only occasional examples are to be met with in the winter months. Early spring specimens are typical, but the hind wings beneath are generally greyer than in the North European form. Those found from May onwards are referable to gen. æst. *eleus*, Fb.

45. *Pieris brassicæ*, Linn. Maltese name, *farfett tal cromb;* Italian, *grande cavolaia*.—Abundant all over the island. The larvæ infest the cabbage-fields and do great damage, so that the country-people, before cutting the plants, find it necessary to examine them several times one by one. Occasional specimens are to be seen on the wing on warm days throughout the three winter months, but the first week in March is the usual time of emergence of the spring brood. A second brood appears in May, a third in July, and probably a fourth in September. Mathew states that "the females of the early autumn brood have the tip of their anterior wings broadly black, and the black spots are much larger than in those of the earlier broods." All my specimens are quite normal, and exhibit no seasonal variation.

48. *P. rapæ*, Linn. Maltese name, *farfett tal cromb zghair;* Italian, *rapaiuola*.— Abundant throughout the year. The first brood emerges in the middle of February, the second in the middle of May; there is a third in July, and a fourth (perhaps partial) in September and October. Specimens of the first brood are similar to our English spring examples (var. *metra*, Steph.), and those of the May brood are the same as our own August specimens (*rapæ*, Linn.). But Maltese specimens taken in July and August have very dark tips to the wings (var. *messanensis*, Zell.), and some of the females of the autumnal brood are of a deep olive-yellow.

57. *Pontia* (*Pieris*) *daplidice*, Linn.—Common in uncultivated places from March to November.

113. *Eurymus* (*Colias*) *croceus*, Fourcroy (*E. edusa*, Auct.). Maltese name, *zolfina*. — Common throughout the year. Freshly-emerged specimens are to be found in March and April, and again in June. Vars. *helice*, Hb., and *helicina*, Oberth., occasionally occur with the type; as also do var. *minor*, Costa, and ab. fem. *obsoleta*, Tutt.

124. *Colias* (*Rhodocera*, *Gonepteryx*) *rhamni*, Linn. — "Prof. Gulia says that this species is common in gardens, together with *R. cleopatra;* on the contrary, it is very rare, and I have only seen it in the collection of Mr. Briffa, who took it in spring-time in the Hastings' garden in Valletta, and he saw another flying over the terrace on March 16th; and on the same day another of the same species was seen near Pembroke Camp by Mr. Phillip (*sic!*) de la Garde" (Alfred Caruana-Gatto in Medn. Naturalist, vol. i. p. 87). "Of the seventeen butterflies known to inhabit Malta . . . . between March and May . . . . I have seen *Gon. rhamni* . . . . leaving unaccounted for *G. cleopatra*"

(P. de la Garde, *l. c.* p. 133). These records are the only information I possess regarding the occurrence of *rhamni* in Malta. It is not a species at all likely to occur, and I strongly suspect an error in determination.

125. *C. cleopatra*, Linn. — Scarce, and confined for the most part to the gardens and valleys of the western side of the island. Mr. Mathew observed the females ovipositing on a stunted thorny buckthorn in February and March. Mina-Palumbo and Failla-Tedaldi (Mat. per la Fauna lepidott. della Sicilia, p. 25) state that "nelle nostre contradə, Madonie, questa specie ha tre apparizioni; la prima in gennaio, la seconda in giugno e luglio, la terza in sett. et ott. . . . . Le diverse generazioni non offrono notevoli differenze." Arguing from analogy, this species should also be triple-brooded in Malta, but there is not sufficient evidence to show whether this is the case. I have only once met with it, on June 14th, 1902, when the specimens, all males, seemed freshly emerged. Caruana-Gatto records a specimen taken in June. Mr. Mathew—who gives (*in litt.*) dates captured or noted:—Feb. 27th, 1897; March 22nd, 1897; March 18th to May 30th, 1898; June 25th, 1892; and July 10th, 1897—considers that there is only one brood, the specimens emerging in June, hybernating, and ovipositing in the spring.

4. *Achivus* (*Papilio*) *machaon*, Linn. Maltese name, *farfett tal feigel;* Italian, *macaone.*—Fairly common between the middle of March and the middle of November. There appears to be a succession of broods, and it is usually most plentiful in April and September. The larvæ are to be found upon fennel, which grows commonly about the island. The later emergences seem to tend more and more to var. *sphyrus*, Hb., to which the majority of the specimens on the wing in the late summer may probably be referred.

735. *Agrius* (*Sphinx*) *convolvuli*, Linn.—Mr. Caruana-Gatto says: "This moth is never a rare species here, but I have been struck by the great numbers I have seen in September and October in all places where there were *Pancratii* in flower" (Medn. Nat. vol. ii. p. 287; Dec. 1st, 1892). I have only once met with this species in Malta, and that was on May 26th, 1902. It appears, therefore, to be double-brooded.

749. *Hyles* (*Chærocampa*) *euphorbiæ*, Linn.—The moth is common in May, and the larvæ are abundant during the autumn.

752. *Phryxus* (*Deilephila*) *livornica*, Esp.—Not uncommon in May. I have seen it hovering over flowers in the Argotti Gardens just before sunset.

753. *Hippotion* (*Chærocampa*) *celerio*, Linn. — Scarce. I have one specimen, taken on Nov. 26th, 1902. Mr. Caruana-Gatto records one on October 11th, 1892, and three others taken about the same time (Medn. Nat. vol. ii. p. 287); and Mr. J. C. Sciortino records another taken at light in August, 1892 (*l. c.* p. 330).

768. *Sesia* (*Macroglossum*) *stellatarum*, Linn. — Abundant throughout the year. Fresh broods appear in May and October, the latter surviving until about the end of March, and constantly appearing on the wing throughout the winter.

970. *Lasiocampa quercus*, Linn. — Mr. De la Garde records both type and var. *sicula;* the latter emerged in July. I have only met

with the species in the larval state, when it was feeding on ivy at Boschetto. Mr. Mathew also (*in litt.*) notes its occurrence at the same locality.

976. *Pachygastria trifolii*, Esp.—Larvæ are abundant in the spring, spinning up about the first week in April. The moth occurs in the late summer and autumn. Mathew notes a specimen (taken on October 26th) as probably referable to var. *iberica*, Gn.

1152. *Agrotis* (*Triphæna*) *pronuba*, Linn.—Not common. Occurs in April and May.

1345. *A. puta*, Hb.—Common at light in October, 1903.

1399. *A. ypsilon*, Rott. (*suffusa*, Hb.).—One specimen on Corradino Hill, February 24th, 1902. Mr. Mathew also took one.

1400. *A. segetum*, Schiff.—Probably common throughout the summer. June 5th and October 22nd, 1902.

1401. *A. trux*, Hb. — One specimen; June 13th, 1902. It seems referable to var. *terranea* Frr.

1402. *A. saucia*, Hb.—One specimen; March, 1897 (Mathew).

1405. *A. crassa*, Hb.—One specimen; to light; October 10th, 1903.

1477. *Mamestra trifolii*, Rott. — One specimen; Argotti Gardens; October 3rd, 1903.

1599. *Bryophila muralis*, Forst.—Larvæ common on lichen-covered walls, the moths appearing in July and August. Cittia Vecchia (Mathew); Argetto Gardens.

1600. *B. perla*. — Previously recorded from Malta in error, the specimens being referable to the preceding species.

1610. *Diloba cæruleocephala*, Linn. — The larvæ are abundant on fruit-trees in spring, and pupate about the first week in April. The moth does not appear to have been noticed at large. My bred specimens emerged in December, and only then when the pupæ were damped, so it seems probable that in its natural state the imago does not emerge before the autumn rains. This extended pupal period, if my theory be correct, precludes oviposition from taking place until the end of the year, when the fruit-trees are again coming into leaf, thus insuring a provision of pabulum for the young larvæ on emergence.

1664. *Hadena solieri*, Bdv. — Common in November. Comes to light freely.

1787. *Polia canescens*, Dup. (*xanthomista*, Hb., var.; *nigrocincta*, Tr. (Mathew)).—The larvæ occur in December and January on various flowers, especially those of a sweet-smelling narcissus. The moth appears in October (Mathew).

2181. *Calocampa exoleta*, Linn.—The larvæ are common in spring, especially on *Oxalis*, and pupate in March. The moth appears in July.

2327. *Heliothis armigera*, Hb.—Generally common from March onwards; but this species seems to be one whose abundance is very intermittent. In some years it is common, even abundant; in other years scarcely one is to be seen.

2380, *Acontia luctuosa*, Esp.—Common from April to June, and again in October.

2428. *Thalpochares ostrina*, Hb.—Common in March and June. As a general rule, March specimens seem referable to var. *æstiralis*, Gn., and June examples to var. *carthami*, H.S.; but intermediate forms occur.

(To be continued.)

NOTES AND OBSERVATIONS.

Peronea hastiana from Surrey and the Lancashire Coast. — Towards the end of August last I collected some two dozen larvæ of *P. hastiana* in the Ockham district, and from these fifteen moths were reared in October. The specimens are mostly reddish brown or blackish brown in colour. One of them has a broad whitish streak on costal area (*divisana*, Steph.); another is a modification of *leucopheana*, Bent.; a third is referable to *autumnana*, Steph., but it has the black discal streak of *leucopheana;* whilst a fourth example is *centrovittana*, Steph., with a black longitudinal discal streak as in *leucopheana*, thus combining the characters of the two forms. The more variegated forms, such as *coronana*, were not represented, except by two examples which perhaps are more correctly to be referred to typical *hastiana* as figured by Clerck. Possibly, if a larger number of larvæ had been secured, a more extended range of variation would have been obtained. From a number of larvæ of *P. hastiana*, estimated at about five hundred by Mr. Baxter, who kindly collected them for me on the Lancashire coast, I have reared two hundred and sixty moths. The bulk of these, as regards the fore wings, are black or fuliginous; some with obscure markings, but mostly unicolorous. Of the named forms there are twenty *mayrana*, about a dozen *centrovittana*, three *divisana*, two *leucopheana*, and one *combustana*. A few specimens are modifications of the typical form (*hastiana*), but there is no example of var. *coronana*, and only one or two are referable to var. *autumnana*. A few specimens are leaden-grey, with darker but ill-defined markings, a form of the species I had not met with before.—Richard South; 96, Drakefield Road, Upper Tooting, S.W.

On "Assembling" in Lasiocampa quercus.—I bred *L. quercus* in some numbers this season, from eggs deposited by a female in 1903, and made a number of experiments in assembling in the garden, the results of which appear below. The females usually emerged between noon and 3 p.m., and in each case were exposed in a large leno cage in the middle of the lawn, so that there was a clear space of over fifty feet all round. It was a pretty sight to see a male pick up the line of scent, which he did instantly if released dead to leeward, otherwise he would fly across wind until he found the line.

July 12th, exposed four females bred on 11th, and (in another cage) three females bred on 12th; released seven males, all of which returned to the females bred on 11th, although the others were sometimes placed just to leeward, and in their line of flight. 13th, exposed one female bred on 11th, and two bred on 13th; released four males, all of which returned to females bred on 13th. 15th, exposed nine females bred same day, and assembled three wild males; three females were left until they died, for the purpose of the following experiments. 16th, assembled six males. 17th, no wild males assembled, but some bred ones, when released, all returned to above nine females, after some delay, though they appeared to be not so strongly attracted, and would often fly away again after a few minutes; they declined to assemble to two females bred on 17th. 18th, four males assembled.

19th, one male attracted. 20th, none seen, but I was away for part of the day. 21st, one male attracted. 22nd, four males assembled. 23rd, one male attracted; after this date none were seen, and the females were all dead by the 29th.

The conclusions I arrive at from above are, that the attractiveness of the female reaches its zenith on the day after emergence, and lasts in some degree for a week afterwards. The experiments of July 13th and 17th are apparently contradictory; I can only assume that the single female on the first date was not "calling"; this possibility I minimised later on by using several females.—A. U. Battley; Kingsfield, Herne Bay.

National Collection of British Lepidoptera.—Mr. Louis B. Prout has recently contributed six specimens of *Tephroclystis* (*Eupithecia*) *jasioneata* reared by him from larvæ obtained in North Devonshire. It may be noted here that the Museum series of several British species in this section are sadly in need of improvement, and this is more particularly the case with the following:—*T. campanulata*, *T. munitata*, *T. trisignaria*, *T. constrictata*, *T. subciliata*, *T. pusillata*, *T. exiguata*, *T. irriguata*, *T. insignata* (= *consignata*), *T. fraxinata*, *T. helveticaria*, *Chloroclystis coronata*, *C. rectangulata*, and *C. debiliata*. Scotch and North English forms of *T. satyrata*, *T. sobrinata*, *T. nanata*, and *Gymnoscelis pumilata*, would be exceedingly useful. Fresh Southern specimens of *T. venosata* are also desirable.

Description of a Variety of the Larva of Calocampa vetusta.—On the night of June 11th last, I was surprised at taking a female *Calocampa* at sugar, but she was in such bad condition I could not distinguish which of the species it was. Both occur here, *vetusta* being rather the more common of the two. She was kept in a chip-box, and in the course of a week deposited about three dozen eggs. These hatched on June 24th, and the larvæ fed up very rapidly on knot-grass, and by July 24th were all full-grown, and were as fine and healthy-looking lot of larvæ as I have ever seen. But they puzzled me exceedingly, for they in no way resembled the figures of either species as represented in Buckler's plates. However, on Sept. 29th, the first moth (a fine *vetusta*) emerged, and subsequently five others, three of them being cripples; and these were all I bred—rather a poor percentage out of thirty-one larvæ. The following is a description of the full-grown larva:—Head pinkish olive-green; second segment the same colour, with a dark transverse olive-green stripe across the anterior part; dorsal stripe conspicuous and pale lemon-yellow, or pinkish yellow; below the dorsal stripe comes a broad very dark, almost black, olive-green stripe, having a soft velvety appearance, and near the lower edge of this upon each segment are three conspicuous white dots arranged in an obtuse angle; this stripe is bordered below by a narrow lemon-yellow line, followed by a broad greenish olive stripe, which is gradually clouded towards its lower edge, where it becomes an intense dark olive-green, and in this the minute orange spiracles are seated; below the spiracles there is a broad lemon-yellow stripe; the under surface and claspers are pale olive-green. It is an

extremely beautiful larva.—Gervase F. Mathew; Dovercourt, Essex, Nov. 16th, 1904.

Pararge achine on the Mendel Pass.—I have read with much interest the note on *Pararge achine* (*ante*, p. 272). As Mr. Lowe surmises, I did not take the species in sufficient numbers to determine whether or not his description of a local race holds good in the case of those observed on the Mendel Pass by me and my friends this year. In fact, I brought home only two females, and have never come across the species elsewhere in my entomological rambles, though I know it is common enough in many parts of the Continent, and notably in the Forest of Fontainebleau. I have therefore no material to compare, and all I can say is that the two specimens in my cabinet correspond with Mr. Lowe's characterisation of his Mendel forms. Under the circumstances, I asked Mr. F. C. Lemann if he would be good enough to look over the series taken by him in the South Tyrol during this and other years, and he reports that undoubtedly most of these specimens have a much more interrupted band of white on the under side than those taken elsewhere. On the other hand, though they are extreme in this respect, there is one from Mendel, and another from the Uetliberg, which are intermediate, and appear to link the two extreme forms. He further remarks that it is curious that another specimen from the Uetliberg is the most distinctly marked with white of all in the series, though some from Sweden and the Rhone Valley run it hard. "As regards the size of the spots," he adds, "they vary in almost every case, but I have Swiss examples with spots quite as large as those from Mendel." I also requested Dr. H. C. Lang to examine his series, and he writes: "I have seventeen specimens of *Pararge achine* in the collection. The disposition of the white band is as follows:—I. 1. A broad white band continued from costa to anal angle, the eye spots being placed in it, *i. e.* surrounded on both sides throughout their entire length (loc., Podolia). II. 2, 3 (Amur); 4, 5, 6 (Switzerland); 7, 8 (Dresden). Broad white band *inside* row of eye-spots (outside only as far as third spot from costa), the three lower spots placed on a colour same as ground colour. III. 9, 10 (Berchtesgaten). White band much narrower; 11, 12, 13, 14 (Dresden), and IV. 15, 16, 17 (Dresden). White band reduced to merely a narrow wavy line not worth calling a band; in one specimen more yellowish than white. This is the result of my observations. I do not think there is much to indicate local races except in the specimen from Podolia. The two specimens from the Amur are remarkable on the upper surface for the size of the eye-spots, and for the distinctness and lightness of colour in the rings surrounding them (=*achinoides*, Butl., *eximia*, Stgr.)." The evidence I have collected, therefore, seems to suggest that the peculiarities noted by Mr. Lowe in his Mendel series are not necessarily constant or distinctive of this particular locality, — H. Rowland-Brown; Harrow Weald, Nov. 17th, 1904.

CAPTURES AND FIELD REPORTS.

Vanessa antiopa in the Isle of Wight.—On Sept. 27th a beautiful specimen of *V. antiopa* swiftly passed me. It was flying along the road at Quarr Abbey, near Ryde, but as I was without my net it escaped capture. I believe that the appearance of this species in the island is an extremely rare event.—H. P. Tarrant; Well Street, Ryde, Oct. 7th, 1904.

Larvæ from Honeysuckle.—Last spring, by beating honeysuckle (*Lonicera periclymenum*) by night, I obtained the following larvæ:—*Triphæna fimbria*, *T. comes*, *T. ianthina*, *Noctua festiva*, *N. triangulum*, *Aplecta nebulosa*, *Mania typica*, *Crocallis elinguaria*, *Pericallia syringaria*, *Boarmia repandata*, *B. rhomboidaria*, *Cidaria truncata*, *Cerostoma nemorella*, *C. xylostella*, and over thirty *Epunda lichenea*. Is not this a hitherto unrecorded food-plant for the last-mentioned species?—E. D. Morgan; 8, Luscombe Terrace, Dawlish, Devon, Nov. 5th, 1904.

Colias edusa and Dasycampa rubiginea in Devon.—I saw six or eight examples of *C. edusa* in this district last August, but they were mostly in a chipped condition. On Nov. 1st I obtained a fine specimen of *D. rubiginea* at ivy bloom.—E. D. Morgan; 8, Luscombe Terrace, Dawlish, Nov. 5th, 1904.

Sphinx convolvuli in Wales.—On Aug. 23rd last a fine male specimen of *S. convolvuli*, in splendid condition, was brought to me by a friend.—Richard Garratt; 2, Victoria Square, Penarth.

Smerinthus populi in August.—On Aug. 13th a little lady friend of mine brought in a fine male specimen of *S. populi*, apparently just emerged.—Richard Garratt; 2, Victoria Square, Penarth.

Coleoptera reared from Decayed Wood.—In the autumn of 1903 I placed in a muslin bag, in a greenhouse, a piece of decayed elm, and from it I obtained *Omalium pygmæum* which I had not seen before; also three examples of *Cistela ater*, with other common species. From dead branches of broom I have reared *Læmophlæus ater* and *Dryophilus anoboides*, and from Scotch fir, *Cryphalus abietis*. I am indebted to Mr. Newbery for confirmation of above.—Alfred Beaumont; The Cottage, Gosfield, Halstead, Essex, Oct. 24th.

Colias edusa in November.—On Nov. 5th a fine male of this species was noticed at Littlehampton, Sussex. Is not this rather late for this species? Of the various works I have consulted, Newman alone gives November.—T. B. Trend; 1, Grosvenor Square, Southampton, Nov. 13th, 1904.

Colias edusa in November.—Yesterday I had brought to me by the six-year-old son of Mr. Moore, of Palmer's Green, N., a specimen of *C. edusa*, which he had captured in Broomfield Park, Palmer's Green. I believe it to be a male, and it seemed in perfect condition, although rather spoilt by the lad throwing his cap on it and bringing it home in his hands.—L. E. Dunster; 62, Lascotts Road, Bowes Park, N., Nov. 13th, 1904.

Orobena straminalis in Surrey.—Referring to note in the November number about this species, it may be of interest to mention that I took two specimens last year in Surrey. The first was on July 5th, at Fetcham, and was quite fresh; but I could not find any more in the same spot. The second example was taken on Aug. 2nd, in a field near Ranmore, but was very worn.—E. C. Goulton; Stanmore House, Benhill Street, Sutton, Surrey.

Butterflies taken in the North of France.—The following short notes were made during a ten days' stay in the North of France this summer. The little country town of Guines, between Boulogne and Calais, surrounded on one side by the Forests of Leek and Guines, on the other by open heathy country, where in former days Henry VIII. of England met the French King with so much magnificence that it is still known as the "Field of the Cloth of Gold," is as good a place for an entomologist to spend a week or two at, as perhaps may be found anywhere. It was my good fortune to be able to stay ten days this summer, during the middle of August, in this district, and I have seldom had a more enjoyable or interesting time, as, besides entomology, there is a great deal to interest the ornithologist or botanist; while the quaint French villages and picturesque country afford many subjects for an artist. The forests of Guines, Leek, and Boulogne, all more or less join one another, and cover a very large tract of land; they are divided by the straight French Government roads, and intersected with paths, clearings where the trees have been cut down, and open grassy glades, carpeted, when I was there, with flowers of great variety—in fact, an ideal place for the "butterfly man." During June, July, and August, one may, with no great difficulty, get fifty out of the sixty-five species of British butterflies. At the Forêt de Boulogne *Apatura iris* was very common, holding the undoubted sovereignty which he well deserves; on Aug. 20th they were just out, and in magnificent condition. The female is of not nearly so aspiring a disposition as the male; she was generally to be seen flying near the sallows; however, her flight is fairly powerful, and passing quickly over the tops of the undergrowth, she is soon lost sight of. This species was common in all the forests, but the Boulogne one appeared to be its headquarters; in point of numbers, though, it was hopelessly beaten by *Limenitis sibylla*, which literally swarmed in every suitable glade or ride of the forest; in fact, *sibylla* was much the most plentiful butterfly on the wing during the middle of August, excepting such common species as *Aphantopus* (*Epinephele*) *hyperanthus*, and *Epinephele tithonus* (of course I am talking now of the forest butterflies). *L. sibylla* varied a good deal in size, all those I took in the Forêt de Guines being considerably larger than those caught in the Forêt de Boulogne. Five species of "fritillaries" were common; *Argynnis paphia*, in beautiful fresh condition, including three specimens of var. *valesina*, was most plentiful. *A. adippe* (generally much worn, however), *A. aglaia* (barring three specimens, I only found this species at the Leek Forest); and the two small species, *A. selene* and *A. euphrosyne* were also common enough. *A. latonia* may be taken sparingly on the common land round Guines, and, I am told, occasionally in some numbers near the coast, but I have never found it

anything but a scarce butterfly in North France. The "hair-streaks" were a very well-represented family in all the forests. *Thecla quercus* was the commonest. *T. w-album* and *T. pruni* were both fairly plentiful; *T. betulæ* was rare. I was fortunate in taking *Lycæna acis*, a single specimen only, in fair condition, between Guines and the forest, in a pit at the corner of a field, which was a sort of kaléidoscope of butterflies, such a variety and crowd were there; *Melanargia galatea*, *Colias edusa*, three species of *Lycæna*, Hesperids; also four species of *Vanessa*. *Papilio machaon* may be taken earlier in the year; *Aporia cratægi* was scarce this summer, and although I did not see a specimen of *Vanessa antiopa*, I heard of certainly two being taken by a French collector at Boulogne.

One morning, on the cliff, I observed a vast flight or cloud of *Pieris brassicæ*, steadily flying in a northerly direction, along the side of the cliff; there must have been many hundreds of them, all going in the same direction, as if following the coast. I cannot account for this at all; it was a bright hot day, with hardly any wind. I was particularly interested in the protective colouration exhibited on the under sides of *Satyrus semele*, which was extremely common everywhere, and varied in response to its environment. In chalky places the marbling of dark and pale brown on the under side of the hind wings is very much mottled with white, giving the appearance of whitish weather-stained chalk; on the sandhills the specimens were of a rich buff colour; while on the heath-land this portion of the wings was always dark, and so nearly agreeing with the rock or earth on which it settles, that so long as it remains with wings closed it is almost impossible to detect it.

A great number of larvæ of *Dicranura vinula* were to be found on every poplar-tree in the neighbourhood of Wimereux; each tree had five or six of these caterpillars on it, some nearly full-fed, others quite small; though I had often found larvæ of this particular moth before, I certainly had never seen them in such profusion as these were; I took sixty larvæ off a small poplar-hedge alone, and could have obtained three times the quantity if I had been so disposed. — Gerard H. Gurney; Keswick Hall, Norfolk, Oct. 9th, 1904.

A Week on the Norfolk Broads.—On the evening of July 30th we arrived at Wroxham and boarded our wherry, 'The Caistor Maid.' A small rowing-boat carried the entomological apparatus—a sheet with the necessary poles, and twelve five-foot posts, on which were nailed pieces of cork, in imitation of Baily's well-known row in Wicken Fen. The day had been fine and sunny, but in the evening it clouded over, and we had heavy rain from the south-west. The journey and the rain prevented an energetic evening, and we contented ourselves with putting up a few posts close to our anchorage, some few hundred yards below Wroxham and at the edge of the fens. To our dismay we found that sugar was as unattractive here as in other places this year. Not a single insect came on this favourable night. My friend Mr. J. H. Wybrants, however, netted two *Toxocampa pastinum*, and a few common wainscots, *Epione apiciaria* and *Cidaria testata*, were captured flying round the boat.

Next day we sailed to Irestead Staithe, close by the entrance to

Barton Broad. The day was fine and sunny, and the wind south-east, a combination which favoured us for the rest of the week. We noted a very large number of *Pieris brassicæ* and *P. rapæ*, flying over the fens on either side of the river, and at Irestead Staithe were greeted with the first *Vanessa io* of the season.

Near the Staithe, and overlooking the large fens bordering Barton Broad, we put up the sheet, a motor-bicycle lamp during duty for the more classical paraffin lighthouse. The night was warm, clear, and with little dew. At dusk we both netted one *Nonagria brevilinea*. But, alas, even an imposing row of posts, and the best of treacle and rum would not tempt our usual friends. The total seen or taken were only *Leucania impura* (2), *Calamia phragmitidis* (2), *Xylophasia monoglypha* (1), *Apamea didyma* (1), *Mania typica* (2), *M. maura* (2), and one *Gonoptera libatrix*. On the sedge-flowers we found three *Apamea leucostigma* (*fibrosa*) and one *N. brevilinea*, together with a few *L. impura*, *L. pallens*, and *C. phragmitidis*. Light was just as bad, for only one *Odonestis potatoria*, one *N. brevilinea*, and a few common wainscots, came to the sheet. Next night we were in a poor locality and did not go out. On Aug. 2nd, however, we reached Potter-Heigham, and in the evening erected the sheet and posts overlooking the south edge of Whitesea Broad. After a fine hot day we had a clear cool night and a fair dew. The first insect boxed off the posts was *Nonagria neurica*, but this proved to be the only gem of the evening. The total at the posts were *C. phragmitidis* (2), *X. monoglypha* (2), *A. leucostigma* (1), *Chareas graminis* (1), and one *Amphipyra tragopogonis*. Nothing came to light except *Phibalapteryx vittata* and *Chilo phragmitellus*. On Aug. 3rd we had two expeditions to the Norfolk coast. The first was *via* Summerton, including a sail in the dingy for about four miles, and a two and a half mile walk to Winterton-on-Sea. On the coast we saw the lyme-grass, and resolved to return in the evening, for was it not the time for *Tapinostola elymi?*

So, after an "all-night tea," my friend and I cast off in our rowing-boat. This time we went by Whitesea Broad and Horsey Mere, for the staithe at the latter is only about a mile and a half from the coast. We started off with the sheet, five poles, innumerable boxes, and a bag full of impedimenta. The sun had nearly set as we reached the marshy land behind the sandhills, when, to our horror, we found them securely barricaded with a barbed-wire fence, our path blocked by a locked gate, and two keepers waiting our approach. Eventually we were allowed to go on, but only on the condition that we walked straight to the sandhills, and thence northwards out of this preserved property. So we had two more miles against time, and in loose sand. No time now to look for the precious lyme-grass, and we were content to erect the sheet at the edge of the forbidden land. Luckily there were a few plants of ragwort, and these, together with some twisted marram grass, were duly sugared. The night was very warm, with a stiff south breeze, and quite clear. Insects were, however, scarce. Nothing came to light except one *Odonestis potatoria*. On the sugared ragwort the only insects of any note were four *Leucania littoralis* and an immense female *Cossus ligniperda*. After the first two rounds we could find nothing fresh, and as the unsugared ragworts were absolutely unproductive, we made off for home, this time along a road to

the staithe. The five-mile row by moonlight across the meres was splendid, and enlivened by the furious approach of two gamekeepers, who took us for poachers.

Thursday, Aug. 4th, was the record hot day of the year. In the evening we anchored at the edge of Ranworth Fen. Here, indeed, we were on famous ground. Sugar was, however an absolute failure, no doubt on account of the aphide-laden sallow and alder bushes. No insects were seen at honey-dew. At dusk we netted some *Cœnobia rufa*, one *Tapinostola fulva*, and also three *N. brevilinea*. Light was better. Five *N. brevilinea* settled on the sheet, but had to be carefully netted, as they would fly off at the least alarm. With several *Lithosia lurideola*, *L. griseola*, *Arctia caia*, *O. potatoria*, *C. phragmitidis*, *E. apiciaria*, *P. vitatta*, *C. testata*, and *C. phragmitellus* things became quite lively. After eleven, however, it turned cold, and with a heavy dew falling no more insects appeared, and so our last night on the Broads came to an end.—G. Lissant Cox; Ellacot, Birkenhead, Oct. 26th.

SOCIETIES.

Entomological Society of London.—*Wednesday, October 19th*, 1904. Professor E. B. Poulton, M.A., D.Sc., F.R.S., President, in the chair. Mr. Henry H. Brown of the Procurator-Fiscal's Office, and of Castletower, Cupar, Fife, N.B.; Mr. George Eckford, of 3, Crescent Avenue, Plymouth; and Mr. W. Vaughan, of Denton Dene, Ealing, were elected Fellows of the Society.—Dr. T. A. Chapman exhibited a series of *Lozopera deaurana*, Peyr., bred last spring at Hyères, a species regarded as lost, or mythical, until he rediscovered it three years ago at Ile Ste. Marguerite, Cannes; and, on behalf of Mr. Hugh Main, a specimen of *Pieris brassicæ*, the wings of which had been symmetrically injured, probably by the girdle when in the pupal stage.—Mr. G. C. Champion, specimens of *Nothorrhina muricata*, Dalm., from Las Navas, Spain, found trapped in the earthenware cups used to collect the exuding resin on the trunks of pines.—Mr. H. St. J. Donisthorpe, specimens of the rare beetle, *Cis bilamellatus*, Wood, taken at Shirley on October 10th last.—Mr. W. J. Lucas, a female specimen of the rare dragonfly, *Agrion armatum*.—Mr. W. J. Kaye, five specimens of *Dianthœcia luteago* var. *ficklini*, from Bude, North Cornwall, taken during the first week of July, 1901, and remarked that, while the typical *D. luteago* of the Continent was tolerably constant, wherever it occurred in Britain it assumed a special local form.—Professor E. B. Poulton, F.R.S., a number of specimens of the genus *Sphecodes*, five species in all, and of their mimetic fly, a Tachinid, illustrating his remarks on Mr. Edward Saunders's paper on the Aculeate Hymenoptera from the Balearic Islands and Spain, recently published in the 'Transactions.'—Mr. G. A. J. Rothney sent for exhibition a series of the Indian ant, *Myrmicaria fodiens*, Jerdon, from a colony established in the big banyan-tree in Barrackpore Park thirty-two years; and *Monomorium salomonis*, Linn., and *Solenopsis geminata*, Fab., 1895, successfully encouraged in Madras godowns as a protection against white ants (termites).—Mr. E. E. Green exhibited a spider from Ceylon mimetic of some Coccinellid

beetle, at present unidentified.—Col. J. W. Yerbury, specimens, and read notes upon the deer-gadflies taken by him this year in Scotland.

Wednesday, November 2nd, 1904.—Professor E. B. Poulton, M.A., D.S.C., F.R.S., President, in the chair.—Mr. E. A. Agar, of Domenica, British West Indies; Mr. R. S. Bagnall, of Winlaton-on-Tyne, Durham; Mr. K. G. Blair, of 23, West Hill, Highgate, N.; Mr. E. A. Cockayne, B.A., of 30, Bedford Court Mansions, W.C.; Dr. G. B. Longstaff, D.M., of Twitchen, Mortehoe, R.S.O., Devon; Mr. R. A. R. Priske, of 66, Chaucer Road, Acton; and Mr. H. W. Simmonds, of 17, Aurora Terrace, Wellington, New Zealand, were elected Fellows of the Society.—Mr. J. E. Collin exhibited a specimen of *Platyphora lubbocki*, Verr., a species of Phoridæ parasitic upon ants, from Stokes Wood, Hereford. No specimen has been recorded since the one originally bred by the present Lord Avebury in 1875, and described for him by Mr. G. H. Verrall in the 'Journal of the Linnean Society' for 1877. Mr. P. J. Barraud exhibited an aberrant *Epinephele jurtina* (*janira*) male, taken by him this year in the New Forest, agreeing with the form described by Mr. Roger Verity in the 'Entomologist,' vol. xxxvii. p. 56, as ab. *anommata*.—Mr. J. Edwards sent for exhibition three specimens of *Bagous lutosus*, Gyll., one found by himself on Wretham Heath, Norfolk, on August 4th, 1900—the first authentic British example—and two taken in the same locality by Mr. Thouless, on May 22nd, 1903; also *Bagous glabrirostris*, Herbst., from Camber, Sussex, for comparison.—Dr. T. A. Chapman exhibited bred specimens of *Hastula* (*Epagoge*, Hb.?) *hyerana*, Mill., from larvæ taken at Hyères last March, and said the facts that the pale frons only have hitherto been known, whereas of those bred nearly half are dark, suggest either that really very few specimens are in collections—which is the most probable case—or that melanism is now affecting the species. The larvæ are not uncommon at Hyères. Before he bred the species this year a single dark specimen only was known, *viz.* one taken by Lord Walsingham at Gibraltar, which he named *marginata*, and he was in doubt whether it was a var. of *hyerana*, or a new species.—Mr. W. J. Kaye, specimens of the moths *Castnia fonscolombei* and *Protambulyx ganascus*, showing the warning and protective coloration of these species.—Mr. H. W. Andrews, specimens of *Eristalis cryptarum*, F., and *Didea alneti*, Fln., two species of uncommon Syrphidæ from the New Forest. Mr. Edward Harris, a brood of *Hemerophila abruptaria* bred by him this season, together with the parent male and female; the female, a dark specimen, was taken in his garden at Upper Clapton, on May 25th, and the male, a normal type, at Ilford, on May 26th. Of the offspring, eighteen in all, eight were females, of which four were dark specimens and of normal size. Of the ten males five were dark specimens, darker than the females, but small even for males. They were smaller than the light specimens of the same brood. One of the light male specimens emerged with only three wings, the left fore wing being absent.—Mr. Gervase F. Mathew, R.N., a case containing some beautiful and interesting examples of *Leucania favicolor*, Barrett, including the varieties described by Barrett in the current volume of the 'Entomologist's Monthly Magazine,' p. 61, and, more recently, by Tutt, in the 'Entomologist's Record' for this year; also a fine series of twenty-four *Camptogramma fluviata*, the descendants of a wild pair

captured on September 22nd, 1903, showing a considerable range of variation. — The President, a photograph taken by Mr. A. H. Hamm, to illustrate protective selection of flowers by *Pieris rapæ*. He also exhibited four specimens of *Conorrhinus megistus*, Burm., the large South American Reduviid, which is well known to attack man, brought back by W. J. Burchell in the year 1828.—H. Rowland Brown, *Hon. Secretary*.

South London Entomological and Natural History Society.—*September 8th*, 1904.—Mr. E. Step, F.L.S., Vice-President, in the chair. Mr. Edwards exhibited a series of the Danaine butterfly, *Tirumala hamata*, from Samoa, and pointed out the secondary sexual characters of the male.—Mr. H. Moore, a specimen of *Stenopteryx hirundinis*, the curious dipterous parasite of the swallow.—Mr. Lucas, a photograph of "Brusher" Mills, of New Forest fame; coloured drawing of varieties of Lepidoptera, including a male of *Gonepteryx rhamni*, extremely like *G. cleopatra* in having the large bright yellow cloud on the fore wings.—Mr. Fremlin, bred specimens of *Hemaris fuciformis*, some still retaining the deciduous scales, of which he placed a few under the microscope, and pointed out the very weak pedicles of the individual scales.—Mr. Manger, on behalf of Mr. Pearson, several species of butterflies from the Swiss Alps, including *Polyommatus hylas*, *P. eros*, *Cœnonympha arcania*, *Satyrus cordula*, *Brenthis amathusia*, &c.—Mr. West, of Greenwich, developed and undeveloped forms of the Hemiptera, *Orthostira parvula* and *Ceratocombus coleoptratus* from Oxshott.—Mr. Turner, on behalf of Mr. Tutt, a few species of butterflies from Cairo, sent by Mr. Groves, including a fine example of *Danais chrysippus*, *Anthocharis belemnia* var. *glauce*, and *A. belia*.—Several members reported taking or seeing *Agrius convolvuli*.

September 22nd, 1904.—Mr. H. Main, B.Sc., Vice-President, in the chair.—Mr. Ernest Joy, of Stoke Newington, was elected a member.—Mr. Moore exhibited a living specimen of the mole cricket (*Gryllus campestris*), found outside his house in Lower Road, Deptford, no doubt attracted by the neighbouring electric light; a number of species taken at Theydon during the Society's field-meeting on Sept. 10th, including series of the Diptera, *Helophilus pendulus* and *Sericomyia borealis*; and from Tasmania a series of the beautiful metallic-coloured Coleopteron *Lamprina aurata*, showing its polymorphism as well as its sexual dimorphism.—Mr. Harrison and Mr. Main, series of *Carsia paludata*, taken at Simonswood Moss, July, 1904, and a bred series of *Cirrhœdia xerampelina*, from Llangollen larvæ.—Mr. Edwards, series of males and females of *Gonepteryx rhamni* and *G. cleopatra*, to illustrate their distinctions.—Mr. Tutt said that he felt quite sure, from observation of their habits, that the two were distinct species.—Mr. G. T. Porritt, a male specimen of the dragonfly *Æschna isosceles*, one of a series taken this year in the Norfolk Broads; also a specimen of *Orthetrum cancellatum*, from the same place.—Mr. Lucas, male and female specimens of the local grasshopper, *Gomphocerus rufus*, from Bookham Common, and said it was easily recognized by its white-tipped clubbed antennæ.—Mr. Turner, specimens of the larvæ of *Phorodesma smaragdaria* from the Essex marshes.—Mr. Dodds, an example of *Locusta viridissima*, from Felixstowe.—Mr. West, three out

of the five British species of *Chætocnema*; these were *C. subcærulea*, *C. hortensis*, and *C. confusa*, from Wisley.

Oct. 13*th.*—Mr. Hugh Main, B. Sc., Vice-President, in the chair.—Mr. Lucas exhibited two species of *Ascalaphus*, taken by Dr. Chapman this year; *A. coccajus* in South France in May, and *A. longicornis* in Spain in July; also living males and females of *Apterygida media* (*albipennis*) from its old locality. He pointed out the specific characters of this rare earwig. — Mr. Moore, several large species of *Cicada* from Tasmania. — Mr. Turner, imagines and cases of the local coleophorid *C. vibicella*, from Trench Wood, where it was now very rare; a life-history of *C. laricella*, showing the peculiar structure and position of the cases at various ages of the larva. — Mr. Joy, a bred series of *Polyommatus bellargus* from Folkestone, and gave notes on their history. They were small, and the larvæ were shy feeders, but were not cannibals.—Mr. Carr, the cocoon of *Lasiocampa quercus*, previously shown. Since no imago had emerged, he had opened it and found a crippled imago, a batch of ova, and a distorted pupa, all dead. Dr. Chapman said the imago probably could not bring its power to force open the cocoon.—Mr. West (Greenwich), four species of grasshopper from Box Hill, *Stenobothrus parallelus*, *S. elegans*, *Gomphocerus rufus*, and *G. maculatus*.—Mr. Goulton, lantern-slides of the larva of *Gonepteryx rhamni*, in various positions during the act of pupating. — Mr. West (Streatham), lantern-slides of various corals. — Mr. Lucas, lantern-slides showing among other objects (1) larva and details of the ladybird *Halyzia ocellata*; (2) Lepidoptera at rest.

Oct. 27*th.* — Mr. E. Step, F.L.S., Vice-President, in the chair. — Mr. Goulton exhibited a series of photographs of lepidopterous larvæ on their respective food-plants. — Mr. Harrison and Mr. Main, series or examples of Lepidoptera captured at, or bred from, Bude, including *Cleora lichenaria*, *Dianthœcia luteago* var. *ficklini*, *D. conspersa*, *Leucophasia sinapis*, *Polia xanthomista*, and *Boarmia gemmaria*. Of the last species examples from Delamere and London were also shown. — Mr. West (Greenwich), the case of a large species of psychid from South Africa. — Mr. Turner reported finding larvæ and cases of *Coleophora virgaureæ* on golden-rod at Sevenoaks, Kent, as well as larvæ of *Eupithecia expallidata*.

Nov. 10*th.* — Mr. E. Step in the chair. — Mr. Fremlin exhibited ordinary and loosely attached scales of *Hemaris fuciformis* under the microscope. — Mr. Harrison and Mr. Main, series of *Dianthœcia albimacula* from Folkestone; *Cymatophora duplaris*, including two melanic specimens from Simonswood Moss, Lancashire; and a form of *Melanargia galathea* with a black streak running through the large white basal areas of the fore wings. — Mr. Main, some large reduviids from West Africa. — A special meeting was then held to consider the proposed alteration of the Bye-Laws.—Hy. J. Turner, *Hon. Report Sec.*

Lancashire and Cheshire Entomological Society.—The opening meeting of the winter session was held in the Royal Institution, Liverpool, on Monday, October 17th, 1904, and took the form of a joint exhibitional meeting with the Manchester Entomological Society. In the unavoidable absence of the President, S. J. Capper, Esq., F.E.S., Mr. R. Tait, Jun., Vice-President, presided over a large attendance of

members. On the chair being taken, Mr. Rd. Wilding, Vice-President, extended a very cordial welcome to the visiting society, and expressed the hope that the gathering of the two societies would become an annual occurrence. Dr. W. E. Hoyle, M.A., D.Sc., President of the Manchester Society, in replying, heartily endorsed Mr. Wilding's suggestion. — A communication was read from Mr. Rd. Hancock, Handsworth, suggesting that a cabinet of entomological micro-slides should be formed. It was unanimously resolved to adopt the suggestion, and to accept with thanks the valuable series of fifty slides accompanying his letter, to serve as a nucleus of the collection.—It was announced that the next meeting would be held in the Grosvenor Museum, Chester, on November 21st.—This concluding the business, refreshments were served, after which the following amongst other exhibits were examined:—*Agrotis ashworthii*, *A. agathina*, including some beautiful red forms, and *Epunda lichenea*—all bred from Welsh larvæ; *Aplecta advena*, *Mamestra anceps*, *Xylophasia hepatica*, *Thecla pruni*, *Phorodesma bajularia*, &c., from Monkswood, Hunts, by Mr. R. Tait, Jun. Bred series of *Agrotis ashworthii*, *A. lucernea*, *Epunda lichenea*, and *Boarmia repandata* from larvæ taken during the spring in North Wales; bred series of *Odontopera bidentata* ab. *nigra* from Manchester larvæ; variable bred series of *Hypsipetes elutata* (sallow form) from Windermere, &c., by Mr. B. H. Crabtree. *Melanargia galatea* from Northants and Dartmoor, and *Cidaria testata* from Epping and Dartmoor, &c., arranged to show the unusual size of the Dartmoor insects; the blue form of *Polyommatus ægon* from Painton, by Mr. H. R. Sweeting, M.A. *Noctua castanea* and the var. *neglecta* bred from Warrington larvæ, *Agrotis agathina* from Delamere larvæ, *Mamestra abjecta*, and *Cryptoblabes bistriga*, a pyralid moth which has only been recorded five times from Lancashire and Cheshire, by Mr. J. Collins. Series of *Acidalia contiguaria* and *Larentia cæsiata* from North Wales, *Tæniocampa opima* from Wallasey, *Leucania putrescens* from South Devon, by Mr. C. F. Johnson. *Agrotis ashworthii*, *A. contiguaria*, and *Zygæna minos*—one black form and also intermediate ones—by Mr. Wm. Buckley. A long series of the rare coleopteron *Anisotoma dubia* from Crosby (1904), by Mr. R. Wilding. A series of the Central and South European earwig *Apterygida media* (*albipennis*, Meg.), of which our only former British record is by Westwood, captured near Faversham, and exhibited by Mr. A. J. Chitty; *Leucophæa surinamensis*, an exotic cockroach which has been found breeding amongst turfs at Fallowfield, Manchester, exhibited by the Secretary on behalf of Dr. Hoyle and Mr. J. Ray Hardy. *Panchlora virescens* and *Periplaneta americana*, captured at Leyland by, and exhibited on behalf of, Mr. J. R. Charnley, F.Z.S. *P. australasiæ* from Buxton, by Mr. J. Kidson Taylor. *Labidura riparia* from Branksome (Major Robertson), and Boscombe (Mr. J. R. le B. Tomlin), *Apterygida arachidis* from Bow, London (Mr. C. E. Bedwell), *Locusta viridissima* from Swanage (Mr. Tomlin), and Ilfracombe (Mr. W. A. Tyerman), and *Xiphidium dorsale* from the Isle of Sheppey (Mr. Tomlin), &c., were exhibited by Mr. Sopp, who also placed on view the series of very beautiful entomological micro-slides executed by Mr. Richard Hancock. — E. J. B. Sopp and J. R. le B. Tomlin, *Hon. Secs.*

RECENT LITERATURE.

Handbook to the Natural History of Cambridgeshire. Edited by J. E. Marr, Sc.D., F.R.S., and A. E. Shipley, M.A., F.R.S. Pp. i–viii and 1–260. Cambridge: University Press. 1904.

This exceedingly useful volume was published in August last, when the British Association held a meeting at Cambridge.

All lovers of nature will find much to interest them in whatever particular direction their studies may lie. For the entomologist there are chapters dealing with all Orders of the Insecta. This section of the work is edited by Mr. W. Farren, who is also responsible for the account of the Lepidoptera, in which we note that no less than sixty species of butterflies occur, or have been found, in Cambridgeshire. Complete lists of species occurring in the county are given in Orthoptera (Malcolm Burr), Neuroptera (Kenneth J. Morton), and Hemiptera (W. Farren). Only local and rare species, or those peculiar to fen-land, are mentioned in Coleoptera (Horace St. J. K. Donisthorpe), Lepidoptera (W. Farren), Diptera (J. P. Collins), and Hymenoptera (C. Morley).

There are two coloured maps—one botanical, the other geological.

Report of the Superintendent of the Government Laboratories in the Philippine Islands for the Year ended September 1st, 1903. Pp. 343–622 (from Fourth Annual Report of Philippine Commission), Bureau of Insular Affairs, War Department.

Among the contents, which mainly deal with the treatment of rinderpest and the history of gutta-percha, is a report by the entomologist, Mr. Charles S. Banks, on Insects of the Cacao. This occupies twenty-three pages, accompanied by upwards of fifty capital plates, and though primarily intended for the use of farmers, should be of much interest to the entomological student.

Annual Report and Transactions of the Manchester Microscopical Society for 1903. Pp. 110. With 6 Plates. Manchester: The Society, 1904.

Issued in July last, but pressure on our space has prevented earlier notice of this excellent little publication. The contents in the way of papers, &c., appeal perhaps to the microscopist chiefly; but those of our readers who are interested in Araneidea, will find the paper on "Spiders," by A. E. Thomson, worth perusal. In his Presidential Address, Prof. Sydney J. Hickson discourses on "Variations." He states: "Many instances are known of the change in the colour of butterflies and moths effected by a change in food." Only one case, however, is quoted; this is a statement by Koch, "that when caterpillars of the common tiger-moth are fed from their hatching to their metamorphosis with leaves of lettuce or deadly nightshade, not one of the imagines produced resembles the original form; when the insects have been fed on lettuce, the white ground-colour of the wings predominates; when fed on deadly nightshade, the brown markings of the upper wings often coalesce, and the white vanishes; in like manner the blue markings on the lower wings fuse together and displace the orange-yellow ground-colour."

Erratum.—P. 284, lines 21, 32, 33, for *Lampides tilicanus* read *Lampides telicanus*.

THE

ENTOMOLOGIST

An Illustrated Journal

OF

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EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.
W. LUCAS DISTANT, F.E.S., &c.
EDWARD A. FITCH, F.L.S., F.E.S.
F. W. FROHAWK, F.E.S.
MARTIN JACOBY, F.E.S.
W. F. KIRBY, F.L.S., F.E.S.
G. W. KIRKALDY, F.E.S.
W. J. LUCAS, B.A., F.E.S.
Dr. D. SHARP, F.R.S., F.E.S., &c.
G. H. VERRALL, F.E.S.

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

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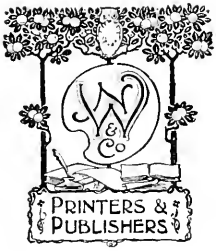
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DIPTERA.

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LEPIDOPTERA.

NEUROPTERA.

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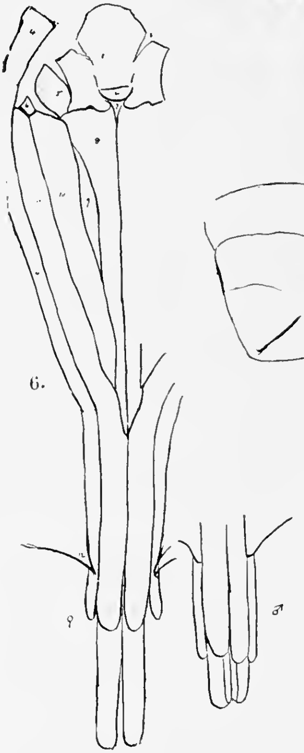

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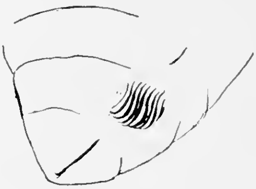

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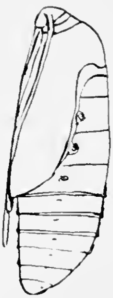

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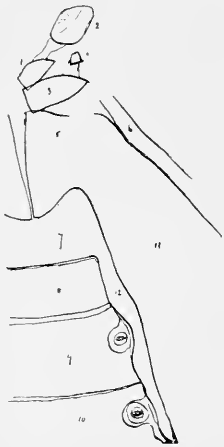

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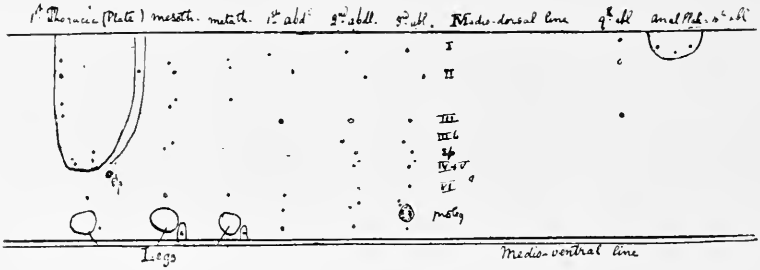

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THE ENTOMOLOGIST

VOL. XXXVIII.] JANUARY, 1905. [No. 500.

THE EARLIER STAGES OF *CATACLYSTA LEMNATA*, L.

BY T. A. CHAPMAN, M.D.

(PLATE I.)

ON June 4th, 1904, being at Bookham with the South London Entomological Society, I observed *C. lemnata* in some abundance, and remembering that it was the only one of the Hydrocampas (except *Acentropus*) with whose early stages I had no acquaintance, I took home a supply of moths, with a view to obtaining eggs.

Curiously enough, I found, on looking into the matter, that all the other species had been well reported on by various authors, but I could find nothing better about *lemnata* than that by Buckler, who tells us nothing of its history earlier than Nov. 10th, when it is beginning to think of hybernation.

The way in which *lemnata* lays her eggs interested me perhaps as much as anything in its history. It lays them under water, and that surface of the egg which in the case of nearly all Lepidoptera is exposed to the air, is in that of *C. lemnata* bathed in water. This fact has never been recorded of *C. lemnata*, but it has been, I think, of all the other Hydrocampas; *A. niveus* (female) appears to go under water to do so, but the others apparently only submerge their ovipositors. The curious fact that all these eggs are truly aquatic is one that I had never clearly understood, probably because attention has not been called to it in records; for example, Buckler (E.M.M. xiv. p. 97) records how Mr. W. E. Jeffrey got *H. stagnata*, Don., to lay eggs, which he found placed in little batches on the under side of floating pieces of *Sparganium*. Not being pointedly told that the eggs are in the water and wetted by it, one reads the fact along with the accounts, which are much more abundant, of how

the *larvæ*, though under water, keep themselves surrounded by air, and supposes the eggs are afforded some similar method of aeration.

Ritsema, in stating how *Acentropus* lays her eggs, says they are under water, but does not say they are wet, which nevertheless they doubtless are.

My notes say that the moths, taken June 4th at Bookham, were kept in a glass, with various leaves and some *Lemna*, with water at the bottom. Eggs are found June 6th, laid in two different manners. In the one case they are laid on leaves of *Lemna triculea*, and are wholly submerged—one surface of the egg attached to the leaf, the other free in the water. These eggs are laid close together, but not overlapping—generally several together, and in one case covering the whole surface of a leaf—reaching the number of twenty-three. The other method of laying affected about a score of eggs, and the eggs were in batches of about three, and in one case six, together. These floated freely on the surface of the water, the lower surface being in the water and wet, the upper above water and dry. This upper surface was coated with a pavement of the scales of the moth, laid over the whole of each batch in one uniform direction, the stalks of attachment in one direction, the serrated margins in, of course, the opposite; but all parallel, and apparently close together or overlapping. When the eggs did not seem quite in the same direction, the scales were nevertheless so, and seemed to be what held the eggs of each group together, and also what kept the upper surface dry, the scales not apparently being capable of getting wet.

The eggs are very flat, almost scale-like, of oval outline, about 0·75 mm. long and 0·56 across. The contents yellowish, and in some cases already showing structure, there being a notch at one side in the yellow mass, from which a groove appeared to nearly cut off a central circular portion.

June 15th.—Larvæ very nearly fully developed; a tortuous tube is visible, no doubt the tracheal trunk of side nearest observer.

16th, 11 a.m.—The larvæ (and eggs) are now very conspicuous, owing to the head and prothoracic plate, which occupy so large a part of the top of the egg, being black; the clypeus is paler, and the jaws, which stand forward prominently, are brown. The eggs look thicker and more rounded, as if by imbibition of water, but this may be merely a perspective effect of the change of colour. No measurement seems available.

June 16th, 5 p.m.—Some larvæ found hatching, and some have already done a good deal in the way of clothing themselves. Their heads, including the clypeus, are now very black. They creep out of the eggs in the ordinary way, and walk off along the leaf on which the egg is laid; in doing so they are in the

water, are quite wet, and seem quite at home. They cut out irregular portions of leaf of *L. trisulca*, and get between the loose bit of leaf and the remaining portion. So far there is nothing that can be called a case, *i.e.* a movable case, and no larva is yet in a tube, or anything of that sort, but is between two flat surfaces, or sometimes three. One larva under *L. minor* had cut up the short radicle into three or four pieces rather more than his own length, and had fastened them together irregularly. All the larvæ that had done anything, and some that had not, had already green matter in the alimentary canal, and it seems certain that portions of plant are cut off by eating the material along the dividing line.

9 p.m.—One of the floating eggs has hatched, and the larva has reached a bit of duckweed; his procedure was not observed, but he did not come out on top; so that the clothed face of the egg is the face of attachment, not the free one, as in such ova as *cæruleocephala*, *lanestris*, &c.

There can be little doubt that the eggs are attached to the duckweed by the same face as that covered by the scales in the floating ones. One face of the egg is in the water, the other attached to something. The eggs on the duckweed could no doubt obtain a supply of oxygen from the green plant, the floating eggs from the air, but I incline to think that in both cases breathing takes place by the wet surface, which is the exposed active surface in all other similar eggs; and were it not so, eggs laid, as must frequently occur, on bits of floating dead vegetation, whether bits of wood or dead *Lemna*, would be unable to respire. I wondered a good deal about the floating eggs. How were they laid, and how were they coated with scales? I came to the conclusion that they must be laid by the moth on her own body, and in some way detached, as she has no apparatus for coating eggs with scales. No doubt laying the eggs under water on leaves of *Lemna* is the usual and proper way of laying the eggs. Were the floating eggs the result of some accident by which the moth laid the eggs on herself, or on another moth (there were several in the jar)? Against this supposition is the fact that the eggs got detached from the surface of the moth, suggesting that it was a normal process, and still more especially that the eggs thus laid, under a layer of scales floating on the water, got on in every respect as well as those on the *Lemna*.

June 17th, 8 a.m.—All the floating eggs have hatched, and the young larvæ are on the bits of duckweed, against which they floated. Two have eaten so far into leaves of *L. minor*, that they can be distinguished from the upper side through the thinned centre of the leaf.

The larvæ in their shelters are still in the water; they have

not surrounded themselves by an air-cavity in a case, or any such arrangement. Two larvæ are found mining in the middle of the thick parenchyma of leaves of *L. polyrhiza*, without any indication that they are not completely wetted by water and sap.

June 16th.—In handling the newly-hatched larvæ, to place them separately, and in positions in which their proceedings may be observed, it is seen that the larvæ are completely wet, but when brought out of the water they become largely dry, but immediately get wet on being placed in the water again. The amount of protection and the manner of it seems not very different from that of the upper surfaces of the leaves of *Lemna* (except *trisulca*). When submerged these became quite wet, but, reaching the surface, the water leaves them, as though they were slightly greasy, and in a way to force the leaves to the surface in a proper position, as soon as one bit reaches the surface. The under side, on the other hand, is always wet, and carries a layer of water with it when taken out. Neither the *Lemna* nor the larva carries with it a coating or layer of air, as is the device of many surfaces that repel water. At the same time a floating larva creeps away under a leaf without any obvious effort, whilst some force is necessary to submerge an upper surface of *Lemna* leaf; so that, though the water-repulsion of both seems of much the same character, it is weaker in the case of the larva.

June 18th.—Larvæ all in cases, of all sorts of sizes and shapes; sometimes all the pieces are cut off, and the cases are portable; sometimes one side is the under surface of a large leaf of *Lemna*, and the case is a fixture. The pieces are of irregular shape, roughly triangular, &c., often as broad as long, so that no sort of larva-shaped case results. These irregular shaped pieces are also of various sizes, down to small corners of leaves, often sections of rootlets, &c. It is in fact somewhat erroneous to call them cases; they are really shelters, manufactured as rapidly as possible from the available materials. The little larvæ also appear to eat freely.

19th.—Examined several cases, and found that they contained no air—that the larva lived bathed in the surrounding fluid; the simplest way to verify this was found to be to open the case under water, when no air at all was found.

22nd.—Several cases examined; the larvæ were found to be in their second stages, and the cases now contained air. The head is pale, with a faint dusky tinting; the prothoracic plate is large and very black, anal plate not tinted, and looks as if of same texture as rest of larva. The larva is full 2 mm. long, rather thick, large head, of fairly uniform thickness throughout (0·3 mm.). The hairs are now (comparatively) much shorter (II=0·08 mm.); they are one to each tubercle, which are now

large oval convex scuta, with the hair central (about 0·04 mm. in diameter); I is about half the length of II; IV, V have a common scutum, posterior hair higher; VI, single hair, and 3 at base of proleg. On thorax 1 and 2, I, II, III and IV (?) have each two hairs.

In preparing a skin, the silk gland was broken against the glass, and the contents almost immediately afterwards were found to have glued the specimen to the glass, although under water.

June 27th.—Opened two cases; found the larvæ of two different ages, one (in second skin?) pale and distended, and nearly as large as the other (in third skin), with larger head, looking collapsed and nearly black; when stretched out it was very much paler; length about 3 mm.

July 2nd.—Two larvæ have gone much ahead of the others, and are very large, possibly in last skin, certainly in penultimate.

Left a number of larvæ in a multitude of glasses on *July 4th*. They were soon reported to be very voracious. Just before *July 12th and 13th* had fastened themselves to sides of glasses, and were supposed to be pupating, but they cut themselves free, and were therefore supposed to have been moulting; they were now in need of much fresh duckweed, as they were very voracious. They then pupated without calling any special attention to the procedure, and on July 22nd two moths emerged. On the 25th seven came out, and many had emerged since 22nd. On 27th all appeared to have emerged. On Aug. 10th, however, another appeared, and on 12th there were found to be still three larvæ feeding. Whether these were laggards, or intruders introduced small with the relays of duckweed, must remain in doubt; one was preserved, one emerged (a male) Sept. 1st, and one was then still feeding. This one was still alive in November, and apparently hybernating.

The cocoon is of much denser (very white) silk than the larva-case, though made within it (or of it), and on the emergence of the moth seems almost at once to lose its water-resisting property.

My larvæ were clearly double-brooded, but, as they were kept indoors, and in (comparatively) small glass vessels exposed to the sun whenever it shone through the window, this part of my experience cannot safely be extended as applying to the insect in its native ponds.

(To be continued.)

NOTES ON THE WAVE MOTHS (GENUS *ACIDALIA*, Auct.)*

By Louis B. Prout, F.E.S.

In the above title I have retained the name "*Acidalia*," to which the moths of which I want to speak have been so generally referred; but there are two objections to it, and I am only using it as a recognizable appellation, not as a tenable genus. In the first place, most modern authors consider it "preoccupied" by *Acidalia*, Hb. Verz., p. 31, and it is just possible that was really published before *Acidalia*, Tr. And in the second place, even if the Geometrid genus (*Acidalia*, Tr.) has really the prior claim to the name, its true type should evidently be *brumata*, Linn., according to the diagnoses of Schiffermüller (Fam. K.) and Treitschke.

The so-called genus "*Acidalia*" is somewhat nearly related to the subfamily which is generally considered typical of the entire superfamily Geometrides, namely the subfamily Geometrinæ, or "emerald moths." The name of "wave moths," given by our old English writers, is due to the pattern of the wings, which is of a tolerably uniform type almost throughout them, consisting of a succession of waved dark lines traversing both pairs of wings, though a few species modify the pattern, *e. g.*, by blotches, especially behind the outer line. Unfortunately, however, this is a rather general—probably primitive—type of marking in the Geometrides, and the terribly superficial classifications of our entomological forefathers, being based upon mere wing-markings, suffered in consequence. Thus Hübner (Verz. bek. Schmett. pp. 308–12, circ. 1825), the first to attempt any elaborate subdivisions, created one stirps for practically the whole of the wave-marked species, giving the stirps, for no very obvious reason, the name of *Sphecodes*—"wasp-like"; he diagnoses it thus: "Body very slender, wings ample, that without markings, these marked with waved lines"—a fair sample of the classificatory characters which satisfied the old lepidopterists. As may be imagined, the genera in this stirps or family were sometimes decidedly mixed as to their contents; thus, *Leptomeris* comprised *exanthemata* and some true Acidaliids, *Asthena*, *candidata*, *luteata*, and some true Acidaliids, and so on. This is neither better nor worse than our vernacular, in which *exanthemata* is the "dingy white wave," *candidata* the "small white wave," and so on. Even so recently as 1857 the French systematist, Guenée, retained the genus *Asthena* (*candidata*, &c.) in his Acidalidæ, and considered that his Caberidæ (*exanthemata*, &c.) also had considerable affinity with them. But his views

* Read before the North London Natural History Society, November 22nd, 1904.

were already a little "behind the times" even when he wrote; for his German contemporaries, Speyer, Herrich-Schaeffer, and Lederer, had for some years been investigating classification upon more of an anatomical basis—leg-structure and neuration in particular—and had published much which showed that the genera in question belonged to three very distinct groups, and this seems fully borne out by studies of the early stages. *Asthena* belongs to the Larentiidæ (commonly called "carpet moths") rather than to the "waves," while *Cabera* has the essential characteristics of the great family Boarmiidæ, including true *Boarmia* (the "oak beauties," &c.), the Fidoniinæ ("heath" moths, &c.), and many others. These, therefore, lie quite outside the range of the Acidaliæ, and I shall dismiss them from consideration.

I have just said that Guenée—whose work has constantly to be referred to because it is the basis of Doubleday's and South's arrangements, so largely used by British workers—that Guenée wrongly includes *candidata*, &c. (Asthenininæ) in his family Acidaliidæ, and a glance at South's List will show you that the elimination of these reduces the family by six—four species of *Asthena*, *Eupisteria obliterata*, and *Venusia cambrica*. But it so happens that, by way of compensation, six species which Guenée placed in a different family immediately before Acidaliidæ, namely, his Ephyridæ, have certainly to be incorporated therein. No one can have noticed the ova or the imaginal characters of *Zonosoma* (*Ephyra*), without seeing how near they come to the "Waves," and even the highly specialized, butterfly-like pupa has clear affinities with the pupa of "*Acidalia*." Probably, however, that compact little group can still stand as a subfamily, Ephyrinæ, leaving us to deal with the *typical* subfamily Acidaliinæ (Sterrhinæ) or "Waves" proper. By an absurdly antiquated arrangement, all of these which are represented in Britain, with the single exceptions of the "blood-vein moth" (*Timandra*) and —in some authors—the beautiful little *muricata* (*Hyria*), are still allowed to stand as one genus (*Acidalia*), not only in our British lists, but also in Staudinger and Rebel's recent 'Catalog' of the Palæarctic Lepidoptera. There is no doubt still much work to be done in investigating the closer affinities of one species with another, but the fact that they represent at least three distinct biological groups has been recognized by the best workers for fully half a century, and the genera which Herrich-Schaeffer formed from the anatomy of the imago are supported, so far as research has yet proceeded, by marked larval distinctions, and I believe by those of the egg also. Probably, however, even the three genera will prove inadequate when the larvæ have been more thoroughly worked through.

The only English text-book which has yet shown us these three main "genera" is Meyrick's 'Handbook of British Lepidoptera' (London, 1895). He calls the genera in question *Eois*,

Sterrha, and *Leptomeris*,* only *ochrata* going to *sterrha*. I shall speak more particularly of the two larger genera presently; of the early stages of his *Sterrha* I know practically nothing, excepting that the larvæ seem somewhat intermediate in form between those of the other groups, and that Mr. Tutt notes distinctive egg characters. In Buckler's 'Larvæ of British Butterflies and Moths' (vii. p. 82) is the astonishing italicized statement that "its (the larva of *S. ochrata*) ventral pair of legs is on the eleventh segment," which, in modern nomenclature, would be the seventh abdominal; if there is not some error of observation, this distinction would be of far more than generic value, but I confess that I can hardly credit the statement. I ought to mention here that Herrich-Schaeffer founded yet a fourth genus upon imaginal leg-structure for *A. fumata*, naming it *Pylarge*, and that Meyrick has accepted this in his 'Handbook'; but the larva seems, from all accounts, so near those of *immutata* and *remutata*, that I doubt whether it could not better have been allowed to rest in *Leptomeris*, as in Meyrick's 1892 'Classification' (Trans. Ent. Soc. Lond.).

A few other attempts to isolate aberrant species of "*Acidalia*" may be very briefly mentioned. *Immorata*, with its warmer and rougher scaling, tesselated fringes, and less characteristically "waved" pattern, was placed by Guenée in *Strenia*, along with *clathrata*; but this was entirely erroneous. *Emarginata*, on account of its peculiar shape, had a special genus, *Ania*, erected for it by Stephens long ago, and this is followed by Barrett in his new book, and will probably prove worth adopting. Barrett also ('Lep. Brit.' viii. p. 72) uses *Timandra* (wrongly, of course, as the name belongs to *amata*) for the species which have the hind wing angulated; they can probably for the present remain as a section of Meyrick's *Leptomeris*. *Rusticata*, being our only British wave with a "carpet band" (*i. e.*, darkened central band) originally got placed among the Carpets, and Stephens in his 1850 Catalogue maintained it as a separate genus under the name of *Cosmorhoë*, Hb.; Hübner himself ('Verzeichniss,' p. 326), had somewhat mixed contents for his *Cosmorhoë*, namely, *galiata*, *ocellata*, *rusticata*. The question of the exact position of this charming little species (*rusticata*) is a somewhat difficult one; but it has long been recognized, and is beyond the possibility of cavil that it is a true "*Acidalia*" in the broad sense in which I have used the term in the title of my paper this evening. Its larva is one of the stout and rugose ones with stiff, clubbed bristles, and would belong very well with *interjectaria*, &c., in *Ptychopoda* (=

* *Eois*, as Moore and Warren have pointed out, rightly belongs to *russearia*, Hb., and this genus should be called *Ptychopoda*, Steph. Meyrick's other names seem historically correct. Warren and Swinhoe have recently substituted *Emmiltis*, Hb., for *Leptomeris*, but Herrich-Schaeffer's prior restriction makes *pygmæaria*, Hb., the type of *Emmiltis*, which is hence a quite distinct genus.

Eois, Meyr.), in which genus, indeed, Meyrick places it. But his genus rests on imaginal characters alone, amongst the chief of which is, " posterior tibiæ in male . . . . without spurs " ; whereas those of *rusticata* most emphatically *have* the terminal spurs, and well developed. This circumstance has led Herrich-Schaeffer to place it in the genus which Meyrick calls *Sterrha*, along with *ochrata*, &c.

I am afraid I shall have wearied you already with these intricacies of the imaginal classification, but I thought it almost necessary to state how matters stood in that regard, in order to be able to compare one or two of the results arrived at with those obtainable from the earlier stages, which have been, in this group, too much neglected from the systematist's point of view, but which I am hoping to take in hand as opportunity offers; and concerning which I want to show that I have already made a commencement. To be sure, I cannot claim to have yet discovered anything novel, and the peculiar hair-structures of certain of the larvæ have been mentioned in a haphazard way by different writers, as have also the extreme differences in the relative length and thickness in various members of the group; but, so far as I am aware, no attempt at all has been made to correlate the imaginal genera with the larval. This, no doubt, arises from the fact that our genus-makers are chiefly museum-workers, who know nothing, and care less, about the earlier stages; for instance, the celebrated Dutch entomologist, Heer P. C. T. Snellen, who not so long ago remarked, very inaptly, that it seemed to him that the classifying of insects by any other than the perfect state was very much like classifying men and women by the shape of the cap which their grandmothers wore! Surely the nearest approach which can be made to a *perfect* classificatory system will be made by those who—like Mr. Tutt and his collaborators in his great work, ' British Lepidoptera '—endeavour to take due account of *all* stages, and *all* characters, of course with an adequate recognition of their probable relative antiquity and stability, and so forth, under the stress of the manifold operations of natural selection.

In speaking of the larvæ of " *Acidalia*," let me first mention some peculiarities of habit, &c., which are more or less distinctive of them, and which may readily attract the attention of even the casual observer. I do not quite know how best to arrange these scattered observations; but perhaps the following will satisfactorily cover the ground, *viz.*: *when* they are found; *where* they are found; *how* they feed; *how* they are protected. In one sense, at least so far as my own experience is concerned, the first two might almost be disposed of in single words—"*nowhen*" and " *nowhere*." During a period of some eighteen years as a more or less active field-lepidopterist, I have only on four occasions, to my recollection, found an " *Acidalia* " larva, and in each

instance by the purest "fluke." Many years ago I remember meeting with a full-grown caterpillar of the common "riband wave" (*Ptychopoda aversata*) crawling on a tree-trunk in Epping Forest, probably searching for a place in which to pupate. And thrice more recently, when prying about amongst a mixture of low-growing plants on rough broken ground, such as that around the "Limpet Run" at Sandown, I have happened upon a larva which has been successfully bred, the three species being *P. interjectaria*, *Leptomeris imitaria*, and *L. marginepunctata*. Yet all these four species, and several others in the genus, are really quite common—either everywhere, as in the case of *P. aversata*, or locally, as in that of the other three. Hence it is pretty clear that their small size and retiring habits—the latter including the fact that they all, or nearly all, feed upon insignificant growths close to the ground, shield them sufficiently from human observation; and were it not that the eggs are easy to obtain from a captured female, and the larvæ not hard to rear, we should probably know comparatively very little about their early stages. It is only right to add, however, that a few entomologists, such as Dr. Rössler, of Wiesbaden, seem to have been exceptionally gifted at finding obscure larvæ in their native haunts, and have given us records of the habits and habitat of quite a respectable number of the species.

If, however, I cannot say much about *when* the larvæ are "found," I can tell you definitely when they are, or theoretically should be, *findable*. And this is throughout ten or eleven months of the year—almost any time, excepting, say, June or July (when practically all the imagines are out). For this is a genus, or group, of clearly-defined habit as regards the general course of its life-cycle. I remember hearing my friend Mr. Bacot tentatively suggest a fixed hybernating stage as a possible generic character—*i.e.*, mark of close phylogenetic relationship — in certain cases amongst the Lepidoptera. Of course neither he nor I would overpress it; for it is well known that sometimes the very closest allies differ in this respect, so that it would even seem as though the physiological isolation which formed them into species were actually due to an initial divergence in the hybernating habit; *e.g.*, *Cidaria immanata* passes the winter as an egg, its twin brother *C. truncata* as a larva. But it is none the less true that several thoroughly natural groups have maintained complete uniformity, so that we find all the Acronyctæ, all the Dianthœciæ, &c., hybernating as pupæ, all the great genus *Agrotis* as larvæ, and so on. Now our '*Acidalia*' seem absolutely incapable of hybernating in any other state than that of caterpillar, and the apparent inflexibility of this rule in so large a group seems at least worthy of mention. I noticed that the Rev. G. H. Raynor commented on the fact in a recent number of the 'Entomologist's Record' (vol. xvi. p. 108); but, misled by

defective information in some of the books, he thought that *P. perochraria* afforded a possible exception. I find that Rössler, from whom the suggestion was supposed to emanate, gives no hint of anything exceptional in its hybernating period.

(To be continued.)

SOME TASMANIAN CASE-BEARING LEPIDOPTERA.

By Frank M. Littler, F.E.S., M.A.O.U.

(Concluded from vol. xxxvii. p. 315.)

Oecetictus ignobilis, Walk.

♂. 40 mm. Head, thorax, and abdomen brownish ochreous, face whitish, antennæ ochreous, legs fuscous. Fore wings elongate, moderate; costa nearly straight; termen oblique, semihyaline, minutely irrorated with fuscous scales, thicker towards base and along costa. Hind wings with termen rounded, slightly uneven; colour as in fore wings; some dull ochreous fuscous hairs towards base and along dorsum.

♀. 15–20 mm. Apterous. Cream-coloured, except for the head and thoracic segments, which are brownish; surface naked, except for slight pilose fringe of short yellowish hairs on the posterior segments.

What I have remarked about the female of *Clania lewinii* applies with equal force to this species. Therefore there is no necessity to repeat myself. This species is not so plentiful as the previous one; its case is formed in the same manner, but is longer and stouter. Personally, I have found it feeding on eucalyptus only. The habits of the male and female moths are precisely the same as those of *C. lewinii*.

On the mainland this species is commonly known as the "Lictor Case-Moth," because its case bears some resemblance to the fasces or bundles of rods borne by the lictors of old before the Roman magistrates.

Cebysa conflictella.

♂. 14–19 mm. Fore wings very deep brown, black in some lights, powdered with minute golden scales; along the costa are five orange-yellow spots at practically equal distances apart; the first spot is just inside the apical angle, and the fifth at the base of the wing; the fringes are likewise orange-yellow. Hind wings same colour as fore, but with more orange-yellow markings; discoidal cell orange-yellow, also apical angle, but this yellow spot is absent in some specimens; the inner margin has four orange-yellow spots; fringes orange-yellow. Under side same as upper. Body very dark brown, tufts on side of thorax pale yellow; under side of abdomen orange-yellow.

♀. 11–15 mm. Semi-apterous. Fore wings a beautiful shade of peacock-green; apical area orange-yellow, extending one-fourth; two

orange-yellow spots on costa; fringes yellow. Hind wings: apical half orange-yellow, basal half peacock-green, with a small orange-yellow spot on inner margin; fringes yellow. Body: upper and under sides peacock-green. Legs same colour. Body often projects 6 mm. beyond the hind wings.

This species is fairly common in parts. The males during February and March may often be seen hovering about fences, especially on any very warm day. They are very rapid and erratic flyers, somewhat difficult to capture. This last summer they were more numerous than usual. The females, on emerging, crawl on to a post or a bough, and are there impregnated by the males. They cannot fly in the least, but can run very fast, with a curious ant-like motion. When approached they immediately run round the post or bough, and hide in some crevice. Very few females are seen in proportion to the number of males; this is perhaps owing to their shyness. The posterior extremity is elongate, and the ovipositor is sheathed in long fuscous hairs. Eggs dull milky white, no sign of any markings even under high magnification, inclined to oval in shape. They are laid singly on or in close proximity to their food-plants, which consist of grasses and many species of garden-plants; also members of the acacia family. The larvæ are, as is usual with many species of case-moths, pale yellowish white, with the head and thoracic segments chitinous, and marked with black. The cases are 15 mm. long by 5 mm. broad, and are composed of silk incrusted on the outside with minute fragments of bark; no twigs are employed in their structure. They are flattened, being not more than 3–4 mm. deep. The under sides of fence-rails is a favourite locality for them, as are also the crevices in the bark of old acacia-trees. The larvæ reverse in the usual manner before emerging from the lower end.

Lepidoscia magnella, Walk.

♂. 25 mm. Head yellow, face fuscous; thorax, antennæ, legs, and abdomen dark fuscous; thorax yellow anteriorly. Fore wings elongate, moderate, dark fuscous, markings yellow; a diffused spot on inner margin; a moderate straight fascia from before middle of costa to before middle of inner margin; a triangular spot on costa at four-fifths; a smaller spot on inner margin before anal angle; a spot on termen below middle. Hind wings dark fuscous; basal third ochreous yellow.

♀. 12 mm. Apterous. Ochreous brown. Round the ovipositor is a dense tuft of hair, yellowish brown on surface, pale yellow at tips, 1·5 mm. long.

The cases of this species are often very plentiful in gardens, especially on apple-trees. They are both curious and interesting, being composed of seven, sometimes eight, segments, each formed by regular narrow strips of wood, 5 mm. long, laid on in a slight spiral. The cases are cylindrical, or rather cannon-shaped,

somewhat narrow, broadest at base, and gradually tapering to apex; up to 40 mm. in length, and 4 mm. at greatest breadth.

I have caught but one male moth; it was very weak on the wing. The others I have bred. The female is quite destitute of wings, and is a very sluggish crawler. She never strays far from her case, but remains an inconspicuous object on a bough of its food-plant until impregnated. Then an occurrence takes place which I am at present at a loss to thoroughly understand. On cutting open a number of cases, I have found eggs sprinkled in them from top to bottom. These eggs, on hatching, have proved to be those of this species. Does the moth, after impregnation, thrust the projecting pupa-case out of the way at the posterior aperture, crawl inside, lay her eggs among the silk lining of the case, crawl out again, and then die? Taking into consideration the behaviour of the female of *Clania lewinii*, such a thing is quite possible. On no occasion did I find the remains of a female in any of the cases.

At present I see no other explanation possible to account for the eggs getting inside the cases. They are round in shape, and of a yellow colour. The larvæ on first emerging are 1 mm. long, thorax and abdomen yellowish, and the head black. From actual observations I found that the first case is made exactly in the same manner as that of *C. lewinii* or *O. ignobilis*. The full-grown larvæ are 15 mm. long and 1·5 mm. broad; head and thoracic segments striped with reddish brown, abdomen yellowish white, legs dark brown. Their food-plants consist of a number of species of native trees, including the acacia and Casuarineæ. Sometimes they become very destructive in fruit-gardens by nibbling through the young shoots on apple-trees. The moths are to be found during February and March.

Xysmatodoma adelopsis, Meyr.

♂. 25 mm. Fore wings blackish brown, dusted with fine silvery scales; running from costa to inner margin are fine interrupted lines of black. Hind wings black, almost purple in some lights; fringes same colour. Head and thorax covered with moderately long silvery hair; abdomen brownish black.

♀. 35 mm. Fore wings blackish brown, well dusted with fine silvery scales; wavy black markings not so pronounced as in male. Hind wings dull blackish brown; fringes tinged with purple. Head grey and thorax black; abdomen blackish brown.

In some districts the cases of this species are rather plentiful on their favourite food-plant, acacia, especially *A. dealbata*, the silver-wattle.

Both male and female moths are heavy flyers, especially the latter. The cases are 24 mm. long and 5 mm. at the widest part, tapering off slightly towards the posterior extremity. They are composed of very fine grains of bark, tightly fastened to a

strong silken envelope. But rarely is a fragment of twig used. When about to emerge the pupa-case is thrust well out of the posterior aperture. The moths emerge in February and March.

Other interesting species I hope to deal with at some later date. My best thanks are due to Mr. Oswald Lower, F.E.S., of New South Wales, for very kindly running me out, from material supplied, the descriptions of *Clania lewinii* (male), and *Lepidoscia magnella* (male).

Launceston, Tasmania: August, 1904.

DESCRIPTIONS OF A NEW GENUS AND SOME NEW SPECIES OF EAST INDIAN HYMENOPTERA.

By P. Cameron.

(Concluded from vol. xxxvii. p. 310.)

CRABRONIDÆ.

Crabro elvinus, sp. nov.

Black; the scape of the antennæ, two-thirds of the pronotum, a small, transverse pyriform mark on the sides near the tegulæ, the greater part of the scutellum, its keels, a line on the post-scutellum, a line down the base of the mesopleuræ, an interrupted line on the base of the third abdominal segment, the front femora, tibiæ, and tarsi, the apical two-thirds of the middle femora, the apex of the hinder broadly —more broadly below than above—and the four hinder tibiæ, yellow. Wings fuscous, the stigma fulvous, the nervures darker. ♂. Length, 9 mm.

Hab. Himalayas.

Head with the front and vertex closely and distinctly punctured, the former more strongly than the latter; the lower part of the front in the centre smooth, shining, furrowed and covered with silvery pubescence and sparsely with long fuscous hairs. Face and clypeus densely covered with silvery pubescence. Mesonotum opaque, closely punctured and covered with long fuscous hair, as are also the scutellums. The metanotal area bears some curved striæ, and is bounded by a curved keel on the sides; the apical slope is deeply furrowed in the middle, and bears some curved transverse striæ. The furrow on the base of the mesopleuræ is wide and deep, and bears eight transverse keels; in front of the yellow line is a curved keel. Above the middle coxæ are four curved keels; there is an oblique keel above the hinder coxæ, and the metapleura is bounded at the apex by a curved keel. The basal segment of the abdomen becomes gradually wider towards the apex where its width is about two-thirds of the total length; the pygidium is bare, closely and distinctly punctured, and is hollowed in the middle; the epipygium is thickly covered with fuscous pubescence. The apex of the radius is rounded.

CRABRO LYSIAS, sp. nov.

Black; the scape of the antennæ, an interrupted line on the pronotum, and two large transverse marks on the second and fourth abdominal segments, yellow; the greater part of the front tibiæ, the middle at the base and apex, the hinder, except in the centre behind, and the basal joint of the hinder tarsi, yellow. Wings hyaline, the stigma fulvous, the nervures darker. ♀. Length, 9–10 mm.

Hab. Himalayas.

Clypeus thickly covered with dark silvery pubescence, and distinctly keeled in the centre. Mandibles punctured strongly, but not closely at the base; the apical teeth equal in size, large. Front and vertex closely, rugosely punctured, opaque, more shining along the lower inner orbits. Ocelli in a curve. Mesonotum opaque, closely rugose, a narrow furrow in the centre of the basal half; the punctures on the scutellum run into striæ at the apex. Metanotal area irregularly, closely longitudinally striated; a deep furrow in its centre; the furrow becomes wider towards the apex, and is united to the furrow on the apical slope, which is obscurely transversely striated. The upper part of the propleuræ obliquely striated; below, at the apex, are three stout, oblique keels. The upper part of the mesopleuræ is stoutly striated, the striæ curved; the lower part punctured, the punctures running into striæ; the basal furrow is wide. Metapleuræ obscurely striated. Tibiæ stoutly irregularly spined. The basal half of the pygidium bears large punctures; the apical is smooth, hollowed, narrowed, and keeled laterally; it is fringed with long golden hair.

Comes near *C. argentatus* and *C. bellus* in Bingham's arrangement.

CRABRO MENYLLUS, sp. nov.

Black; the scape of the antennæ, except for a brownish line above, an interrupted line on the pronotum and two transverse large marks on the base of the second abdominal segment, yellow. Wings hyaline, the nervures and stigma dark fuscous. ♀. Length, 7 mm.

Hab. Himalayas.

Front and vertex closely and distinctly punctured, the former more strongly than the latter, which is not furrowed, and is covered below with silvery pubescence. Ocelli in a curve. Clypeus not keeled or furrowed in the centre; thickly covered with silvery pubescence. Mandibles black, piceous towards the apex. Mesonotum closely and strongly punctured, and thickly covered with longish pale pubescence. Scutellum closely punctured, less strongly and obscurely striated at the apex; the extreme apex shining. Post-scutellum closely punctured, with a smooth space in the centre. Metanotum aciculated, the base closely striated, the striæ stronger and oblique on the sides; the apical slope aciculated and closely, but not strongly, obliquely striated. Mesopleuræ distinctly, but not very closely, punctured; the meta- closely, finely obliquely striated. Petiole as long as the second and third segments united; it becomes gradually wider towards the apex; the third and following segments are thickly covered with fulvous

pubescence. Legs normal; the fore tibiæ with a broad yellow band on the apical half.

This species, from the form of the petiole, is allied to *C. ardens* and *C. odontophorus*. The area on the metanotum is not bounded by a furrow; the furrow on its apical slope is wide and deep on the upper half.

CERCERIS FLAVOPLAGIATA, sp. nov.

Black; the upper part of the head, the mesonotum and scutellum red; the head and thorax largely marked with yellow, the vertex with four yellow marks in a transverse row; the abdomen black, the sides of the first segment, the base of the second broadly, its apex and that of the third, fourth, and fifth narrowly, the lines becoming gradually narrower, two marks, wider than long, on the base of the third segment, the edge of the pronotum behind, the middle of the propleuræ, a mark behind the tubercles, projecting narrowly upwards at the base, an irregular mark on the lower part of the mesopleuræ, the yellow turning into rufous below and two large oval marks on the apex of the metanotum, extending on to the metapleuræ, a mark on the sides of the scutellum and the post-scutellum, yellow. Wings hyaline. ♀. Length, 12 mm.

Hab. Himalayas.

Antennæ rufous, darker above, the scape lined with yellow below. Head: the lower half of the outer orbits, the inner broadly from shortly above the middle, a line extending from the ocelli to the base of the antennæ, dilated below and to a less extent above, the face, clypeus, and the mandibles, except at the apex, lemon-yellow; there is a black line commencing shortly behind the ocelli, where it is obliquely narrowed, extending down the sides of the central yellow line to the base of the clypeus. Occiput black below. Clypeus roundly convex, its apex almost transverse, rufous. The outer marks on the vertex are irregularly oval, the two central narrower, longer, and oblique. The whole head is closely and strongly punctured; the clypeus is less strongly and closely. Thorax punctured, but not strongly, the base of the pronotum shagreened. Metanotal area closely but not very strongly punctured, and more closely on the sides than in the centre. The metapleuræ at the base above with some stout, clearly separated striæ, the lower part and the centre finely, indistinctly striated. Four front legs rufous, mixed with yellow, the coxæ and the femora for the greater part above, black, the middle tarsi black above; the hinder coxæ black, with a yellow line in the centre above, the trochanters for the greater part yellow, the femora for the greater part black, their tibiæ broadly black, as are also the tarsi. Petiole stout, of nearly equal width throughout, fully one-third longer than wide. Pygidium longitudinally rugose, of almost equal width throughout; the epipygium with the apical two-thirds incised; the incision becoming gradually, but not much, widened towards the apex. The basal three ventral segments are largely marked with yellow.

In Bingham's arrangement this species would come in near *C. tristis* and *C. sulphurea*.

ANOPLINI.

Anoplius (Pompilus) orodes, sp. nov.

Black; densely pruinose; the apex of the hinder femora broadly and the hinder tibiæ red; the wings yellowish-hyaline, the apex from the end of the radius smoky; the third cubital cellule much narrowed above. ♀. Long. 13 mm.

Hab. Darjeeling.

Black; pruinose; the abdomen broadly banded with white pile; the apical third of the hinder femora and the hinder tibiæ red. Head very little developed behind the eyes; the occiput transverse. Eyes parallel, only very slightly converging above. Ocelli in a curve, the hinder separated from each other by a greater distance than they are from the eyes; there is a narrow furrow on the lower half of the front. Apex of clypeus transverse, its sides rounded. Thorax smooth, densely pruinose; the pronotum is as long as the head. Median segment large; the top flat; the apex with an oblique slope, its sides slightly dilated; the outer edges broadly, roundly dilated; below ending in a tooth. The first and third transverse cubital nervures are broadly, roundly curved; the second is straighter and more oblique; the fuscous apical cloud commences at the end of the radial cellule, and does not extend to the third transverse cubital nervure; the third cubital cellule is greatly narrowed above.

Comes near to *P. incognitus*, Cam., but is a larger and stouter insect; has the third cubital cellule not petiolate, the apex of the median segment not thickly covered with silvery matted pubescence, and the wings are not uniformly infuscated. It has the coloration of *P. pedestris*, but it wants the transverse furrow on the second ventral segment found in that species.

Obs.—*P. vischnu*, Cam., has nothing to do with *P. incognitus*, Cam., as Bingham suggests (Hym. of India, 157). It would be much better when an author, in a monographic work, cannot quote a species with certainty as a synonym, to give the original description in full. *Vischnu*, Cam., has the legs entirely black, and has not the hinder femora and tibiæ red, as in *incognitus*. It is related, as I have stated (Manr. Memoirs, 1891, 469), to *P. vivax*, Cam. So, too, on p. 169, *hero*, Cam., is doubtfully referred to *P. rothneyi*. There are considerable differences in coloration between them, and although the two might be sexes of one species, it would have been better, and have saved the student trouble, if the original description had been given in full, seeing that the identity of the two species was so doubtful.

A PRELIMINARY LIST OF THE LEPIDOPTERA OF MALTA.

By Thomas Bainbrigge Fletcher, R.N., F.E.S.

(Concluded from vol. xxxvii. p. 319.)

2429. *T. parva*, Hb.—Common; occurs in June and October, and probably throughout the summer. A specimen taken on October 6th, 1903, is ab. *rubefacta*, Mab.

2490. *Emmelia* (*Erotyla*) *trabealis*, Sc. (*sulphuralis*, Linn.).—Not common. Marsa; May 16th, 1901, and June 7th, 1902.

2557. *Plusia chalcytes*, Esp. One specimen; at light; October 11th, 1903.

2562. *P. gamma*, Linn.—Common from March onwards.

2583. *Metoptria monogramma*, Hb. — Common, but very local. Occurs in grassy places in the wieds in April and May. Birzebbugia (Mathew); Wied Kratal; Mnaidra.

2818. *Hypena obsitalis*, Hb.—Common in shady places and caves from May to October. The variation is very great.

2820. *H. lividalis*, Hb. — Not common. May 24th, 1902, and November 14th, 1903.

2897. *Enerostes indigenata*, Vill.—One specimen; October 11th, 1902,

2971. *Acidalia asellaria*, H.S.—"28th March, 1891" (de la Garde). I have a specimen, beaten from *carouba* May 24th, 1902, which I doubtfully refer to this species.

2983. *A. virgularia*, Hb.—"Male, pale form (var. *australis*, Zell.); May 1898 (is not this rather early for 'gen. æst.?'), Mathew's coll." (Prout, Entom. xxxvi. p. 204.)

3032. *A.* (*Idæa*) *filicata*, Hb.—One specimen; May 16th, 1901.

3143. *Rhodometra* (*Sterrha*) *sacraria*, Linn.—Common from April to October.

3220. *Anaitis plagiata*, Linn.—Common from February to October.

3340. *Larentia salicata*, Hb. *Venusia* sp. (de la Garde). Common in February and March. Maltese specimens rather incline to var. *ablutaria*, Bdv.

3344. *L. fluctuata*, Linn.—"Female, dated 3rd March, 1897; an extremely interesting aberration, the markings being all excessively weak, notwithstanding that the specimen is in immaculately perfect condition—Mathew's Coll." (Prout, Entom. xxxvi. p. 204.)

3481. *L.* (*Camptogramma*) *bilineata*, Linn.—Common in March and April. Boschetto, Zurrico, &c.; beaten out of ivy, &c. (Mathew).

3658. *Tephroclystia pumilata*, Hb.—Common; February to June. Maltese examples seem intermediate between the northern form and var. *tempestivata*, Z.

3948. *Gnophos variegata*, Dup.—Not uncommon in the early spring. This species is beautifully protected by its coloration when at rest on the rocky sides of the wieds.

4075. *Aspilates gilvaria*, Fb.—Mr. Mathew (*in litt.*) informs me of the occurrence of this species.

4077. *A. ochreata*, Rossi. (*citraria*, Hb.).—Common from March to May.

4168. *Phragmatobia fuliginosa*, Linn.—Not uncommon in March. I have found the larva in May, so there is probably another brood which emerges in the summer and oviposits in the early autumn. Maltese specimens seem to incline to var. *fervida*, Stdgr.

4203. *Arctica villica*, Linn.—One crushed larva upon a road near Zurrico (Mathew).

4238. *Cymbalophora* (*Euprepia*) *pudica*, Esp.—Common from July to October. The larvæ are common under stones, in waste places, from January to March; they feed by night on various kinds of grass.

4249. *Euprepia* (*Coscinia*) *striata*, Linn. (*grammica*, Linn.).—One specimen; July, 1897; valley leading down to Birzebbugia (Mathew).

4257. *Utetheisa* (*Deiopeia*) *pulchella*, Linn.—I never met with this species, which appears to be scarce as a rule, but intermittently abundant. There seem to be two (? three) broods, as dates noted are:—May 9th (de la Garde); beginning of August, 1892 (Caruana-Gatto); and October 25th, 1897 (Mathew). Mr. Caruana-Gatto gives us an interesting note on the spasmodic abundance of the species in 1892. He writes (Medn. Nat. vol. ii. p. 239, September, 1892):—"It is worthy of notice that this pretty moth has occurred in unusual abundance this year, and at the moment of writing (August 10th), and for a fortnight past, it has been the commonest moth to be seen on the wing. I do not remember, in fact, ever having had occasion to record such extraordinary numbers of any butterfly or moth. In the open country, and in fields, especially where the *Heliotropium europæum* (on which the *Deiopeia* feeds) grows, it is a most curious sight to see the innumerable quantities of this pretty species, fluttering here and there, looking like large animated snowflakes. Nor is it only by daylight that the moth appears, but also in the night it is found, attracted by the lights. Mr. R. Briffa, a friend of mine, and a gentleman greatly interested in our Lepidoptera, was telling me that at Sliena there were thousands of the species flitting about in every part of the gardens and fields. The same may be said of all other parts of the island, as I have seen the Marsa, Corradino, Notabilo, Attard, and many other places, teeming with this moth and its caterpillar."

"As to the cause of such an unusual frequence, I believe it is to be referred to the rains which fell during the late spring causing an overgrowth of the *Heliotropium*. The extra abundance of this plant . . . may therefore in a measure account . . . for the unusual numbers of this insect."

Psyche sp.—Larvæ are abundant during the spring, and feed on various kinds of grass. The moth appears in August.

4641. *Trypanus* (*Cossus*) *cossus*, Linn. (*ligniperda*, Fb.). — Mr. Mathew notes that he has often smelt the larva of this species. I cannot help thinking that it is of rather doubtful occurrence in Malta, and even then only as a casual importation in trees.

II. 257. *Ephestia calidella*, Gn.—One specimen. April 5th, 1902.

377. *Heterographis convexella*, Led. One specimen. June 14th, 1902.

401. *Oxybia transversella*, Dup.—Two; June 7th and 14th, 1902.

516. *Bradyrrhoa cantenerella*, Dup.—Fairly common at the end of May.

825. *Aglossa pinguinalis*, Linn.—"28th March," 1891 (de la Garde).

836. *Pyralis farinalis*, Linn.—Common from March to May; probably throughout the year.

927. *Duponchelia fovealis*, Zell.—One specimen; April 14th, 1902.

1039. *Nomophila noctuella*, Schiff. — Abundant throughout the year. The dates of capture of my specimens range from February 24th to June 7th; the variation, however, does not seem to depend on the season of emergence.

1058. *Phlyctænodes nudalis*, Hb.—One specimen; October 10th, 1903.

1151. *Pionea ferrugalis*, Hb.—Common from March to June. Specimens range from pale straw-colour to dark yellowish brown.

1274. *Cornifrons ulceratalis*, Ld.—"March (var.)."—De la Garde.

1291. *Noctuelia floralis*, Hb.—Common from June to September, flying in the sunshine over fields, and feeding on flowers of wild thyme.

1365. *Alucita tetradactyla*, Linn. —Common from April to June; Wied Kratal.

1387. *Pterophorus monodactylus*, Linn. (?)—One specimen; June 14th, 1902. This identification appears doubtful. If correct, the specimen is very small, but I have a similar one from Greece.

1406. *Stenoptilia bipunctidactyla*. Haw., var. *plagiodactyla*, Stt.—One specimen; April 6th, 1902.

1437. *Orneodes hexadactyla*, Linn.—One specimen; January 14th, 1902.

1573. *Tortrix pronubana*, Hb.—Fairly common in April.

1608. *Cnephasia longana*, Hw. (*ictericana*, Hw.). —Common in March and April.

1811. *Euxanthis straminea*, Hw.—One specimen; May 24th, 1902.

1832. *Phtheochroa duponcheliana*, Dup.—One specimen; May 15th, 1902.

2447. *Plutella maculipennis*, Curt. (*cruciferarum*, Zell.).—Common in February.

Depressaria, sp.—Common in May and August. The green larvæ were common, spun-up in leaves of wild fennel, in Wied Kratal, at the beginning of April, 1902. Pupation takes place in a cocoon formed of fragments of the fennel-leaves.

4693. *Nemotois latreillellus*, Fb.—Common in May, but very local. I have seen the males flying around thistle-flowers in the hot afternoon sunshine.

In addition to the foregoing, I have some fifteen species which as yet I have been unable to identify.

Finally, I cannot conclude better than by thanking those to whose courtesy I am indebted for making the foregoing list as complete as possible. To Sir George Hampson my warmest thanks are due, for valuable assistance in enabling me to identify many doubtful species; and also to Mr. Gervase F. Mathew, for his extreme kindness in supplying information, and for the loan of some of the specimens from his own collection.

A NEW GENUS AND SPECIES OF LARRIDÆ FROM CENTRAL AMERICA.

By P. Cameron.

On bringing together recently, for the purpose of study, my neo-tropical specimens of *Odynerus nasidens* and allies, I found among them a species of Larridæ which agreed almost exactly with *O. nasidens*, having the same size, golden pubescence, wing-coloration, and form. It belongs to the Lyrodinæ, and comes closest to *Heliocausus*, which may be known from it by the transverse median nervure being received behind the transverse basal, by the cubitus in hind wings being received much behind the median, by the recurrent nervures being widely separated, he first behind the middle, and by the eyes converging above.

Icuma, gen. nov.

Eyes parallel, not converging above, reaching to the base of the mandibles. Ocelli in a triangle. Clypeus short, its apex broadly rounded. Mandibles not incised below, the apical tooth long. Temples broad, obliquely narrowed; the occiput transverse. Pronotum very short. Scutellums large. Median segment short, gradually rounded, the basal area large, closely striated. Tibiæ and tarsi spined, the fore tarsi ciliated with long stout spines on the outer side; claws long, curved, without a spine. Abdomen short, ovate; the pygidial area distinct. Antennæ short, placed close to, but clearly separated from, the clypeus. Radial cellule long, its apex narrowed, but bluntly pointed; the transverse median nervure received clearly beyond the transverse basal; the recurrent nervures are received in the apical third of the second cubital cellule; the cubitus in hind wings originating shortly beyond the transverse median.

Icuma sericea, sp. nov.

Black, covered densely with a pale golden pile; the under side of scape, an irregular line across the middle of the clypeus, a line on the lower half of the inner orbits on the apex of the pronotum, a narrow one on the second abdominal segment, more than the apical half of the third, and the whole of the other segments, fulvous yellow. Legs black, a line on the under side of the femora, on the under side of the tibiæ, and on the posterior at the basal half behind, fulvous yellow. Wings fulvous hyaline, clearer at the apex, the radial cellule and the basal two cubitals smoky; stigma and costa fulvous, the nervures darker. ♀. Length, 12 mm.

Panama, Pacific side.

Head with scattered punctures, the face and clypeus more shining than the rest. Thorax distinctly but not closely punctured, the metanotum more strongly than the rest; the striæ on the basal area distinct, rather stout, clearly separated. Abdomen, except the pygidial area, almost impunctate; the area with longish, clearly separated

punctures in rows. The second cubital cellule is the smallest, and is narrowed in front; the first and second abscissæ of the radius are equal in length; together they are equal in length to the third. Hind ocelli separated from each other by a slightly greater distance than they are from the eyes. Basal four joints of flagellum rufo-fulvous below; the first joint of flagellum is shorter than the following two united.

The form of coloration shown by this species is found in various genera and species of neo-tropical Vespidæ. I have a *Chartergus* which resembles it very closely.

NOTES AND OBSERVATIONS.

Colias edusa reared from Ova in 1904.—Last August I received from a friend twenty ova of *Colias edusa*, which were deposited by a female taken by him at Sidmouth, South Devon, in the same month. These hatched on the 30th, and feeding-up on clover all the larvæ pupated from Sept. 25th to Oct. 16th. I then moved the pupæ into a warm room and they began to change colour on Oct. 19th. Nineteen fine imagos emerged from Oct. 23rd to Nov. 4th, eight males and eleven females, one of the latter being without the yellow spots in the black hind-marginal band on the fore wings.—J. B. Morris; 14, Ranelagh Avenue, Barnes, Dec. 12th, 1904.

Teratological Specimen of Hybernia defoliaria.—It may be of interest to note that on Nov. 20th I captured at West Wickham a recently emerged male specimen of *Hybernia defoliaria* in which both wings on the right side are entirely absent. The antennæ, legs, and the wings on the left side are perfectly developed and quite normal; but there is no trace of even the rudiments of wings on the right side.—A. B. Kidner; 139, Rosendale Road, West Dulwich, S.E., Dec. 12th, 1904.

Monk's Wood and Thecla pruni.—It will, I fear, be a great disappointment to entomologists in general to hear that Monk's Wood, near Huntingdon, is now closed to the public. Lord Chesham, the owner, is at present preserving game in this wood so closely that the keepers have strict orders to forbid the entrance of entomologists. The result of this will, no doubt, be an increased difficulty in obtaining a good series of *T. pruni*, for, although the species does occur elsewhere—notably at Barnwell Wold—still Monk's Wood may be regarded as its headquarters in the British Isles. So much so that those desiring to take *T. pruni* with their own hands have for the last hundred years undertaken a pilgrimage to this celebrated Midland wood. At various times I have had the pleasure of looking through many of the best collections of British Lepidoptera, and I think I may safely say that the two obtainable species that are least adequately represented are *T. pruni* and *Carterocephalus palæmon*—but more especially the former. Caught specimens are the rule, generally brown with age, or torn, or bereft of many scales. In fact, *T. pruni*, like *T. w-album*,

to be really fine, must be bred. It is then of an intensely black hue (instead of black-brown) and is a decidedly "taking" species. *C. palæmon* is almost equally local, but is fortunately much easier to obtain in fine condition, if captured when it first appears at the end of May. I suspect the reason one so seldom sees a fine representative series is that very few collectors live within reach of this most charming member of the Hesperidæ. To some collectors the idea of placing a monetary value on British Lepidoptera is altogether repugnant, But I must confess that to me it seems the only feasible method of determining the relative value of the different species, and I do not mind confessing that I am always deeply interested in the prices charged by reliable dealers or realized at London auctions. Most of us, I think, occasionally buy species we see no other possibility of obtaining, but any one who thinks he can buy really fine specimens of *pruni* and *palæmon* at the usual quotations is grievously mistaken. I myself have bought a good deal of late years, but have never succeeded in purchasing a single fine bred specimen, or a single larva, of *T. pruni*, although I have commissioned the chief dealers to procure me the latter even at so high a price as 2s. each. I really think that a fine bred *pruni*, compared with other British butterflies, is quite worth 5s., and *palæmon* I should estimate at 2s. With regard to the range of *pruni* in these islands, I find old records of its occurrence at Linford Wood, near Stony Stratford (Entom. vii. 175) and at Beaumont, Berks (Entom. xvii. 267); but at the latter place the (single) specimen was only *seen*. I wonder if any of your readers have come across *pruni* elsewhere than in its Northamptonshire and Huntingdonshire haunts. —(Rev.) Gilbert H. Raynor; Hazeleigh Rectory, Maldon, Dec. 13th, 1904.

The Noctuid Genus Ala.—The name of this genus (Staudinger, 1882) was used by Lockington for a crustacean in 1877. Hence the later name *Trichanarta*, Hampson, 1896, will stand, and the three species will be known as *Trichanarta picteti* (*Ala picteti*, Staud.), *T. pretiosa* (*Ala pretiosa*, Alph.), and *T. ladakensis* (*Anarta ladakensis*, Feld.). T. D. A. Cockerell.

The Entomological Collections in the Oxford University Museum.—In the "Sixteenth Annual Report of the Delegates of the University Museum" (for 1903) will be found an exceedingly interesting account of work completed, in hand, or to be undertaken, connected with the entomological collections in the Hope Department of the Museum. Some idea of the thoroughness with which the labours are there conducted may be gathered from the following excerpt from Dr. Dixey's account of work upon the Pierinæ which is embodied in the "Report of the Hope Professor of Zoology" (pp. 21-69).

"In 1893 the Pierinæ in the Hope Collection occupied about fifty drawers; they were to some extent sorted out into genera and species, but the arrangement did not pretend to critical exactness, nor did it profess to represent the existing knowledge of the different species with their distribution and affinities. There were no labels except those in MS. attached to the individual specimens. These were often elaborate and written with much care; but they could not, as a rule, be read without the removal of the specimen from the cabinet. The greater

number of the species were grouped together, but several were detached from the general arrangement, and had to be sought in different parts of the collection. For reasons of this kind the difficulties in the way of making an effective study of the group were very great.

"At the present time the space devoted to the Pierinæ consists of five cabinets of sixty drawers each—three hundred drawers in all. Each specimen has been carefully considered and placed in the position that may best illustrate its natural affinities and relation to conditions of locality and season. The genera and species have been indicated throughout by easily-read labels, and synonyms have been added when they possess special interest or importance. The order of the species within each genus, and of the genera within the subfamily, has been determined with the view of exhibiting the probable relationship of the various forms on a phylogenetic basis. With every genus and every species a map is given, coloured to show the present distribution of the particular assemblage on the earth's surface. Within the limits of each species the individual specimens are arranged geographically, according to a uniform plan; seasonal modification of forms, where it exists, is duly indicated by special labels."

Æschna mixta in Epping Forest.—Henry Doubleday is apparently not properly entitled to hold the Epping Forest record for *Æ. mixta*. In his list of 1871, Doubleday speaks of this dragonfly as being on the wing as early as June—in fact, his observations are confined to that month. Now, we claim to have a particularly close acquaintance with *mixta* in the Epping Forest district, and we have never met with the species before September; indeed, its flight seems to be restricted to that and the succeeding month. We think it is pretty clear that Doubleday wrongly identified some other species as *mixta*, or, alternatively, failed to keep a proper note of the dates of capture or observation. — F. W. & H. Campion; 33, Maude Terrace, Walthamstow, Essex, Oct. 31st, 1904.

[It certainly seems to be the case that *Æ. mixta* does not appear before August.—W. J. L.]

CAPTURES AND FIELD REPORTS.

Sphinx (Agrius) convolvuli in Hampshire.—*S. convolvuli* has been common here this season wherever the tobacco-plant was grown. A cat belonging to a gentleman residing in Brockenhurst has accounted for three specimens. She might be seen on any mild evening during August and September prowling along by the flower-beds and waiting for the moths which, although never seen in the act, she, no doubt, captured on the wing. The three specimens mentioned were taken from her mouth alive (they were not cabinet specimens); how many more she caught and consumed is, of course, unknown. *S. convolvuli* did not come to the flowers on cold nights, neither did puss attempt to go hunting. In this she showed more wisdom than some of our local entomologists. Mr. L. F. Hill, of Cremona, Brockenhurst, has

kindly supplied me with a list of forty-nine specimens which he saw, and most of which he captured, at tobacco, between Aug. 16th and Sept. 23rd, a record for this neighbourhood.—G. T. Lyle; Brockenhurst.

Late Appearance of Colias edusa.—On Oct. 18th last, a fine warm day, I saw, while shooting on the marshes at Wallasea, Essex, a male *C. edusa* on the wing; after watching it a short time it settled to feed on yarrow-blossom. It was apparently in perfect condition. I hear that other specimens have recently been seen in Devon, one as late as Nov. 13th.—F. W. Frohawk; November, 1904.

Late Appearance of Pyrameis atalanta.—Owing to the recent fine warm weather, *P. atalanta* has been putting in a late appearance. On Nov. 13th my wife saw a specimen on the wing, in the finest condition, at Rayleigh, Essex, and during the past week specimens have been emerging. The larvæ were found quite young at the end of September and beginning of October, which were obviously from eggs deposited during September by specimens which emerged during August or September. Although it is generally believed that only one brood emerges in the year, I am convinced that usually, if not every year, there are two broods, the first appearing in July and August, and the second continuing through the autumn.—F. W. Frohawk; Nov., 1904.

Colias edusa, C. hyale, &c., at Felixstowe.—On Aug. 10th and 11th last I took, at Felixstowe, two female specimens of *C. edusa*, on open land, fluttering over patches of red clover. I saw six altogether, but these two alone gave any chance of capture. I also saw two specimens of *C. hyale* in the public road, but my net was disconnected, and they flew almost at once into private grounds. I was only able to spare two days for collecting out of my brief vacation, and then found the following plentiful but much worn; only a small number of the specimens captured were worth retaining: *Pieris brassicæ*, *P. rapæ*, *P. napi*, *Vanessa urticæ*, *V. polychloros*, *Pyrameis atalanta*, *Pararge egeria*, *P. megæra*, *Satyrus semele*, *Epinephele ianira*, *Cœnonympha pamphilus*, and of *Lycæna icarus* I obtained a large series, both males and females. I may perhaps note that I did not see a single specimen of *P. cardui*, neither have I met with this species during the year in or near London.—W. T. Page, F.Z.S.

Lepidoptera at Kingston, Surrey.—*Cheimatobia boreata* is simply swarming at the lamps here just now. It is no exaggeration to say that one might easily take hundreds each evening. Previous to this year I had only one specimen taken in Kingston, although I have often searched for it. I may also mention that *Chesias spartiata*, *Oporabia dilutaria*, and *Hybernia defoliaria* have been extremely abundant, and some beautiful forms of the latter have been obtained. I have seen a specimen of *Asteroscopus sphinx* (*cassinea*) which was taken on the hill, also a few *Diloba cæruleocephala*. I have not seen *H. aurantiaria* at all this year.—Percy Richards; "Wellesley," 11, Queen's Road, Kingston Hill, Nov. 18th.

Species of Plusia visit Flowers of Stachys.—When capturing insects on the wing at dusk this year, I noticed a fact which may not

be generally known. It is that several species of *Plusia* come to the flowers of the hedge woundwort (*Stachys*). I have never seen the name of this plant in the list of natural attractions, but of some Plusias I could have captured large numbers, so attractive is it. During the past summer the following species were captured at *Stachys*:—*Abrostola urticæ*, *A. triplasia*, *Plusia chrysitis*, *P. gamma*, *P. iota*, and *P. pulchrina*. Of these species *P. chrysitis* and *P. pulchrina* were the most numerous, but both species of *Abrostola* were fairly common. *P. iota* and *P. gamma* were scarce.—W. A. Bogue; Spring Cottage, Shepton Mallet.

[Barrett (Lep. Brit. vol. vi.) mentions the following Labiatæ as being attractive to species of *Plusia*:—*Ballota nigra* and other Labiates (*P. chrysitis*), *Stachys palustris* and *S. sylvatica* (*P. festucæ*), and *Teucrium scorodonia* (*P. interrogationis*); the blossoms of various labiate plants are visited for their honey by *P. iota*. Several species of the Labiatæ, especially *Lamium* and *Stachys*, are among the known larval food-plants of *P. bractea*, *P. chrysitis*, *P. gamma*, *P. iota*, and *P. pulchrina*.—Ed.]

Notes on Coleoptera in South-west Surrey.—The following is a list of Coleoptera taken in this district during 1904:—*Cychrus rostratus*, L.: I took two specimens of this Carabid in July, and one of them exhibited traces of three irregular lines on each wing-case. *Carabus monilis*, F., *C. violaceus*, L., were plentiful on paths and under stones. *C. granulatus*, L., in the rotten wood of fallen trees and under stones on Peasmarsh. *Creophilus maxillosus*, L., abundant on dead animals. *Pæderus caligatus*, Er.: I found this for the first time on Peasmarsh on Feb. 21st. *Xantholinus fulgidus*, F., in decayed wood. *Ocypus olens*, Müll., occurred frequently. *Aromia moschata*, L., in July, on willows. *Cetonia aurata*, L., common on roses. *Lucanus cervus*, L., occurred from about July 2nd, the males being far more plentiful than the females. *Prionus coriarius*, L., one female taken on July 24th, while flying against a window at night. *Melolontha vulgaris*, F., *Rhizotrogus solstitialis*, Latr., very plentiful. *Phyllopertha horticola*, L., frequently during the daytime in June, at rest on oak. *Strangalia armata*, Herbst., occurred frequently on flowers. *Geotrupes typhœus*, L., common at Puttenham in early spring, in the loose sandy soil. I observed several dragging pellets of rabbits' excrement into their burrows. They varied much in colour, some having castaneous elytra. *Dorcus parallelopipedus*, L., abundant. On March 26th I found larvæ, pupæ, and several imagines in one piece of decayed oak, *Necrophorus humator*, F., common on dead animals. *N. mortuorum*, F., occurred only once, on a dead rat near Eashing. *Cicindela campestris*, L., fairly common on sandy soil. *Notiophilus biguttatus*, F., common on ploughed fields. *N. aquaticus*, L., occasionally on Peasmarsh. *Geotrupes stercorarius*, Er., abundant everywhere. *G. vernalis*, L., occasionally in cowdung. *Timarcha lævigata*, L., on grassy banks. *Aphodius fimetarius*, L., plentiful in cowdung. *Balaninus villosus*, Herbst., on oak-trees. *Malthodes marginatus*, Latr., under bark and in *Cossus*-infected trees. *Blaps mucronata*, Latr., common in cellars and outhouses. *Pterostichus madidus*, F., *P. æthiops*, Panz., *P. vulgaris*, L., *P. striola*, F., *P. versicolor*, Sturm., under stones and logs of wood. *Lampyris nocti-*

luca, L., abundant. *Coccinella 7-punctata*, L., *C. bipunctata*, L., *C. variabilis*, F., common everywhere. *Coccinella ocellata*, L., only one, taken on pine-tree, *Hister bimaculatus*, L., under stones. *Cossonus linearis*, F., very local. *Clivina fossor*, L., under stones. *Athous hæmorrhoidalis*, F., very abundant. *Œdemere cærulea*, L., abundant on flowers during July and August. *Telephorus clypeatus*, Ill., and other Telephoridæ, common on flowers. *Xestobium* (*Anobium*) *tessellatum*, F., plentiful in old wood. *Nebria brevicollis*, F., *Pogonus chalceus*, Marsh, under stones on the "Hog's Back." *Amara fulva*, De G., very few met with. *A. familiaris*, Duft., *A. lucida*, Duft., common under stones, particularly on Peasmarsh.—J. A. Croft; Charterhouse, Godalming, Surrey.

Pygæra pigra in Surrey.—In the most recent list of the Lepidoptera of Surrey *P. pigra* is noted as being uncommon, and only two localities in the county are given for the species. It may therefore be of interest to mention that larvæ of *P. pigra* are to be found more or less commonly in the Esher and Ockham districts. On August 27th last they were decidedly numerous at Wisley, and I collected over forty small ones in less than half an hour. The species also occurs at Byfleet, and I have frequently found larvæ there on dwarf sallow.—Richard South.

SOCIETIES.

Entomological Society of London. — *Wednesday, November 16th*, 1904.—Professor E. B. Poulton, M.A., D.Sc., F.R.S., President, in the chair.—Mr. Edward Goodwin, of Canon Court, Wateringbury, Kent, was elected a Fellow of the Society.—Mr. H. St. J. Donisthorpe exhibited the second recorded British specimen of *Orchestes sparsus*, Fahr., taken by him on August 28th last in the New Forest. —Mr. H. W. Andrews, specimens of *Atherix crassipes*, Mg., from the New Forest, the only previously recorded locality in Great Britain being near Ticehurst, Sussex.—Mr. G. O. Sloper, two aberrant forms of *Melitæa athalia*, male and female, from Luan, above Corbeyrier, Switzerland, and one male taken on June 26th this year at Martigny. The tendency of the black markings to supersede the fulvous was particularly noticeable in the latter specimen.—The President, cases containing Diptera, and a case containing the skins of African Sphingid larvæ, dried in botanical paper, and, after seventy years, still preserving their colours, from the Burchell collection in the Hope Museum, Oxford. Mr. C. O. Waterhouse, a gall of some lepidopterous insect found on the Calafate bushes in Patagonia. The gall resembled that of *Cynips kollari*, but was hollow, the walls being about $\frac{1}{8}$ in. in thickness. The circular door prepared by the larva was about $\frac{1}{3}$ in. in diameter. The pupa was lying free, without any silk cocoon. It was suggested that the insect was perhaps allied to *Œcocecis*.—Mr. C. H. Kenrick communicated a paper entitled "Natural Selection applied to a Concrete Case." Mr. J. C. Kershaw, papers on "Enemies of Butterflies in South China," and "A Life-history of *Gerydus chinensis*."—Mr. Nelson Annandale, B.A., a paper on "The Eggs and Early Stages of a Coreid Bug, probably *Dalader acuticosta*, with a note on its Hymenopterous Parasites."

Wednesday, December 7th, 1904.—Professor E. B. Poulton, M.A., D.Sc., F.R.S., President, in the chair.—Mr. Horace A. Byatt, B.A., of the Colonial Office; and Mr. J. C. Winterscale, F.Z.S., of Karangan, Kedah, Penang, Straits Settlements, were elected Fellows of the Society.—Mr. Rowland Brown, one of the Secretaries, read the list of Fellows recommended for election as Officers, and to serve on the Council for the ensuing year; and there being no additional Fellows proposed, they were nominated accordingly.—Mr. H. St. J. Donisthorpe exhibited *Quedius nigrocæruleus*, taken by Mr. H. C. Dollman in a rabbit-hole at Ditchling, Sussex, this being the fourth recorded British specimen.—Professor T. Hudson Beare, a specimen of the rare Longicorn, *Tetropium castaneum*, L., taken about two years ago in the vicinity of the Hartlepool Quays, and probably introduced from abroad. —Mr. G. J. Arrow, a series of the Lamellicorn beetles from the Burchell Collection, and remarked that Burchell, at the time of their capture some seventy years ago, had already noted their powers of producing musical sound.—Mr. C. O. Waterhouse, drawings illustrating the development of the front wing in the pupa of the tusser silk-moth, showing the relation of the tracheæ to the veins, prepared for exhibition in the Natural History Museum. He also exhibited some coffee-berries from Uganda, injured by a small beetle belonging to the Scolytidæ. The beetles laid their eggs in the berries when young and green. The mature berries were often found with little of the inside left. Mr. Waterhouse further exhibited two coleopterous larvæ from the Burchell Collection from Brazil, submitted to him for determination by Prof. Poulton. One was a heteromerous larva two inches long, much resembling the larva of *Helops*. The more interesting one was noted by Burchell to be luminous, and appeared to be the larva of an Elaterid, but the prothorax was unusually large, and the head retracted beneath.—Commander J. J. Walker, the type-specimen of *Haplothorax burchelli*, G. R. Waterhouse, from the Hope Collection, Oxford University Museum. This very remarkable Carabid was discovered by Burchell in St. Helena. It is now exceedingly rare, if not entirely extinct, in its sole locality, the late Mr. Wollaston, during his visit to the island in 1875–6, having entirely failed to find the beetle alive, although its dead and mutilated remains were often met with. —The President, cases showing the results of breeding experiments upon *Papilio cenea* conducted by Mr. G. F. Leigh, who had for the first time bred the *trophonius* form from *trophonius* itself; also a photograph, taken by Mr. Alfred Robinson, of the Oxford University Museum, showing the Xylocopid model and its Asilid mimic exhibited by Mr. E. E. Green at a previous meeting. The example was particularly interesting, inasmuch as Mr. Green's record of the mimic circling round its model tended to support the view that the bee is the prey of the fly.—Dr. T. A. Chapman, M.D., read a paper on *Erebia palarica*, n. sp., and *E. stygne*, chiefly in regard to its association with *E. evias* in Spain. Describing *E. palarica*, he said it was a new species from the Cantabrian range, phylogenetically a recent offshoot of *E. stygne*, and the largest and most brilliant in coloring of all the known members of the family.—Dr. G. B. Longstaff, D.M., gave an account of his entomological experiences during a tour through India and Ceylon, Oct. 10th, 1903, to March 26th, 1904, illustrating his remarks by

exhibiting some of the insects referred to, and lantern-slides of the localities visited.—H. Rowland Brown, M.A., *Hon. Secretary.*

South London Entomological and Natural History Society.—*November 24th*, 1904.—Mr. E. Step, F.L.S., Vice-President, in the chair. Special exhibit of varieties :—Mr. H. W. Moore, of Shortlands, Kent, was elected a member.—Mr. Cannon exhibited, on behalf of Mr. Frohawk, (1) a long series of *Colias edusa* v. *helice* bred from v. *helice* ova in 1900 (autumn), showing every gradation from typical white v. *helice* to typical *C. edusa* ; (2) a series of *C. hyale* showing gradation in extent of markings; and (3) a fine pale variety of the last with all the usual black markings replaced by pale opalescent colouring.—Mr. Colthrup, (1) a very pale form of *Smerinthus ocellatus* ; (2) a partially xanthic form of *Anthrocera filipendulæ* ; and (3) a *Dianthœcia capsincola* of a very unusual shade.—Mr. Harrison and Mr. Main, (1) *Argynnis aglaia*, from North Cornwall, with xanthic markings; (2) a bleached specimen of *Epinephele jurtina* (*ianira*), from North Cornwall; (3) *Zonosoma pendularia* v. *subroseata* from Staffordshire; (4) a series of *Boarmia repandata* and v. *conversaria* from North Cornwall, with series from Wiltshire and Isle of Lewis for comparison ; (5) a series of *Aplecta nebulosa* from North Cornwall, with series for comparison from Delamere Forest, including v. *robsoni*, and from Epping Forest; (6) *Miana strigilis*, from North Cornwall, but none dark; from Delamere Forest, but scarcely any bright forms; (7) *Hybernia marginaria*, melanic specimens from near Liverpool ; (8) long series of *Pieris napi*, spring brood from North Cornwall, with spring-bred Enniskillen series for comparison ; (9) summer broods of the same species from Enniskillen and Delamere Forest ; and (10) series of spring brood of the same species from Kilkenny, bred by Mr. Montgomery, with particularly dark females.—Mr. Montgomery, series of bred and captured *Leucophasia sinapis* of both broods, from Berkshire, Cornwall, Devonshire, Worcestershire, and the New Forest.—Mr. Hickman, an extremely dark var. of *Arctia caia* bred from a larva taken at Wye in August, 1903.—Mr. Crow, a remarkable rosy form of *Calymnia trapezina* from Hayes, and a specimen of *Pyrameis atalanta*, showing xanthic spots, bred from a larva taken at Elmer's End.—Mr. Stonell, a gynandrous example of *Lachneis lanestris*.—Mr. Joy, (1) a bred series of *Pararge egeria*, from ova laid by a female taken in June, 1903 ; (2) two series of the same species, bred from a pairing induced in captivity, of which (*a*) hybernated as pupæ, (*b*) hybernated as half-fed larvæ.—Mr. Chittenden, a large number of varieties and aberrations of Lepidoptera, including *Spilosoma lubricipeda* var. *radiata* with black fringes, *Boarmia repandata*, dark, *Acidalia inornata*, very dark, from Kent, very dark *Cymatophora duplaris* from Market Drayton, *Caradrina morpheus*, *Agrotis segetum*, *A. exclamationis*, *A. corticea*, all very dark, from Kent.—Mr. R. Adkin, (1) a specimen of *Saturnia pavonia*, having the body and wings undoubtedly female, while the antennæ were distinctly male. It was bred in 1904 from an Isle of Lewis larva of 1901 ; (2) a very dark specimen of *Syrichthus malvæ* from Brighton ; and (3) a fine specimen of *Agrius convolvuli* taken at Eastbourne, Sept. 18th, 1904.—Mr. Harris, a very interesting series of *Hemerophila abruptaria*, bred from a pairing obtained in captivity between two captured specimens, includ-

ing a number of the more or less extreme melanic form.—Mr. Goulton, varied series and examples of *Hypsipetes sordidata* (*elutata*) with dark forms, *Pseudoterpna prunata* with brown forms (bred), and light forms of *Boarmia repandata* from Ranmore.—Mr. Brown, numerous species and forms, including *Hydræcia nictitans* var. *paludis*, very dark *Xylophasia polyodon*, dark *Leucania conigera*, all from Deal; varied under sides of *Polyommatus corydon* from Reigate, bred and very varied series of *Cidaria russata* and *C. immanata* from Horsley, and light and dark forms of *Amphidasys betularia*, bred.—Mr. Dobson, twenty-seven species of dragonflies taken by him in Surrey and Hampshire during the last two years, including *Gomphus vulgatissimus*, *Anax imperator*, *Æschna mixta*, *Platycnemis pennipes*, *Ischnura pumilio*, and *Agrion mercuriale*.—Mr. H. Moore, an example of *Heliconius siculata* from Trinidad, somewhat different from the type, and a series of the beautiful *H. cydno*, showing the range of variation of the snow-white markings.—Mr. Garrett, a specimen of *Pyrameis atalanta*, taken in Northamptonshire, having xanthic markings in red band of the hind wings.—Mr. South, (1) *Aplecta nebulosa* with var. *robsoni* and the so-called var. *thompsoni*, and numerous examples from many localities to show the range of variation in the species; (2) *Polia chi*, a female var. *olivacea*, and a series reared from ova laid by it, all of which were dark;* (3) an *Abraxas grossulariata* with buff ground colour; (4) *Eurrhypara urticata* with confluent or much-intensified spots; (5) *Peronea hastiana*, series from Wisley and Lancashire,† the latter including several forms; and (6) *Pædisca solandriana*, a long series. collected in two afternoons at Oxshott, including at least seven named forms.—Mr. G. T. Porritt, a fine bred series of *Agrotis ashworthii* from North Wales.—Mr. H. J. Turner, a copy of the original edition of Moses Harris' 'Aurelian,' slightly defective, picked up for a few shillings on a bookstall.—Mr. W. J. Kaye, (1) a series of *Pseudoterpna pruinata*, showing considerable variation in the banding, several bred specimens from Bude had all the usual markings suppressed; and (2) a specimen of *Titanus giganteus*, the largest known longicorn beetle, from British Guiana.—Mr. Barraud, (1) *Epinephele jurtina* var., with the usual white pupilled spot on the fore wing absent, and on the under side hind wings specks instead of spots; and (2) a brown suffused *Spilosoma menthastri* from Bushey.—Rev. J. E. Tarbat, (1) *Euthemonia russula*, with smoky hind wings; (2) a female *Pœcilocampa populi*, having a rudimentary fifth wing anterior to the right fore wing; and (3) a male *Erebia æthiops* with shaded marks on left hand wings.—Mr. Bacot, varieties of various species and long series of *Spilosoma urticæ* consisting of eight broods belonging to three generations, all originating from a single female captured in Norfolk. They showed large extremes of variation as regards the spotting.—Mr. Prout, for Mr. Mutch, pale aberrations of *Agrotis ypsilon* and *Phlogophora meticulosa*, with much darkened specimens of *Cleora glabraria*.—Mr. Prout, some extremely fine varieties of (1) *Melitæa cinxia*, mostly of one aberrant brood in 1902; (2) blackish ab. *ingenua* of *Aporophyla australis*; and (3) very dark *Eubolia bipunctaria* from North Devon and *Luperina testacea* from Sandown.—Mr. Edwards, representatives of all the genera closely allied to the genus *Papilio*, and contributed notes on each. The rare *Armandia thaidina*

* See Entom. xxxvii. 263. † See Entom. xxxvii. 320.

and *Bhutanitis lidderdalii* were included in the exhibit.—Dr. Chapman, (1) a very large number of the genus *Chrysophanus* taken this year in Spain, including the var. *miegii* of *C. virgaureæ*, various forms of *C. phlæas*, from light forms to the extreme dark var. *eleus*; (2) a drawer of Erebias, also from Spain, including various races of *E. evias* and *E. stygne*, and a long series of a new species, which he had named *E. palarica*, and which was closely allied to *E. stygne*, but much larger than any *Erebia* hitherto known.—Dr. Chapman, on behalf of Mr. Tutt, for comparison with his own, a large number of Chrysophanids from many mid-European sources.—Mr. Tonge, three albums of photographs of Lepidoptera, most of them taken with the aid of the electric light,—Mr. Carr, on behalf of Mr. F. M. B. Carr, a specimen of *Vanessa io* having the usual eye-like spots on the hind wings very obscure.—Mr. West (Streatham) and Mr. Fremlin exhibited objects under their microscopes.—Hy. J. Turner, *Hon. Rep. Sec.*

Lancashire and Cheshire Entomological Society.—By the kindness of the Chester Society of Natural Science an ordinary meeting was held in the Grosvenor Museum, Chester, on Monday, Nov. 21st, 1904, Mr. Rd. Wilding, Vice-President, in the chair.—The following gentlemen were elected members of the Society: Messrs. C. M. Adams, F.C.S. (Southport), Rd. S. Bagnall, F.E.S. (Winlaton-on-Tyne), J. H. Leyland (Ormskirk), W. C. Boyd (Cheshunt), John F. Dixon-Nuttall (Prescot), Rd. Hancock (Handsworth), and E. E. Lowe (Plymouth).—Dr. Herbert Dobie having welcomed the Society to Chester, the chairman called on Mr. Robert Newstead, A.L.S., F.E.S., Hon.F.R.H.S., who gave a most interesting and instructive lecture on "The Collections in the Grosvenor Museum."—Amongst interesting exhibits examined during the evening were:—Mr. Newstead, a living specimen of the male of *Lecanium hesperidum*: this he had recently bred from a colony of Coccids which had been under observation for the past three or four years, the example being the first authentic one observed, although the male had been searched for since the time of Linnæus.—Mr. J. J. Richardson, a series of exotic Lepidoptera mounted in frames, with slips of glass so arranged as to allow of the examination of the under sides.—Mr. J. R. Charnley, F.Z.S., fourteen specimens of insects in amber from the north coast of Germany, both the insects and clearness of some of the pieces of amber being much admired.—*Anisotoma furva* (from Crosby) was exhibited by Mr. Wilding; and a selection of British Lepidoptera by Mr. W. Mansbridge, F.E.S.; &c.—E. J. B. Sopp and J. R. le B. Tomlin, *Hon. Secretaries.*

RECENT LITERATURE.

Catalogue of Lepidoptera. By Frederick Lowe. Vol. i. pt. 1. Pp. 51. London: Hutchings & Crowsley. 1904 (Dec.).

The initial instalment of this important work deals with the Nymphalid subfamily Danainæ, and all the species, subspecies or local races that have been described up to date are included therein. The part is interleaved with MS. paper, so that subsequent new species, &c., may be added. There is also an index to the species mentioned

in the catalogue. This method of treating the Lepidoptera by sub-families possesses obvious advantages, and the scheme of compilation has been devised to facilitate the work of the student. Where they are accessible the location of types is stated. The arrangement of genera and groups is based on a trivial character which the author states he has found constant and not confined to one sex.

Judging from the part before us, the Catalogue promises to be of the utmost utility, and will meet a pressing need.

The Second Part is in the press, and it is proposed to complete the work during the year.

CHARLES GOLDING BARRETT.

Entomologists throughout the kingdom will regret to hear that on December 11th last Mr. C. G. Barrett succumbed to the malady from which he had suffered for some time past. As an authority on Lepidoptera he was known far and wide, and his willing help and kindly advice were always at the service of anyone who appealed to him. His departure from among us has created a void that will not be readily filled.

Among his contributions to entomological literature are notes contained in the 'Entomologist's Weekly Intelligencer' (1856–61), also in the 'Weekly Entomologist' (1862), and occasional communications to the 'Entomologist,' dating from 1864.

Mr. Barrett, in 1880, joined the editorial staff of the 'Entomologists' Monthly Magazine,' to which he had been a valued contributor from its foundation in 1864. Among the more important of his writings that have been published in that journal are a series entitled "Notes on British Tortrices," which were commenced in vol. ix. (1872), and continued year by year up to vol. xxvi. (1890).

In his excellent work "The Lepidoptera of the British Islands" is concentrated the knowledge acquired during a lifetime of assiduous research and careful observation. The first volume was issued in 1893, and the ninth in 1904. In the tenth volume, which was passing through the press at the time of his decease, was commenced the consideration of the Tortricina, a group in which he as an expert had long been acknowledged pre-eminent. It is ever to be regretted that he was not spared to see this great undertaking completed, and we earnestly hope that among his literary remains material will be found to enable the work to be continued to, at least, the end of the Tortricina, which, excepting the Tineina, is perhaps the most neglected group of British moths.

Mr. Barrett was elected a Fellow of the Entomological Society of London in 1884, and a Member of the South London Entomological and Natural History Society in 1889. He was President of the latter Society in 1892.

We understand that the collections of British, Continental types, and South African Lepidoptera will be realized.

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SOME AMERICAN HALICTINE BEES IN THE BRITISH MUSEUM.

BY T. D. A. COCKERELL.

AFTER being long neglected, the Halictinæ of America have come to receive a good deal of attention. Mr. Charles Robertson has lately published tables (Can. Ent., Sept., 1902) for the separation of the Illinois species; while Mr. Crawford has prepared, and I believe will shortly publish, a synopsis of all those inhabiting the United States. Mr. J. Vachal, in 'Miscellanea Entomologica,' 1903–1904, has in course of publication a synopsis of all the American Halictines seen by him, very many being regarded as new. All this activity is rapidly increasing our knowledge of these insects, but the value of some of the results obtained is seriously impaired by the difficulty of recognizing many of the numerous species described years ago by F. Smith, of the British Museum. Mr. Vachal, in the majority of cases, practically abandons the attempt to identify the Smith species, and gives new names to a great many bees, some of which must certainly be Smithian. I should be more ready to condemn this proceeding, had I not discovered that some of my own identifications of Smithian species, made by the most careful use of the descriptions, were quite erroneous.

The present paper is the result of an examination of the material, including most of Smith's types, in the collection of the British Museum. This collection, although it has been scarcely touched since Smith's death in 1878, is probably still the most valuable collection of bees in existence, and it is remarkable that it has not received more attention from students.

The following abbreviations are used:—(T.) = type specimen examined; s. m. = submarginal cell; r. n. = recurrent nervure; b. n. = basal nervure; t. c. = transverso-cubital nervure; t. m. = transverso-medial nervure; hind spur = hind spur of hind tibia;

area=basal area of metathorax; vibrissæ=hairs forming a fine ciliation on hind margins of abdominal segments 1 and 2.

Agapostemon.

(1.) *A. sicheli*, Vachal.—The museum contains a male of this extraordinary species from Mexico, out of F. Smith's collection. The flagellum is black, twisted like a corkscrew. The insect has the hairy eyes and plumose pubescence of Cameron's *Cœnohalictus*.

(2.) *A. rhopalocera*, Sm. (T.) ♂.—Easily known by the very long antennæ, with the last joint black and somewhat broadened. The yellow band on first abdominal segment has on it two dark spots. Eyes naked.

(3.) *A. nasutus*, Sm. (T.) ♂.—Easily known by the broad, yellow, turned-up anterior margin of clypeus, like a hog's snout. Abdomen with six dark bands; head broader than long; eyes naked.

(4.) *A. æruginosus*, Sm. (T.) ♂.—Runs to this in Vachal's table, but punctures of scutellum, though somewhat larger than those of mesothorax, are still extremely dense.

Corynura.

Abdomen red, second segment not rapidly broadening, and not much broader than first; antennal joints 9 to 11 strongly crenulate; first r. n. joins second s. m. (which is broad) very near its end (Chile). *abdominalis*, Sm. (T.).

Abdomen not red . . . . . 1.

1. Head and thorax bright green all over; second s. m. parallel-sided, first r. n. meeting second t. c.; first abdominal segment narrow, second rapidly broadening to apex; antennæ very much shorter than in *abdominalis* or *marginata* (which Chilian species have very long antennæ) *jucunda*, Sm. ♂ (T.); n. syn. *pseudobaccha*, Ckll. 1901.

Head and thorax at least largely dark . . . 2.

2. Marginal cell and costa beyond fuliginous; first r. n. meeting second t. c.; hind spur with three spines; first abdominal segment narrow, but much broader at apex than at base, with no depression between it and second along lateral margins (Mexico) *discolor*, Sm. ♀ (T.).

Wings yellowish; marginal cell and costa beyond not fuliginous . . . . . 3.

3. Hind margins of abdominal segments white, edged in front with a sort of golden-brown; first and second abdominal segments both very narrow, second not expanding apically to any extent; antennæ very long; second s. m. very broad, receiving first r. n. near its end (Chile) . *marginata*, Sm. ♂ (T.).

Hind margins of abdominal segments not so coloured;

first segment very narrow, second becoming broader apically; first r. n. meeting second t. c.; antennæ moderate (Brazil) . . . . . *agilis*, Sm. ♂ (T.).

By the venation and the long antennæ, the Chilian species form a group separable from those of Brazil. In Proc. Acad. Nat. Sci, Phila. 1901, p. 218, I misidentified *C. jucunda*, owing to a misinterpretation of a sentence in the description. My so-called *jucunda* will stand as *C. ænigma*, Gribodo, while my *C. pseudobaccha* is the real *jucunda*.

The antennæ of *C. discolor* (♀) are bright orange at the tip, a useful character to separate it from *C. atromarginata*.

Augochlora titania, Sm. (T.), which I have referred to *Corynura*, has a clavate abdomen, narrowed basally, but otherwise is not suggestive of *Corynura*. It is very small; first r. n. joining second s. m. near its end; no vibrissæ; wings dusky; eyes deeply emarginate; area striato-granular.

Corynura briseis (*Augochlora briseis*, Sm.) (T.). ♀.

Hind spur with two spines and two nodules or extremely short spines; second s. m. extremely narrow, receiving r. n. at its middle or slightly beyond; first abdominal segment broad but narrowed basally, with strong large punctures, its dorsal surface, viewed laterally, occupying a much lower plane than that of second; second segment with large punctures like first, but third and beyond lack these punctures, and have a greenish lustre; no vibrissæ; upper part of metathorax smooth and shining; scutellum dark pinkish-purple; mesothorax shining very dark purplish, with large sparse punctures, its anterior margin sharp, and overlapping prothorax.

Megalopta.

I discuss under this name the species here placed by Smith, although it is evident that they do not form a natural group. Eventually, either *Megalopta* must be given up, and its species merged in *Augochlora*, or else it must be restricted to a much smaller number of species.

Bright blue-green; abdomen shining; thorax very coarsely sculptured . . . . . *ornata*, Sm.
Not so, colours dull . . . . . 1.
1. Without metallic colours, or at most slightly purple . 2.
With bright metallic colours on some part . . 3.
2. Wings strongly suffused with orange; abdomen narrowed basally; scutellum normal; body dark purplish . . . . . *purpurata*, Sm.
Wings not suffused with orange; abdomen broad at base; scutellum bituberculate; body not purplish *bituberculata*, Sm.
3. Abdomen pallid . . . . . 4.
Abdomen dark. . . . . 6.

4. Abdomen green, covered with short pubescence . *pilosa*, Sm.
   Abdomen fulvous; scape long and slender . . 5.
5. Face narrow; legs without black . . . . *idalia*, Sm.
   Face broad; legs with much black . . . *nigrofemorata*, Sm.
6. Hind margins of abdominal segments 1 and 2 regularly ciliate (vibrissate) with orange hairs; metallic colours of face bluish-green and purple . . *vivax*, Sm.
   Hind margins of abdominal segments 1 and 2 not ciliate . . . . . 7.
7. Abdomen thinly pruinose with pale pubescence; clypeus and supraclypeal area strongly suffused with crimson . . . . . *cuprifrons*, Sm.
   Abdomen not thus pruinose; face brilliant golden-green, vextex purplish . . . . . 8.
8. Larger; tegulæ dark . . . . . *janthina*, Sm.
   Smaller; tegulæ ferruginous . . . . *calliope*, Sm., ms.

The following notes, additional to the table, will serve to confirm identifications made by it:—

(1.) *M. bituberculata*, Sm. ♂ (T.).—Face narrow; ocelli large; wings hairy; hind spur microscopically cillate (but probably spined in the ♀, which I have not seen); first r. n. joins second s. m. well before its end; third s. m. very large, about as large as first.

(2.) *M. janthina*, Sm.—Ocelli only moderate; wings hairy; stigma large; both r. n. received by third s. m. (near base and apex), which is not nearly so large as first.

(3.) *M. purpurata*, Sm. (T.).—Ocelli large; first r. n. joining second t. c.; third s. m. not nearly as long as first.

(4.) *M. cuprifrons*, Sm. (T.).—Wings hyaline, not at all orange, but costa and marginal cell fuliginous; first r. n. joining second t. c.; second r. n. entering third s. m. farther from its end than in *janthina* (in *janthina* almost at its end); ocelli moderate; first abdominal segment with very numerous large strong punctures.

(5.) *M. vivax*, Sm. (T.).—Ocelli moderate; wings dusky hyaline, not yellowish or dark on costa; first r. n. joining third s. m. at its extreme base; second r. n. joining third s. m. as in *cuprifrons*.

(6.) *M. ornata*, Sm. (T.).—Bright green, face splendid crimson; ocelli fairly large; thorax with very large punctures, becoming subcancellate; hind spur with numerous (6 or 7) long spines; first r. n. meeting second t. c. on the basal side.

(7.) *M. pilosa*, Sm. (T.).—Hind spur with long spines; first r. n. joining second t. c.

(8.) *M. nigrofemorata*, Sm. (T.).—Ocelli rather large; wings hairy; first r. n. meeting second t. c.; second r. n. joining third s. m. almost at its end.

(9.) *M. idalia*, Sm. (T.).—Hind spur with few long spines; first r. n. joining second s. m. near its end.

(10.) *M. calliope*, Sm., from Ega, Brazil, was never published. I should refer it to *Augochlora*, with the following characters :—

AUGOCHLORA CALLIOPE (Smith) n. sp. ♀.

Head, thorax, and abdomen dark purple; face brilliant golden shining with coppery; clypeus very sparsely punctured; mandibles dark ferruginous; ocelli moderate; area with a beautiful crimson lustre (orange-golden lustre in *janthina*), and delicately striate; scutellum not bituberculate; hind spur with very few long spines; hair-brush at apex of basal joint of hind tarsi orange-fulvous; venter of abdomen with quite abundant white hair; first r. n. joining second t. c. (entering third s. m. near base in *janthina*); second r. n. joining third s. m. at its end; stigma large.

AUGOCHLORA FESTIVAGA D. T. (*festiva*, Sm.) ♂ (T.).

Santarem.—This is a peculiar species, in some things suggestive of *Corynura* and *Megalopta*; it has gigantic ocelli, such as are not seen in *Megalopta idalia*; nor has it any vibrissæ. Face white-pruinose at sides, much narrowed below; clypeus prominent, its central part yellow; scape yellow, with the apex brown; ocelli large for *Augochlora*; mesothorax shining, smooth; area shining, slightly rugose, not striated; each side of metathorax with a very remarkable dense patch of slightly yellowish cotton-like pubescence; posterior face of metathorax shining, longitudinally sulcate; legs yellow; abdomen with the first two segments, and base of third, shining fulvous; wings hairy; second s. m. very narrow, with parallel sides; first r. n. joining second t. c.; fourth ventral segment of abdomen with middle of apical margin produced.

HALICTUS NANUS (*Augochlora nana*, Sm.) (T.).

Very small; head and thorax yellowish-green, abdomen and legs entirely fulvous; inner orbits not emarginate, but gently concave; first r. n. joining second s. m. at its end; outer nervures weak as in *Chloralictus*.

HALICTUS ASPASIA (*Augochlora aspasia*, Sm.) (T.).

♀. Inner orbits gently concave, not emarginate. Front, vertex, mesothorax, and some adjacent parts, entirely covered with a dense moss-like fulvous tomentum; abdomen largely covered with a similar tomentum, and its tegument fulvous, the bases of the third and fourth segments becoming black (but this colour mostly concealed by the pubescence); venter dark red-brown with fulvous bands; first and second dorsal segments without vibrissæ; area strongly defined, strongly longitudinally striate-ridged; tegulæ fulvous; first r. n. joins second s. m. before its end; nervures very pale, outer nervures weakened as in *Chloralictus*; hind spur with few spines.

THE EARLIER STAGES OF *CATACLYSTA LEMNATA*, L.

By T. A. Chapman, M.D.

(Concluded from p. 5.)

The newly-hatched larvæ are 1·5–2·0 mm. long, according to the degree to which they are extended; they have hairs apparently in precisely the same positions as the older larvæ, but the principal setæ are very long, II and III being more than half the diameter of the larva in length, and the middle pair on the anal plate three times as long, *viz.* about 0·3 mm., the others being about 0·1 mm., and I about 0·07 mm. The circlet of hooks on the prolegs contains about eighteen crochets, all of about the same size, and not in two or three lengths as in the older larvæ.

In an older larva the thoracic plate possesses at its anterior border three pairs of hairs, much like those on the next two segments, but has also one towards the middle at its dorsal and another at its outer edge, and there is one in the posterior half-tinted border. On the first abdominal, I is on one side duplicated, a rare variation. I, II, and III are in usual position, IIIa, is wanting, but is present as a very minute point on the following segments. IV+V has the posterior and smaller member the higher, a character apparently common to all Pyraustidæ, and the reverse of what occurs in Pyralidæ and Phycitidæ. Below these, first abdominal has two hairs at regular intervals; on second the first of these has a companion above and behind it; on third the lower of these is represented by the usual three hairs above and one below the proleg. The anal plate is rounded, and has three hairs down each side. Ninth abdominal has four hairs in line, the third hardly visible; they range with and may be I, II, III, and IV+V.

The prolegs have a complete circle (or oval) of crochets, of which the inner and outer ones are closely set and nearly of a size, but the anterior and posterior have the alternate ones of more than double the size of the others, to the number of three or four on each margin. The claspers have about seven large hooks anteriorly, with smaller between, and beyond these at either end they dwindle away to mere points in about a dozen crochets, slightly alternate in size. On both prolegs and claspers are a few points here and there, as if representing a third class of still smaller crochets.

The general surface is covered with very minute black points, to which, in fact, the dark colour of the larva is due; these are ranged or massed in some degree more densely in zones, so as to suggest three subsegments in each segment, the anterior

being the larger. They are ranged in some degree in transverse and other lines, but broadly their arrangement is too irregular to be described. They present various circular lacunæ, one of which, a little above and behind the spiracle and two to three times its diameter, is conspicuous. The spiracles are very inconspicuous.

The head and mouth parts are not very intelligible without elaborate drawings. The second (?) antennal joint is very long, and the jaws have a remarkable form. Where they face each other they have not merely a toothed margin, but have a circular face, hollowed centrally, and with teeth round more than half the margin, so that they are like scoops with toothed edges. This structure seems to be attained by the ordinary five teeth being placed in more crowded disposition than usual, and then continued and supplemented beyond the end with largest (not smallest) teeth by a little row of four smaller accessory teeth, which I do not remember to have observed before in other larvæ (of course I have examined really very few). The circle in which the teeth lie is, however, continued right round to the attached margin of the jaw, suggesting that the two jaws form a more than usually closed pocket, possibly to retain sap, &c., in subaqueous mastication.

The larva moults four times. The difficulty of following any individual larva and noting its moults seemed to be so great that I did not attempt it, but I preserved first instar larvæ and full-grown ones, as well as a considerable number in intermediate stages, of which those in second instar were the only ones of whose stage I was certain. But, arranging all my specimens by the sizes of their heads, I find that between the second and the last instars two, and only two, sizes occur, and these five sizes range themselves in regular order. This method is of course nevertheless not so sure to be correct as the actual observation of each moult in one individual.

The pupa is 8–10 mm. in length and 3 mm. in breadth, varying a little in size, and especially the females are the larger and wider; but there is much latitude in size in both sexes. The apparent size varies also a good deal, owing to the amount of collapse possible in the two free abdominal segments (five and six). In a dead pupa these close up very much by drying, and in an empty pupa-skin they are often completely telescoped.

The widest part of the pupa is at the end of the wings, some 5·5 mm. from the front. Seen laterally, the pupa is of somewhat ordinary oval form, well rounded at each end, and a little flat in front; but, viewed dorsally (or ventrally), it tapers to either end, and this looks more remarkable forwards, conically rather than by an oval outline. At any rate, it differs from our average idea of a pupa in this direction.

The next point to attract attention is the projection beyond the wing-cases as a free spine of the cases of the third pair of legs, supported basally by the wing apices and the ends of the second legs and antennæ.

The colour is a pale brownish, decidedly darker than straw-colour, but still nearer straw-colour than to the ordinary pupal brown.

The wings and appendages are fixed to the end of the fourth abdominal segment. The hind wing is visible between the fore wing and the abdominal dorsum as a narrow strip, made somewhat waved and irregular by having to accommodate the spiracles on second and third abdominal; it ends at the end of third abdominal segment, at the anal angle of fore wing, it being the hind margin of fore wing that crosses the fourth abdominal segment. The inner margins of both wings, and especially of the under one, have many fine wrinkles or creases, probably due to resistance to the backward movement of the wings that takes place when they expand immediately after pupation.

The spiracles are interesting; on second, third, and fourth abdominal segments they have a very elaborate circumvallate fortification and are very conspicuous; on the other segments (fifth, sixth, seventh abdominal) they are quite simple and not very easily seen. In these special spiracles is first and centrally the spiracle proper, consisting of a central opening (transverse to length of pupa), with a fibrillate margin, and round this a set of fine circular lines, making the oval spiracle into a circular (or nearly so) area. Next round this is a smooth dome-like area, by which the spiracle is raised on to a prominence, and next a series of raised ridges varying in number and form, but apparently trying to be circular, but forced by the wings to extend themselves as trenches along the wing border.

The effect of these spiracles on the associated tubercles suggest strongly that the spiracles have been forced dorsally by the wings—a circumstance not distinctly suggested, as in many similar pupæ, by the form of the circumvallate ridges.

The dorsal tubercle I is generally easily seen, but II cannot be found; III is situated fairly normally, as in the larva on fifth, sixth, and seventh abdominal, and IIIa, is in front and above the spiracle. On fourth abdominal, III and IIIa, are fairly normal in direction from the spiracle, but are close to the circumvallatory ridges. On third, however, III is quite as much in front as above spiracle, and on second abdominal segment it is quite in front of spiracle; IIIa, though in front in both cases, is rather below spiracle in third, and quite so on second segment.

At first view, one demands, is this not V, in a situation very usual for it in some families, but, by tracing its migration

segment by segment, as above, its real nature is not open to doubt; and further confirmation comes from finding IV and V close together a considerable way below the spiracles on the following segments disposed as in the larva. These hairs and tubercles are microscopic, and the pupa may be described as quite smooth, as that idea is usually understood. There is a pair of hairs on the face, but there seem to be none on the thorax. They appear to have become obsolete, like II on the abdominal segments.

The two anal spines noted by Buckler are very curious; they are on the tenth abdominal segment, but the segmental incisions are so obscure that in some views they seem to be on the ninth. Their situation is quite dorsal, dorsal to the spiracular level; they point directly outwards, and are thin and flat, so that even from behind they appear to lie almost flat on the surface.

Noting the appendages in front, there is a well-marked labrum, and there are angles of the face below it that may be the mandibles; between these is a small angular space, the floor of which is no doubt the labial palpi. Between the eyes and the base of the second pair of legs is a small square piece abutting against the antenna. I believe I have called this piece the maxillary palpus in some pupæ similar to this one, and I am not prepared to say positively that it is not, as it occupies precisely the position that the end of the palpus occupies in all those *pupæ incompletæ* in which its nature is obvious. Here, however, on dehiscence, this piece remains attached not to the maxilla, but to the prothoracic dorsal piece, and it seems therefore that it really is a portion of the prothorax visible in front of the antenna.

The pupa possesses a primitive feature in having a separate dorsal head-piece, to which the eye-piece, separated from the rest of the face, remains attached on dehiscence. The maxillæ reach more than half-way to the wing-tips, and then disappear by passing under the second pair of legs; in some specimens there is an appearance as if the extremity came to the surface just at the wing-tips, behind the free portions of the appendages. In dehisced specimens the applied surfaces of the hind legs in this process separate, and leave an angular line that looks sometimes as though there were something else besides the hind legs present; this could only be the maxillæ. The appearance is, however, due merely to the exposure of the inner aspect of the leg-case.

Between the maxilla and first leg is a portion of the first femur (as in sphingids, &c.); the first legs are cut off from the face (eye) by the angular portion of the prothorax, and do not extend quite as far as where the maxillæ disappear. The second legs and antennæ, as already noted, reach a little beyond the end of the wings, along the free portion of the third leg-cases.

It is noteworthy that in the female they hardly reach one-third of the length of the spine formed by the third leg-cases, whilst in the male they reach rather more than two-thirds.

The wing apices are long and pointed, quite different to those of the imago, and reach inwards behind the antennæ to the second pair of legs. The apex of the hind wing also appears here, and is as pointed, and a little longer than the fore wing.

The front of the last abdominal segments differ in the two sexes in the usual way, the male having two eminences on the ninth abdominal segment, whilst the female has a longitudinal impressed line on the eighth. On the ninth, however, the female structures are of a very unusual character. There are nine or ten raised ridges, parallel and longitudinal, and the sharp edges of the ridges are of dark (dense ?) chitin. Though straight longitudinally, they have an antero-posterior curvature, such that the set together look just like the upright iron bars placed to protect windows, where the lower portions are bent outwards.

It may be well to recapitulate that the larva is truly aquatic, *i. e.* in water and wetted by it, in the first instar. Afterwards, though under water, is aerial, *i. e.* surrounded by air in a case. To compare it with the allied species, *A. niveus* and *N. stratiotata* appear to be aquatic throughout. *H. stagnata* appears to be aerial after hybernation, but I can find no definite statement on the point. *H. nymphæata* is aerial; I do not find any definite statement that it is aquatic in first instar. It is the species described by Reaumur, and often since as filling its case with air, and the one that most readily occurs to us in thinking of the group. At top of p. 2 I was thinking of *nymphæata* rather than *stagnata*, of which I was speaking.

Explanation of Plate I.

Details of Cataclysta lemnata.

Fig. 1.—Eggs, as laid under a leaf of *Lemna trisulca*, × 20. The reproduction of photo (by A. E. Tonge, Esq.) fails to show the slight sculpturing, but gives size, and shows method of laying, *viz.* border to border, and not imbricated, as is usual in this sort of scale-like egg.

Fig. 2.—Diagram of one side of larva-skin, from medio-dorsal to medio-ventral line, to show disposition of tubercles from first thoracic to third abdominal segments.

Fig. 3.—One mandible, much magnified, to show marginal teeth supplementing the usual five, and forming a scoop (× 160).

Fig. 4.—Side view of pupa, × 3½.

Fig. 5.—Portion of dehisced pupa, × 10, shows:—1. Dorsal head-piece, carrying (2) eye-cover. 3. Prothoracic cover, carrying (4) ventral portion, that looks in pupa like maxillary palpus. 5. Mesothorax. 6.

Antenna. 7. Metathorax. 8, 9, and 10. First three abdominal segments. 11. Fore wing. 12. Hind wing.

Fig. 6.—Another portion of dehisced pupa, × 10, showing appendages. 1. Face piece. 2. Labrum. 3. A rent due to flattening preparation. 4. Antenna. 5. Eye-cover restored to natural position; it is at once torn from here if in handling the dorsal and ventral portions of pupa are separated, as happens also to 6. Ventral portion of prothorax, really probably outer end of dorsal plate. 7. Angle where labial palpi would form floor of space. 8. Maxilla. 9. Femur of first leg. 10. First leg. 11. Second leg. 12. Wing; third tarsi are seen beyond second leg. The main sketch is female; the subsidiary addition is of same parts in male pupa, showing relative greater length of second legs and of antennæ. The line on third tarsi shows where their opposed faces have been separated (on dehiscence), and not another member of appendages.

Fig. 7.—Ventral aspect of last four segments of male pupa, × 10.

Fig. 8.— ,, ,, ,, female pupa, × 10.

Fig. 9.—Portion of same, further enlarged (× 20), to show grid-like arrangement on ninth segment.

NOTES ON THE WAVE MOTHS (GENUS *ACIDALIA*, Auct.).

By Louis B. Prout, F.E.S.

(Concluded from p. 11.)

But although an "*Acidalia*" cannot hybernate otherwise than as a larva, it does not by any means follow that it needs to hybernate at all. Some of the species, I believe, do need, and therefore only give a single life-cycle in the year. But others can go through their metamorphoses quite rapidly in the warmer months, being only checked by the approach of winter, so that there are two, or even three or more, generations of the imago in a single summer, the larvæ which produce the later broods necessarily dispensing with any hybernation. Cases of such double-broodedness occur, in the South of England, with *Ptychopoda dimidiata*, *P. subsericeata*, *Leptomeris marginepunctata*, and I think others, in all excepting the most backward seasons; whilst the abundant little *P. virgularia* has probably at least *three* generations in the year. Yet a third (and not inconsiderable) class, not at present known to throw a second brood in a state of nature, can readily be induced to do so in artificial breeding. Such are *P. inornata*, *P. rusticata*, *P. trigeminata*, &c.; and at least one of the partially double-brooded ones, *P. subsericeata*, can yield a *third* brood in captivity. Concerning *P. trigeminata*, let me relate my own experience, as it "points a moral," not to lepidopterists only, but to all scientific workers. I have three

times tried to breed it from the egg, and each time, in spite of the stimuli of abundant warmth and abundant food freely administered, the larvæ have persisted in hybernating; and had I had only my own experience to draw upon, I should by this time probably be dogmatically asserting that this was one of the species which did not allow of artificial "forcing." But Barrett writes as follows ('Lep. Brit.' viii. p. 18): "On the wing in May and June, and as a partial second generation, at the end of July and in August, but Mr. A. H. Jones records that if fed up in moderate warmth the second generation becomes complete, every moth emerging in August or September." Two or three friends, whose word I would trust as implicitly as my own, have confirmed this last statement from their own experience; and I am fain to admit that mine has really been quite exceptional, albeit thrice repeated. My moral is obvious. *Do not generalize on slender data.* By all means *record* personal experiences, but use them, not as a basis for too sweeping deductions, but simply as one tiny contribution to be cast upon the common heap, from which, at last, sound generalizations may be made practically without fear of a "possibility of error."

I have said above that an "*Acidalia*" "cannot hybernate otherwise than as a larva." One would not be surprised therefore to hear that there was further a fixed age, or larval stadium, assigned for this important period in its economy. There was a good deal of talk in our entomological circles a few years ago about this fixed hybernating stage and the certainty of death if the stress of weather, or of failure of food, met the insect at any other than the right period. But some data are already to hand showing that the operation of natural selection is not always so cruelly rigid as this, but—sometimes, at least—allows of a little flexibility. Thus our "Wood Argus" butterfly and our common "Brimstone Moth" can winter either as larva or pupa; Mr. R. South once successfully hybernated four *larvæ* of *Coremia unidentaria*, a species which almost invariably hybernates as pupa; and in the *Acidaliæ* I have *certainly* had *P. rusticata* and *almost certainly* also *P. inornata* hybernate in two different larval stadia.

Where Acidaliid larvæ may be found—or sought—I have already indicated to a certain extent. They are all low-plant feeders; few, if any, are specialized to a particular plant; and therefore, theoretically, they might occur almost everywhere. But there are few things more noticeable than their extreme *localization*, and often they seem almost *gregarious*, so closely does a particular colony keep to a particular hedge or bank. There was a little bit of hedge opposite Highams Park Station where, for years, the imago (and therefore of course the larva, if one had searched closely enough) of *P. interjectaria* positively swarmed; I have had seven in my net at once when "dusking" along that hedge. And most entomologists have

had some similar experiences with members of the genus. The wider question of "Where--" *i. e.*, that of geographical distribution—deserves separate treatment and shall be passed over for the moment.

How do the larvæ feed? They are somewhat specialized in their tastes, notwithstanding that I have just denied their specialization to any particular plant. Their peculiarity is that, unlike most caterpillars, they have a strong preference for *withered* or even *mouldy* food. We may be interested or amused at this apparently unnatural taste; but let not those of you who have any liking for "high game," or for certain cheeses which I could mention, or even for dried vegetables or fruits, "cast the first stone." *P. rusticata* likes dead *and mouldy* leaves, and is suspected of feeding, in a state of nature, on fallen elm, hawthorn, and other leaves under the hedges in which the moth occurs. *P. dimidiata* is stated to be "even well pleased with a mouldy slice of turnip!" *P. herbariata*, so scarce in England, where it is certainly not indigenous, does not mind how dry its food is; indeed, the few that have been taken in this country have been in herbalists' shops, where, doubtless, the larvæ had fed up; it is also reputed occasionally to attack herbaria. *P. dilutaria*, better known as *holosericata*, has a very interesting habit; it first bites nearly through the leaf-stalk of its chosen plant, causing the leaf to droop and wither, and then feeds off the delicacy thus prepared. *Sterrha ochrata* will not touch fresh leaves when withered ones are at hand; yet likes to have the latter sprinkled with water. *P. virgularia* used to be found freely by Rössler feeding on brushwood heaped up in his garden. I rear nearly all my Acidaliæ with withered dandelion leaves, and with a generous supply of these, larger and finer specimens may often be reared than are met with in a wild state.

How are the larvæ protected? They are mostly of a very sober brown or brown-grey garb, and probably most of them sufficiently resemble little bits of curled-up dead leaf, &c. A few, such as *Leptomeris strigilaria*, are long, thin and twig-like, and rest in a rigid position to aid this resemblance. But these, or at least the one just named, have also a more aggressively defensive habit, which has caused me a good deal of amusement. When disturbed they throw themselves into the most violent and indescribable contortions, during which it would probably be as hard for any small enemy to seize them, as it is to get a firm hold of the proverbial eel. Curiously, I have, during the past summer, made acquaintance with three Geometrid species which indulge in these remarkable acrobatic performances, which I had never witnessed in any prior to this year, though of course I had heard of them. The three species are the common *Panagra petraria* (whose larva I had never found simply because I had never searched bracken for it at the right time), the much scarcer

Anticlea cucullata, and *Leptomeris strigilaria*, ova of which Dr. Chapman sent me from Guethary (Basses-Pyrénées) this summer. Mr. Barrett says that the larva of *L. immorata*, another of the long, thin, rigid species, "if touched, coils up almost like a watch-spring." Mr. Bacot reports on the larva of *L. incanata*—a continental species, not occurring in Britain, but related to our *marginepunctata*—that "They rest either in an extended position or with a partial double spiral coil." I have also noticed these singular coils in others of the slender group of larvæ—*L. imitaria*, &c. The stout species, which cannot actually coil themselves, like to rest in slightly curved positions or sometimes quite straight, and when disturbed bend the front segments in to meet or approach the under side of the hinder, making a form which may very roughly be likened to a figure 2; whereas the thin larvæ, in making the "spiral," of course have to bring the front segments round *beside* the hinder.

To give, in a paper like the present, the technicalities of the larval descriptions which Mr. Bacot has kindly prepared on *Leptomeris incanata*, *Ptychopoda trigeminata*, and a Pyrenean species *P. asellaria*, would serve no useful purpose; we shall hope to make scientific use of them when a larger number of species have been studied in the same thorough way. I have myself, in addition, some fairly full notes on certain stages of the larvæ of *P. virgularia* and *L. strigaria*, made four or five years ago, and some on the newly-hatched larva of *P. trigeminata;* and these furnish a few further details of value for our studies, as do also some very good notes on the earliest stages of *L. emutaria* by Mr. A. Sich (Ent. xxxvii. p. 108). I will only now mention one or two general points.

So far as I know personally, all the Acidaliid larvæ are, on first hatching, distinctly slender in proportion to their length, though probably in somewhat varying degree. I learn from Van Leeuwen's account in Sepp's 'Nederlandsche Insecten,' that those of *P. humiliata* and *P. interjectaria* are stouter than most. I find from my notes that *P. trigeminata*, which becomes decidedly one of the stumpy ones in its later stages, is slender at first, and so is *P. virgularia*, which is of medium proportions when full grown, as well as such larvæ as *L. strigilaria*, *strigaria*, &c., which remain slender to the last. The arrangement of the tubercles would seem to be fairly constant. The setæ furnish some interesting structures, and I fancy will yield material of some classificatory value. Sometimes they are fairly normal, short, stiff hairs, often they are thickened or clubbed at the extremity, sometimes thickened throughout, sometimes (as in newly-hatched *P. trigeminata*, or in *P. asellaria*, up to the very last) they begin thickening rapidly almost from the base, and make either a flask-shaped structure or something approaching an inverted pyramid. I suspect that some of these last-named

structures are glandular, and I cannot help wondering whether they are akin to what Mr. Burrows calls "battledore processes" in the larvæ of the "Emeralds," though I understand him that these are not homologous to the true larval setæ. Most, if not all, of the Acidaliid larvæ have the skin decidedly rugose in appearance, subsegmentation distinctly marked, and generally a more or less well-developed lateral flange.

Earlier in my paper I spoke of the two large genera into which—excluding *ochrata* and perhaps *rusticata* and *fumata*—Meyrick and others find our imagines divide according to neuration and leg-structure; and I have stated or hinted two or three times in its course, that these seem to be roughly correlated with some of the more striking larval differences. Ever since the Acidaliid larvæ have been at all systematically described—*i. e.*, since the time when Buckler and Hellins were at work—it has been customary to speak of the "short broad *Acidalia* type" and the "long thin." Now it is noteworthy that the larvæ of all the British species which fall under Meyrick's *Leptomeris*—namely, *remutaria*, *immutata*, *marginepunctata*, *ornata*, *imitaria*, *emutaria*, *strigilaria*, *immorata*, and *rubiginata*—belong most distinctly to the "long thin" group; and so do such non-British ones of the same genus as I have had under observation (*incanata* and *strigaria*), or as are known to me from figures and descriptions by Millière, &c. The least unequivocal—to judge from the figures—is that of *L. ornata*, and this, with its allies, has been placed into a distinct section by Lederer, on account of the indentations of the margin of the hind wing between veins 4 and 6, and would, perhaps, form the type of a natural genus—*Craspedia*, Hb. There are, of course, other larval characters which go with this "long thin" group, such as the nearly cylindrical form, the *comparative* freedom from rugosities, the extremely short setæ apparently seldom developing, in the later stages, into the clavate forms, &c.

The bulk of the remaining species—Meyrick's genus *Eois*—have quite a different type of larva, short and thickened—especially posteriorly, more or less flattened, very rugose, generally comparatively hairy, the hairs often knobbed at their extremity. But I fancy they are less homogeneous than the *Leptomeris* group, and will need careful revision. A few seem almost to form connecting links between the group in which their imago would place them and *Leptomeris*; *P. virgularia*, for instance, has not very much of the typical *Ptychopoda* character, and even *P. bisetata*, *P. straminata*, *P. subsericeata*, &c., make some approach to the intermediate form. Still, I do not think any of them are capable of assuming the spiral coil characteristic of true *Leptomeris*,* and they all show *some* approach to the

* *P. virgularia* may be an exception, as some small, but by no means newly-hatched, larvæ kindly given me by Mr. South since this paper was written, show a strong predilection for the *Leptomeris* attitude.—L. B. P.

flattening, the thickening, &c., characteristic of their congeners. By the way, the pupa-case of *subsericeata* is superficially very different from all the others which I have, whether of *Leptomeris* or *Ptychopoda ;* but I have made no close examination of them.

A few words in conclusion as to the distribution of the species of "*Acidalia*." I have remarked, in connection with the larvæ, how extremely local they generally are, and a study of our British species will afford plenty of illustrations. We have one species confined, in these islands, to Lewes, one to Freshwater (Isle of Wight), one almost to Deal, one to Folkestone, one to the "Breck Sand" district of Norfolk and Suffolk, one to the Isle of Portland, while others are only a little less restricted in their range—*e.g.*, *P. rusticata* (which has colonies in the Isle of Portland and in the Northfleet-Gravesend district, but hardly occurs elsewhere), or *P. contiguaria*, which is confined to the mountains of Wales. With the exception of this last, and possibly the Breck Sands, each habitat which I have named may reasonably be described as southern, and it should be added that a few of the other species, though somewhat more widely distributed, are distinctively southern, others mainly so, while very few of the species extend into Scotland. Our only characteristic *northern* species of the group is *Leptomeris* (*Pylarge*) *fumata*. These facts shadow forth what no student of the Palæarctic Geometrides as a whole can fail to notice—namely, that the genus, or subfamily, belong more to southern Europe than to northern. It has been my good fortune to have brought to me by my kind friend Dr. Chapman four collections from different parts of Spain, and one (some years ago) from Norway ; in all the former, Acidaliid species were very much in evidence, generally indeed forming the dominant family; whereas in the Norwegian collection, amongst a large number of species, there was only *one* of them (*L. fumata*). In Staudinger and Rebel's 'Catalogue of the Palæarctic Lepidoptera,' the genus is credited with 179 species, of which we in Britain can claim 27, or about one-seventh. The total number of Geometrides is given as 1229, of which Britain yields about 275, or well over one-fifth. The discrepancy is fairly marked, and would be still greater were it not for the number of species which just maintain themselves in one spot in our southern counties (chiefly on the coast). These species will give much food for reflection to the student of geographical distribution, and I regret that I have no definite suggestions to offer on the subject. I trust I have said enough this evening to show that, both in this and in other directions, the homely little "wave moths" are not unworthy of the attention of the scientific naturalist.

AN ABBREVIATED LIST OF BUTTERFLIES FROM THE SOUTH OF FRANCE AND CORSICA.

By Albert F. Rosa, M.D.

The following are a few notes on the more special butterflies observed during three visits to the South in 1902–3–4. The two first occasions included Nîmes (Pont du Gard and Remoulins), Digne, and Hyères; in 1902, May 9th to 20th, and in 1903, July 5th to 14th. Last season, ten days, from July 9th to 19th, were spent in Corsica. To obviate the too frequent repetition of full dates, it will be noticed by the foregoing that May indicates May, 1902, and July means July, 1903, unless where a Corsican locality is given, in which case July, 1904, is understood.

Papilio alexanor, Esp.—I secured one on the afternoon of the day of arrival, the 6th of July, at Digne, on the left of La Colette, the next morning two on the ridge at the other side of the Bléone, and two that afternoon on Les Dourbes road. After this it was more frequently seen, but soon began to show signs of wear. I got a series of nearly a dozen perfect specimens, including four females. The females have the ground colour paler, but otherwise there seems to be very little variation amongst mine excepting in size, one being abnormally small.

P. hospiton, Géné.—We arrived in Corsica on the 9th, and it was the 13th before this was actually taken. Leaving out those that were only seen and might be doubtful, I think we can account for about eight or ten. Our records are as follows: I got a female on the 13th, a perfectly fresh male on the 14th, had another in my net on the 15th but it escaped, another female on the 16th, liberated because imperfect, and lastly, a perfect male on the 18th. Mr. Tylecote also secured a female on the 13th, two, I think males, on the 15th, and one (or two) on the 16th set at liberty. All of these in the neighbourhood of Tattone. There is some little variation amongst mine. The female is much darker than the males, the characteristic diffused band on the hind wings and other black markings being more pronounced. One male and the female have only five marginal yellow lunules on the hind wing, the one next the costa being absent; but this lunule is developed in the other male.

Pieris daplidice, L., var. *bellidice*, O.—One taken on the Dourbes road at Digne on May 12th, and another at Pont du Gard a few days later.

Euchloë belia. Cr.—Along with the preceding, flying at the more barren parts over the shaly mounds.

E. euphenoides, Stgr.—Only a short series obtained. One or two at Digne, to the west of the town, on May 13th, and a few at Pont du Gard on the 20th, including two females. Not seen at Hyères, where I was from the 16th to the 18th.

Leptidia duponcheli, Stgr.—The spring brood was flying at Digne along with the var. *lathyrus* of *L. sinapis*, and both were taken in good condition between May 10th and 13th.

Colias edusa, Fab., var. *helice*, Hübn.—One at Digne, July 9th, and one at Corte, July 18th. *C. edusa* was very common at Tattone, but I did not see any of this variety there.

Gonepteryx cleopatra, L.—Common at Nîmes, Remoulins, and Pont du Gard early in July, but rare at Digne. Very abundant and fine at Hyères from the 12th to the 14th of the same month. In May I only saw one or two at Digne, and one at Hyères in the grounds of the Hôtel des Palmiers.

Charaxes jasius, L.—Three seen at Hyères on the hills north of the town, on the 12th and 13th July. This is the only species included in the list of which a specimen was not obtained.

Vanessa urticæ, L., var. *ichnusa*, Bon.—One taken, newly emerged, at Tattone, on the 17th July. Also some larvæ from nettles, near the Hôtel du Monte d'Oro, at Vizzavona, which pupated in Corsica and during the return journey. Of twenty-eight pupæ, seventeen produced single ichneumons, and eleven butterflies emerged after I arrived home, three being cripples.

Polygonia egea, Cr.—Three taken at Digne, on the 9th and 10th July, about the beginning of the Dourbes road. No doubt a couple of weeks earlier would have been better for the taking of this species.

Melitæa aurinia, Rott., var. *provincialis*, B.—A few at Digne, about the middle of May, on the 'Les Dourbes' road and adjacent fields, in company with *M. cinxia*, which was very common and in fine condition.

M. parthenie, Bkh.—Not uncommon at Digne in July. I do not remember noticing any of *M. athalia*.

Argynnis daphne, Schiff.—A few also taken at Digne in July.

A. elisa, Godt.—At first only seen occasionally, but became very common, towards the middle of July, about Tattone and Vizzavona, especially in the fields around the former locality. The sexual variation at the extreme is very distinct, the smaller males being of a very ruddy fulvous, and the females, besides being considerably larger, are very much duller in tone; although a few members of the sexes run pretty closely alike in size and colour. By the third week of July the males especially were getting worn.

A. paphia, L., var. *immaculata*, Bell (*anargyra*, Stgr.).—All the *paphia*, which were very common in the forest at Vizzavona and at Tattone, probably incline to this variety; but it is not easy to get specimens entirely without the silver fasciæ. The violet colour seems to be associated with the development of the silver markings, because it diminishes in equal proportions and is absent in well-marked specimens of *anargyra*.

Ab. ♀ *valesina*, Esp.—This variety was frequently observed in the forest at Vizzavona, and, as might be expected, has the same tendency to suppression of the silver markings. One is *valesina* above and *immaculata* below, the under side of the hind wing being a very vivid green.

A. pandora, Schiff.—Much more frequently seen than taken, and was most common at Tattone, a few extending as far as Vizzavona station. It did not seem to occur amongst the *paphia* in the forest, but two were observed higher up on La Foce, in the neighbourhood of the hotel. One or two were also seen at Corte. I got six males and one female, having taken, after the first day or two, about one per day, not considering those discarded at the time when imperfect. One male

is all but without the silvery fasciæ on under side hind wing, thus approaching ab. *paupercula*, Ragusa, only one small crescent next the costal margin being present.

Melanargia lachesis, Hb.—Was pretty common on the road between Remoulins and Pont du Gard on July 5th. I got a series of males, but only one female.

M. galatea, L., var. *procida*, Hbst,—Common at Digne early in July. They vary a good deal, some being considerably darker than others.

M. syllius, Hbst.—Very abundant and fine at Hyères in the Beau Vallon and terraced garden plots behind the town. Taken from the 16th to the 18th May.

Erebia evias, Godt.—Two at Digne on the 9th and 11th May.

Satyrus circe, F.—Taken at Remoulins and Pont du Gard on 5th July, and common at Digne from the 6th onwards, mostly males. Females more common later, as at St. Auban, July 11th, and at Hyères about the 14th. Also very abundant in Corsica, especially in the fields around Tattone.

S. semele, L., var. *aristæus*, Bon.—Occasionally in Corsica, on the roads at Tattone, Vizzavona, &c. Only four or five taken.

S. neomyris, Godt.—Pretty common, mostly on the roads and occasionally in the fields around Tattone, Vizzavona, Bocognano, &c.

S. statilinus, Hüfn., var. *allionia*, Fab.—Two taken at Hyères on the 13th and 14th July, in the terraced plots to the right behind the town.

S. fidia, L.—Flying along with the last species, which it closely resembles, but was apparently more common, judging from the number taken.

Pararge megæra, L., var. *tigelius*, Bon.—Nearly every locality visited in Corsica produced a specimen or two; never common and inclined to be getting past its best.

Epinephele jurtina, L., var. *hispulla*, Hb.—The best specimens were taken at Hyères, July 16th and 18th. In Corsica it was most abundant though not so large, and going over when we were there.

E. ida, Esp.—One male at Remoulins, and a few at Digne early in July; but most at Hyères towards the middle of the month, where the females also were obtainable. Also occasionally in Corsica.

E. pasiphaë, Esp.—Just about as abundant and in as fine condition as *M. syllius* at Hyères 16th to 18th May. One or two were also seen at Pont du Gard on the 19th and 20th. Worn specimens were also noted in July.

Cœnonympha dorus, Esp.—Digne, July 6th and onwards, common at some parts, as also was *C. arcania*, both in good condition. *C. dorus* was also taken at Remoulins on the 5th.

C. corinna, Hb.—Very abundant on the Vivario road, between Vizzavona and Tattone, and also at La Foce de Vizzavona.

C. pamphilus, L., var. *lyllus*, Esp.—A few taken in cut hay-fields about Tattone.

Læosopis roboris, Esp.—On 6th, 7th, and 8th July, at Digne, flying around pollard oak. The same tree was occasionally visited, perhaps eight or ten being seen altogether, sometimes a pair at a time. I got two males and one female, all freshly emerged and perfect.

Thecla ilicis, Esp., var. *cerri*, Hb.—This variety was common,

along with *T. spini*, in a quarry at Remoulins, and they both also occurred at Digne.

T. acaciæ, Fab.—One undoubted female at Digne on July 9th, and five other specimens from Remoulins and Digne which are not so certain. The latter have a row of orange spots, six in number, on the under side of the hind wing, almost reaching the costal margin (Kane gives two or three in the male and three or four in the female); at anal angle there is little or no blue, and the next spot is not marked with a black dot outside. The upper sides, however, correspond most closely with this species.

Chrysophanus phlæas, L., var. *eleus*, Fab.—Common at Ajaccio, also at Tattone and Corte. The date was apparently rather late for this brood.

Lampides telicanus, Lang.—Tattone, two *in copula*, but rather poor specimens.

Lycæna argiades, Pall., ab. *coretas*, O.—One on May 11th at Digne, on the mountains in Les Dourbes direction at considerable elevation.

L. argus, L. (*ægon*), var. *corsica*, Bell.—Rather common on the bracken at La Foce de Vizzavona, and also frequently at Tattone.

L. astrarche, Bgstr., var. *calida*, Bell.—Some very bright; Tattone, Ajaccio, Vizzavona, Corte, pretty common.

L. meleager, Esp.—A few at Digne, at the other side of the Bléone and Les Dourbes road, including one fine blue female. Just emerging about July 7th.

L. admetus, Esp., var. *ripartii*, Frr.—Three at Digne on July 9th, beside the river on the road to the thermal springs. Just emerging.

L. sebrus, B.—Two at Digne on May 10th, Les Dourbes direction, where the road ascends the side of the mountain.

L. cyllarus, Rott.—Common towards the middle of May at Digne, but going over. I got, however, a fairly good series, including some females.

L. melanops, Boisd.—Not nearly so common as the last-named and more worn. Half-a-dozen fair specimens, being all obtainable.

Cyaniris argiolus, L., gen. æst. *parvipuncta*, Fuchs (ex Corsica).—Common at sunny corners on the Vivario road, both in the forest above Vizzavona and in the open towards Tattone.

28, Pitt Street, Edinburgh.

A NEW GENUS OF CULICIDÆ.

By Fred. V. Theobald, M.A.

Genus Anisocheleomyia, nov. gen.

Head clothed with flat scales rather loosely applied to surface of head, and which form a more or less projecting mass between the eyes in front. Antennæ densely pilose in the male. Proboscis swollen apically. Palpi very short in both sexes. Thorax with narrow-curved scales in the middle, and with broad spindle-shaped ones around the front and sides; scutellum with small flat scales rather loosely applied, very distinctly trilobed. Wings ornamented. Ungues of male not very unequal in length but differing in breadth, one on each leg broad and leaf-like. Fork-cells short, as in *Uranotænia*.

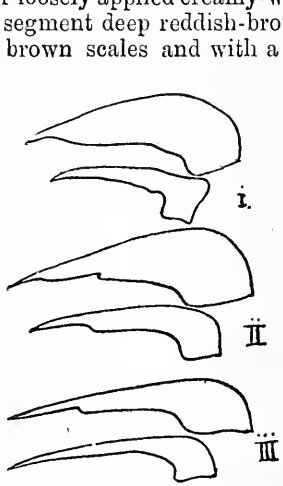
Closely related to *Uranotænia*, but differing in the non-plumose male antennæ and peculiar ungues, also in the absence of flat thoracic scales and more rugged appearance of the head and scutellum.

I cannot detect the genitalia, but the perfect specimens are evidently all three males. The ungues are the most marked characters, and can only be seen by breaking up the types. The two species are undoubtedly connected by squamose characters as well as the quaint ungues. Although the ungues are unequal, as in all male Culicids, they are not very unequal in length, but are in breadth, and differ in form. As no genitalia can be detected, I can only assume them to be all males from the abnormal ungues. A female sent was all destroyed but the head and thorax, so no details can be given. The antennæ are less pilose than in the male.

Anisocheleomyia nivipes, nov. sp.

Head creamy-white. Thorax rich brown in the middle, creamy-white around the dark area; pleuræ creamy-white. Abdomen deep brown with apical white bands. Legs deep brown, with pale reflections apically, last two hind tarsi white. Wings ornamented; costa dark, veins pale-scaled except for a dark area spread across at the base of the fork-cells; a noticeable pale spot on the dark costal area not reaching the costa.

♂. Head brown, clothed with rather loosely applied creamy-white flat scales; antennæ deep brown, basal segment deep reddish-brown; clypeus brown; palpi clothed with deep brown scales and with a few long black chætæ; proboscis deep brown with bronzy reflections swollen apically, hairy. Thorax bright brown; the middle of the mesothorax with narrow-curved bronzy-brown scales, and three rows of black chætæ, the dark scaled area surrounded by thicker creamy-white curved scales, forming a well-contrasted whitish area, which is indented into the dark area on each side in front before the base of the wings; scutellum with small flat dark brown scales and black border-bristles, four to the mid-lobe; metanotum bright chestnut-brown; pleuræ clothed with dense creamy-white scales continuous with the pale areas around the mesothorax. Abdomen deep brown, with deep brown scales and creamy-white scaled apical borders; the apical segment all pale-scaled; border-bristles pale. Legs deep brown; coxæ and trochanters pale, last two and apex of the antepenultimate hind tarsi white; the fore and mid tarsi pale beneath; ungues unequal in size,



Ungues of *Anisocheleomyia nivipes*, n. sp.
(i. Fore; ii. Mid; iii. Posterior.)

but the posterior of nearly equal length, the larger very broad and thick, the smaller abruptly curved basally. Wings ornamented; costa black and spiny; first long vein black-scaled with a large white area over the cross-veins, and a white apex; a dark area on the stem of the first submarginal cell, a small dark area beneath it on the third, most of the stem of the second fork-cell dark, also a dark area in the middle of the upper branch of the fifth and at the apex of the lower branch; the whole forming a dusky band across the otherwise pale-scaled wing; first submarginal cell about two-thirds the size of the second posterior cell, its stem twice as long as the cell; stem of the second posterior slightly longer than the cell; posterior cross-vein longer than the mid, and nearly twice its own length distant from it, situated close to the base of the upper branch of the fifth vein. Lateral scales on the fork-cells and the third long vein large and lanceolate, a few very similar ones on the apex of the upper branch of the fifth; median vein-scales small and dark on the fork-cells, third vein and middle of the upper branch of the fifth and the apex of the lower branch; those on the stem of the first fork-cell dark, and some of almost *Etiorleptiomyian*-form (*i. e.* heart-shaped), but more elongate. Halteres with pale testaceous stem and fuscous knob. Length 2·5 mm.

Habitat. Queensland (Dr. Bancroft).

Observations.—Described from two perfect specimens; Dr. Bancroft bred the specimens, which live, he says, in association with *Uranotænia pygmæa*, Theob. Although very distinct, they cannot be told from *pygmæa* until boxed. This species differs from all other related Ædinæ, except the next species described here, in having distinctly ornamented wings. The thoracic ornamentation is also very marked, the indent of white scales into the dark area of the mesonotum in front being very characteristic, and the general sharply defined light and dark areas of the mesothorax make it very conspicuous. The tarsi show paleness on all the legs in certain lights, and all are evidently pale beneath, but the hind legs only have the last two creamy white above. The ungues are not drawn from a microscopic preparation, so only the general form is shown.

I have placed the type in the British Museum collection.

Anisocheleomyia alboannulata, nov. sp.

Head black, with a narrow white line around the eyes with very long white projecting scales in front between them; proboscis black, with a white patch above near the apex and another large white patch near the base. Thorax deep brown, with a narrow silvery-white line around the end of the mesonotum up to the base of the wings, and another more irregular one on the brown pleuræ. Abdomen black and snow-white, ornamented with median white areas and white segments. Legs black, the hind pair with broad apical white bands, and the last two segments white; femora of all with white spots. Wings ornamented, costal border black, veins white-scaled with two broad dusky bands running across them.

♂. Head black, clothed with small flat black scales, and a border of similar white ones around the eyes, which show pale-blue reflections in certain lights under the $\frac{2}{3}$rd power, in front between the eyes projects a tuft of very long white scales, there are also scattered small upright black forked scales and a small basal medial blue patch; antennæ deep brown, basal segment black, base of second segment reddish-brown; palpi very small black-scaled; proboscis black, a large silvery-white patch towards the base, and a smaller one on the dorsum nearer the apex. Thorax deep brown, with narrow-curved bronzy scales, a narrow white border around the front and sides of the mesonotum composed of broad curved scales, which appear pale-blue in certain lights, ending about the roots of the wings; scutellum deep brown, clothed with small flat deep brown scales, very distinctly trilobed, the mid-lobe large with four border-bristles; chætæ of mesothorax and scutellum black; metanotum black; pleuræ brown, with a narrow wavy white-scaled line running along it from the base of the abdomen to the head, and a few white puncta near the base of the legs. Abdomen black and silvery-white, the first segment mostly white-scaled, the second and third with a white median patch, the fourth all white, the fifth black with a few apical white scales, the sixth all white, the apical one black and white. Fore legs deep brown with a white spot at the apex of the femora and a trace at the apex of the tibiæ; mid legs with two white femoral spots and silvery-white venter to femora; hind legs with femoral spots more pronounced; tibiæ with broad white median and apical bands; metatarsi and tarsi with broad white apical bands except the last two tarsi, which are all white; ungues unequal, one on each fore and mid leg very broad and curved, a thin web-like membrane between the curved outer portion; hind not examined. wings ornamented with black and white scales much as in the former species, but there are two dusky areas across the surface. The stem of the second long vein close to the first, almost fused with it; stem of the first posterior cell nearly three times as long as the cell; stem of the second not quite twice as long; scales on the stem of the fourth rather long and broad, longer than in the former species; posterior cross-vein longer than the mid, about one and a half times its own length distant from it. Black scales on the stem of the first fork-cell, on the basal half of the third, some on the base of the stem of the second fork-cell, on the greater part of the upper branch of the fifth, a few at the apex of the lower branch, and a batch near the base, also some near the base of the fourth. Halteres with testaceous stem and fuscous knob. Length 2·5 mm.

Fore ungues of *Anisocheleomyia alboannulata*, n. sp.

Habitat. India (Capt. James, I.M.S.).

Observations.—Described from a single specimen. The species is a very beautiful and marked one, and cannot be confused with any other mosquito. The structure of the ungues is very

peculiar. The specimen is a male certainly. The fore leg removed to show by microscopic examination the ungues, which seem to be exactly the same in the mid leg. This type is also sent to the British Museum collection.

CURRENT NOTES.

By G. W. Kirkaldy.

(Continued from vol. xxxvii., p. 305.)

11. Jas. G. Needham and others: "Aquatic Insects in New York State" (Bul. 68 N. York State Mus. (Entom. 18), pp. 199–517, pls. 1–52, text-figs. 1–26 (1903)).

12. Walter W. Froggatt: "Locusts and Grasshoppers" (Agr. Gazette N. S. Wales, xiv. pp. 1102–10, coloured plate) (1903).

13. Benj. D. Walsh: "First Ann. Rep. on the Noxious Insects of the State of Illinois (1867)" (reprinted 1903 by S. A. Forbes as a Special Publication of the Illinois State Lab. of Nat. Hist.), pp. 1–140, 1 plate.

14. 'Zoologischer Anzeiger' (Dec. 8, 1903), xxvii. pp. 113–144.

15. 'Allgemeine Zeitschrift für Entomologie' (Nov. 1, 1903), viii. nos. 20–1, pp. 389–436.

16. J. C. Koningsberger: "Ziekten van Rijst, Tabak, Thee en andere Cultuurgewassen, die door Insecten worden veroorzaakt (Meded. uit 's lands plantentiun" lxiv. pp. 1–109, pls. 1–5 (first three coloured) (1903)).

Dr. Needham, with three collaborators, has given us a valuable second instalment of his investigations upon the aquatic life of New York State (11). The first instalment * treated of the aquatic fauna of the Adirondacks; the second deals with that of Ithaca, and consists of a preface by Dr. Felt (p. 199); "Station Work of the Summer of 1901" (pp. 200–4); "Food of Brook Trout in Bone Pond" (pp. 204–17); "Life Histories of Odonata, suborder Zygoptera" (pp. 218–79); "Some New Life Histories of Diptera" (pp. 279–87)—all by J. G. Needham; "Aquatic Chrysomelidæ and a Table of the Families of Coleopterous Larvæ" (pp. 288–327) by A. D. MacGillivray; "Aquatic Nematocerous Diptera" (pp. 328–441) by O. A. Johannsen; "Sialididæ of North and South America" (pp. 442–86) by K. C. Davis; explanation of plates, index, &c. (pp. 487–517).

The Entomologic Field Station formerly at Saranac Inn was made in 1901 to Ithaca with advantage. As was to be expected considerable space is occupied by the consideration of the metamorphoses of zygopterous dragonflies, and this is elucidated by

* See 'Entomologist,' xxxv. p. 295 (1902).

2 coloured and 8 plain plates, as well as numerous text-figures. Next in extent comes the monograph of American Sialidæ, illustrated by 2 plates and numerous text-figures, and the paper on aquatic Chrysomelidæ, accompanied by 11 plates. The most extensive contribution, however, and in some ways the most important, is the section devoted to Nematocera, amounting to 114 pages and supplemented by 18 plates. As very many of the forms delineated and described are either also British or very closely allied to British forms, this bulletin should prove indispensable to British students; the price is nominal. Mention should also be made of the seven pleasing views of some of the collecting grounds.

Froggatt (12) discusses, with a coloured plate of six of the species, the short-horned grasshoppers of Australia, which is very rich in species of that fauna. Eleven species are described in this part. Entomologists will be grateful to Dr. Forbes for the timely reprint of Walsh's Classic "First Illinois Report" (13), which has long been out of print and difficult to obtain.

The December number of the 'Zoologischer Anzeiger' is devoted almost entirely to Insects (14), and contains the following papers:—

R. von Ihering: "On the Origin of the Formation of Societies in the Social Hymenoptera" (pp. 113–8).

N. Cholodkovsky: "Aphidological Contributions, No. 20, on a Species of *Phylloxera* destructive to Pear-trees" (pp. 118–9, text-figs. 1–2); and "On the Morphology of the Pediculidæ" (pp. 120–5, text-figs. 1–6). The author agrees with Melnikov that the Mallophaga and the Pediculidæ should be placed close together, but considers that they are connected with the 'Pseudoneuroptera' rather than with the Rhynchota, deeming it better to found a special order for the Pediculidæ, which he names "Pseudorhynchota," ignoring the already well-established "Anoplura."

A. Thienemann: "Anal Branchiæ in the Larvæ of *Glossosoma boltoni*, Curt. and some Hydropsychidæ" (pp. 125–9, text-figs. 1–3).

G. Enderlein: "On the Position of *Leptella*, Reut., and *Reuterella*, nov. gen.)* the representatives of two new European subfamilies of Copeognatha (Psocidæ) (pp. 131–4).

H. Stitz: "On the Genital Apparatus of Lepidoptera" (pp. 135–7, 1 text-fig.).

A. C. Oudemans: "Symbiosis of *Coptorthosoma* and *Greenia*. A question of priority" (pp. 157–9).

The Allg. Zeitschrift (15) as usual contains a large amount of interesting notices, among which may be cited:—

P. Bachmetjev: "On the Variability in the Length of the Wings of *Aporia crataegi* in Sophia [Lepid.]" (pp. 389–95).

G. Ulmer: "On the Trichopterous Fauna of Hesse"

* Too near *Reuteriella*, Signoret, 1880.

(pp. 397–406, text-figs. 1–3), from which seventy-three species are recorded.

L. Reb continues his paper "On European Coccidæ" (pp. 407–19), dealing with twenty-one species of "Lecanium."

Dr. Koningsberger has continued his researches upon the economic entomology of Java by his recent consideration (16) of the insect enemies of rice, tobacco, tea, coffee, india-rubber, and other plants. The metamorphoses, so far as known, are described as well as the nature of the damages. The five plates contain over one hundred figures of all orders.

ON A SMALL COLLECTION OF ANTHOPHORID BEES FROM COLORADO.

By T. D. A. Cockerell.

The Anthophorids are swift-flying bees, not easily caught, and on this account have not usually been obtained by collectors of miscellaneous insects. Some of them fly only in the spring, and have disappeared before the usual advent of the visiting entomologist. Thus it has happened that several large and conspicuous forms, which are probably widely distributed and not uncommon, have been overlooked until quite recently. A small collection of these insects received from the Colorado Agricultural College brings out a number of new facts which are given below. The species represented may be separated as follows:—

Females.

Hair of thorax appearing grey, from a mixture of black and white . . . . . 1.

Hair of thorax not so; more or less yellowish or red . . . . . 2.

1. Size larger; length about 16 mm., very robust *Anthophora porteræ*, Ckll.

   Smaller; length about 13 mm. . . . *Anthophora euops*, Ckll.

2. A patch of black hair in middle of thorax; outer side of hind tibiæ with orange hair *Emphoropsis mucida* var. *johnsoni*, n.v.

   No patch of black hair in middle of thorax . 3.

3. First three abdominal segments covered with hair, which is usually red; hair on outer side of hind tibiæ black *Anthophora bomboides* subsp. *neomexicana*, Ckll.

   Only the first abdominal segment covered with hair, which is not very red; hair on outer side of hind tibiæ yellowish-white *Anthophora montana*, Cresson.

MALES.

Basal joint of hind tarsus toothed . . . . 1.
Basal joint of hind tarsus not toothed . . . 2.
1. Basal joint with a large tooth; pubescence often red . . . . *A. bomboides* subsp. *neomexicana*, Ckll.
Basal joint with a small tooth; pubescence never red . . . . . *Anthophora gohrmanæ*, Ckll.
2. Middle tarsus with copious red hair; face-marks light-yellow, a heavy black band on each side of clypeus . . . . . *A. euops*, Ckll.
Middle tarsus without red hair . . . 3.
3. Abdomen fasciate; thoracic pubescence often red; face-marks light yellow . . *A. montana*, Cresson.
Abdomen not fasciate; thoracic pubescence never red . . . . . 4.
4. Face-marks white . . *Emphoropsis mucida* var. *johnsoni*, n. v.
Larger; face-marks light yellow . *Anthophora porteræ*, Ckll.

(1.) *Emphoropsis mucida* (Cresson) var. *johnsoni*, n. var.

♀ (type; Fort Collins district, 1903) differs from *E. mucida* by having a patch of black hair in middle of dorsum; hair on outer side of hind tibiæ shining reddish-orange, conspicuously plumose; first recurrent nervure joining second submarginal cell a little distance from its end (meeting second transverso-cubital in *mucida*); hair of middle of fifth abdominal segment light brown, at sides white.

♂. Pubescence of hind legs black on femora, white on outer side of tibiæ and tarsi; abdomen with the first two segments with yellowish-white hair, segments beyond with black, except extreme sides and the apical segment.

The type was taken by Mr. S. A. Johnson in the foothills near Horsetooth Mountain, flying over a patch of larkspur. The bees were very shy, swift flyers, Mr. Johnson reports. The actual label on the specimen gives the date, May 12, 1903, and the locality "Fort Collins." I presume, therefore, that other such labels are to be understood to refer to the region about Fort Collins, but not necessarily to the place itself. This is important, because the foothills fauna certainty differs in many respects from that of the town. Other specimens, males, are from Fort Collins, May 10, 1901, and Lamar, Colorado, collected by Prof. C. P. Gillette.

This may be a valid species. I have not seen typical *mucida*, but Mr. Viereck kindly examined for me Cresson's type, and reports that it has no black hairs on the thoracic dorsum; and the hair on outer side of hind tibiæ is whitish straw-coloured, and not at all conspicuously plumose. From Cresson's descriptions, I inferred that *mucida* (female) and *morrisoni* (male) were the sexes of one species, and Mr. Viereck, after comparing the types, is of the same opinion.

(2.) *Anthophora gohrmanæ*, Ckll.—Denver, Colo., May 2, 1902 (S. A. Johnson, 465); Montrose, May 5, 1901; Grand Junction, May 8, 1901. New to Colorado; previously known only by a single specimen found in New Mexico.

(3.) *A. bomboides* subsp. *neomexicana*, Ckll.—Fort Collins, May 29, 1901; Denver, May 24, 1902 (S. A. Johnson, 221); Parker, May 10, 1902 (S. A. Johnson, 475). Mr. Johnson writes that the Parker specimens were bred from cells collected from adobe banks along Cherry Creek, four miles north of Parker. From this group of cells he bred the meloid beetle *Leonidia neomexicana* (Ckll.).

(4.) *A. montana*, Cresson.—Denver, July 15, 1899; Fort Collins (P. K. Blynn); Livermore (E. D. Varney); foothills near Horsetooth Mountain, at larkspur, along with *Emphoropsis mucida johnsoni*, one male (S. A. Johnson). The male, which has not previously been described, is distinguished by the linear abdominal bands.

(5.) *A. porteræ*, Ckll.—Golden, May 3, 1902 (S. A. Johnson, 477); Montrose, May 5, 1901. New to Colorado.

(6.) *A. cuops*, Ckll.—Palisade, May 7, 1901; Fort Collins, June 12, 1898; Boulder, May 17, 1902 (S. A. Johnson, 481); Denver, May 2, 1902 (S. A. Johnson, 469).

Boulder, Colorado, U.S.A.: Dec. 6, 1904.

NOTES AND OBSERVATIONS.

Parargе achine on the Mendel.—I trust I was justified in drawing attention to the peculiarity I noticed in the Mendel specimens of *P. achine*. The more so that Rölh says: "It is a usually constant species which has little or no tendency to variation—as a matter of fact, I find among more than one hundred examples before me not a single anomalous form" p. 583. I think the following additional notes, if you can find room for them, will show that, though my suggestion that the Mendel form might be a *local* race cannot be maintained, yet the form is worthy of a distinguishing name, and appears to be *the* form of Tyrol and eastwards, with, of course, intermediates. But none of my correspondents record it from Switzerland or France, though probably it will be proved to be everywhere an occasional aberration. I am much obliged to Mr. Rowland-Brown for his examination of collections beyond my reach. The sum of his investigations (Entom. xxxvii. p. 322) I take to be this: that Mr. Lemann's specimens of *achine* from the South Tyrol are of the form I have called "*mendelensis*," with an intermediate example from Zurich. Dr. Lang, from a series of seventeen specimens, describes the white band as broadest, and embracing *both sides* of *all* spots, in an individual from Podalia (I have specimens from Aigle and Freiburg in Baden agreeing with the Podalia specimen). Dr. Lang's examples from Amur, Switzerland, and Dresden have the band reduced in varying degrees, till some from Dresden

appear to agree entirely with my Mendel specimens. Mr. Tutt, in reply to a letter of enquiry, writes: "I have examples of *achine* I took myself at Mendel Pass in 1895; some others taken in the same district at Pejo by Chapman; and some examples I got at Fontainebleau. Only two real Switzers, though. These Mendel and Pejo specimens are extra dark on the under sides. The Fontainebleau examples are much larger and paler, the under sides with very much white." Later, Mr. Rowland-Brown writes: "I have since examined a fairly long series of *achine* in Miss Fountaine's beautiful collection at Bath. Specimens from Switzerland (mostly Glion) are type, but in the Buda-Pest specimens I find very much the same tendency of the broad band to break up with light wavy interior, and leaving the ocellated spots, as noted by you, in the ground colour of the wings." Mons. L. Dupont says: "I was interested with this new var. of *P. achine*, as I had never seen it. I have just looked at my specimens. They are from Pont de l'Aube (Eure) and from Angoulême (Charente), and I have also one from Japan; they all have the white fascia." The evidence collected then by Mr. Rowland-Brown and myself "seems to suggest that the peculiarities noted in the Mendel series are not necessarily constant or distinctive of this particular locality," to quote Mr. Rowland-Brown. Only it does not yet appear that we have the type from the Tyrol, nor "*mendelensis*" from France or Switzerland; but in Austria, and Hungary, and perhaps Eastern Germany, this latter form is the prevailing one. — Frank E. Lowe; Guernsey, Dec. 20th, 1904.

The National Collection of British Lepidoptera.—Mr. Porritt, of Huddersfield, has contributed a number of species, chiefly from his district; also some beautiful specimens of *Agrotis ashworthii* reared from larvæ obtained in Wales in 1904.

Melanic Aspilates gilvaria. — On July 25th last, while netting specimens of *Aspilates gilvaria* in the Warren at Folkestone, I took a female very strongly affected with melanism. On the upper surface the fore wings are of a smoky brown, with a slight ochreous tint, the transverse bar scarcely visible, and the central lunule completely lost in the ground colour. The hind wings are smoky white, clouded with brown towards the hind margin. The only part of the insect which is at all of the normal colour is the collar of the thorax. On the under side the transverse bar on the fore wings is rather more distinct and the lunule is also visible, but the hind wings are exceedingly striking, as they are dark brown (darker than on any other part of the insect), but inclining towards white at the base. As this is an insect fairly constant in its markings and colour, it occasioned me considerable surprise to meet with such a variation, especially in so southern a locality as Folkestone. All the other specimens I took were males, and strictly typical. The species appeared to be just out, and all I obtained, including the insect above described, were in excellent condition.—Hugh J. Vinall, 3, Priory Terrace, Lewes.

The Entomological Club. — The meeting of this old-established association held at the Holborn Restaurant on Jan. 17th last was by far the largest that even Mr. Verrall, the chairman and host of the evening,

had presided over. The number we understand was eighty-four, including all but one of the eight members of the club.

In proposing "The prosperity of the Club," the chairman expressed his pleasure at seeing so many entomological friends but, he remarked, although the number present exceeded that at any previous meeting, he should not be quite satisfied until the total reached three figures.

We believe that the toast just referred to is not proposed at other assemblings of the club, and there seems to be one especially excellent reason that this should be reserved as a feature of the first meeting of the year, practically the "Annual" of the club. At one time this venerable institution, flourishing as it now is, came dangerously near extinction, and there is little doubt that had it not been for Mr. Verrall's strenuous, and eventually successful, efforts in the direction of obtaining a full complement of members, it would have collapsed some years ago. Other associations of a similar character might have arisen (even now the meetings of the Entomological Club are no longer unique), but the long line of these social réunions, connecting the past with the present, would have been severed, and this would have been regrettable from a sentimental point of view if for no other reason.

CAPTURES AND FIELD REPORTS.

Limenitis sibylla in August ?.—Mr. Gerard H. Gurney (Entom. xxxvii. 324) states that in the middle of August *L. sibylla* literally swarmed in forests near Boulogne. It would be interesting to hear whether Mr. Gurney can give any reason why this species should be out about two months later there than at the other side of the Channel. In the lower part of the Jura this year *L. sybilla* was out from June 13th to 23rd, I having a number of specimens taken by friends between those dates, which is about the time the species would probably be out in England.—E. E. Bentall; The Towers, Heybridge, Essex, Dec. 29th, 1904.

Late Appearance of Pyrameis atalanta. — Mr. Frohawk (*ante*, p. 25) notes the late appearance of *P. atalanta*. On Dec. 3rd last I saw one basking in the sun (which was very strong), on ivy, in Chiswick Mall, London; it was very fresh, and had the appearance of having only recently emerged. Being so late I had no box with me, or its capture would have been quite easy. I may here say that I have records of having seen *P. atalanta*, *V. polychloros*, and *V. urticæ* in October, November, December, January and February; of course such cases cover a number of years, and they were hybernated specimens, enticed abroad by unusually genial weather. But the one seen last month was without doubt a very recent emergence and in faultless condition.—W. T. Page; 6, Rylett Crescent, Shepherd's Bush, W., Jan. 6th, 1905.

Pygæra pigra in Surrey.—In reference to your note on *Pygæra pigra* in Surrey (*ante*, p. 27), it may be of interest to mention that larvæ of this species were taken plentifully near Dormansland, on

dwarf sallow, in the first week in September.—Cuthbert Jeddere-Fisher; Apsleytown, East Grinstead, 10th January, 1905.

A Few Captures from Wyre Forest in 1904.—During a week of bad weather in the middle of August, the following, amongst others, were taken:—*Heliophobus popularis*, *Luperina cespitis*, *Vanessa c-album*, *Agrotis suffusa*, *Noctua dahlii*, abundant; *N. neglecta*, abundant; *N. glareosa*, *Amphipyra pyramidea*, *Notodonta dromedarius*, *Minoa euphorbiata*. Amongst larvæ taken were: *Dicranura bifida*, *D. furcula*, *Platypteryx falcula*, *Demas coryli*, *Pœcilocampa populi*, *Cymatophora or*, *C. ocularis*, *Halias prasinana*, *Orygia gonostigma*.—W. A. Rollason; The White House, Truro, Cornwall.

The Season of 1904.—My work at Dorking this year compares favourably with that of 1903; several species were unusually abundant, and I took no less than seventeen that were new to me, as far as this locality is concerned. The first noteworthy entry in my diary is for April 4th, from which date until the 14th *Amphidasys strataria* was very abundant on the lamps, though not a single female was observed. On May 14th I took *Euchloë cardamines* for the first time, and this species swarmed until well into June. A single specimen of *Lycæna argiolus* was taken on May 14th, the only one I have seen in this neighbourhood for two years. *Nemeobius lucina* made its appearance on May 18th, and from then until the first week in June it was extremely abundant, its range on Ranmore and elsewhere appearing to have extended more widely than during previous years. *Pararge egeria* occurred sparingly from May 18th onwards, and *Syrichthus malvæ* was not nearly so abundant as in 1903. I took a nice series of *Phytometra viridaria* on May 19th and 23rd, and on the latter date a very large specimen of *Notodonta dictæa* from a lamp. On June 1st *Eupithecia satyrata* was abundant, and on the 2nd I observed *Lycæna adonis* for the first time, though this species was not nearly so plentiful as it has been in former years. On June 3rd I was fortunate enough to take five examples of *Agrotis cinerea* from one lamp, but they were all males; and on June 5th I took *Notodonta trepida* from the same lamp. On this date also a nice brood of *Mamestra persicariæ* began to emerge; I had fed the larvæ during the autumn of 1903, on geranium. *Lithosia sororcula* was taken from a lamp on June 11th, and the first *Lycæna minima* was observed on the 17th. On the following day *Eurymene dolabraria* was beaten out of a blackberry-bush on Ranmore, and on the 27th a nice series of *Setina irrorella* was taken from long grass. On the 30th *Acontia luctuosa* was taken on the same ground, and a female deposited about fifty ova in the pill-box on the way home. *Emmelesia alchemillata* was taken from a lamp on July 1st, and on the 2nd a fine specimen of *Sesia myopæiformis* was taken, just after it had emerged from an old apple-tree in my garden early in the morning. Though I watched the tree carefully, however, I never saw another, and I only took one specimen from the same tree in 1903. On July 6th *Anarta myrtilli* was taken on Ranmore, and *Cidaria fulvata* was flying out of almost every bush. On the 8th some larvæ of *Smerinthus populi* went down to pupate, and the imagines emerged and died during my absence from home in August, as also did one specimen of *S. ocellatus*, which had gone down to pupate on July 15th.

This is the second time I have bred both these species in the late summer, the first having been already recorded in the 'Entomologist' (vol. xxxiv. pp. 229 and 258), and I was very much interested to read Mr. Richard Garratt's note in this month's issue (vol. xxxvii. p. 323) on the same subject, indicating that the two broods occur wild as well as in confinement. On July 12th *Arentia flexula* was beaten out, and on the 14th and 20th *Plusia moneta* was taken from the lamps. *Acronycta aceris* was taken on the 18th, and *Triphæna ianthina* on the 23rd. Larvæ of *Smerinthus tiliæ* went down to pupate on the 25th, but neither this year, nor previously, have the imagines appeared the same year. On the 25th also, a rather striking light variety of *Abraxas grossulariata* flew into my study window; and on the 27th and 30th *Hesperia comma* was to be seen in great numbers on Ranmore. On these dates also, I beat *Lithosia deplana* and *Anticlea cucullata*, both of which were new to me. Also, on the 27th, I took a bleached specimen of *Epinephele ianira*, the under side being especially light. From this time until the middle of September I was away from Dorking, and so my next entry for this locality is Sept. 17th, when a brood of larvæ of *Hadena oleracea* began to go down; they had been feeding since July 26th. I did nothing of note during the rest of the year, except an occasional visit to the lamps, when I took *Xanthia citrago* on Oct. 11th, and *Nonagria arundinis* on Oct. 12th. On Dec. 1st *Pœcilocampa populi* was fairly abundant.

The new species taken by me in this locality this year are:—*Lithosia deplana*, *Drepana falcataria*, *Asphalia flavicornis*, *Leucania lithargyria*, *Nonagria arundinis*, *Xanthia citrago*, *Anarta myrtilli*, *Eurymene dolabraria*, *Zonosoma pendularia*, *Asthena luteata*, *Bapta taminata*, *Emmelesia alchemillata*, *Eupithecia scabiosata*, *E. lariciata*, *E. sobrinata*, *Melanippe procellata*, and *Anticlea cucullata*. Some of these, of course, are quite common things, but I had not taken them here before.—F. A. Oldaker; Parsonage House, Dorking, Dec. 30th, 1904.

Lepidoptera at Light in Reigate and Redhill, 1904.—During the past season I have worked the street-lamps in this district for Lepidoptera very regularly, and I think perhaps the following list of my captures may be of interest to some of my fellow-collectors. The electric arc lamps in the market-places of both towns were especially productive, *Stauropus fagi*, *Pheosia dictæoides* (fertilized female), *Notodonta trepida*, and *Ennomos fuscantaria* (37) being taken flying around these. I must add that I am indebted to Mr. Tongé, of Reigate, for the identification of many of the species. The date given is for the first specimen taken. *Sphinx ligustri*, July 5th. *Chærocampa elpenor*, June 20th. *C. porcellus*, July 8th. *Smerinthus tiliæ*, May 23rd. *S. ocellatus*, June 27th. *S. populi*, July 5th. *Ino statices*, July 27th. *Arctia caia*, July 27th. *Phragmatobia* (*Spilosoma*) *fuliginosa*, July 6th. *Spilosoma lubricipeda*, May 16th. *S. menthastri*, May 26th. *Hepialus humuli*, July 7th. *H. hectus*, July 1st. *H. lupulinus*, May 30th. *Cossus ligniperda*, June 30th. *Zeuzera pyrina*, July 27. *Porthesia similis*, June 28th. *Stilpnotia* (*Leucoma*) *salicis*, July 8th. *Dasychira pudibunda*, June 6th. *Pœcilocampa populi*, Nov. 14th. *Malacosoma neustria*, July 27th. *Lasiocampa quercifolia*, July 27th. *Cilix glaucata*, June 3rd. *Dicranura vinula*, May 11th. *Stauropus fagi*, July 27th. *Pterostoma*

palpina, Aug. 9th. *Lophopteryx camelina*, July 5th. *Pheosia* (*Notodonta*) *dictæa*, May 11th. *P.* (*N.*) *dictæoides*, May 18th. *N. ziczac*, May 14th. *N. trepida*, May 17th. *Phalera bucephala*, June 28th. *Thyatira derasa*, June 28th. *Bryophila perla*, June 30th. *Acronycta psi*, June 30th. *A. aceris*, June 28th. *A. megacephala*, June 29th. *Diloba cæruleocephala*, Oct. 10th. *Leucania conigera*, July 29th. *L. comma*, June 30th. *L. lithargyria*, July 8th. *L. impura*, June 30th. *L. pallens*, July 8th. *Gortyna ochracea*, Sept. 28th. *Hydræcia nictitans*, Sept. 2nd. *H. micacea*, Sept. 30th. *Axylia putris*, July 27th. *Xylophasia monoglypha*, June 15th. *X. lithoxylea*, July 5th. *X. sublustris*, July 29th. *Neuronia popularis*, Sept. 28th. *Cerigo matura*, Sept. 3rd. *Luperina testacea*, Sept. 8th. *Mamestra brassicæ*, May 18th. *M. persicariæ*, June 30th. *Apamea gemina*, June 28th. *A. didyma*, June 11th. *Miana strigilis*, July 4th. *Grammesia trigrammica*, June 8th. *Caradrina quadripunctata*, Sept. 19th. *Agrotis puta*, Sept. 7th. *A. suffusa*, Oct. 11th. *A. segetum*, Aug. 8th. *A. exclamationis*, July 8th. *A. strigula*, June 21st. *Noctua plecta*, July 5th. *N. c-nigrum*, Sept. 22nd. *N. brunnea*, June 28th. *N. xanthographa*, Sept. 8th. *Triphæna ianthina*, Sept. 2nd. *T. fimbria*, Nov. 1st. *T. orbona*, July 6th. *T. pronuba*, June 24th. *Amphipyra tragopogonis*, July 4th. *Mania typica*, June 24th. *M. maura*, June 8th. *Panolis piniperda*, April 30th. *Pachnobia rubricosa*, April 4th. *Tæniocampa gothica*, March 24th. *T. instabilis*, April 9th. *T. stabilis*, March 31st. *T. pulverulenta*, April 4th. *Orthosia macilenta*, Nov. 1st. *O. litura*, Sept. 13th. *A. pistacina*, Sept. 19th. *A. lunosa*, Sept. 14th. *Cerastis vaccinii*, March 7th. *Calymnia trapezina*, Sept. 29th. *Scopelosoma satellitia*, Oct. 17th. *Xanthia fulvago*, Sept. 12th. *X. flavago*, Sept. 27th. *X. citrago*, Aug. 17th. *X. gilvago*, Sept. 8th. *X. aurago*, Sept. 23rd. *X. circellaris*, Sept. 15th. *Cirrhædia xerampelina*, Aug. 30th. *Epunda lutulenta*, Sept. 28th. *Miselia oxyacanthæ*, Sept. 12th. *Euplexia lucipara*, June 24th. *Phlogophora meticulosa*, Sept. 14th. *Hadena oleracea*, July 5th. *H. genistæ*, July 29th. *Xylocampa areola*, April 7th. *Asteroscopus sphinx*, Nov. 29th. *Cucullia umbratica*, June 29th. *Gonoptera libatrix*, Sept. 11th. *Abrostola tripartita*, May 29th. *Plusia chrysitis*, June 29th. *P. moneta*, July 5th. *P. iota*, June 27th. *P. gamma*, May 27th. *Acontia luctuosa*, July 27th. *Hypena proboscidalis*, July 2nd. *Uropteryx sambucaria*, June 30th. *Rumia luteolata*, May 12th. *Metrocampa margaritaria*, June 27th. *Ellopia prosapiaria*, July 30th. *Pericallia syringaria*, June 28th. *Selenia bilunaria*, April 16th. *S. tetralunaria*, June 14th. *Odontopera bidentata*, May 26th. *Crocallis elinguaria*, Aug. 5th. *Ennomos alniaria*, Aug. 8th. *E. erosaria*, Aug. 22nd. *E. fuscantaria*, Aug. 9th. *E. quercinaria*, Aug. 16th. *Himera pennaria*, Oct. 18th. *Phigalia pedaria*, Jan. 11th. *Biston hirtaria*, May 10th. *Amphidasys strataria*, March 21st. *A. betularia*, May 14th. Var. *doubledayaria*, July 3rd. *Hemerophila abruptaria*, May 1st. *Boarmia repandata*, July 1st. *B. rhomboidaria*, June 28th. *Pseudoterpna pruinata*, July 5th. *Geometra vernaria*, July 6th. *Thalera* (*Iodis*) *lactearia*, June 16th.

Many species were taken belonging to the Ephyridæ, Acidaliidæ, &c., but these, I fear, are not yet accurately identified, all my time being taken with the larger species enumerated.

A few further notes on some of the species may perhaps be useful:—*N. trepida*, three were taken between May 17th and 23rd. *P. dictæoides*, eight were taken May 15th and 21st. *S. fagi*, one only, July 27th. *X. aurago*, three between Sept. 23rd and 27th. *X. gilvago*, eight during September. *C. xerampelina*, twenty-seven were captured between Aug. 30th and Sept. 23rd, but many of the latest specimens were very worn, and few were in good condition. *E. erosaria*, one only, Aug. 22nd. *E. fuscantaria*, abundant from Aug. 9th to Sept. 8th, and a few were taken even later in good condition.—A. J. Wightman; 28, Station Road, Redhill.

A List of Captures at Light, in Clapham, 1904.—Every species mentioned in the following list has been taken by myself, on shop windows within twenty yards of Stockwell Station, City and South London Railway.—*Smerinthus ocellatus*, several specimens, June and July. *S. populi*, common, June and July. *S. tiliæ*, rather scarce, June. *Earias chlorana*, six specimens, May 11th to 16th. *Arctia caia*, one female, July 3rd. *Spilosoma lubricepeda*, exceedingly common, June. *S. menthastri*, very common, June and July. *Hepialus hectus*, two dwarf specimens, June 11th. *Cossus ligniperda*, fairly common, July. *Zeuzera pyrina*, males common, females scarce, July 2nd to 24th. *Stilpnotia salicis*, a few specimens, August. *Dicranura vinula*, two males, June 3rd and 7th. *Cerura bifida*, two specimens, June 3rd, 1903. *Phalera bucephala*, very common, May and June. *Cymatophora duplaris*, one female, June 7th. *Bryophila perla*, several specimens, May, June, July. *Acronycta psi*, very common, June. *A. aceris*, very common, June to July. *A. megacephala*, very common, June and July. *Leucania pallens*, common, June. *L. impura*, slightly scarcer than former species, June. *Hydræcia nictitans*, two specimens, July 17th. *Axylia putris*, common throughout June and July. *Xylophasia rurea*, one female, June 9th. *X. polyodon*, very common, June to August. *Apamea basilinea*, two specimens, June 15th and 17th. *Mamestra brassicæ*, one specimen, August 5th, usually common. *M. persicariæ*, common, June and July. *Miana strigilis*, fairly common, June. *M. fasciuncula*, eight specimens, June 15th to 20th. *Caradrina morpheus*, common, July 1st to 18th. *C. quadripunctata*, common, June and July. *Agrotis exclamationis*, very common, July to September. *A. nigricans*, rather scarce, July. *Noctua plecta*, very common, June to August. *N. triangulum*, one specimen, July 9th. *N. brunnea*, a few specimens in June. *N. festiva*, one male, July 7th. *N. xanthographa*, common, August to September. *Triphæna fimbria*, three, common yellow form, July. *T. ianthina*, common, August 1st to 29th. *T. interjecta*, one male, August 3rd. *T. orbona*, occasional specimens throughout August. *T. pronuba*, fairly common, June to August 23rd. *Mania typica*, common, August. *M. maura*, a few to light, but commonest in side streets. *Calymnia trapezina*, one female, July 18th. *C. affinis*, one, August 1st. *Hecatera serena*, four specimens, July. *Euplexia lucipara*, very common, July to September. *Hadena chenopodii*, common, August 1st to 8th. *H. oleracea*, very common, June and July. *Abrostola triplasia*, one specimen, August 5th, usually common. *Plusia chrysitis*, fairly common, August. *Uropteryx sambucata*, common, July 15th to 29th. *Rumia cratægata*, very common,

May 16th to July 3rd. *Ennomos angularia*, one or two males, August 10th to 12th. *E. fuscantaria*, one male, August 29th. *Amphidasys betularia*, males common, females rare, June to August; var. *doubledayaria*, rather scarce, July. *Hemerophila abruptaria*, one dwarf specimen, July 11th. *Boarmia rhomboidaria*, males common, July 10th to 28th. *Acidalia aversata*, scarce, June and July. *A. incanaria*, fairly common throughout July. *Abraxas grossulariata*, common, July. *Hybernia defoliaria*, three males, November 13th, 14th and 15th. *Cheimatobia brumata*, one male, December 18th. *Eupithecia vulgata*, common, June and July. *E. centaureata*, three specimens, June. *Hypsipetes elutata*, fairly common, July. *Melanippe fluctuata*, very common, June to August.

This list is by no means exhaustive as regards all my London captures; it is simply a list of specimens obtained at light during last year. Many species mentioned in it as rare are to be captured commonly by other methods; as, for instance, *H. abruptaria*, of which I have only once taken a specimen at light, I find commonly on fences and walls. *B. hirtaria* still seems as common as ever on the trunks of the limes, and appears not to change its position for sun or wind; in fact, the only species of the seventy-one above mentioned that seems to get scarcer is *E. centaureata*. Ten years ago it would have been an easy matter to have taken twenty or thirty specimens by a cursory examination of the garden wall; gradually, however, it became scarcer, and at last seemed to die out. In fact, the three specimens recorded above are the only examples I have seen here for five years. I should be very grateful to any London entomologists who would inform me of captures of any species not mentioned in the above list.—B. Stonell, 25, Studley Road, Clapham, S.W.

SOCIETIES.

Entomological Society of London.—*Wednesday, Jan. 18th*, 1905. —The 71st Annual Meeting, Professor Edward B. Poulton, D.Sc., F.R.S., the President, in the chair.—After an abstract of the Treasurer's accounts, showing a good balance in the Society's favour, had been read by Mr. R. W. Lloyd, one of the Auditors, Mr. Herbert Goss, one of the Secretaries, read the Report of the Council. It was then announced that the following had been elected Officers and Council for the Session 1905–1906:—President, Mr. Frederic Merrifield; Treasurer, Mr. Albert H. Jones; Secretaries, Mr. H. Rowland-Brown, M.A., and Commander James J. Walker, R.N., F.L.S.; Librarian, Mr. George C. Champion, F.Z.S.; and as other Members of Council, Mr. Gilbert J. Arrow, Lieut.-Colonel Charles Bingham, F.Z.S., Dr. Thomas A. Chapman, F.Z.S., Mr. James Edward Collin, Dr. Frederick A. Dixey, M.A., Mr. Hamilton H. C. J. Druce, F.Z.S., Mr. Herbert Goss, F.L.S., Mr. William John Lucas, B.A., Professor Edward B. Poulton, D.Sc., F.R.S., Mr. Louis B. Prout, Mr. Edward Saunders, F.R.S., F.L.S., and Colonel John W. Yerbury, R.A., F.Z.S. The President referred to the loss sustained by the Society by the deaths of the Treasurer, Mr. Robert McLachlan, F.R.S., Mr. Charles G. Barrett,

and other entomologists. He then delivered an address, in which he discussed the part played by the study of insects in the great controversy on the question, "Are acquired characters hereditary?" He argued that the decision whether Lamarck's theory of the causes of evolution is or is not founded on a mistaken assumption largely depends upon evidence supplied by the insect world, and finally concluded that the whole body of facts strongly supports Weismann's conclusions. At the end of his address the President urged that the study of insects is essential for the elucidation and solution of problems of the widest interest and the deepest significance. Professor Meldola, F.R.S., proposed a vote of thanks to the President and other officers. This was seconded by Mr. Verrall and carried. Prof. Poulton, Mr. Goss, Mr. Rowland-Brown, and Mr. Jones replied.—H. Goss, *Hon. Secretary.*

South London Entomological and Natural History Society.—*December 8th*, 1904.—Mr. Step in the chair.—Mr. Grosvenor, of Red Hill, Surrey, was elected a member.—Mr. Tonge exhibited some thirty-five species of British Lepidoptera, which he gave to the Society's collections.—Mr. Main, Orthoptera from Borneo and the Cape.—Mr. West, a specimen of the extremely rare coleopteron, *Tropideres sepicola*, taken by him in the New Forest in the summer of 1904.—Mr. Edwards, the parasitical bee, *Celioxys elongata*, from Blackheath, and read notes on its habits. — Mr. Dobson, series of *Geometra vernaria* and *Aglossa cuprealis*, which had come to light at dusk around his house at Maldon; the former sitting on leaves, and the latter resting in the curtains. *Plusia chrysitis* had also been seen at light in the neighbourhood.—The remainder of the evening was devoted to an exhibition of lantern-slides by Messrs. Tonge (ova of Lepidoptera), Lucas (biological and botanical subjects), Goulton (lepidopterous larvæ), Step (lepidopterous larvæ), Main (resting positions of larvæ and imagines of Lepidoptera), and Dennis (flowering and seeding of trees and shrubs). Hy. J. Turner, *Hon. Rep. Sec.*

Lancashire and Cheshire Entomological Society.—The Annual Meeting was held in the Royal Institution, Liverpool, on December 19th, 1904, Mr. Robt. Tait, Junr., Vice-President, in the chair. Messrs. A. Bury (Newburgh), I. W. Horton (Mawdesley), and W. A. Rhodes (Liverpool), were elected members. Mr. Sopp, one of the Secretaries, read the Report of the Council, which showed that the past session had been one of the most successful in the history of the Society, and that the membership had increased by thirty-three. The Treasurer's Balance-sheet, presented by Dr. Cotton, showed a credit-balance at the bank and in the hands of the Treasurer of £12 13s. 7d. Certain alterations in the rules having been adopted, the following officers were elected to serve during 1905:—President: Saml. James Capper, F.E.S. Vice-Presidents: Professor T. Hudson Beare, B.Sc., F.E.S., F.R.S.E.; H. St. J. K. Donisthorpe, F.Z.S., F.E.S.; Richard Wilding; F. C. Thompson; J. R. Charnley, F.Z.S., F.E.S. Treasurer: J. Cotton, M.R.C.S., F.E.S. Secretaries: E. J. B. Sopp, F.R.Met.S., F.E.S.; J. R. le B. Tomlin, M.A., F.E.S.; W. Delamere Harrison, Librarian: F. N. Pierce, F.E.S. Council: B. H. Crabtree, F.E.S.; J. F. Dutton; Wm. Mansbridge, F.E.S.; F. R. Dixon-

Nuttall, F.R.M.S.; C. E. Stott; H. R. Sweeting, M.A.; R. Tait, Junr.; A. Tippins; W. A. Tyerman, and W. Webster, M.R.S.A.I. The following were appointed Recorders:—Messrs. J. R. le B. Tomlin, M.A. (Coleoptera); Edwd. Saunders, F.R.S., F.L.S., F.E.S. (Hymenoptera); F. N. Pierce (Lepidoptera); C. R. Billups, M.R.C.S., and E. E. Lowe, F.L.S. (Diptera); W. J. Lucas, B.A., F.E.S. (Neuroptera); E. J. B. Sopp (Orthoptera), and Oscar Whittaker (Hemiptera). Mr. R. Tait, Junr., delivered an exhaustive address on "The Season 1904 lepidopterologically considered"; after which the undermentioned exhibits were shown:—*Boarmia repandata* (Penmaenmawr), *Aplecta advena*, *Nyssia lapponaria* (Rannoch), &c., by Mr. Tait; *Deilephila euphorbiæ*, by Mr. J. Roxburgh; *Amara rufocincta* (Crosby), by Mr. R. Wilding; *Metœcus paradoxus*, *Melandrya caraboides* (Winlaton), *Stenostola ferrea* (Gibside), *Chrysomela orichalcia* var. *hobsoni* (S. Hylton), &c., by Mr. R. S. Bagnall; *Licrona cærulea*, L. (Grange), by Mr. O. Whittaker; a live specimen of *Acridium ægypticum* (Italy), by Mr. C. B. Williams; *Labidura riparia* (Liverpool), *Nyctibora holosericea* (Kew), *Schistocerca peregrina* (Birkenhead), and *Bruchus pisi* and *B. rufimanus* (Liverpool), by Mr. Sopp.—E. J. B. Sopp and J. R. le B. Tomlin, *Hon. Secretaries.*

Birmingham Entomological Society.—*October* 17*th*, 1904.—Mr. S. T. Bethune-Baker, President, in the chair.—Mr. J. T. Fountain showed *Callimorpha dominula*, L., from Devonshire larvæ, and mentioned his difficulties in breeding them. He found that whatever treatment he adopted, more than half were cripples. He also showed *Lasiocampa quercus*, L., bred from larvæ taken in Sutton Park in March and April. They included light and dark forms, the latter apparently var. *callunæ*, Dalm. Amongst the dark ones were two which were very diaphanous, though the wings were perfect and the ciliæ unbroken, the outer third of each wing looked as if rubbed, owing to deficient scaling.—Mr. H. W. Ellis exhibited a collection of the Rhyncophora and allies; he gave a general account of the group, and then mentioned the local species, which included many that were rare, and numbered about 308 out of the 540 occurring in Britain.—Mr. R. C. Bradley shewed *Thriplocera bicolor*, Meg., three specimens bred from larvæ of *Lasiocampa quercus*, L., from Sutton Park, taken in 1904 by Mr. W. H. Wilkinson.

November 21*st*, 1904.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. A. H. Martineau exhibited for Mr. H. Stone a collective cocoon made by some lepidopterous larvæ. Information was lacking as to its place of origin and the species which had caused it. It consisted of one large cocoon like a great brown nut, about 6 in. × 4 in., with a thick hard integument, containing a considerable number of ordinary brown cocoons massed together inside. The pupæ were empty, but there was no obvious means of exit, and the interior was closely packed with the material of the cocoons, so that it was not easy to judge how the moths had emerged.—Mr. R. S. Searle showed various Lepidoptera and foreign Coleoptera.—Rev. C. F. Thornewill read a paper upon "The Genus *Eupithecia*, especially in relation to Breeding them from the Larvæ." He had reared a considerable number of the species, and gave a general account of the larvæ, their

life-history, and a number of useful hints as to methods to be followed to find and rear the larvæ of various species. Mr. G. T. Bethune-Baker showed a number of British and continental specimens of the genus in illustration of the paper.—Colbran J. Wainwright, *Hon. Sec.*

Manchester Entomological Society.—In the Manchester Museum, Owens College, on October 5th, 1904. — The President and Vice-President being unavoidably absent, the chair was occupied by Mr. R. Tait, Junr.—A paper was read by Mr. G. Kearey, entitled "Pupæ Digging and Collecting." — The following exhibits were shown by the members:—Mr. R. Brauer, Indian moths (family Chalcosiidæ). Mr. G. Kearey, larvæ of *A. caia*. Mr. L. Krah, Lepidoptera, selected; specimens bred from continental ova—*L. dispar* (from Locarno), *S. menthastri*, *P. pigra*, *O. gonostigma*, *P. anachoreta* (from Bex), *P. rubricosa*, *P. trifolii* (from Bex), *S. populi* (British). Mr. C. F. Johnson, Lepidoptera from Torquay, North Wales, and Staffordshire—*L. cæsiata*, *T. opima*, *A. lunigera*, and *B. muralis*. Mr. A. Binns, specimen of *A. atropos* taken at Clayton, near Manchester, on Sept. 17th, 1904. Mr. W. Buckley, specimen of *A. ashworthii*, emerged Oct. 5th, 1904.

November 2nd, 1904.—Mr. R. Tait, Junr., presided in the absence of the President.—The meeting took the form of an exhibit evening, and the following specimens were shown by the members:—Mr. L. Krah, case containing exotic silk spinners, and including *P. cecropia*, *C. promethea*, *A. luna*, *T. polyphemus* (North America), *C. regalis* (South America), *A. pernyi* (China), *A. mylitta*, *A. cynthia* (India), *C. regina* (Japan). Mr. C. E. Bailey, the following silk moths (with cocoons and pupæ): *S. pyri*, *T. polyphemus*, and *A. cynthia*: *Vanessa antiopa*, with pupæ (Austrian form); *Thecla rubi*, male and female (Isle of Wight), *Mania maura* (Marple, Cheshire); *Euclidia mi* (Isle of Wight); *Arctia villica*, bred from larvæ taken at Eastbourne. Mr. J. Ray Hardy, larvæ, pupæ, and imagos of *Calandria palmaria*. Mr. R. J. Wigelsworth, illustrations of larvæ and insect life. Mr. R. Brauer, Coleoptera from West Africa of the genus *Goliath*, *Ceratorhina*, &c.; Coleoptera from Transvaal and East Africa—Cetoniinæ, Elateridæ, Scarabæidæ, &c.; also Lepidoptera—*Apatura iris* var. *iole*, *V. antiopa* var. *hygiæa*, *V. chelmys*, and Satyridæ (various) from Europe and Asia. Mr. W. Warren Kinsey, case containing preserved larvæ of British moths; cocoons of *E. lanestris*; larvæ and ichneumon cocoons of *M. typica*. Mr. R. Tait, Junr., *A. galatea*, *T. pruni*, *C. fulvata*, *M. rubiginata*, *P. bajularia*, *T. albicillata*, from Monkswood, 1904; *A. agathina*, a grand series, including some fine rosy forms, bred from Welsh larvæ, 1904; *E. lichenea*, from Welsh larvæ, 1904.

December 5th, 1904.—A very successful Conversazione was held in the Manchester Museum, Owens College, on the above date. Upwards of three hundred invitations were issued, the majority of which were accepted. Representatives from scientific and other societies in Manchester, Liverpool, Chester, and other towns, were present during the evening. Dr. W. E. Hoyle, addressing the company, extended to them a very hearty welcome. He was not only the Director of the Manchester Museum, but esteemed it a great honour to be the first President of the Society, the history of which was then briefly traced, from the first meeting in the Municipal School of Technology, Manchester, to the present occasion. The object and aims of the Society

were explained; also the advantages and privileges enjoyed by the members, some of which were, access to entomological collections, and use of the library. The Lepidoptera exhibited during the evening had been specially selected and laid out for inspection by Mr. J. Ray Hardy (who has the charge of the Natural History Department). He explained the more interesting details of the insects, of which upwards of seven thousand specimens were on view, the Manchester Museum, possessing one of the finest and most valuable public collections of Lepidoptera outside London. During the evening light refreshments were served; afterwards the visitors appreciated, to the fullest extent, all that had been prepared for their benefit and enjoyment. The following is the list of Lepidoptera exhibited (principally from the well-known "Schill" collection):—*Ornithoptera cræsus* (Batyan), *O. paradiseus* (North Guinea), showing sexual differences. *Papilio antimachus* (Africa), *P. sesostris* (South America), sexual differences. *P. ascanius* (Brazil), *P. coon* (Java), &c. *P. blumei*, *P. joesa*, *P. paranthus*, &c. *P. homerus* (Jamaica). *P. androcles* (Celebes) &c., showing development of hinder wing prolongations or "tails." *Teinopalpus imperialis* (India), *Armandia lidderdalii*, and their allies, showing the great difference in sex. The genus *Prioneris*. The genus *Dismorphia:* New World species of extraordinary coloration. The genus *Morpho:* mostly New World insects of great size and brilliancy. The genus *Acræa:* nauseous insects. The genus *Kallima* ("Leaf-butterflies"). The genus *Callicore* (the "88" butterfly). The genus *Callithea:* a New World group of perfectly opaque butterflies. Palæarctic Lepidoptera: Parnassiidæ and Coliadæ.—Robert J. Wigelsworth, *Hon. Secretary*.

RECENT LITERATURE.

1. *New Dragonfly Nymphs in the United States National Museum.* Proc. U.S. National Mus., vol. xxvii. pp. 685-720. 11 figs. and 7 pls. J. G. Needham. Washington, 1904.

A valuable addition to the excellent work done by Mr. Needham in this long neglected field of Entomology.

2. *The Labium of the Odonata.* Trans. Am. Ent. Soc. xxx. pp. 111–133. 7 plates. Hortense Butler. 1904.

A most useful addition to our knowledge of the highly specialised labium of the dragonfly nymph. The seven plates of details are excellent.

3. *The Skewness of the Thorax in the Odonata.* Journal of the New York Entom. Soc. Sept., 1903. J. G. Needham and Maude H. Anthony. Pp. 117–125, with a plate.

4. *The Phasmidæ, or Walking-sticks of the United States.* Proc. U.S. National Mus. Vol. xxvi. Pp. 863–885. 4 plates. A. N. Caudell. Washington, 1903.

Another of the useful monographs of groups of American insects that appear from time to time. The Phasmids, of which we have no single representative in Britain, are not numerous in the United States.

5. *An Orthopterous Leaf-roller.* Proc. Ent. Soc. Wash. Vol. vi. No. 1. A. N. Caudell.

6. *Oviposition and Carnivorous Habits of the Meadow Green Grasshopper* (Orchelimum glaberrimum). Psyche. Vol. xi. Pp. 69–71, with one plate. J. L. Hancock. 1904.

7. *The Leaf-hopper of the Sugar-cane.* Bulletin No. 1. Board of Commissioners of Agriculture and Forestry; territory of Hawaii. R. C. L. Perkins. Pp. 38. Honolulu, 1903.

A full account of the insect and its natural enemies.

8. *Suppression and Control of the Plague of Buffalo-gnats in the Valley of the Lower Mississippi River.* Proc. 25th Ann. Meeting of Soc. for Promotion of Agric. Sci. Pp. 53–72; 7 figures and diagrams. F. M. Webster. 1904.

An account of the insect and a review of its occurrence in the district.

W. J. L.

The Common Mosquitoes of New Jersey. By John B. Smith. New Jersey Agricultural Experiment Stations. Bulletin 171. Pp. 40. Plates 11, and other figures in the text.

Of the thirty-three species of Culicidæ occurring in the State of New Jersey, only three are unable to bite. Several others are confined to limited areas, and for one reason or another the number of noxious species considered of sufficient economic importance to be noticed in this bulletin is reduced to thirteen; three of these are members of the malaria-transmitting genus *Anopheles*

Who's Who? pp. 1796; *Who's Who Year-book,* pp. 128; and *The Englishwoman's Year-book,* pp. 368. London: Adam & Charles Black. 1905.

Each of the above-mentioned annuals will be found of great interest to all whom they may concern, and this means a large section of the general public. The chief volume, *Who's Who?* comprises short biographies of many biologists, including specialists in various branches of Entomology whose names are familiar to most, if not all, of our readers.

We have also received the following:—

Analytische Uebersicht der paläarktischen Lepidopterenfamilien. Von C. v. Hormuzaki. Pp. 68, with 45 figures in the text. Berlin: R. Friedländer & Sohn. 1904.

Ants and some other Insects. By Dr. August Forel. Pp. 49. Chicago: The Open Court Publishing Company. London: Kegan Paul, Trench, Trübner & Co. Ltd. 1904.

An inquiry into the psychic powers of these animals, with an appendix on the peculiarities of their olfactory sense. Translated from the German by Prof. William Morton Wheeler.

A Treatise on the Acarina, or Mites. By Nathan Banks. Pp. 114, with numerous text-figures. (Smithsonian Institution. United States National Museum). Washington: Government Printing Office. 1904.

Entomologisches Jahrbuch. Kalender für alle Insekten-Sammler auf das Jahr 1905. Von Dr. Oskar Krancher. Pp. 240, with one coloured plate. Leipzig: Frankenstein & Wagner. 1905.

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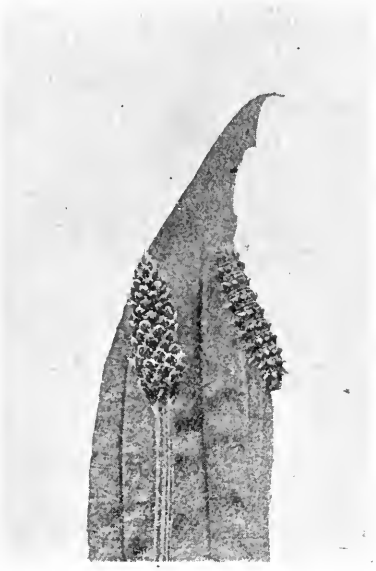
CRYPTIC FORM AND COLOURING IN *MELITÆA* LARVÆ.

BY T. A. CHAPMAN, M.D.



THE larvæ of *Melitæa cinxia* and *M. athalia* when full grown are usually very conspicuous, still it has often struck me that, obvious as they are when you look for them—*i. e.* if they are not hidden away—you may easily pass by without seeing them, even though looking where they are, if not thinking of them. These larvæ considerably resemble the heads of *Plantago*; but this is still more the case with *Melitæa didyma*, whose yellow and brown markings make it very like a plantain-head with yellow stamens and brown scales.

This resemblance is brought out very well in the above reproduction of a photograph taken by Mr. H. Main of a larva of *M. didyma*—remarkably so since the assistance given by coloration is left out.

A NEW SPECIES OF *NODARIA* FROM JAPAN AND COREA.

NODARIA LEECHI, sp. n.

Antennæ of male knotted and contorted about the middle. Primaries grey-brown tinged with lilacine, and with four transverse brown markings; antemedial and postmedial lines, the former slightly undulated, the latter rather wavy and curved round the end of cell; medial line broad, band-like, with a darker discal mark on it; submarginal line undulated, outwardly edged with whitish. Secondaries similar in colour to primaries and with two darker transverse lines, the outer one angled and outwardly edged with whitish below the middle. Expanse 24–26 millim.

Somewhat similar to *Nodaria fentoni*, Butl., but in the male separable therefrom by the knotted antennæ, and in both sexes by the different shape of the postmedial line. The secondaries also are darker in colour.

Described from a male specimen from Fusan in the National Collection at South Kensington, where also are a female specimen from Fusan and another from Gensan, one example of each sex from Tsuruga, and two males from Nagahama. All these were formerly in the Leech Coll., and were erroneously referred to *Nodaria fentoni*, Butl.

RICHARD SOUTH.

DESCRIPTIONS OF THREE NEW BEETLES FROM THE GOLD COAST, AND ANGOLA, WEST AFRICA.

BY E. A. HEATH, M.D., F.L.S.

ZOGRAPHUS LANEI, sp. n. (fig. 1).

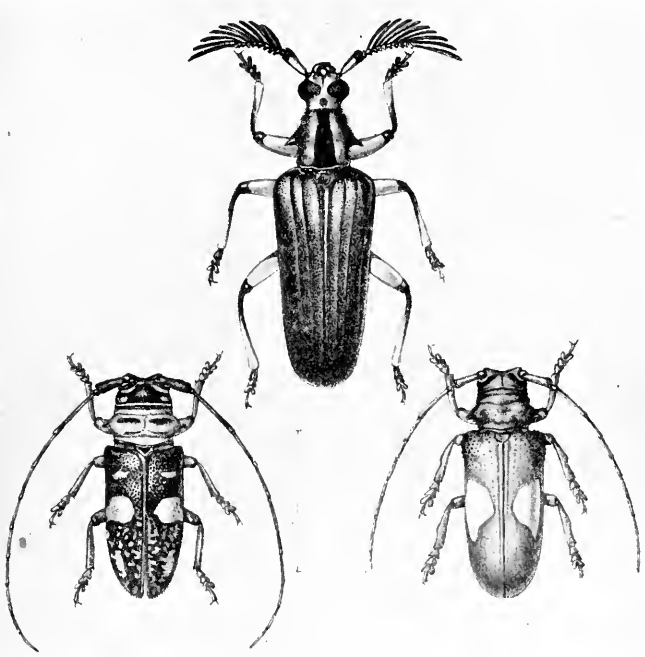
Shining black; pronotum transversely striate, in alternate bands of pale ochraceous pubescence, and shining black. The head is shining black, rugose, with two curved lines of pale ochraceous pubescence on each side, the one at the base being much shorter than the anterior line. The antennæ are very slightly longer than the body; the basal joint is stoutest, and shorter than the head, rather coarsely granulated, the second joint being smoother, and nearly three times as long as the first joint; the remaining joints are shorter than the second, and about equal in length; the segments are bluish grey at their basal insertion, and black at the apical end. The elytra are thickly and coarsely punctured and sparsely pilose; the humeral angles are slightly produced forward; a broad band of pale ochraceous hair on each elytron about the centre reaching from the lateral margin to near the suture, a short narrow pale ochraceous transverse fascia on each side of suture, half-way between the white pale band and the base, and in a line with these on each side are irregular pale ochraceous marks at margin of elytra; near the apical margin of

each elytron is a short longitudinal fascia of pale ochraceous hair, and from the centre to apex are small irregular dots of the same colour; the apices of the elytra are fringed with black hair. The body beneath and the legs and tarsi are black, with pale ochraceous hairs. Long. 8 lines, max. lat. 3 lines.

Hab. Angola.

PROSOPOCERA BIPLAGIATA, sp. n. (fig. 3).

Shining brown, densely covered with pale brown pubescence. The pronotum is roughly sculptured, and has a tooth on each side, and the



1. 2. 3.

posterior margin transversely striated. The scutellum is rounded, tongue-shaped. The head, legs, and antennæ are the same brown colour; the latter are longer than the body; the basal joint stoutest, and twice as long as the head, rather rougher than the second joint, which is nearly twice as long as the first; the third joint is not quite as long as second joint, and rather longer than the fourth joint; the remaining joints are of equal length. The elytra are rather coarsely punctured, and densely shortly pilose; the humeral angles are slightly raised, and near them the basal area is blackly tuberculate; an irregular triangular white spot about the centre, broader at the lateral margin, which it does not quite touch, and its apex reaching to

near the suture. The body beneath is of the same brown colour, densely pilose, with a long white lateral fascia reaching from the base of the head, where it is broadest to the base of the mesosternum, where it is pointed; in some specimens this mark is only on the mesosternum, in others it is absent. Long. 12 lines, max. lat. $3\frac{1}{2}$ lines.

Hab. Angola.

PLECTROGASTER JORDANI, sp. n. (fig. 2).

Elytra brownish black, piceous, coarsely and thickly punctured, and having on each elytron four longitudinal carinate lines, which terminate 2 lines from the apex. The scutellum is rounded, tongue-shaped. Pronotum densely pilose; in the centre is a brownish black longitudinal fascia reaching from the head to the scutellum; on each side of this is a rich reddish fascia, also reaching from the head to the elytra, and on each side of this red mark is another brownish black one reaching from the head to just below the pronotal tooth, which is reflexed backward. The head is red, pilose. The antennæ are blackish brown, beautifully pectinate; the basal joint is red, small at its insertion and thickened at its apex, which is blackish; the lamellæ, nine in number, arise from the joints of the antennæ and are nearly equal in length (3 lines), except the first, which is a little shorter; the joints of the lamellæ form a serrature on the under side of antennæ. The body beneath and the legs are light shining reddish brown; the joints of legs are blackish. The middle and hind femora are pubescent, and the hind femur has a longitudinal groove underneath; the tarsi are blackish brown. Long. 20 lines, max. lat. 6 lines.

Hab. Gold Coast.

This insect comes very near to *P. pectinicornis*, Waterhouse, a female of which is figured in his 'Aid'; but it differs in some important respects. *P. pectinicornis* has blacker elytra, and the pronotum and head are wholly black; the femora are yellow, and black at their insertion, with black tibiæ and tarsi. The elytra and pygidium are pilose.

I am indebted to Mr. Horace Knight for the wonderfully fine drawings for the figures of the three beetles above described.

BIBLIOGRAPHICAL NOTES ON THE HEMIPTERA. No. 4.

By G. W. KIRKALDY.

General Notes.

1. Schaum's 'Bericht' gives the dates of the nineteenth Band of Herrich-Schæffer's 'Wanzenartigen Insecten' as follows:—Heft 1, 1849; hefte 2–6, 1850; heft 7 (Index), 1853.

2. In a review in 'Nature,' W. T. Blanford (Dec. 31st, 1903, vol. 69, pp. 199–201) objected to my new name for the bed-bug, viz. *Klinophilos*, one of the grounds being that it was already

the type of the Linnean genus *Cimex*. To this I replied, in the same journal (March 17th, p. 464), that the type of the Linnean *Cimex* could never be *lectularius*, as (1) Linnæus stated no types; (2) *lectularius* does not agree with the diagnosis of *Cimex;* and (3) another type for the latter genus was duly selected by Fabricius later on. Blanford replied on the same and following pages, stating that types of certain genera *were* fixed by Linné. As the information was, in part, new to me and several of my correspondents, I abstract it now. It would have been answered long ago had I not had a very bad accident while horse-riding, rendering me a cripple for over eight months (with the prospect of several more), and necessitating operations under chloroform (one more in a few days).* Under these circumstances all my work has been greatly retarded, and I was unable to visit the only house in which 'Nature' was to be found (*then*) in Honolulu.

The "rules of Linnæus" were, according to Blanford, printed in his 'Philosophia Botanica,' a work not accessible to me now. Of these, Nos. 242 and 246 are quoted by Blanford:—

"242. *Nomen genericum* Antiquum *antiquo generi convenit.*

"246. *Si genus receptum, secundum jus naturæ et artis in plura* dirimi *debet, tum nomen antea* commune *manebit* vulgatissimæ *et officinali plantæ.*"

There are several comments to be made on this:—

(1) The 1758 edition of the 'Systema Naturæ' is universally regarded as the foundation of entomological nomenclature, and there is nothing there of such rules, nor is there any mention, in the Introduction, of the 'Philosophia Botanica.'

(2) Even admitting these rules for Vertebrata, it is well known that many of the insects known to the ancients are incorrectly identified at the present day. Linné himself fell, apparently, into gross error; for example, Chermes, Ichneumon (not an insect), Empis, Tipula, Aphis, &c.; and, personally, I would be very sorry to attempt to affix the types of any Linnean genera by those "rules."

There are, I believe, only two generic names which can be settled in this manner, viz. *Apis* (*mellifera*) and *Cimex;* but here another (and, as I believe, superior) factor comes into play —*lectularius* cannot be the type, because it is antagonistic to the generic diagnosis.

It is curious that not one, so far as I can trace, of Linné's entomological pupils paid any attention to this (impossible) rule of "commonest species," and that the best known, *i. e.* Fabricius, deliberately fixed on *bidens* as the type of *Cimex*.

As to *Clinocoris*, 1829, which I restored in place of *Klinophilos*, I am aware that the "substitution of one name for

[* The present article was received on January 9th, 1905.—Ed.]

another on the score of convenience is absolutely in defiance of the 'rule of priority,'" but when the earlier name is found to have been wrongly accepted up to the present, it is, I think, obvious that such a substitution is not only convenient, but obligatory.

3. It may be noted, with reference to recent discussions, that Sherborn ('Index Animalium,' 1902) accepts Geoffroy's 1762 genera.

Fam. Coccidæ.

1. Fernald Cat., p. 54. *Leeaniodiaspis;* the original spelling of this was *Lecanodiaspis*, and the type is *sardoa*, not *dendrobii*, as stated.

2. A species omitted in Fernald Cat. (apparently) is *Coccus pruni*, Burmeister (May 28th, 1849), in Zeit. für Zoologie, p. 177, on *Prunus domestica*, Germany.

The diagnosis is as follows :—

"♂ viridi-griseus, albo farinosus, alis albidis; scutello parvo, binodoso; antennis pubescentibus, pedibus nudis gracilibus; abdominis segmento penultimo et antepenultimo bisetoso. Long. $\frac{2}{3}$ lin.

"♀ elliptica, viridigrisea, albo farinosa, capite magno in prothoracem postice producto; abdominis lateribus paululam depressis, segmentis duobus ultimis utrinque pilosis. Long. 1 lin."

This is followed by a long description in German.

3. The references to many of the Zehntnerian species are incorrect, being taken from separately paged reprints. At the present moment I can supply a correct reference only to the following :—

Aspidiotus sacchari caulis, Zehntner (July 15th, 1897), 'Archief voor de Java-Suikerindustrie,' v. p. 735–44, pl. viii.

Fam. Cimicidæ.

In the 'Entomologist' (August, 1903, p. 215), I stated that I had not seen the description of *Philia*, Schiödte. I have now been able to secure Kröyer's 'Naturhistorisk Tidskrift,' Bind iv. (1842-3), and find that *Philia* is not a valid genus. In the 'Revisio critica specierum generis Tetyrae Fabricii, qvarum exstant in Museo Regio Hafniensi exempla typica' (pp. 279–312), "*Philia m.*" is simply placed at the head of the descriptions of several species below the Fabrician nomenclature. On p. 281, Schiödte states that *Calliphara* and *Callidea* (sic) are preoccupied by *Calliphora*, Macquart, 1835, and *Calleida*, Dejean, Latr., 1829, and that they form only one genus. On pp. 315–60 are the "Forhandingler i det skandinaviske entomologiske Selskab," in which (on pp. 346–8) Schiödte discusses his own paper, and definitely states that *Philia* is proposed as a new name for the above mentioned genera. As neither *Calliphara* nor *Calidea* is

preoccupied, and as they form good genera, *Philia* cannot stand, and for "*Philia*, Stål nec Schiödte," I propose "*Schioedtia*, nn., type *senator* (Fabr.)."

2. To the same entry in the 'Entomologist' (1903, p. 215) add:—

Schiödte, 1842–3, Naturh. Tidskr. iv. p. 330. (δ) *Cephaloctenus*, unnecessary "emendation" for *Cephalocteus*, Dufour, 1834.

3. The reference to *Legnotus*, Lethierry and Severin (Cat. i. p. 78), is Kröyer's Naturh. Tidskr. (2), ii. p. 464.

Fam. Naucoridæ (?).

1. Sherborn ('Index Animalium,' 1902, p. 647) cites a hemipterous genus, *Naucorinus*, Meuschen, 1778, Mus. Gronov. p. 69, with apparently (see p. 1146) no species mentioned. I have not seen the work recently, but believe the form is only used in the plural, and is rather of a tribal or sectional value. I would be grateful for any information.

ERRATA (Entom. xxx.).

"Bibliographical and Nomenclatorial Notes on the Hemiptera.—No. 3."

Page 280, Fam. Pyrrhocoridæ, delete "*Probergrothius*," n.n., for *Odontopus*. The latter is apparently not validly preoccupied.

Page 281, line 18, for "*techii*" read t. *echii*; line 23, for "1903" read 1803; lines 24 and 26, delete *Macrothyreus* and *Macrocephalus*; line 6 from bottom, for *Dakulosphaira* read *Daktulosphaira*; line 3 from bottom, for *Embolophora* read *Embolophpora*; line 2 from bottom, for *Gonionotus* read *Gonianotus*; transpose marks to footnotes.

Page 282. The footnote refers to the spelling of *Phlœophthiridium* and *Rhizophthiridium*.

LEPIDOPTERA OF THE LINCOLNSHIRE COAST.

By A. E. Gibbs, F.L.S.

I had the good fortune to spend the month of July, 1904, at Theddlethorpe St. Helen, a little-frequented spot on the Lincolnshire coast. Our bungalow was situated on the top of the sandhills, which are of considerable height, and have been raised to protect the low-lying district eastwards of the wolds from the ravages of the sea. These sandhills, upon which most of my collecting took place, are covered with scrub, consisting chiefly of sea-buckthorn, dwarf elder, whitethorn, bramble, and similar

low bushes, the first named so greatly predominating that one soon became painfully familiar with its prickly spines. The seaward face of the sandhills is clothed with lyme-grass, marram, and other plants, which serve to bind the sand and keep it from being blown or washed away. *Tapinostola elymi* was here to be found in almost unlimited numbers, while by searching among the lower-growing grasses a plentiful supply of *Nudaria senex* was obtainable. My lamp, however, attracted the attention of the coast-guard officers, who warned me that a moving light on this flat coast was apt to be attended with danger to shipping, and courteously requested me to keep on the other side of the hills. Long series of both the species mentioned were secured, but in the case of *T. elymi* the specimens were for the most part rather worn, owing doubtless to their habit of clinging to the swaying heads of the lyme-grass, and so getting blown against the surrounding herbage. On the day of arrival at the bungalow the first consideration was to find a suitable spot for sugaring. The district being almost treeless, advantage had to be taken of the posts of the wire fence which surrounded our little enclosure, and of the thicker stems of the buckthorn and other shrubs, while some clumps of thistles just coming into flower proved excellent objects on which to spread the alluring sweets. Among the moths obtained in limited numbers at sugar were *Lithosia complana*, *Axylia putris*, *Xylophasia sublustris*, *Neuria reticulata*, *Mamestra albicolon*, *Agrotis vestigialis*, *A. aquilina*, *Triphæna interjecta*, *Plusia festucæ*, *P. iota*, while any number of specimens of *Acronycta rumicis*, *Cerigo matura*, *Miana literosa*, *Agrotis tritici*, and *Hadena pisi* could have been obtained. Dusking yielded fair results. The most plentiful Geometer was *Acidalia imitaria*, which flew among the scrubs in considerable abundance, in company with *A. immutata*. Some elder-bushes in front of the bungalow appeared to have attraction for *Cleora lichenaria* and *Larentia viridaria*, the latter species greatly predominating. Light did not prove the success which was anticipated. A brilliantly illuminated sheet, placed in what appeared to be an excellent position, brought nothing but a few *T. elymi* and *L. viridaria*, and this method of working was therefore abandoned. The lights of the house, however, to some extent made up for the disappointment, and on several evenings the net was kept busy by the insects which came in at the open door. The most noteworthy visitor, so far, at any rate, as size was concerned, was *Odonestis potatoria*, of which there were often several males flying about at the same time. This is one of the familiar insects of the sandhills—the males at light and the females ovipositing among the long grass. On one particular evening, Saturday, July 16th, the bungalow was visited by a swarm of *Leucania impura*, which were flying about in large numbers, but curiously enough the experience was confined to

that particular night, though the insect was fairly common at sugar on other occasions. Several days were spent investigating the large woods a few miles inland, but so far as Lepidoptera were concerned the result was not very cheering. Burwell woods yielded only *Charæas graminis*, *Acidalia bisetata*, *Hypsipetes sordidata*, *Nomophila noctuella*, and *Sphaleroptera ictericana*. A visit to the "Greasy Field," near Louth, in company with Mr. C. S. Carter and Mr. Vincent Crow, two local entomologists, in search of *Melitæa aurinia*, which is recorded to occur there, and from which the field takes its name, proved fruitless, no signs of the presence of that insect being discernible, nor was a second attempt on a subsequent day any more profitable. A chalk-pit near by was carpeted with the yellow blossoms of *Hypericum perforatum*, from which *Catoptera hypericana* was beaten out in considerable numbers. The following is a list of the Lepidoptera observed at Theddlethorpe between July 1st and August 3rd :—

Nudaria senex.
Lithosia lurideola.
L. complana.
Euchelia jacobææ.
Hepialus humuli.
Odonestis potatoria.
Thyatira derasa.
Cymatophora octogesima.
Acronycta psi.
A. rumicis.
Leucania lithargyria.
L. comma.
L. impura.
Calamia phragmitidis.
Tapinostola elymi.
Axylia putris.
Xylophasia rurea.
X. lithoxylea.
X. sublustris.
Neuria reticulata.
Cerigo matura.
Mamestra sordida.
M. albicolon.
M. brassicæ.
Apamea basilinea.
A. gemina.
A. didyma.
Miana strigilis.
M. fasciuncula.
M. literosa.
M. bicoloria.
M. arcuosa.
Caradrina morpheus.
C. alsines.
C. taraxaci.
C. quadripunctata.
Rusina tenebrosa.
Agrotis vestigialis.
A. suffusa.
A. segetum.
A. exclamationis.
A. corticea.
A. tritici.
A. aquilina.
Noctua augur.
N. festiva.
N. rubi.
Triphana interjecta.
T. orbona.
T. pronuba.
Mania typica.
Euplexia lucipara.
Aplecta advena.
Hadena oleracea.
H. pisi.
Plusia chrysitis.
P. festucæ.
P. iota.
P. gamma.
Cleora lichenaria.
Acidalia dimidiata.
A. dilutaria.
A. immutata.
A. imitaria.
A. emarginata.
Cabera pusaria.
Larentia didymata.
L. viridaria.
Eupithecia subfulvata.
Melanthia ocellata.
M. albicillata.
Melanippe sociata.
M. montanata.
M. fluctuata.
Cidaria dotata.
Pelurga comitata.
Aglossa pinguinalis.
Pyralis glaucinalis.
Scoparia mercurella.
Herbula cespitalis.
Scopula olivalis.
S. prunalis.
Crambus tristellus.
Homœosoma nimbella.
H. nebulella.
Dictyopteryx læflingiana.
Aspis udmanniana.
Sericoris lacunana.
Sciaphila conspersana.
S. virgaureana.
Sphaleroptera ictericana.
Catoptria hypericana.
Eupœcilia atricapitana.

SUPPLEMENTARY LIST OF THE LEPIDOPTERA OF THE ISLAND OF CAPRI.—No. 2.

By C. Seymour Browne.

In my previous supplementary list (Entom. xxxvii. pp. 186–188) twenty additions were enumerated. I now give twenty-two others.

Notodontidæ.

791. *Hoplitis milhauseri*, F.

Noctuidæ.

1787. *Polia canescens*, Dup.
2005*b*. *Caradrina selini*, B., var. et ab *noctivaga*, Bell.
2068. *Tæniocampa stabilis*, View.
2183. *Xylomyges conspicillaris*, L., ab. *melaleuca*, View.
2199. *Calophasia lunula*, Hufn.
2221. *Cucullia verbasci*, L.
2391. *Eublemma suava*, Hb.
2417. *Thalpochares polygramma*, Dup.

Geometridæ.

2953. *Acidalia dimidiata*, Hufn.
3003. *A. extersaria*, H.-S.
3008. *A. ochroleucata*, H.-S.
3020. *A. herbariata*, F.
3886. *Boarmia umbraria*, Hb.
4009. *Thamnonoma semicanaria*, Frr.

Nolidæ.

4110. *Nola chlamitulalis*, Hb.

Arctiadæ.

4203*a*. *Arctia villica*, L., ab. (et var.) *angelica*, B.
4203*b*. *A. villica* var. *konewkai*, Frr.

Cossidæ.

4685. *Hypopta cæstrum*, Hb.

Pyralidæ.

700. *Dioryctria abietella*, F.
1242. *Pyrausta sanguinalis*, L.

Tortricidæ.

2055. *Notocelia uddmanniana*, L.

NEW SPECIES OF HYMENOPTERA (ACULEATA, ICHNEUMONIDÆ, AND BRACONIDÆ) FROM INDIA.

By P. Cameron.

ACULEATA.

Diodontus reticulatus, sp. nov.

Niger, mandibulis late flavis; geniculis, tibiis tarsisque anticis flavis; alis hyalinis, nervis stigmateque nigris. ♀. Long. fere 5 mm.

Hab. Deesa (Major C. G. Nurse).

This species comes near to *D. striolatus*, Cam., from Lahore. The two may be separated thus :—

Clypeus roundly and deeply incised in the middle; the base of the mesopleuræ without stout striations; the hinder tibiæ and tarsi testaceous . . . *striolatus*, Cam.
Clypeus not roundly and deeply incised in the middle; the base of the mesopleuræ with some stout striations; the hinder tibiæ only testaceous at the base *reticulatus*.

Antennæ black; the flagellum with a pale microscopic pile. Head black; the front and vertex minutely and sparsely punctured; the face is thickly covered with silvery pubescence; the apex of the clypeus almost transverse. Mandibles yellow, their apical third black. Thorax shining; the base of the propleuræ with stout striations; there are two stout long oblique striæ behind the middle, and a shorter curved one behind these, almost in the middle; mesopleuræ with stout, widely separated keels on the basal half, which form irregular reticulations; the basal half coarsely aciculated, the apical smooth and shining. The base of the metapleuræ is smooth and shining; the rest bears oblique distinctly separated striæ. The base of the median segment bears stout oblique keels, which run into irregular reticulations in the middle; the apical slope is irregularly transversely striated; the fovea is large and deep. The four anterior tibiæ and the anterior tarsi are for the greater part testaceous; the base of the hinder tibiæ white; there are four longish spines on the hinder tibiæ, and there are three or four shorter spines on the apex on the outer side; the middle tibiæ are similarly but not so strongly spined. Abdomen smooth and shining; the apical half covered with a pale down.

Cerceris simlaensis, sp. nov.

Black, largely marked with yellow, and thickly covered with white hair; the scape of the antennæ beneath yellow; the third joint and the base of the fourth rufous; legs yellow; the four anterior femora largely marked with black behind; the hinder pair with the apical two-thirds black; the basal area on the median segment stoutly longitudinally striated. ♂. Length, 10-11 mm.

Hab. Simla (Nurse).

Head black; the frontal spine, the face, the inner orbits to shortly above the base of the antennæ—the yellow line narrowed and rounded above—the clypeus, cheeks, and mandibles, except at the apex, yellow. Face strongly punctured; the clypeus is rounded at the top; its upper part convex, its lower with a semicircular depression in the middle; the apex black and transverse in the middle; the sides obliquely narrowed; both are black on the lower side. Vertex strongly punctured; the punctures distinctly separated; the front is much more closely and more minutely punctured, especially below where they run into striations. Thorax strongly and closely punctured, and thickly covered with white hair; there is a yellow mark—obliquely narrowed on the inner side—on either side of the pronotum, and the postscutellum is yellow. The scutellum is more sparsely punctured than the mesonotum. The basal area on the metanotum is stoutly longitudinally striated; the rest of it is closely rugosely punctured, and is thickly covered with long white hair. Pleuræ closely but not deeply punctured, except the part below the hind wings, which is closely striated. Legs yellow; the four front femora above broadly at the base, slightly more than the apical half of the posterior, and a line on the outer and inner sides of the apical half of the hinder tibiæ, black; the hinder tarsi infuscated. Wings hyaline, the apex smoky; the stigma, the costa, and the basal nervures fulvous. The abdominal segments are lined with yellow on the apex; the last has an irregularly round mark on the sides. The pygidial area is strongly punctured, more sparsely in the middle than at the apex or base; the epipygium has a rounded incision in the apex; the fifth and sixth segments are, at the apex laterally, armed with bundles of stiff golden hair, the last being the thicker and longer, and looks like a stiff broad spine.

Come nearest to *C. himalayensis*, Bingham.

ICHNEUMONIDÆ.

Cryptus excavatus, sp. nov.

Niger; pedibus rufis; coxis trochanteribus femoribusque anticis subtus nigris; alis hyalinis, stigmate nervisque nigris. ♀. Long. 12, terebra 3 mm.

Hab. Simla (Nurse).

Antennæ entirely black. Head black; the inner orbits narrowly in the middle and the outer still more narrowly yellow. Face strongly and closely punctured, and thickly covered with white hair; the centre roundly projecting. Clypeus smooth, shining, and sparsely punctured. Front deeply depressed, smooth, closely and finely transversely striated; the part below the ocelli is coarsely irregularly transversely striated; the vertex near the ocelli is stoutly reticulated. Thorax closely rugosely punctured, more or less striated on the pleuræ and mesonotum. Scutellum shining and sparsely punctured. The median segment is more coarsely rugosely punctured than the mesonotum; the basal keel is less distinct than the apical; the teeth are broad. The mesosternal furrow is deep, curved, and does not reach beyond the middle. Legs rufous; all the coxæ and trochanters, the front femora to near the apex below and behind, the middle pair behind to near

the middle, the apex of the hinder narrowly, and of the tibiæ more broadly, black. Abdomen shining, the black with a bluish tinge. The wings have a slight fulvous tint.

A smaller and more slenderly built species than *C. luculentus*.

CRYPTUS LUCULENTUS, sp. nov.

Niger; pedibus rufis; coxis trochanteribusque nigris; alis hyalinis, stigmate testaceo, nervis fuscis. ♀. Long. 17, terebra 5 mm.

Hab. Simla (Nurse).

Antennæ entirely black; the scape punctured and sparsely covered with short hair. Head black; the inner and outer orbits and a transverse mark on the middle of the clypeus near the apex, yellowish. Face closely and rather strongly punctured, and thickly covered with white hair; the centre is dilated broadly and roundly; the clypeus is more shining, and not quite so strongly punctured as the face. Mandibles black, rufous behind the teeth. Thorax closely and distinctly punctured; the pleuræ more strongly than the mesonotum. The punctuation on the sides and on the apical slope of the median segment run into reticulations, this being also the case with the metapleuræ. The base of the median segment is obliquely depressed in the middle; the basal transverse keel on it is interrupted in the middle, distinct on the sides, and projecting on the outer edge. Wings hyaline, with a slight but distinct fulvous tinge. Abdomen smooth; the middle segments aciculated. Legs rufous; the coxæ and trochanters black; the hinder tarsi have a yellowish tinge; they are distinctly spinose.

SPILICHNEUMON ANNULICORNIS, sp. nov.

Niger; pedibus, scutello abdomineque late rufis; annulo flagello antennarum, abdominisque apice albis; alis hyalinis, stigmate nervisque nigris; apice tibiarum posticarum tarsisque posticis nigris. ♂. Long. 11 mm.

Hab. Simla (Nurse).

Antennæ shorter than the body, black, the flagellum brownish beneath towards the apex; there is a broad white band beyond the middle. Head black; the inner orbits and the sides of the clypeus broadly lemon-yellow; the centre of the clypeus has a rufous tinge. Face and clypeus closely punctured; the front and vertex are quite as strongly and closely punctured; the mandibles are broadly rufous near the middle. Thorax black, the scutellum yellow. Pro- and mesothorax closely and strongly punctured, and thickly covered with pale pubescence; the scutellum is not so closely punctured, and is covered with long pale hair. Median segment closely and strongly punctured, and thickly covered with longish white pubescence; the areola is twice longer than broad; the basal half is slightly but distinctly narrowed, its apex transverse; the sides are stoutly transversely striated, the centre aciculated; in the middle of the apical half is a longitudinal keel; the apical slope is closely irregularly rugose. Pleuræ closely, almost rugosely, punctured, the metapleuræ more coarsely than the rest. Legs rufous; the four anterior coxæ and the trochanters pale yellow; the hinder coxæ, the basal joint of the trochanters, the apical

third of the tibiæ, and the hinder tarsi, black. Wings hyaline, the stigma and nervures dark fuscous. Abdomen black; the post-petiole, the second and third segments, and the sides of the fourth red; a large semicircular white mark on the apex of the sixth segment and the whole of the seventh white. The post-petiole is strongly but not very closely punctured; the gastrocœli are narrow, dilated at the base; their outer side longitudinally striated.

(To be continued.)

A LIST OF THE "MACRO-LEPIDOPTERA" OF LANCASTER AND DISTRICT.

By C. H. Forsythe.

In compiling this list of our local "Macro-Lepidoptera," I have kept strictly in view the necessity of excluding any species I have had the slightest doubt about. I could have included several species on the authority of the late Mr. J. B. Hodgkinson, who marked them in Newman's 'British Butterflies and Moths' as "probably occurring in the neighbourhood"; but, as I have no record of their actual capture, I have excluded them. That the list is far from complete I know, but I hope this will stimulate collectors to record the capture of anything "new to the district," so that we may in the near future have a more complete one. I have to thank Mr. George Loxham, of Lancaster, for much valuable information; some of his records, extending over a period of forty years, are unique.

Pieridæ.

Pieris brassicæ.—Common everywhere in June and July, and the second brood in August and September.

P. rapæ.—Abundant; late May and June, and the second brood in August and September. A yellow form occurs occasionally.

P. napi.—Abundant; late May and June, and the second brood in July, August, and September. Some of the forms about Clougha Pike are much suffused with black scales, and the veins are broadly marked, showing a tendency to melanism.

Euchloë cardamines.—Uncommon about Lancaster. Odd specimens near Quernmore and Torrisholme. Abundant at Witherslack and Methop in May and June.

Leucophasia sinapis. — Local. Fairly common at Methop and Witherslack in April and May. No second brood has been recorded.

Colias edusa.—Very rare generally; in "*edusa* years" we frequently obtain specimens. I have taken this species (in 1900) at Hest bank and near Halton, and saw a specimen the following year flying over a clover field near Lancaster. "In 1892 I took several examples near Lancaster, and in 1900 I took a few near Methop bank" (G. Loxham). The var. *helice* has not been captured, as far as I know.

Gonepteryx rhamni.—Rare about Lancaster, fairly common at Arnside, and abundant at Witherslack in late July, August, and September.

NYMPHALIDÆ.

Argynnis selene.—Formerly common near Clougha Pike; now extinct there. "Up to a few years ago it occurred commonly in a rough field near Witherslack, but cultivation has stamped it out in that locality" (G. Loxham). The imago appears in June.

A. euphrosyne. — Common near Warton, Carnforth, on Arnside Knott, and near Grange-in-Cartmel, in early June.

A. aglaia.—I took a specimen in July, 1901, near Hest bank. Common at Warton, Arnside, and Witherslack.

A. adippe.—Fairly plentiful at Warton; common at Arnside and Witherslack in July and August. "I took a fine aberration of this species some years ago on Arnside Knott" (G. Loxham).

A. paphia.—I took a specimen at Witherslack on August 3rd, 1901—a record (*vide* 'Entomologist,' vol. xxxiv. p. 253).

Vanessa polychloros.—One specimen taken by me at Witherslack, July 24th, 1901 (*vide* 'Entomologist,' vol. xxxiv. p. 245—"The Butterflies of the Witherslack District," contributed by me in September, 1902).

V. urticæ.—Abundant everywhere in early May and in September. Although we rarely get aberrations of this species, I took one at Arnside in August, 1903, and another in Grimshaw Lane three days later.

V. io.—Uncommon about Lancaster. Odd examples near Clougha Pike, Quernmore, Grimshaw Lane, &c., in August. Abundant about Witherslack and Arnside. This species is apt to vary; though such aberrations are rare, I have a Witherslack example, taken in 1901, without the "eye" markings on the hind wings.

Pyrameis atalanta. — Fairly common in some seasons, scarce in others. Lancaster, Methop, Witherslack, Arnside, Halton, &c., in July, August, and September.

P. cardui. — Uncommon generally; in some years (as in 1903) fairly plentiful. Lancaster, Arnside, Silverdale, Witherslack, &c., in August and September. "I used to take the larva feeding upon *Cnicus*, annually, at Heysham some years ago" (G. Loxham).

Erebia æthiops.—Plentiful at Arnside and Witherslack in August.

Pararge egeria.—"Fairly common near Witherslack some years ago" (G. Loxham). This species is now extinct in this district.

P. megæra.—Common near Sline, Heysham, Warton, Methop, and Witherslack in late May and June, and the second brood in August.

Satyrus semele.—Common at Arnside and Witherslack in July and August.

Epinephele ianira.—Abundant everywhere in June and July.

E. tithonus.—Very local, near Overton. "Formerly common about Heysham Moss in July" (G. Loxham).

Aphantopus (E.) hyperanthus.—"Formerly common in Maud's Wood, near Grange-in-Cartmel, in July and August" (G. Loxham). This species has not been taken in this district for the last few years, and is probably extinct.

Cœnonympha typhon. — The type does not occur here. On the

mosses at Witherslack, Methop, and Heysham, the var. *rothliebi* is abundant in June and July.

C. pamphilus.—Abundant everywhere in June, July, and August.

LYCÆNIDÆ.

Zephyrus (*Thecla*) *betulæ.*—Very local and scarce near Silverdale in late August and September. "Common near Silverdale, formerly" (G. Loxham).

Z. (*T.*) *quercus.*—Fairly common on Arnside Knott in July and August.

Callophrys (*T.*) *rubi.* — Abundant near Clougha and Quernmore; common at Methop in April, May, and June.

Chrysophanus phlæas. — Fairly common in Grimshaw Lane, near Clougha, Blea Tarn, Arnside, Witherslack, &c., from June to September.

Lycæna egon.—Locally common at Witherslack in August.

L. agestis.—Common at Arnside, Methop, &c., in May, June, and July. The var. *salmacis* occurs occasionally at Warton and Arnside, and the var. *allous* at Arnside fairly commonly.

L. icarus. — Common everywhere in June, and the second brood (often very diminutive in size) in September.

L. corydon. — "Common about Arnside Tower some years ago. Common near Warton in 1892" (G. Loxham).

L. minima.—Very local near Witherslack early in June.

Cyaniris (*L.*) *argiolus.* — Common about Grange, Methop, and Witherslack in late May and early June. No second brood occurs in this district.

ERYCINIDÆ.

Nemeobius lucina. — Very local near Grange and at Witherslack in late May and June.

HESPERIADÆ.

Thanaos (*Nisoniades*) *tages.* — Plentiful at Arnside and Witherslack in May.

Augiades (*Hesperia*) *sylvanus.* — Fairly common near Methop and Arnside in May and June.

SPHINGIDÆ.

Acherontia atropos. — Scarce, although odd specimens are captured nearly every year in July, August, and September. The larvæ have also been taken feeding on potato occasionally.

Sphinx convolvuli.—Rare. I took two specimens in August, 1900, and had another brought to me by a gardener, who found it at rest on a fuchsia; and on August 23rd, 1902, I found a specimen on a gate near Halton. I have only one record of the larva being found on bindweed (*Convolvulus arvensis*) on July 19th, 1900, near Quernmore.

Deilephila galii. — The larvæ are rare at Heysham on *Galium* in September.

Chœrocampa celerio.—Very rare. Mr. John Ralph has a specimen, taken in Lancaster some years ago; and on July 28th, 1898, I had a small male brought to me by our electrician.

Metopsilus (*C.*) *porcellus.* — I took two specimens at Quernmore in June, 1901, and have seen it on the wing near Clougha. "It occurs on the Witherslack and Methop Mosses" (G. Loxham).

Smerinthus ocellatus. — This species occurs near Hest bank, but I have only taken larvæ there; at Witherslack the sallows growing by the sides of the mosses are prolific hunting grounds for the larvæ in July.

S. populi.—Common everywhere: imago in June, larvæ in July and August.

Macroglossa stellatarum. — "Common at Arnside, Methop, and Witherslack in May" (G. Loxham).

Hemaris (*M.*) *fuciformis.*—"Rare near Methop bank in late May" (G. Loxham).

H. (*M.*) *bombyliformis.*—"Occasionally about the mosses at Witherslack and near Methop bank in late May" (G. Loxham).

Sesiidæ.

Trochilium crabroniformis.—Common in the County Asylum grounds on sallow trunks in late June and July. Occasionally at Heysham and Hornby.

Zygænidæ.

Ino statices. — Very local near Witherslack in late June and early July.

Zygæna filipendulæ.—Local, but abundant near Grange in July.

Cymbidæ.

Hylophila prasinana. — Not common; Grimshaw Lane, County Asylum grounds, near Quernmore, &c., end of May. I have bred this species from Witherslack and Methop larvæ.

Nolidæ.

Nola cucullatella.—Local; Freeman's Wood, Lancaster, in July.

Arctiadæ.

Nudaria mundana.—Not common, but generally distributed. Blea Tarn, Quernmore, County Asylum grounds, &c., end of July.

Cybosia (*Lithosia*) *mesomella.* — "Uncommon near Scotforth and at Witherslack in July" (G. Loxham).

Lithosia lurideola.—Common at Witherslack and Arnside in July.

L. sericea.—Local at Witherslack in mid-July.

Œnistis (*Gnophria*) *quadra.* — "Two examples attracted to light near Lancaster, July, 1902" (G. Loxham).

Hipocrita (*Euchelia*) *jacobææ.* — Abundant at Witherslack and Methop, less so at Warton, in June.

Diacrisia (*Nemeophila*) *russula.* — Fairly common near Quernmore and Clougha, common on the Witherslack and Methop Mosses in July.

Parasemia (*N.*) *plantaginis.*—Common at Witherslack, near Quernmore, and Clougha in July and early August.

Arctia caia.—Common everywhere in July.

A. villica. — "Rare. Two specimens were taken in Ridge Lane, near Lancaster, in June, a few years ago" (G. Loxham).

Phragmatobia (*Spilosoma*) *fuliginosa.*—Rare at Heysham; common near Clougha and Methop bank, end of June.

Spilosoma mendica.—Common; Freeman's Wood, Lancaster (generally), Quernmore, &c., in June.

S. lubricipeda.—Common everywhere in June.

S. menthastri.—Plentiful in June, and generally distributed.

S. urticæ. — Very local. "I have only taken this species near Oakcliffe Hall in June" (G. Loxham).

(To be continued.)

NOTES AND OBSERVATIONS.

Pupation of Cataclysta lemnata.—The larva noted (*ante*, p. 5) as alive in November was brought into a warm room, fed up rapidly, and made a case nearly an inch long. When it made its cocoon (about January 25th) it much shortened this, and made it broader, by what engineering expedients I do not know, nor how it made a further important improvement. The larval case was very shabby, being covered with leaves of *Lemna*, mostly dead and discoloured. The cocoon (15 mm. long and 10 wide) is now covered by bright fresh leaves of the duckweed, so far as regards the portion above water, and, except that it is convex and prominent, it now looks just like the weed growing around it.—T. A. Chapman; Betula, Reigate, Feb. 4th, 1905.

The Time of Appearance of Lepidoptera in connection with Season and Latitude.—The question of the time of appearance of *Limenitis sibylla*, raised by the notes of Messrs. Gurney (Entom. xxxvii. 324) and Bentall (*ibid.* xxxviii. 62), is one of wider interest than may appear from the case of a single species. The whole subject of the time of appearance of species in connection with the two factors of season and latitude requires collating and discussing. I regret that I have no time to do this myself, but I beg to communicate two personal observations as a contribution to the discussion. Some years ago I spent a few weeks at the little village of Framzelle, near Cape Gris Nez. Early in October, when the weather had become cold, and Lepidoptera had nearly all disappeared, the only butterfly found along the coast was *Argynnis lathona*, which species was fairly common. On those rare occasions when this butterfly is taken in this country, it is, if I remember the records accurately, always taken some weeks earlier. Again, this last autumn (1904), I was at Ballater, in Scotland. On Sept. 21st, in the course of an evening walk by the banks of the Dee, I saw and captured *Chesias spartiata*, which was flying in profusion over the broom on a clear, cold, moonlight night. The flight lasted for about twenty minutes. This date struck me as being very early for Scotland. R. Meldola; 6, Brunswick Square, W.C., Feb. 1st, 1905.

Gynandrous Specimen of Cyaniris (Lycæna) argiolus.—During a fortnight's holiday in South Devon I paid a visit to Torquay on Aug. 8th, 1904, and was rewarded by the capture of a freshly-emerged gynandrous specimen of *Lycæna argiolus*. I had just previously taken a fine male *Lasiocampa* (*Bombyx*) *quercus*, one male *L. argiolus*, and seven specimens of *Macroglossa stellatarum*, and had seen *Colias edusa*, when, as we were returning to the harbour from the bathing-cove, my wife called my attention to a holly blue, which settled in the middle of

the road, and fell an easy victim to my net. When boxed, the insect elevated its wings over its back, and its true character was not then recognized. On our return to the boarding-house it was transferred to the killing-bottle, when it closed its wings round its body and revealed the fact that the right pair of wings were those of the male, and the left pair those of the female. The markings on the under side are quite normal. The abdomen appears to possess the characters of the female. The specimen is 1¼ in. in expanse. There was no opportunity of establishing evidence of the theory that these freaks occur in pairs, for the fellow one did not cross my path. I have collected for twenty-one years without having met with a gynandrous specimen, and this capture was in consequence especially pleasing to me. The weather that day was all that could be desired, the sun shining brilliantly in a cloudless sky, and the heat was intense.—C. Granville Clutterbuck; Heathside, Heathville Road, Gloucester.

Notes on Odonata.—Mr. H. M. Edelsten sends the following interesting notes on dragonflies in 1905:—*Sympetrum striolatum* and *Æschna mixta*, South Devon, common, Aug. 19th to 30th; *Æ. cyanea* and *Æ. grandis*, Enfield, August; *Erythromma naias*, Enfield, several, June 10th; *Pyrrhosoma nymphula*, Enfield and Epping Forest, June; *Ischnura elegans*, Enfield and Epping Forest, June, July, and August; *Agrion pulchellum*, Enfield, June; *A. puella* and *Enallagma cyathigerum*, Enfield, June, July, and August. He also received from the Norfolk Broads, *S. striolatum* and *Lestes sponsa*, Aug. 25th, Sept. 5th. On one occasion Mr. Edelsten was able to watch a female *E. cyathigerum* ovipositing. It descended below the surface and remained under water for nearly fifteen minutes. When it came up again it flew off and was at once seized by a male, *per collum*.—W. J. Lucas; Kingston-on-Thames.

CAPTURES AND FIELD REPORTS.

Vanessa antiopa in Surrey.—I have a rather damaged specimen of the "Camberwell Beauty" butterfly, which was captured on August 29th, 1904, at Raynes Park.—W. Smith; 46, Durham Road, Cottenham Park, Wimbledon, Jan. 3rd, 1905.

Lycæna bœtica in Cornwall.—I have much pleasure in recording the capture, near to Truro, of a female specimen of *L. bœtica*. It was netted on August 2nd, 1904, by a young friend of mine, a schoolboy collector, who so far has only a very small collection of the commoner species of butterflies. He saw the insect in his garden hovering around a veronica-bush, which it quickly left for a fuchsia-tree in bloom, and from which he netted it. It was not until he boxed the insect that he thought it to be anything unusual. He kept it alive for a day or two, hoping to find me at home, but unfortunately I was away on my holidays. He therefore pinched the thorax in the old-fashioned way, and set the insect, which is now in my collection. Both the wings on the right side are a little split at the edges, and the fringe worn; otherwise it is in good condition, the under side being beautifully marked and

coloured. The tail-like appendages and antennæ are complete, but by the pinching of thorax to kill it only one leg remains. I am delighted, however, to have the specimen. Can you inform me whether there are any later records of the capture of this insect than those given in Barrett's 'British Lepidoptera,' published in 1893?—W. A. Rollason; The White House, Truro, Feb. 10th, 1905.

[In 1893 three specimens of *L. bœtica* were recorded in the 'Entomologist' for that year—a male on September 7th at Dartford; one at Hastings, also in September; and a specimen in Sussex, August 28th. Two examples were reported as occurring in England in 1899. One of these was recorded as taken at Tunbridge Wells on September 1st; the other was said to have been captured at Deal on September 16th (Entom. xxxii. p. 281).—Ed.]

Unusual Dates.—The following dates may be worth recording:—On Nov. 15th, 1904, a fine male specimen of *Colias edusa* was seen on the wing; on Jan. 25th, 1905, one example of *Cidaria psittacata* (*siderata*) was found at rest on a bank; and on Feb. 3rd, 1905, a specimen of *Rumia luteolata* (*crataegata*) was seen in a similar position. The latter is, I think, quite exceptional even for South Devon.—E. D. Morgan; 8, Luscombe Terrace, Dawlish, Devon, Feb. 3rd, 1905.

[In the December number of the 'Entomologist' for last year there are two records of *C. edusa* having been observed in November. *C. psittacata* hybernates in the imago state. February is certainly an unusual date for *R. luteolata*.—Ed.]

Leucophæa surinamensis Linn. in Essex.—This pretty cockroach has occurred abundantly in a tanpit adjoining the greenhouses of a private garden between Chelmsford and Bloomfield, and is doing considerable harm to the pineapples, orchids, and other plants. In Mr. Burr's 'British Orthoptera,' published in 1897, the occurrence of two individuals at Bognor, Sussex, and one at Kew is mentioned, but Mr. Burr states that "it hardly deserves to be called British until it is proved that it actually breeds here." There is no doubt of its breeding in the present locality, as it has been established for several years, and the specimens brought to me are of every age and size, from recently hatched young to mature insects. The gardener who submitted the specimens to me does not know how they came, but in the past few years numerous tropical plants have been brought into the garden, and the cockroaches may have been brought with one of them. I have sent specimens to the British Museum Collection, and my naming has been confirmed there.—E. Charles Horrell; County Laboratories, Chelmsford, Essex.

Since writing the above, I hear from Mr. W. H. Harwood, of Colchester, that about thirty specimens have recently been found near Liverpool and Manchester.—E. C. H.

A few Captures from North Cornwall in 1903.—The following insects, taken during July and August, may be worth noting:—*Argynnis aglaia*, abundant and in grand condition; *Leucophasia sinapis*, including one of the pale variety; *Hesperia linea*, abundant; *Melanargia galatea*, *Habrosyne derasa*, *Cymatophora duplaris*, *Emmelesia alchemillata*, *Triphæna interjecta*, *Hylophila quercana* (*bicolorana*), *Hypsipetes elutata*

beautiful vars.; *Epione apiciaria*, common; *Noctua baia*; and a grand specimen of *Cidaria truncata* var. *comma-notata*, of the colouring described by "Newman."—W. A. Rollason; The White House, Truro, Cornwall.

Notes on Coleoptera in South-west Surrey.—*Claviger foveolatus*, Müll. In the nests of *Formica flava* under stones on the "Hog's Back."—*Chrysomela polita*, L. Occurred only once in the interior of a fallen tree on Peasmarsh.—*Oncomera femorata*, F. Abundant in the vicinity of Shackleford, on *Ægopodium podagraria*.—*Leistus spinibarbis*, F. Under refuse in a wood near Puttenham.—*Carabus intricatus*, L. Fairly plentiful during the summer months.—*Pterostichus nigrita*, F., *P. strenuus*, Daws. Widely distributed, but few specimens taken.—*Notiophilus palustris*, Duft. Occurred once or twice on Peasmarsh.—*Geotrupes sylvaticus*, Panz. One specimen taken in a copse near Compton.—*Clytus arietis*, L. On roses at Godalming.—*Meloë proscarabæus*, L., *M. violaceus*, Marsh. Occurred frequently on grassy banks.—*Zabrus gibbus*, F. Was taken only once in a field of standing corn at Shackleford.—*Anobium pertinax*, L. Plentiful in old willows on the banks of the Wey.—*Toxotus meridianus*, L. One specimen only crawling on a road.—*Bolitobius atricapillus*, F. Abundant in fungi.—*Callistus lunatus*, F. Under stones on the "Hog's Back."—*Apion pomonæ*, F. Abundant.—*Silpha rugosa*, L., *S. atrata*, L. Plentiful on dead animals.

I also did a little collecting among the water-beetles during the first fortnight in July. From Cuttmill ponds I obtained *Pelobius tardus*, Herbst; *Ayabus bipustulatus*, L.; *Acilius sulcatus*, L.; *Ilybius faliginosus*, F.; *Gyrinus natator*, Scop.; *Cercyon flavipes*, F.; *Dytiscus marginalis*, L.; *Haliplus obliquus*, F.; *Hyphydrus ovatus*, L. And from Losely, *Hydroporus palustris*, L.; *Sphæridium bipustulatum*, F.—J. A. Croft; Charterhouse, Godalming, Surrey.

Collecting in West Cornwall during 1903-1904.—Omitting captures of the commoner species, the following may be interesting to record:—

1903. Truro District.—June: *Lycæna argus* (*ægon*), *Acidalia subsericeata*, *Eupithecia plumbeolata*. July: *Habrosyne derasa*, *Thyatira batis*, *Acidalia bisctata*, *Cymatophora duplaris*, *Bapta* (*Corycia*) *temerata*, *Melanippe galiata*.

Newquay District.—July: *Lycæna argus* (fairly abundant), *L. astrarche* (*medon*).

Falmouth District.—July: *Melanippe galiata*. August: *Colias edusa* (scarce), *Vanessa cardui* (fairly common), *Epineuronia* (*Neuronia*) *popularis*, *Noctua rubi*, *Melanippe galiata*, *Agrotis suffusa*, *A. puta*, *A. obelisca*, *Triphæna interjecta*, *Noctua c-nigrum*, *Axylia putris*, *Miana literosa*. September: *Eupithecia centaureata*, *Heliothis armigera*, *Caradrina blanda*, *Aporophyla australis*, *Polia flavicincta*.

1904. Truro District.—May: *Rusina tenebrosa*. June: *Heliodes arbuti*, *Emmelesia alchemillata*, *Melanippe galiata*, *Æthia* (*Zanclognatha*) *tarsipennalis*, *Anticlea rubidata* (common), *Rusina tenebrosa*, *Eupithecia exiguata*, *E. castigata*, *Cymatophora duplaris*, *Acidalia subsericeata*. July: *Eupithecia tenuiata* (from larvæ taken in sallow-catkins in April),

Metrocampa margaritaria, *Ligdia adustata*, *Eupithecia rectangulata*, *Melanippe unangulata*, *Anticlea sinuata*. August: *Acidalia promutata*, *Xanthia silago* (from larvæ taken in sallow-catkins in April). September: *Xylina rhizolitha*, *Colias edusa* (2), *Orthosia lota* (from larvæ taken in sallow-catkins in April), *Polia flavicincta*.

St. Austell District.—June: *Erastria fuscula*, *Tephrosia punctularia*. July: *Emmelesia alchemillata*, *Melanippe unangulata*, *M. rivata*, *Anticlea rubidata*, *Erastria fuscula*.

Falmouth District.—June: *Anticlea rubidata*, *Emmelesia affinitata*, *Bapta* (*Corycia*) *temerata*, *Anticlea sinuata*. July: *Agrotis lunigera*, *Cleora glabraria*, *Emmelesia affinitata*, *Eupithecia rectangulata*. August: *Lasiocampa* (*Bombyx*) *quercus*, *Pyrameis* (*Vanessa*) *cardui* (numerous). This month were taken also larvæ of *Bapta temerata*, and in July larvæ of *Emmelesia affinitata*, *Dianthœcia capsophila*, *Eupithecia venosata*, *Macroglossa stellatarum*, and *Pieris napi*.

I should be glad to know if *Cleora glabraria* and *Anticlea sinuata* have been previously recorded from Cornwall. — W. A. Rollason; The White House, Truro, Cornwall.

[*Anticlea cucullata* (*sinuata*) has once been recorded from Cornwall. *Cleora glabraria* is known to occur in Devonshire, but, so far as we are aware, it has not been reported before from Cornwall.—Ed.]

SOCIETIES.

Entomological Society of London.—*February* 1*st*, 1905.—Mr. F. Merrifield, President, in the chair.—The President announced that he had appointed Dr. Thomas Algernon Chapman, M.D., F.Z.S.; Dr. Frederick Augustus Dixey, M.A., M.D.; and Professor Edward B. Poulton, D.Sc., F.R.S., as Vice-Presidents for the Session 1905–6.—Mr. H. St. J. Donisthorpe exhibited specimens of *Oligota granaria* found in a granary in Holborn, the only other localities reported hitherto being Shoe Lane and Scarborough.—Mr. W. J. Kaye, a specimen of the Erycinid butterfly, *Mesosemia eumene*, pinned in its natural position of rest to show its resemblance to the head of a small mammal, such as a mouse.—Dr. T. A. Chapman, a variety of the female of *Lycæna melanops*. As a mere aberration it was interesting, but it was of value as showing that the position in the genus for long accorded to the species, whether by accident or design, close to the *Arion-Euphemus* group, was correct. The considerable extension of the blue in this specimen showed up certain black spots on the upper surface of both upper and lower wings, strictly similar to these characteristics of the *Arion-Euphemus* group. He had named the variety, which seemed to be undescribed, var. *wheeleri*, in recognition of the work done by the Rev. George Wheeler among alpine butterflies.—Mr. F. Enock, a living female *H. defoliaria*, taken as late as February 1st, at rest on north side of oak-tree, and another female taken January 28th in the same wood at Bexley. He also exhibited, on behalf of Mr. Leonard Newman, of Bexley, two fine hybrids bred from a male *Notodonta ziczac* and a female *N. dromedarius*, the colour being that of *dromedarius* while the markings were those of *ziczac*.—

Mr. O. E. Janson, a living specimen of *Acridium ægyptium*, L., found in a cauliflower in Bloomsbury, and probably imported from Italy.—Mr. G. C. Champion, two specimens of *Malachius barnevillei*, Puton, captured by Mr. Thouless at Hunstanton, Norfolk, in June, 1899, a recent addition to the British List.—Mr. H. W. Andrews, male and female examples of *Machimus rusticus*, Mg., a rare Asilid, taken *in cop.* at Freshwater, Isle of Wight, on August 13th, 1903.—Mr. W. J. Lucas, a female specimen of *Panorpa cognata* taken at Byfleet Canal on August 23rd, 1904. The species occurs at Folkestone, and is said to be found in the New Forest. For comparison he also exhibited female specimens of *P. communis* and *P. germanica*.—The following papers were read:—"A Revision of the Genus *Criocephalus*, with Notes on the Habits of *Asemum striatum* and *Criocephalus ferus*," by Dr. D. Sharp, M.A., F.R.S., and J. Gilbert Smith, Mr. Smith exhibiting specimens.—"Another Entomological Excursion to Spain" (with descriptions of two new species of Hemiptera by Dr. O. M. Reuter), by Dr. T. A. Chapman, M.D., and G. C. Champion, F.Z.S.—"On the Matrivorous Habit of *Heterogynis*," and "On the Pupal Suspension of *Thais*," by Dr. T. A. Chapman, the author exhibiting examples of *Heterogynis* from numerous localities.—"Notes on New Zealand Lepidoptera," by E. Meyrick, B.A., F.R.S.—H. Rowland-Brown, M.A., *Hon. Secretary*.

South London Entomological and Natural History Society.—*January 12th*, 1905.—Mr. E. Step, F.L.S., Vice-President, in the chair.—The President referred to the death of Mr. C. G. Barrett, who had been a former President of the Society, and it was unanimously agreed to send a letter of condolence to Mrs. Barrett and family.—Mr. Main exhibited *Panorpa communis* and *P. germanica* from Folkestone.—Mr. Lucas, *P. cognata*, the rarest British scorpion-fly, and the other two species for comparison, with a female of the latter taken during the field-meeting at Byfleet on July 23rd. He also showed *Chrysopa ventralis*, from the same locality.—Mr. Goulton, photographs of lepidopterous larvæ.—Mr. Joy, varieties of *Aphantopus* (*Epinephele*) *hyperanthus* (1) with white ocelli on the upper side of the hind wing; (2) with the ocelli on the under side wholly or partially reduced to mere dots = var. *arete*; and (3) with elongate ocelli on the under side = ab. *lanceolata*.—Mr. R. Adkin gave an account of the Annual Meeting of the South-eastern Union of Scientific Societies, which he attended as the Society's delegate. He also read the report of the field-meeting held at Eynsford on June 25th, 1904.—Mr. Lucas read the report of the field-meeting at Byfleet on July 23rd, and then showed a number of lantern-slides illustrative of protective resemblance, kindly lent him by Mr. Hamm, of the Hope Museum, Oxford.—Messrs. Dennis, Clark, Lucas, Step, Tonge, and West also exhibited various slides.

January 26th.—Mr. Sich, F.E.S., President, in the chair.—Annual General Meeting.—The first part of the meeting was devoted to the business of receiving the Treasurer's balance-sheet and statement; the reading of the Council's report for the past year; the announcement of the Officers and Council elected for the ensuing year; and the reading of the retiring President's address. A satisfactory financial condition was announced by the Treasurer, Mr. T. W. Hall, and the Council's report showed that the work of the Society had been generally successful throughout the year, with an average attendance

at the twenty-five meetings of over thirty. A list of the elected Officers and Council:—President, Hugh Main, B.Sc., F.E.S.; Vice-Presidents, A. Sich, F.E.S., and E. Step, F.L.S.; Treasurer, T. W. Hall, F.E.S.; Librarian, A. W. Dodds; Curator, W. West (Greenwich); Hon. Secretaries, Stanley Edwards, F.L.S., F.E.S., and Hy. J. Turner, F.E.S.; Council, R. Adkin, F.E.S., F. Noad Clark, F. B. Carr, A. Harrison, F.L.S., F.Z.S., F.C.S., W. J. Kaye, F.E.S., H. A. Sauze, and W. West (Streatham).—Ordinary Meeting: Mr. Hugh Main, B.Sc., President, in the chair.—Dr. Chapman exhibited a living specimen of *Doritis apollinus*, bred from a pupa sent from Syria.—Mr. Step, a further portion of the "Tugwell" herbarium.—Mr. Main reported having seen *Hybernia rupicapraria*, *Phigalia pedaria*, *Cheimatobia brumata*, *H. marginaria*, and *P. monodactylus* in Epping Forest in some numbers on Jan. 22nd.—Mr. Turner read a few notes on the Entomology of Assiniboia, Canada, received from Mr. A. J. Croker.—Hy. J. Turner, *Hon. Rep. Sec.*

Lancashire and Cheshire Entomological Society. — The first ordinary meeting of the session was held in the Royal Institution, Liverpool, on Monday, January 16th, 1905. — Mr. Wm. Webster, M.R.S.A.I., in the chair. — The Rev. Chas. E. G. Kendall, B.A., Ripon Street, Preston, and Mr. Albert Wade, F.E.S., Frenchwood Street, Preston, were elected members of the Society.—Donations to the Library were reported by the Secretary from Messrs. H. St. J. K. Donisthorpe, F.Z.S.; J. R. Charnley, F.Z.S., and H. B. Score, F.R.G.S.—The chairman announced that the Council had decided to hold a microscopical and lantern meeting in March, when it was hoped that as many members as possible would contribute to make the innovation a success.—This completing the business, a paper was communicated by Mr. E. J. B. Sopp, F.R.Met.Soc., on the "Orthoptera of Lancashire and Cheshire."—A paper was then read by Mr. H. B. Score, F.R.G.S., F.R.Hist.S., on "Ants and their Ways," which was copiously illustrated by lantern slides. In opening, the lecturer treated interestingly and fully of the general external anatomy of the ant, afterwards discoursing on the uses of the various organs described, and shown on the screen. He then reviewed the habits of some of the better-known insects, and enlarged on the life-histories of such well-known species as the "Driver Ants" (*Anomma arceus*) of West Africa, the "Grain Storing Ants" (*Atta barbara*), of Palestine, &c., the "Parasol Ants" (*Œcodoma cephalotes*), "Agricultural Ants" (*Atta malefaciens*), and others. Passing to a consideration of *Formica rufa*, *F. fusca*, *F. sanguinea*, *Myrmica ruginodis*, and other British species, he recapitulated what is known regarding the habits and life-history of the various species, and mentioned that he had for many months had under observation, in a Lubbock formicarium, a nest of our common black house ant, *Lasius niger*.—On the motion of Dr. Cotton, seconded by Mr. Oulton Harrison, a hearty vote of thanks was accorded the lecturer.—Amongst exhibits shown were a beautiful series of slides of larvæ by Mr. J. J. Richardson: *Acronycta leporina*, *Anarta myrtilli*, *Liparis salicis*, *Fidonia atomaria*, *Cœnonympha davus*, &c., by Dr. Cotton, and *Periplaneta americana* and *Leucophæa surinamensis*, from the Liverpool Docks, by Mr. Sopp.—E. J. B. Sopp and W. B. Harrison, *Hon. Secs.*

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DESCRIPTIONS OF TWO NEW BEETLES FROM ANGOLA.

BY E. A. HEATH, M.D., F.L.S.

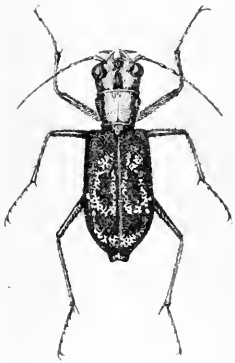

FIG. 1.

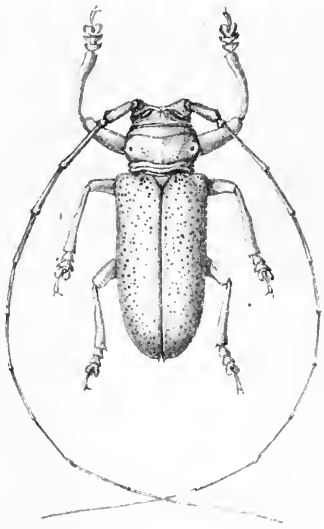

FIG. 2.

Fam. CICINDELIDÆ.

OPHRYODERA DISTANTI, sp. n. (Fig. 1.)

Head, pronotum, and elytra piceous, varying in some specimens to coppery brown; elytra coarsely punctured with very pale ochraceous irregular and indistinct marks from a little above the centre to the apex, where they form an irregular submarginal band. The head, face, pronotum, and pygidium are covered with brownish white hairs. The antennæ are piceous, except the first three joints, which are purple; the first joint is much thicker than the second, which is twice

longer; the third joint is half as long as the second. The body beneath is shining black, except the pro- and mesonota, which are green and coppery. On each side of the head, thorax, and abdomen is a band of white hairs reaching to the pygidium. The femora are bluish coppery black, and densely covered with white hairs; the tibiæ are bluish black, and slightly less hairy; the posterior tibiæ are longer than the tarsi; all the tarsi are purple, with white hairs at the joints.

Var. *a*.—Elytra with only a few white spots.

Var. *b*.—Elytra spotless.

Var. *c*.—Elytra coppery brown.

Long. 12 lines, lat. 4 lines.

Hab. Angola.

Fam. Cerambycidæ.

Prosopocera rothschildi, sp. n. (Fig. 2.)

Head, pronotum, scutellum, and elytra densely covered with short pale brown pubescence; the pronotum is slightly sculptured, and has a very short tooth on each side, and a black puncture on the upper side in a line with and near each tooth, and one just under the tooth, the anterior and posterior margins are transversely striated; the scutellum is tongue-shaped; the elytra are rather thickly covered with black punctures, the humeral angles are slightly raised and produced forward, the basal area is blackly tuberculate. The antennæ in the male are nearly three times as long as the body, and covered with a fine silky lavender-coloured pubescence; the basal joint is stoutest, and half as long as the second joint; all the remaining joints are of the same length as the second, except the last joint, which is slightly longer. The legs and tarsi are covered with pale lavender-coloured pubescence. The body beneath is the same brown colour as the elytra. Long. 15 lines, max. lat. 6 lines.

Hab. Angola.

NOTES ON SOME STEPHENSIAN TYPES OF TORTRICINA IN THE NATIONAL COLLECTION.

By Richard South.

Cnephasia sinuana, Steph., and C. incanana, Steph.

For nearly a quarter of a century I have been under the impression that I knew *C. sinuana*, Steph., but it was not until quite recently that I became aware of the existence of *C. incanana*. The revelation came about when examining the Tortricina in the Stephens collection in the Natural History Museum. In working through the species of *Cnephasia*, I found three specimens over the name *sinuana*; each of these had one of the small oval labels on the pins which distinguish veritable Stephensian specimens from others which have been added since the collection went into the Museum. One of these specimens accurately

agrees with the description of *C. sinuana* (Ill. iv. 128); the other two were indicated as *cinerana*, Bent., a label bearing that name being pinned in the drawer under the specimens. These last are most certainly referable to *C. chrysantheana*, Dup., but the type of *sinuana*, if it is not an aberrant form of *C. chrysantheana*, is most distinctly not the *sinuana* of Wilkinson and all later authors. In the same drawer was a series of a *Cnephasia* over the name *incanana*, Steph. ("The Scotch Gray T."). The description of this species was found in the appendix to Stephens's 'Catalogue of British Micro-Lepidoptera,'* p. 101. The species is also included as *Cnephasia incanana*, Steph. MSS., in the list itself (p. 66, No. 12). There were twelve examples of this species in the series, but only three of these were Stephensian, and, although neither was so indicated, it was not difficult to fix on the type.

After a close but unsuccessful search through all the available literature to discover further reference to *C. incanana*, I communicated with Mr. Eustace Bankes on the subject, but he was unable to refer me to any work wherein the species was mentioned. When he was in town lately, Mr. Bankes was good enough to call at the Museum, and, when he had made a critical examination of the types of *sinuana* and *incanana*, he expressed himself satisfied that the latter was identical with the insect that he and others have always considered to be *sinuana*, Steph. With regard to the specimens standing as *sinuana*, he concurred in the removal of the two labelled *cinerana*, Bent., to *C. chrysantheana*; but he was rather dubious, I think, about referring the type of *sinuana* to that species also.

I append a copy of the original description of *C. incanana*:—

"*Alis anticis cinereo-albidis, fascia basali rotundata, secunda obliqua media, margineque postico nigro-fuscis.* (Exp. alar. 7–8 lin.)

"Head hoary; thorax and anterior wings pale ashy-white, or hoary, with a few dusky scales; near the base is a distinct deep fuscous bar, rounded externally, and not reaching to the inner margin; on the costa towards the middle is a similarly coloured bar, extending across the wing, but not to the anal angle; this bar is well-defined and bi-angulated on the basal edge, but on the hinder one it is gradually shaded off to the ground colour; the hinder margin is also fuscous, with a curved black transverse streak, reaching from the costa to nearly the anal angle; fringe ashy; posterior wings and fringe pale fuscous.

"Scotland: Perthshire."

It will be noted from the above that the subbasal *bar* is described as *rounded* externally, whereas of *sinuana* the description runs: "with an incurved deep fuscous *fascia* near the base, having a *tooth without*." The italics are mine. Wood's fig. 1003

* 'List of the Specimens of British Animals in the Collection of the British Museum,' part x. Lepidoptera (continued). 1852.

(*obsoletana* in error) represents *sinuana*, Steph., whilst Wilkinson's figure of *sinuana* (Brit. Tort. pl. ii. fig. 6) is really that of *incanana*, Steph.

CATOPTRIA RUFANA, Steph., and C. EXPALLIDANA, Haw.

In the Stephens collection were five specimens of a *Catoptria* over the name *expallidana*, and in the same series a specimen with the name *rufana* pinned under it. The latter, except in the matter of colour, does not agree exactly with Stephens's description of "*Carpocapsa*" *rufana* (Ill. iv. 124), as there are no traces of the "very obscure somewhat ocellated silvery spot, with two fulvescent lines in the middle." Wood's fig. 989 certainly represents this particular specimen. Of the other specimens referred to, two only are Stephensian, and neither of these can be made to accord with Stephens's description (identical with Haworth's) of *Bactra expallidana*, Haw., but they fit in very closely with the *C. expallidana* of Wilkinson, Stainton, and others, and in part with Stephens's description of *rufana*.

As pointed out to me by Mr. Bankes when he examined the series, the specimen of *rufana* might be a reddish form of *B. lanceolana*, Hübn., and there is a somewhat similar example from Stainton's collection in the Museum series of this species. I am, however, not at all certain that the Stephens specimen is referable to *B. lanceolana*. In his Catalogue, previously mentioned, Stephens places *rufana* under "*Grapholita*" *expallidana*, Haw., as a synonym, and he quotes Wood's fig. 989. Now, as I have already stated, the specimen of *rufana* in Stephens's collection is without doubt the one figured by Wood, although it does not tally in every detail with Stephens's description. It would appear therefore that this description was made from more than one individual. The fact of specimens with a lined ocellus (the *expallidana* of Wilk. and Sta.) being in his series with *rufana* strongly supports this view. But why did he afterwards merge *rufana* in *expallidana*, Haw.? Seeing that there is no mention of an ocellus in the description of *expallidana*, Haw. and Steph., it would seem that both authors had a species before them which was not identical with the *expallidana* of Wilkinson and others, and in part with the *rufana* of Stephens. The description of *expallidana*, Haw., in Ill. iv. 125, reads: "*Pallida, lucida, tinctura costam versus alarum anticarum icterici*"; and to this Stephens adds: "Palpi long, and slightly curved over the back." He further remarks: "Taken near Coombe Wood: probably not strictly belonging to the genus [*Bactra*], but my specimen is too injured to determine." I have been unable to detect any specimen in the Stephensian collection that could be the one from which the above was written.

NEW CULICIDÆ FROM THE WEST COAST OF AFRICA.

By Fred. V. Theobald, M.A.

The new Culicidæ described here were sent me by Mr. Austen, of the British Museum, and were collected at Bihé, Angola, Portuguese West Africa, by Dr. Creighton Wellman in 1904, and at Sierra Leone by Major Smith, D.S.O., R.A.M.C.

The new *Danielsia* and *Ædimorphus* are very marked and beautiful species. The *Pyretophorus* was pointed out as being distinct from *P. costalis*, Loew, by Mr. Austen, after whom I have named the species. The *Anopheles* closely resembles *A. nigripes*, Staeger, but is clearly distinct.

The types are deposited in the National Collection. The strange genus *Heptaphlebomyia* is more fully described than in my Monograph, as fresh material was included in the collection from Angola.

Genus Anopheles, Meigen.

(Syst. Beschr. 1818, Meigen; Mono. Culicid. iii. p. 17, Theobald.)

Anopheles smithii, n. sp.

Head black, with a patch of frosty grey scales in front; proboscis black; palpi black, with three narrow pale bands, apex black. Antennæ with outstanding scales as well as hairs on the second segment, giving a tufted appearance. Thorax frosty grey in the middle, deep brown at the sides, and with a median dark line and brown hair-like scales. Abdomen black, with dull golden hairs. Legs black, unbanded. Wings unspotted, the veins clothed with dense dark brown scales.

♀. Head black, with a patch of frosty grey upright forked scales in front, dense black upright forked scales behind, over which shows a prominent tuft of large grey narrow-curved scales projecting forwards from the thorax; several thick black bristles project forwards between the eyes; proboscis and clypeus black, the former thin; palpi as long as the proboscis, thin, scaly, black, with three pale bands, the apical segment black. Antennæ black, the second segment with a small dense tuft of hairs on the inner side as well as the normal longer black ones. Thorax frosty grey in the middle, showing a median dark line and a pale yellowish brown one on each side of it in front, more or less tessellated behind, and with many small black specks, the sides deep brown, the pale frosty area contracted in front, thus widening the dark brown lateral areas; hairs or hair-like scales of thorax brown; scutellum and metanotum deep brown, posterior border-bristles of the former black. Abdomen black, with deep brown hairs. Legs long and thin, deep brown; ungues equal and simple, thin, rather long. Wings clothed with dense rather stumpy lanceolate scales, uniformly dark brown; the first submarginal cell considerably longer and narrower than the second posterior cell, its base nearer the base of the

wing than that of the latter, gradually becoming acute at the base, its stem about two-thirds the length of the cell; stem of the second posterior cell longer than the cell; supernumerary and mid cross-veins close together, the mid a little behind the supernumerary posterior cross-vein about its own length distant behind the mid. Length, 3·5 to 4 mm.

Habitat. Sierra Leone (800 ft.) (Major Smith).

Observations.—Described from several females collected by Major Smith. It is a very dark species, coming near *A. nigripes*, Staeger, but can be told at once by the denser wing-scales and banded palpi. The structure of the second antennal segment is very marked; the scales are rather long and outstanding, giving a tuft-like appearance.

Genus Pyretophorus, Blanchard.

(Comp. Rend. Soc. d. Biol. p. 795 (1902); Mono. Culicid. iii. p. 66, 1902, Theobald.)

Pyretophorus austenii, n. sp.

Head black, with grey scales in front; proboscis black, with two broad snowy white bands, the last forming a white apex to the palpi, and a third very narrow white band. Thorax brown, clothed with silvery grey scales; also the scutellum. Abdomen black, with golden hair. Legs black, with apical white tips. Wings with black and white patches of scales, costa with two small white spots and traces of a minute third spot towards the base; most of the veins pale-scaled, but prominent black spots at base of the second posterior cell and apex of lower branch of fifth long vein.

♀. Head black, with upright snowy white forked scales in front, black ones behind; proboscis black; palpi black-scaled, densely at the base, with two broad white bands towards the apex, one forming the apex of the palpi, and a third small one towards the basal half. Antennæ black, with grey pubescence. Thorax black, with scattered broad curved snowy white scales; also the scutellum. Abdomen black, densely clothed with golden hairs; the two lobes with black scales. Legs black, the apices of all the segments, except the last in the fore and mid legs, with a narrow white band; in the hind legs all the segments are banded; ungues equal and simple, rather long. Wings with rather dense *Pyretophorus*-like scales; the costa with three white spots, the apical one large, the second smaller, and the third very small; all three spread fairly evenly on to the first long vein, which has in addition a small white spot between the two apical costal ones, and another near the third spot, its base mostly white. On the base of the costa is another small white spot not reaching the top of the costa; the branches of the third long vein are black at the tips and bases near the fork, and there is another black patch near its base; the third long vein pale, except for a black spot *near* the apex, and two near the base; the fifth has two black spots *near* the apices of its branches, a *large* black-scaled area in front of and including the base of the fork and its stem near the fork, rest of the vein pale-scaled; the sixth has three black spots, the median one the largest; wing-

fringe with a pale area at the junction of all the veins. First submarginal cell considerably longer and a little narrower than the second posterior cell, its base nearer the base of the wing, its stem about one-fourth the length of the cell; stem of the second posterior cell rather more than two-thirds the length of the cell; supernumerary cross-vein a little behind the mid, the posterior about its own length distant behind the mid; posterior border-scales of the fringe long, narrow, and curved. Length, 5 mm.

Habitat. Bihé, Angola (Dr. Creighton Wellman).

Observations.—Described from a single perfect female. The chief characters are in the thoracic squamose structures and marked wing ornamentation.

Genus Danielsia, Theobald.

(The 'Entomologist,' p. 78, March, 1904.)

Danielsia wellmanii, n. sp.

Head creamy white, with two median black spots. Palpi and proboscis brown. Thorax deep brown, with a broad creamy area on each side, expanding in front, and passing around the front of the mesonotum, and with a short creamy median line arising from the pale anterior area; numerous golden brown bristles posteriorly. Abdomen black, with basal white lateral spots on basal segments, becoming median on the apical ones. Legs deep brown, front pair unbanded, mid and hind with a broad basal pale band to the metatarsi and first tarsal segments.

♀. Head deep brown, with rather loosely applied flat creamy scales, with two large patches of flat dark scales above, and with creamy narrow-curved scales behind. Clypeus and proboscis black; palpi rather long, black; antennæ black, with indistinct narrow grey bands. Thorax black, clothed with narrow-curved bronzy-brown scales, with a broad creamy scaled area on each side, which expands anteriorly, and which meets around the front, and sends a narrow short median line of creamy scales into the brown area; a few pale scales in front of the scutellum and numerous golden brown bristles over the roots of the wings; prothoracic lobes with small flat creamy scales; scutellum with rather broad narrow-curved scales, narrowest on the lateral lobes; border-bristles bright golden brown; mesonotum black; pleuræ with white puncta. Abdomen black, with deep violet reflections; the basal segments with basal white lateral spots, which become median on the last two or three segments, the latter having a few white scales extending on to the dorsum and in the middle, but not forming bands; border-bristles small, pale golden. Venter with basal white bands. Legs deep blackish brown, the front pair with only a faint trace of a pale band at the base of the metatarsus; the mid and hind with a broad white basal band to the metatarsi and first tarsus; venter of base of fore and mid femora white; base of hind femora white, and white knee-spot. Ungues uniserrated, the tooth long. Wings with the first submarginal longer and narrower than the second posterior cell, its stem nearly two-thirds the length of the cell; stem of the second posterior as long as the cell; posterior cross-

vein about twice its own length distant from the mid; lateral vein-scales long and straight. Halteres creamy. Length, 4·0 mm.

Habitat. Bihé, Angola.

Observations.—Described from a perfect female. It is a very distinct species, easily told by the thoracic and abdominal ornamentation and leg-banding. It clearly comes in the genus *Danielsia*, but the scutellar scales are rather broader than in the type (*D. albolineata*).

(To be continued.)

PREOCCUPIED NAMES IN COLEOPTERA.

By T. D. A. Cockerell.

There is urgent need for someone to go over the generic names used for Coleoptera, and sift out the homonyms. For some reason coleopterists seem extraordinarily careless about homonymy, and it is evident that some of them, while proposing numerous new generic names, never take the trouble to consult the indices of Scudder or Waterhouse. *Alexia*, Steph., 1835, is the name still in use for a genus of Endomychidæ, but it is invalid because of the molluscan *Alexia*, Leach, 1818.* Fairmaire still uses the name *Anodon*, proposed in the seventies, for a Dynastine beetle, but Oken used *Anodon* in Mollusca in 1815. The Dynastine genus may take the name *Paranodon*, n. n. *Coryphus*, Cski, 1902, for an Endomychid genus, would be considered by many a homonym of *Corypha* (Gray, 1840; Walker, 1860), but I think it may be allowed to stand.† Weise, in 1902, proposed *Stenella* and *Spilonota* as the names of two Chrysomelid genera, but both names are invalid (Gray, 1870; Stephens, in Lepidoptera). *Stenella* may be changed to *Stenellina*, n. n., type *Stenellina marginata* (Weise), and *Spilonota* may become *Spilonotella*, n. n., type *Spilonotella sagax* (*Spilonota sagax*, Weise). The original descriptions are in Arch. Naturg. vol. 68, pp. 145 and 151. In the same paper, Weise proposes a genus *Sphondylia*, which many would consider too like *Sphondyla* (Illiger, 1805).

* Since writing the above I have found that, according to Mr. B. B. Woodward (Journ. of Conch. 1903, p. 361), the date given for the molluscan *Alexia* in the 'Nomenclator Zoologicus' is wrong; that is, it is the date of Leach's *manuscript*, which was not actually published until 1847. Hence the coleopterous name stands, and it is the familiar molluscan *Alexia* which has to go.

† It may be added that the arachnid genus-name *Coryphæus*, Cambridge, 1895, is a homonym of *Coryphæus*, Gistl, 1848.

NEW SPECIES OF HYMENOPTERA (ACULEATA, ICHNEUMONIDÆ, AND BRACONIDÆ) FROM INDIA.

By P. Cameron.

(Concluded from p. 86.)

Spilichneumon coxalis, sp. nov.

Niger; facie, clypeo, mandibulis, linea pronoti, mesosterno, scutelloque flavis; abdominis medio late rufo; apice petioli flava: pedibus rufis, coxis posticis, apice tibiarum posticarum tarsisque posticis nigris. ♂. Long. 10 mm.

Hab. Simla (Nurse).

Antennæ black; the under side of the scape yellow, of the flagellum brownish; they are hardly longer than the body, and taper perceptibly towards the apex, where they are serrate. Head black; the face, clypeus, mandibles, the inner orbits to the occiput narrowly, and the outer from near the top broadly, yellow. Face and clypeus closely, uniformly, and distinctly punctured; the front and vertex are more closely punctured. Mandibles yellow, their teeth black, the part behind them rufous; palpi pale yellow. Thorax black, shining; the edge of the pronotum, the scutellum, the apex of the post-scutellum, the tegulæ, and the tubercles pale yellow. Mesonotum closely and uniformly punctured, the scutellum flat and less closely punctured. Post-scutellum smooth; its sides at the base largely depressed. Median segment closely and distinctly punctured, the base and the areola smooth and shining; the apical slope is thickly covered with white hair; the areola is twice longer than wide; the basal keel is flat, wide, and broken in the middle; the apex is transverse; the inner side is bordered by a wide furrow; in the centre of the apex is a small triangular projection; the surface is finely shagreened. Pleuræ closely punctured; the apex of the pro- irregularly striated. Wings clear hyaline, the stigma and nervures black. The four anterior legs are reddish fulvous; the coxæ and trochanters pale yellow, the hinder coxæ black, their apex yellow all round, the basal joint of the trochanters black, as is also the apex of the hinder femora narrowly, the apical two-thirds of the tibiæ, and the tarsi entirely; the calcaria pale yellow. Petiole black; the apex with a yellow band, which is narrowed in the middle; the second, third, and basal half of the fourth segment rufous; the rufous band on the fourth extends to the apex; there is a narrow yellow band on the apex of the fifth, a large one on the apex of the sixth, and the seventh segment is entirely yellow. The segments and the post-petiole are thickly covered with short white pubescence, and closely punctured; the gastrocœli are small, deep, and smooth.

Cratichneumon erythrozonus, sp. nov.

Niger; abdomine late femoribusque posticis rufis; alis hyalinis, nervis stigmateque nigris. ♂. Long. 11 mm.

Hab. Simla (Nurse).

Antennæ as long as the body; the flagellum brownish beneath.

Head black, the inner orbits from the middle to shortly below the eyes lemon-yellow, the band becoming wider below; the face and clypeus, except at the apex, closely and rather strongly punctured, and thickly covered with white pubescence; the apex of the clypeus is slightly obliquely depressed and impunctate; the front and vertex are closely and distinctly punctured. Mandibles black, dark rufous near the apex; the palpi fuscous. Thorax entirely black, and thickly covered with short white pubescence; the scutellum is less closely punctured; the basal half of the post-scutellum is smooth, the apical closely punctured. The base of the median segment is closely and somewhat strongly punctured; the sides of the areæ are irregularly striated. Pleuræ uniformly and distinctly punctured. Mesosternum thickly covered with white pubescence. The four anterior tibiæ in front and the anterior femora above in front are pale testaceous; the hinder femora, except at the apex, are bright red; the calcaria are black. Wings clear hyaline, the nervures and stigma black; the stigma fuscous on the lower side; the disco-cubital nervure is largely bullated in front of the stump of a nervure; the recurrent nervure bullated above and below the stump. Petiole closely punctured; the middle of the post-petiole smooth; the sides sparsely punctured; the other segments are closely punctured and thickly covered with short white pubescence; the gastrocœli are shallow and stoutly striated at the base; the apex deep, wide, and aciculated.

ANOMALON APICATE, sp. nov.

Nigrum; abdomine rufo, apice nigro; facie, clypeo, scutello, post-scutelloque flavis; pedibus anterioribus flavis, posticis rufis; alis hyalinis, stigmate fusco, nervis nigris. ♂. Long. 16 mm.

Hab. Simla (Nurse).

Antennæ testaceous, the second and the greater part of the fourth joints black. Head black, below the antennæ pale yellow; the vertex closely punctured; the front with eight irregular keels on the central part, which is also closely transversely striated; the face closely and distinctly punctured, and thickly covered with white pubescence; the base of the clypeus closely punctured, the apex almost impunctate. Mandibles pallid yellow, their teeth black; the palpi pallid yellow. Thorax black; the scutellum, post-scutellum, and tegulæ yellow. Mesonotum closely and rather strongly punctured, its centre at the base raised; the apex in the middle transversely irregularly striated. Scutellum and post-scutellum coarsely punctured. Propleuræ above closely punctured; the rest coarsely irregularly reticulated. Mesopleuræ above irregularly longitudinally striated; below closely punctured. The median segment at the base is closely rugosely irregularly reticulated; the lateral keels are roundly curved; the space behind these is smooth; the apex behind is narrowed into a distinct neck, and is irregularly transversely striated. Metapleuræ coarsely irregularly reticulated. Legs rufous; the anterior pair paler, more yellowish in tint; the four front coxæ and trochanters pale yellow. Wings hyaline, with a faint fulvous tinge at the base; the stigma testaceous, the nervures black. The second and third segments of the abdomen are black above; the apical two are entirely black.

BRACONIDÆ.

Iphiaulax elizeus, sp. nov.

Luteous; the antennæ, front, vertex, the occiput, the upper half of the outer orbits, and the apical abdominal segment black; the face, clypeus, and malar space, and upper half of the inner orbits, pale yellow; the wings to the transverse basal nervure and the basal half of the stigma yellow; beyond that dark fuscous; the apex of the hinder tibiæ broadly, and the hinder tarsi black. ♂ and ♀. Length 8, terebra 2 mm.

Hab. Deesa (Nurse).

Head smooth and shining, the face sparsely covered with pale hair; mandibles pale rufous. Back of abdomen irregularly rugosely punctured; the sutures on the second, third, and fourth segments are wide and stoutly striated; on the sides of the fifth the furrow is wide, closely and finely striated; the furrows on the apex of the fifth and sixth segments are narrow, distinct, and deep; there is no keel or distinct plate on the base of the second segment. The base of the first cubital cellule is hyaline, broadly above and below; the cloud on the posterior wings commences opposite that on the anterior.

Iphiaulax smenus, sp. nov.

Rufous, the flagellum of the antennæ black; the wings dark fuscous, the first cubital cellule and a spot below it hyaline, the stigma yellowish fulvous; the mesonotum and scutellum sparsely but distinctly punctured; the median segment closely and strongly punctured. ♂ and ♀. Length 8–11 mm., ovipositor 13–16 mm.

Hab. Deesa (Nurse).

Vertex smooth; the front with a deep furrow, its sides finely and closely punctured; the sides of the face somewhat strongly and closely punctured. Clypeus almost smooth, except close to the apex. Mandibles punctured and rufous at the base, the apex black. Parapsidal furrows distinct, narrow, deep, indistinctly crenulated. Median segment thickly covered with white pubescence. Petiole coarsely rugosely punctured, except in the centre at the apex; the lateral furrows with a few transverse keels; the second, third, and fourth segments are more closely rugosely punctured; the transverse and oblique furrows are closely striated; the apices of the segments are smooth; the oblique furrows on the second segment are stoutly striated, the hollow at their apex smooth. There is no plate or keel on the base of the second segment. The basal four segments of the abdomen are together as long as the head and thorax united.

Agrees in coloration (except that the hinder tibiæ and tarsi are not black) with *I. punjabenses*, Cam., but that species has the ovipositor only as long as the body, and the abdomen is shorter and broader. The species varies considerably in size. The male has (or may have) the apical segments of the abdomen black.

A LIST OF THE "MACRO-LEPIDOPTERA" OF LANCASTER AND DISTRICT.

By C. H. Forsythe.

(Continued from p. 90.)

Hepialidæ.

Hepialus humuli.—Abundant near Halton, County Asylum grounds, Quernmore, Grimshaw Lane, &c., in July.

H. sylvanus.—Fairly common at Arnside and Witherslack in July.

H. fusconebulosa (*velleda*). — Plentiful in Grimshaw Lane, Ridge Lane, Blea Tarn, Halton, &c., late June and July. The var. *carnus* is fairly common.

H. lupulinus.—Abundant in Grimshaw Lane, near Halton, County Asylum grounds, &c., in June.

H. hectus.—Very local near Quernmore in late June.

Lymantriadæ.

Porthesia similis.—Common in July everywhere, especially at Blea Tarn and near Freeman's Wood.

Dasychira pudibunda. — Local; near Clougha. I beat the larvæ from oak in this locality in 1902, and bred the imago the following June. "Uncommon near Quernmore" (G. Loxham).

Orgyia antiqua.—Common on Cockerham Moss, about Arnside and Witherslack, &c., in August.

Lasiocampidæ.

Pœcilocampa populi. — Fairly common some seasons, scarce in others; comes freely to the street lamps about Lancaster in October and November.

Eriogaster lanestris. — Nests of the larvæ are plentiful at Grange, Warton, &c., in late June.

Macrothylacia (*Bombyx*) *rubi.* — The larvæ are common about Witherslack, Methop, and Grange in August. In the wild state the imago is uncommon.

Lasiocampa (*B.*) *quercus.* — Plentiful at Witherslack, less so at Heysham, in mid-July. Var. *callunæ* occurs about Clougha and near Quernmore,

Cosmotriche (*Odonestis*) *potatoria.* — The larvæ are often abundant about Heysham in the spring; the imago occurs in July.

Saturniadæ.

Saturnia pavonia. — Abundant on the mosses around Witherslack and Methop; less plentiful near Quernmore in late April and May.

Drepanidæ.

Drepana lacertinaria.—Fairly common at Methop and Witherslack in June. I have bred this species from larvæ obtained in September near Methop bank.

D. falcataria.—Fairly common at Methop and Witherslack in late May and June.

Cilix glaucata.—Common in Grimshaw Lane, at Blea Tarn, &c., in June.

NOTODONTIDÆ.

Cerura (*Dicranura*) *furcula.*—I have bred this species from Witherslack and Methop larvæ obtained in September. The imago occurs in June, on sallow tree-trunks, but is not common.

C. (*D.*) *bifida.* — Scarce. I have bred this species from Methop larvæ only, taken from aspen trees in September. "I have taken the larvæ on aspen trees near Faraway Moss, Witherslack, occasionally" (G. Loxham).

Dicranura vinula.—Fairly common and generally distributed in June.

Pterostoma palpina. — Uncommon. I have bred this species from larvæ beaten from sallow and birch near Methop bank in September.

Lophopteryx camelina.—Occasionally in the County Asylum grounds in July. The larvæ are common on birch and oak on the mosses at Cockerham, Methop, and Witherslack in September.

Pheosia (*Notodonta*) *dictæa.*—Local, and not common. I have only bred this species from Witherslack larvæ, beaten in September from sallow.

Notodonta dromedarius.—Not uncommon on the Witherslack, Methop and Cockerham Mosses. The larvæ occurs on birch in September.

Phalera bucephala. — Common everywhere in June. The larvæ occur in Grimshaw Lane, Ridge Lane, near Halton, &c., on oak, in July and August.

Pygæra curtula. — Not common. I have bred this species from larvæ taken near Methop Bank in September. The imago appears in late April and May.

CYMATOPHORIDÆ.

Habrosyne (*Thyatira*) *derasa.* — Fairly common at sugar near Bowerham Bottom, County Asylum grounds, Witherslack, Methop, &c., in July.

Thyatira batis. — Fairly common at sugar in late June. County Asylum grounds, Bowerham Bottom, Witherslack, &c.

Cymatophora duplaris. — Local. I have bred this species from Methop and Witherslack larvæ beaten off birch in early September. The imago appears in May and June.

NOCTUIDÆ.

Bryophila perla.—Common and well distributed on walls, July and August.

Demas coryli.—Comes to sugar at Arnside and Grange in May and June.

Acronycta psi. — Fairly plentiful and generally distributed in June and July,

A. leporina. — Local. I have only bred this species from larvæ taken off birch trees in the County Asylum grounds (Old Side) in July and August. The imago appears in late May and June.

A. megacephala. — I brought a quantity of larvæ from London last year (1902), and have since found larvæ feeding on poplar in the County Asylum grounds. I have also bred it from larvæ taken in September near Methop bank, otherwise I should not have included it in this list.

A. rumicis.—Fairly common and generally distributed in late May and June. The larvæ are generally to be found in dyke sides, &c., on rumex and various other low plants in August and September.

A. menyanthidis.—Occurs near Methop, Clougha, &c., but is not common, in June.

Craniophora (*A.*) *ligustri.*—Uncommon. I took three specimens in mid-July in the County Asylum grounds. "I have taken it in Corporation Wood, Quernmore" (G. Loxham).

Diloba cæruleocephala.—Fairly common and generally distributed. The imago in September and October, and the larva on the white-thorn in June; Quernmore, Halton, Caton, Grimshaw Lane, and near Clougha.

Leucania lithargyria.—Fairly common at sugar, County Asylum grounds, near Halton, Grimshaw Lane, &c., in June and early July.

L. comma.—Common at sugar and bloom; generally distributed in June.

L. impura.—Abundant at sugar in July.

L. pallens.—Abundant everywhere at sugar in July and August.

(To be continued.)

NOTES AND OBSERVATIONS.

My attention has been called to a note on the type of the Linnean genus *Cimex* by Mr. Kirkaldy in the last number of the 'Entomologist.' I dealt with the matter in 'Nature' of March 17th, 1904, and showed why *C. lectularius* must be regarded as the type of the Linnean genus, and I also pointed out that *Clinocoris* is a mere synonym of *Acanthia*. To this note I would ask the attention of anyone who takes any further interest in the matter. If Mr. Kirkaldy would consult the 12th edition of Linnæus he would find why *C. lectularius* is classed with winged species under *Cimex*.—W. T. Blanford.

Breeding Dragonflies from the Egg.—In my note (Entom. xxxvii. 285) recording dimorphism in the females of *Ischnura elegans* and *Enallagma cyathigerum* at Wicken, I mentioned that I had attempted to get the females taken *in copula* to lay eggs, but without success. I now find, however, that in one of the aquaria used in the attempt with *E. cyathigerum* there are a number of dragonfly nymphs about half an inch in length. Before being used for the dragonflies the aquarium had been untouched for more than a year, and contained only small Crustacea, &c.; so that there can be no possibility of accidental introduction of the nymphs. The dragonflies taken *in copula* were put in a large muslin bag over the aquarium, and I saw the females feeling about under the water with the tip of the abdomen, and occasionally walking down the weeds till they were quite submerged, but at the time I could find no eggs. I should be grateful if anyone experienced in rearing dragonfly nymphs could tell me what is the best food to supply them with when they grow larger. And I should like again to point out that anyone interested in dragonflies who may succeed in

rearing considerable numbers from *known parents*, of a species shewing female dimorphism, will be able to render valuable service to science.—L. Doncaster; University Museum of Zoology, Cambridge, Feb. 13th.

[If such small animals as water-fleas can be easily obtained, these should be given. Otherwise decaying leaves, &c., from the bottom of a pond or stream will always contain bloodworms and other small life on which the nymphs will feed; but care must be taken that no fresh nymphs are introduced. The size of the nymphs of *E. cyathigerum* in the present instance raises an interesting question. Clearly they will not be full-grown and ready to emerge in May, yet they will probably disclose imagines this year. It is pretty certain that in this species emergences do take place late in the season; still there do not appear to be two broods annually. Possibly the eggs laid early in the season produce early imagines in the next season, while the late ones produce late imagines the next year. Are there two races, in fact? Perhaps Mr. Doncaster will be able to settle the question. I have thought that the late males of *E. cyathigerum* at the Black Pond, in Surrey, have more pronounced markings than the early ones.—W. J. L.]

Western Smerinthids.—The whole Smerinthid fauna of the United States numbers only about nine species. A few of these have spread over a very large area, and have split up into more or less distinguishable local races. Thus *Smerinthus cerisyi*, Kirby, and *Pachysphinx modesta*, Harris, have their eastern and western forms, quite distinguishable, but not very well to be separated specifically. The beautiful *Calasymbolus excæcatus*, Abbot and Smith, is common in the States east of the plains, but has apparently not been reported further west.* At Pecos, New Mexico, July 22nd, 1903, I took a fine female of *C. excæcatus*, with an expanse of 85 mm. It differs from the normal eastern form in having the upper third of the outer margin of the anterior wings more strongly dentate, and the colours of the wing in general paler and yellower, with the upper two-thirds of the median field light greyish ochre, leaving the dark central spot very conspicuous. Provisionally, this form may be treated as a variety, *pecosensis*; but, as the pallid coloration is just what would be expected in a western race, judging from other known cases, it is at least probable that the discovery of other examples will enable us to recognize a subspecies or idiomorph. On the other hand, it is very likely that a similar coloration may occur here and there as an aberration among eastern examples.—T. D. A. Cockerell; Boulder, Colorado, Feb. 10th, 1905.

Leucophœa surinamensis, L., breeding in Britain.—With reference to the interesting note by Mr. Horrell in your last issue (*ante*, p. 92), it may be worth recalling that at the October (1904) meeting of the Lancashire and Cheshire Entomological Society in Liverpool, I exhibited a series of this distinct little cockroach, in all stages of growth, which had been captured amongst turfs at Fallowfield during 1903 and 1904, and kindly sent to me by Dr. W. E. Hoyle, M.A., and Mr. J. Ray Hardy, of the Manchester Museum. Cockroaches are at

* Except in the far north-west (British Columbia), where climatic conditions are entirely different from those in New Mexico.

all times difficult to rear in captivity, and I regret that I was unable to keep the insects alive sufficiently long to learn much of their habits and life-history. I hope Mr. Horrell may be more fortunate.—E. J. B. Sopp; Liverpool Road, Birkdale, March 15th, 1905.

The Mason Collection.—A portion of this historical collection of British Lepidoptera, accumulated by the late Philip Brookes Mason, Esq., M.R.C.S., F.L.S., &c., of Burton-on-Trent, was dispersed at Stevens's Auction Rooms on March 14th and 15th last. Besides the extinct and rare species and numerous interesting aberrations that it contained, there were types and other specimens from the collection of Adrian Hardy Haworth, author of 'Lepidoptera Britannica,' and editor of the first volume of 'Transactions of the Societas Entomologica,' which was founded in London in the year 1806. Also some types and examples of many species from other collections that were formed in the early part of the last century.

The attendance was good, but perhaps not quite so numerous, especially on the second day, as we have seen on other occasions when notable collections have come under the hammer. The bidding for many of the lots could hardly be described as competitive; in fact, it was sometimes found necessary to combine two and even three lots before any desire to make an offer was evinced. The majority of the specimens were on white pins, and without localities, &c.; possibly, in these days of black pins and full data, this may have somewhat influenced prices. Altogether there were 538 lots put up during the two days, and we believe that the amount realized was somewhere about £550. In the following notes only the most important details of the first day's sale are referred to:—

Butterflies.—*Pieris daplidice*, eleven specimens, averaged 11/- each. The specimen mentioned in Newman's 'British Butterflies' as having been reared from one of the eggs laid by a female captured near Dover was sold for 16/-; a pair, one of which was a female captured in the Isle of Wight in 1867, 30/-; one example taken at Folkestone, and another without data, 26/-; three specimens (two from Sydenham), 27/6. There were sixteen examples of *Colias edusa* var. *helice*; these averaged 2/6 apiece, and seemed to be not dear at the price. A specimen of *Argynnis niobe* (Canterbury), together with a long series each of *A. euphrosyne* and *A. selene*, only made 8/-. Of *A. latonia* there were no less than sixteen specimens, and these sold for four guineas, or at the rate of 5/3 each. They were in four lots of three specimens, and one lot of four specimens, the price per lot ranging from 14/- to 24/-. Ten examples of *Vanessa antiopa* produced £9 8s. altogether. They were put up singly, and the prices each were 26/- (3), 22/- (1), 18/- (2), 16/- (1), 14/- (2), and 8/- (1). Several of these were ancient examples from the Haworth and E. Shepherd collections, but those that brought the highest price were two from Horning, Norfolk (1872), and one taken by the late Mr. J. Sang at Darlington. An example of *Anosia* (*Danais*) *plexippus*, L. (*archippus*, Fabr., *erippus*, Cr.), the common milk-weed butterfly of the United States. Apparently this species had not been noted as migratory previous to 1870. However this may be, its first visit to Britain seems to have been in 1876, and between that year and 1896 several specimens have been recorded, chiefly from

places on the southern and western coasts of England, and during the years 1885–6. The earliest report was from Wales, and the latest records (of specimens seen) were from Surrey and Hampshire. The Mason specimen was formerly in the late Mr. Tugwell's collection, and at the sale thereof realized 35/– It now passes into the Tring Museum at the enhanced price of £4 10s. *Lycæna arion*, in good condition, were not expensive. Three lots of males, seven and eight in a lot, sold at 7/– a time, while a series of seven females found a buyer at 12/–, and six other females (one with large spots) went for 20/–. The three dozen brought in a total of 53/–, and this gives an average of about 1/6 each all round, or, say, 10/– per dozen males, and 30/– per dozen females. For three couples of *L. semiargus* (*acis*), the prices were 45/–, 60/–, and 70/–; two lots of the same species, each comprising three males, 40/– and 50/–; three males, 35/–; three males and two females, with long series of *L. minima*, 60/–; three males, with a number of *L. minima*, some of the latter without spots on the under side, 32/6. Sixteen specimens of *Chrysophanus dispar* increased the total for the first day's sale by £80 6s., which amount gives an average of about £5 per specimen. The highest price was £8 for a fine female in which the basal spots of the fore wings were united. The lowest bid was 45/– for a female example that was not exactly in the best condition. Two examples of *C. virgaureæ* and one of *C. chryseis*, from Haworth's collection, together with nice series of *Thecla w-album* and *T. pruni* (among the latter was one example without white lines on under side), went for £3 10s. (Janson). These two "coppers" are not now recognized as British species, but the specimens offered are of historical interest.

Moths.—A dark specimen of *Acherontia* (*Manduca*) *atropos*, with broad black outer margin, sold for two guineas, and an example of *Hyloicus* (*Sphinx*) *pinastri* from Haworth's collection, together with a specimen of the same species from E. Shepherd's collection, only made 12/–, whilst 18/– was given for another specimen that formerly belonged to Dr. Hewgill. Eight *Deilephila euphorbiæ* obtained £8 12s. One specimen labelled from "Mr. Raddon, Sept., 1848; larva found near Bideford," ran the bidding up to 40/–; three other Raddon specimens sold for 16/–, 18/–, and 22/– each; the specimen recorded by the late Mr. W. P. Weston as taken by himself in a garden at Southampton in August, 1871, made 24/–; one from Mr. Spry's collection brought in 36/–; and one from Haworth's collection, coupled with *D. hippophaës* (Devonshire) only fetched 12/–. A specimen of *Daphnis nerii*, taken in a street at Burton-on-Trent in 1888, found a purchaser at 14/–; another example from Dr. Hewgill, together with the type of *Phlegethontius quinquemaculata*, Haw., a North American species, was bought for the Tring Museum at a cost of £6. *Deilephila galii*, of which species there were twelve specimens, went for 2/6 apiece, while the seven *D. livornica* ranged in price from 7/– to one guinea. Of *Chærocampa celerio* nine specimens were offered, and these sold at from 8/– to 20/– each, the total for the set being £5 14s. Among the Sesiadæ were some very desirable species, and for the possession of some of these bidding was pretty brisk. Six examples of "*vespiformis*" were disposed of at from 12/– to 20/– each. *Sesia scoliiformis* and *S. sphegi-*

formis were put up in three assorted lots, thirteen or fourteen specimens in each, and fetched 14/–, 24/–, and 26/– per lot. Five specimens of *S. andreniformis*, lotted singly, produced £8 3s. altogether, but the price per lot varied greatly; one from E. Shepherd's collection only made 8/–; one from "Rev. A. Matthews" secured £4; two others went for 10/– each; and for one taken at Folkestone in 1878, 55/– was obtained. There was a nice series of *Zygæna exulans*, but the price per specimen did not much exceed 1/–. Twenty-six *Z. filipendulæ*, including two examples of the yellow form and other minor aberrations, sold for 20/–. For a fine specimen of the rare "black" form of this species, known as *chrysanthemi*, the bidding quickly ran up to ten guineas (Janson). The type of *Sarrothripus revayana* var. *stonanus*, Curtis, was sold for 27/6 (Janson), and the type *ramulanus*, Curtis, a form of the same species, made 20/–.

Aberrations.—A curious specimen of *Euchloë cardamines*, in which the orange patch on left fore wing did not extend to the apex, was bought by Mr. Sydney Webb for 30/–. Two females streaked with orange on upper or under surface were sold for 18/– and 20/– respectively, one going into the collection of Mr. J. A. Clark. A straw-coloured variety of *Argynnis selene* sold for 20/– (Janson), but another interesting under-side aberration of the same species was obtained by Mr. Farn for 4/– less. There were two fine "sports" of *A. euphrosyne*; one of these, nearly black both above and below, was sold to Mr. Farn for 37/6; the other, "extraordinary light var., almost spotless, with cream-coloured margins," reached the handsome price of £8 (Tring Museum). A pale straw-coloured var. of *A. paphia*, from E. Shepherd's collection, sold for £2 (Janson), and a very dark, almost black, form of *A. aglaia* went for 20/–. Two aberrations of *Satyrus semele*, one tawny and the other very pale, were not dear at 22/–. A specimen of *Epinephele ianira* (*jurtina*) "cream coloured, with disc of fore wings orange, J. W. Douglas collection," realized £5 (Janson), and an interesting example of *E. tithonus*, "outer disc of fore wings white with pale grey border," was secured, we believe by Mr. Studd, for £4. An almost unicolorous male example of *Nemeobius lucina*, brownish orange or fulvous in colour, went for £3, but a similar aberration of the female was bought for the Tring Museum at £9. A specimen of the *schmidtii* form of *Chrysophanus phlæas* went for the easy price of 8/–. Although it was not exactly true *schmidtii*, it was only removed therefrom by reason of the slight creamy tint of the ground colour. The specimen was from E. Shepherd's collection. Among the species of *Lycæna* there were some nice aberrations, but the prices obtained for them seemed to be low in most cases, possibly due to the absence of data.

The gynandrous specimens were five in number, and these realized £4 18s.:—(1) *Lycæna ægon* (left ♂, right ♀), 28/–; (2) *L. icarus* (left ♂, right ♀), 18/–; (3) *L. icarus* (left ♀, right ♂), 16/–; (4) *Smerinthus populi* (left ♂, right ♀), 18/–; (5) *S. populi* (left ♀, right ♂), 18/–. Three hybrid *S. ocellata-populi* produced only 16/–.

Notes on the second day's sale will be given in the May number of the 'Entomologist.'

CAPTURES AND FIELD REPORTS.

Tortrices in the Liverpool District.—The localities worked comprise Wallasey sand-hills, and Kirby and Simonswood Mosses, near to Liverpool; also Delamere Forest, some twenty miles away, in Cheshire. Most of the species are common and pretty generally distributed, but, as no local notes appear to have been published for some time, this record may be of interest. *Tortrix podana*, Scop., is common all round Liverpool. *T. rosana*, L., occurred freely at Wallasey, a nice series being bred from larvæ taken on sallow early in July; while *T. dumetana*, Tr., was captured on Kirby Moss at the end of the month. *T. ribeana*, Hb., was taken sparingly on the Moss early in August, and a few *T. corylana*, Fb., were bred from Wallasey. *T. unifasciana*, Dup., occurred freely on palings around Sefton Park, though worn, as a rule, when I came across them. *T. viridana*, L. I did not see any green specimens, although very abundant on the Mosses, and at Delamere in July. The moths were yellow, although many appeared fresh; I attribute this to the damp, especially on the Mosses, where it was very noticeable. *T. ministrana*, L., and var. *ferrugana* occurred in some numbers at Delamere in May. *T. forsterana*, Fb., is common throughout the district, as one would expect of so universally distributed an insect. The genus *Peronea*, Curt., is well represented. *P. sponsa*, Fb., was bred from beech, and the moth was common on palings under the trees during September. The specimens are all noticeably darker than a series taken at Brockley, S.E., in 1898. A visit to Wallasey the last week in July produced *P. variegana*, Schiff., which was very abundant among the burnet-rose (*Rosa spinosissima*). The special object of search was *P. permutana*, of which only one example was found; another trip on August Bank Holiday was blank as regards this local insect, but *P. aspersana* turned up in good numbers. It is noteworthy that the black form of *variegana* was only found on the east side of Liverpool, in the Sefton Park district; the nearest approach to it, at Wallasey, was a nearly unicolorous dark brownish variety. *Teras contaminana*, Hb., was a common moth round Sefton Park in the autumn, but I did not take many, being busy with other things. The pretty *Dictyopteryx bergmanniana*, L., was plentiful among the burnet-rose on the sand-hills throughout June; one specimen was a pale lemon-yellow, with the ferruginous markings obsolete. *Penthina betulætana*, Haw., and *P. corticana*, Hb., are everywhere abundant among birch; some examples were bred from Delamere larvæ obtained in May. Of *P. sororculana*, Zett., only one was captured at Delamere, also in May. *Pardia tripunctana*, Hb., and *Spilonota incarnatana*, Hb., were met with at Wallasey, where the latter simply swarmed the last week in July, but only seemed to last a few days in good condition. *Aspis udmanniana*, L., is common, and found throughout the district. *Sericoris urticana*, Hb., *S. lacunana*, Dup., and *S. cespitana*, Hb., were also generally common. Delamere produced *Phoxopteryx myrtillana*, Tr., in May; abundant and easily disturbed in the daytime. *Hypermecia cruciana*, L., a pretty little species addicted to sallow, abounded on the sand-hills, and, at Wallasey, was found to vary scarcely at all. *Grapholitha ramella*, L., and *Catoptria æmulana*,

Schl., were represented only by single specimens from Simonswood and Wallasey respectively. A visit to the Mosses at the end of July produced *Pædisca bilunana*, Haw., *P. occultana*, Doug., and *Retinia pinicolana*, Hb., as well as one *R. pinivorana*, Zell., *occultana* being very common among the pines. *Pædisca solandriana*, L., was bred from birch at Delamere, and *P. semifuscana*, St., was yielded by larvæ found on sallow from St. Helens; these two variable species will have more attention in 1905, as they appear to be common in the district. *Ephippiphora similana*, Hb., and *E. pflugiana*, Haw., are represented by a few specimens of each. One specimen of *Dichrorampha petiverella*, L., was found at Wallasey; at the same place, in June, *Eupœcilia dubitana*, Hb., occurred freely on the wing in the evening, and *E. angustana*, Hb., abounded on Kirby Moss among heather. I looked out keenly for evidences of melanochroic tendency, but so far as I could see there was no particular variation, the series I took being very little darker than some captured in Kent several years ago. I have one insect which has been doubtfully referred to *Pædisca corticana*, Hb., from Wallasey, and a few specimens of *Phlœodes tetraquetrana*, Haw., from Delamere Forest; while, in conclusion, I should state that the following species were observed in some numbers, viz. *Sphaleroptera ictericana*, Haw., at Wallasey; *Catoptria ulicetana*, Haw., at Formby, on the sand-hills among furze; and *Tortricodes hyemana*, Hb., at Delamere in April.—William Mansbridge; 27, Elmbank Road, Liverpool.

SOCIETIES.

Entomological Society of London.—*March 1st*, 1905.—Mr. F. Merrifield, President, in the chair.—The Duke of Bedford, K.G., President of the Zoological Society, &c., of Woburn Abbey, Beds., and 15, Belgrave Square, S.W.; M. Lucien Chopard, Membre de la Société Entomologique de France, of 98, Boulevard St. Germain, Paris; Mr. Wilfred Fleet, F.H.A.S., of "Imatra," Bournemouth; and Mr. Robert Sidney Mitford, C.B., of 35, Redcliffe Square, S.W., were elected Fellows of the Society.—Mr. H. St. J. Donisthorpe exhibited an example of *Oxypoda sericea*, Heer, taken in Dulwich Wood, June 17th, 1904, a species new to Britain; also *O. nigrina* Wat. (with a type lent by Mr. E. A. Waterhouse), to demonstrate that it is not synonymous with *sericea* as stated on the Continent; and *O. exigua* which is also there regarded as synonymous with *nigrina*.—Mr. Hugh Main and Mr. Albert Harrison, a long series of *Colias edusa*, with var. *helice*, bred from one female *helice* sent by Dr. T. Chapman from the South of France, to show the proportion of type and variety obtained; and the results of similar experiments with *Amphidasys betularia*, bred from a male var. *doubledayaria* and a type female taken at Woodford, Essex, in 1903.—Mr. R. Priske, a specimen of *Helops striata*, with a photograph, showing an abnormal formation of the right antenna, which was divided into two branches from the fifth joint.—Mr. Percy H. Grimshaw, examples of *Hydrotæa pilipes*, Stein, male and female, the latter sex being previously unknown; and several specimens of *H. tuberculata*, Rond, not hitherto recorded in Britain, captured by Mr. W. Dale and Dr. J. H. Wood in various localities.—Dr. F. A.

Dixey, some cocoons and perfect imagines of hybrid *Saturniids*, including female and male of *S. pavonia*, L. × *S. pyri*, Scheff., with added specimens of both sexes of the parent forms for comparison, the cross product resembling a large *S. pavonia* rather than a small *S. pyri*. The exhibit further included three males and three females, of which the female parent was *S. pavonia* and the male parent a hybrid between *S. pavonia* male and *S. spini* female, *viz.* the cross product to which Professor Standfuss has given the name *S. bornemanni*. These six individuals had been reared from ova supplied by him, and Dr. Dixey gave an account of their life-history. The remaining four examples of the hybrid = *S. schaufussi* disclosed far less strongly marked sexual differences than in *S. pavonia*.—Professor E. B. Poulton, F.R.S., groups of synaposematic Hymenoptera and Diptera captured by Mr. A. H. Hamm; three broken specimens of *Papilio hesperus*, taken at Entebbe in 1903, by Mr. C. A. Wiggins, showing that the tails of a *Papilio*, if untouched by enemies, can endure a great deal of wear; and Nymphaline butterflies from Northern China, apparently mimetic of the male *Hypolimnas misippus*, which is not known to occur in that region. The President, a number of examples of *Pyrameis atalanta* and a pair of *Aglaias urticæ*, illustrating the effects of cold season breeding, by Mr. Harwood of Colchester.—Mrs. De la B. Nicholl read a paper on "Butterfly-hunting in British Columbia and Canada," illustrated by numerous examples of the species captured during the summer of 1904.—Sir George Hampson, B.A., F.Z.S., communicated a paper on "Three Remarkable New Genera of Micro-Lepidoptera."—Mr. Herbert Druce, F.LS., F.Z.S., a paper entitled "Descriptions of Some New Species of Diurnal Lepidoptera, collected by Mr. Harold Cookson in Northern Rhodesia in 1903–4; Lycænidæ and Hesperiidæ by Hamilton H. Druce, F.Z.S."—Mr. F. DuCane Godman, F.R.S., D.C.L., a paper entitled "Descriptions of Some New Species of Satyridæ from South America."—Mr. W. L. Distant, a paper entitled, "Additions to a Knowledge of the Homopterous Family of Cicadidæ."—H. Rowland-Brown, M.A., *Hon. Sec.*

South London Entomological and Natural History Society.—*February 9th*, 1905.—Mr. Hugh Main, B.Sc., F.L.S., President, in the chair. — A special exhibition of *Hybernia defoliaria* males had been arranged, and series were shown by Messrs. Rayward, Pratt, Crow, Browne, Hickman, Harrison, Main, Goulton, and Tonge. The variation ranged from uniformly dark forms to uniformly light ones, with considerable variation in widths and colour of the transverse markings. It was noted that the males migrated in large numbers, but no well ascertained facts were known as to the distribution of the females.—Mr. Rayward. living females of *H. rupicapraria* from Wallington.—Mr. Crow, on behalf of Mr. Hickman, the whole of the imagines and varieties bred from the brood of *Arctia caia*, referred to at the Exhibition of Varieties in November, 1904. Several extreme forms had scarcely any white or light markings, and yet the usually dark markings appeared through a veil of semitransparent smoky scales. There were no intermediates. — Mr. Kaye, two forms of the rare *Heliconius pasithoë* from the Demarara River.—Mr. Adkin, a series of *Lycæna* (*Cupido*) *minima*, taken last year at Eastbourne, and showing an unusual amount of blue in the males.—Mr. South, a long series of very varied

specimens of *Gelechia populella*, taken on birch trunks at Oxshott on Aug. 20th, 1904. He also showed a hybrid between *Anthrocera* (*Zygæna*) *filipendulæ* female × *A. trifolii* male, and contributed the following note:—The specimen of *Zygæna* exhibited was reared from eggs deposited by a female *Z. filipendulæ* that had paired with a male *Z. trifolii*. The parents, also exhibited, were one of the four cross pairs to which reference was made at a meeting of the Society held on Oct. 22nd, 1903 (see also Entom. xxxvii. 15). Although all the eggs hatched, and the larvæ, over 100 in number, appeared at first to be doing fairly well, they gradually died off until there appeared to be only a few that seemed likely to survive the winter. In the spring of 1904 it was found that only four larvæ gave any promise of completing their metamorphoses, but two of these ultimately disappeared; the other two formed cocoons in due course, but only one imago emerged, and this was unable to clear itself properly from the pupal case. The specimen therefore is imperfectly developed, and each antenna is still encased in the pupal sheath. However, it is evident that the offspring has inherited characters of each parent, but in a modified form. The sixth spot of the fore wings is present, but only faintly discernible (in the female parent this spot is unusually large, and united with spot 5); the border of the hind wings is much broader than in *Z. filipendulæ*, but not quite so broad as in *Z. trifolii*. Altogether the specimen closely resembles the form of *Z. filipendulæ* known as var. *hippocrepidis*.—Mr. Edward, two male examples of the rare *Papilio blumei*, from Celebes.—Mr. Priske, an example of *Calosoma sycophanta*, recently picked up in Kew Gardens.—Dr. Chapman, a long series of bred *Hastula* (*Dichelia*) *hyerana* and its dark var. *marginata*, a Tortrix from the South of France, together with a quantity of details of its life-history, including larvæ in each instar, pupa-cases, stems of asphodel showing the ravages, photographs of ova, microscopical slides showing tubercles, &c., and read a paper on the exhibit.

February 23*rd*.—The President in the chair.—Mr. G. H. Briault, of Acton, was elected a member. — There was a special exhibition of *Hybernia marginaria* (*progemmaria*). — Messrs. Harrison and Main, series from (1) Epping Forest, mostly typical; (2) neighbourhood of Liverpool, including a number of var. *fuscata*; (3) Delamere Forest, only a few var. *fuscata*. — Mr. Tonge, series from Tilgate Forest and Reigate, with some very prettily variegated forms from the latter place.—Mr. Priske, a short series from Richmond Park, including one specimen with the basal half of the fore wings dark, and the only example of southern origin approaching var. *fuscata*.—Mr. Adkin, bred series from Yorkshire, and read notes on the brood, together with series from Rannoch, Kent, and Surrey. — Messrs. Dennis, Rayward, Edwards, and Turner also exhibited series from various southern localities.— A discussion took place, and it was noted (1) that all the southern specimens had light hind wings, while in all var. *fuscata* forms they were dark; (2) all but var. *fuscata* had the submarginal row of light wedge-shaped marks on the fore wings; and (3) a general absence of intermediate forms between the general type and the dark var. — Mr. Priske, a specimen of *Helops striatus* in which the left antenna was bifurcated about one-third of its length from the apex.—Mr. Main exhibited specimens of various species of scorpions, and also an example of the king-crab (*Limulus*), and by means of a series of

diagrams showed that many of their characters appeared to point out a somewhat closer relationship than was formerly considered to be the case.—Hy. J. Turner, *Hon. Rep. Sec.*

Lancashire and Cheshire Entomological Society. — The second ordinary meeting of the session was held in the Royal Institution, Liverpool, on Monday, February 20th, Mr. Richard Wilding, Vice-President, in the chair.—Mr. G. Lissant Cox, of Oxton, was elected a member of the Society.—Donations to the library were announced from Messrs. J. W. Carter, F.E.S., H. B. Score, F.R.G.S., and E. J. B. Sopp, F.R.Met.S.—A paper was communicated by Mr. William Mansbridge, F.E.S., on "The Tortrices of the Liverpool District," in which, in addition to the enumeration of the species met with, much valuable information was given on the habits of many of the more noteworthy insects, both in the larval and imaginal states. Several allied groups of the Micro-Lepidoptera were also discussed, and notes of considerable interest relating to life history given. Altogether four Pyrales, six Crambidæ, three Pterophori, forty-three Tortrices (of which fifteen were bred), and twenty-six Tineæ were dealt with. The Chairman congratulated Mr. Mansbridge on his paper, and the Society on possessing such a keen worker amongst the Micro-Lepidoptera of the district. After remarks by Messrs. F. N. Pierce, W. H. Holt, and Dr. J. Cotton, a hearty vote of thanks was accorded the lecturer.—Amongst the many interesting exhibits on view were the following:—Several cases of Micro-Lepidoptera, to illustrate the paper, including fine series of *Phycis fusca=carbonariella*, *Ephestia elutella*, *Teras contaminana*, *Dictyopteryx bergmanniana* (a very pallid form), *Catoptria æmulana*, &c., by Mr. Mansbridge; varieties of *Abraxas grossulariata*, including fine light forms, in which the dark markings were almost obliterated, by Mr. Mountfield; *Morpho cypris* (Columbia), *Caligo telemonius*, *Hypolimnas salmacis*, and *Dismorphia nemesis* (South America), by Mr. J. J. Richardson, who also showed a live specimen of *Dermestes peruviana* from Liverpool; *Antoricum sulcatum* (Oliv.), and *Longitarsus æruginosus*, and other recent additions to the British list, by Mr. W. E. Sharp, F.E.S.; *Œdemera virescens*, L. (pair), and *Malachius barnvillei*, Putore, recent additions to the British list, and a specimen of the very rare *Bagous lutosus*, Gyll., by Mr. W. Thouless, F.E.S.; *Anchomenus gracilipes*, Duft, of which only one or two specimens have been recorded for Britain; *Quedius nigrocæruleus*, Rey, of which only three British specimens are known; and *Bembidium quadripustulatum*, one of the rarest of our Bembidia; all three species captured and exhibited by Mr. E. C. Bedwell, F.E.S.; *Triplax bicolor*, Gyll. (with *T. russica* and *T. ænea* for comparison), recently reinstated in the British list on its occurrence to Mr. R. S. Bagnall, for whom the insects were exhibited by the Secretary. *Leucophæa surinamensis*, an exotic cockroach, just received from the Liverpool Docks, was shown by Mr. Sopp.—E. J. B. Sopp and J. R. le B. Tomlin, *Hon. Secs.*

Birmingham Entomological Society.—*February 20th*, 1905.—Mr. G. T. Bethune-Baker, President, in the chair.—Annual Meeting. The various annual reports were received, and the officers and council were elected for the ensuing year.—Mr. W. E. Collinge, The University, was elected a member.—A resolution was carried to invite the following

gentlemen to become honorary members of the Society:—Mr. H. St. J. K. Donisthorpe, F.Z.S., F.E.S.; Rev. F. D. Morice, M.A., F.E.S.; Messrs. E. Saunders, F.R.S., F.L.S., F.E.S., and J. W. Tutt, F.E.S. —Mr. G. H. Kenrick exhibited a few insects collected by himself in the North of Scotland last year in the intervals of shooting; he said the most interesting perhaps were nice silvery forms of *Larentia autumnata*, Bkh. They also included *Calocampa solidaginis*, which was not uncommon, and *Anaitis paludata* var. *imbutata*, Hb. — Mr. J. T. Fountain exhibited *Adopæa thaumas* (*linea*) and *A. lineola*, taken together in the Wye Valley; also bred *Actias selene*, Hb., reared in this country from Indian ova.—Mr. A. H. Martineau exhibited a spray of oak with three different kinds of galls on close together; they were probably made by *Neuroterus lenticularis*, Ol., *Andricus fecundatrix*, Hart., and *Dryophanta divisa*, Hart.; he also showed *Pemphredon lethifer*, Schenck., bred from bramble-stems gathered at Marston Green, together with its parasites, the chrysid *Ellampus auratus*, L., and the ichneumon *Perithous divinator*, Rossi.—Mr. W. Harrison showed a nice series of *Eriogaster lanestris*, L., breed from a brood of larvæ found at Trench Woods; some had emerged in 1902, and others in 1904.— Colbran J. Wainwright, *Hon. Sec.*

Hawaiian Entomological Society. — A preliminary meeting was held in December last, and the constitution of the Society was formulated on January 26th. The following are the officers for 1905:— President: R. C. L. Perkins (Supt. of Entomology, Hawaiian Sugar Planters' Experimental Sta.), who appointed Alexander Craw (Supt. of Entomology, Bureau of Agriculture and Forestry) as Vice-President; Secretary and Treasurer: Jacob Kotinsky (Asst. Entomologist, Bureau of Agriculture and Forestry); Committee: D. L. Van Dine (Entomologist U.S. Experiment Sta.), and Otto H. Swezey (Asst. Entomologist, Hawaiian Planters' Sta.). Twelve members constitute the Society so far, which meets the first Thursday in every month, at the Bureau of Agriculture and Forestry, Honolulu, 7.30 to 10 p.m., for the study of the Arthropoda, especially of the Pacific Region.—G. W. Kirkaldy.

OBITUARY.

With much regret we have recently heard that Mr. Alfred Beaumont, of Gosfield, Essex, died early in March of this year. He was a most indefatigable worker, and his interest was extended to all orders of the Insecta, although Coleoptera was possibly his strong point. He was especially keen in his investigations, and was sometimes rewarded by the discovery of additions to the British lists of Diptera and Hymenoptera, or more frequently by the capture of very rare species in those orders or in Coleoptera. There are many notes from his pen in the 'Entomologists' Monthly Magazine' subsequent to the year 1882; and there are also a few of his contributions in the 'Entomologist,' the latest of which was published in the number for December, 1904. He was a Fellow of the Entomological Society of London, and one of the oldest, having been elected in 1851. A man of high principle, steadfast courage, and great tenacity of purpose, Mr. Beaumont was highly esteemed by all who knew him.

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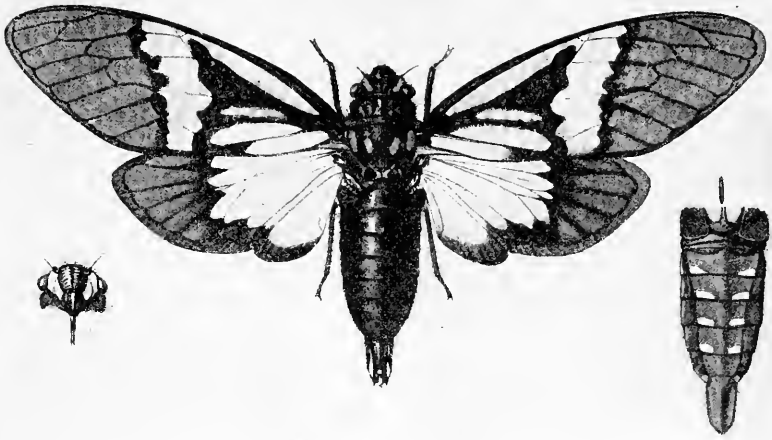
DESCRIPTION OF A NEW SPECIES OF CICADIDÆ.

BY W. L. DISTANT.



Subfam. GÆANINÆ.

Div. GÆANARIA.

Gæana vestita, sp. n.

♂. Body and legs black; head with an oblique spot on each side of vertex at inner margins of eyes, mesonotum with a curved transverse series of four spots, and two central spots to cruciform elevation golden yellow; posterior abdominal segmental margins narrowly luteous; abdomen beneath with two discal spots on second, third, fourth, and fifth segments and an apical lateral spot on each side, stramineous; tegmina black on basal, dark fuscous on apical area with the venation black; radial area, large elongate spots in the two lower ulnar and claval areas, and a broad transverse fascia near middle, stramineous; wings with more than basal half stramineous,

remaining area dark fuscous with the venation black; rostrum just passing the intermediate coxæ; opercula small, obliquely transverse.

Long. excl. tegm. ♂, 40 millim. Exp. tegm. 102 millim.

Hab. Yunnan; Yunnansen (Excoffier; Paris Mus.).

This beautiful species is allied to *G. sulphurea*, Hope.

BUTTERFLIES COLLECTED BY SURGEON LAMBERT, R.N., AT VLADIMAR BAY, &c., AUGUST, 1897.

By Henry Charles Lang, M.D., F.E.S., M.R.C.S., &c.

This small collection came into my hands through Mr. O. E. Janson in 1900; it consists of one hundred and five specimens, collected by Surgeon Lambert at Vladimar Bay, in Russian Tartary, between the dates of August 1st and 9th, 1897, and a few from Port Hamilton, in Corea, on June 16th and 17th of the same year. Owing to the care with which these specimens were labelled, I am able to give the exact dates. He also collected in Japan and China, but at the time of seeing the collection I was not interested in these latter, as I did not then consider that the butterflies of Japan and China should be included in the Palæarctic Region, though I have now altered my views in this respect as regards Japan.

Papilionidæ.

Papilio xuthus, L.—Eight males, one female; August 5th to 8th, 1897. Vladimar Bay. On comparing these with four males and five females from Pryer's collection, taken near Tokio, I find that the Japanese specimens differ as regards the males from those from Vladimar Bay in having the marginal band of the hind wings broader, and reaching to the discoidal cell, just as in *P. machaon* var. *sphyrus*. Four of the Japanese females differ in no way from that from the Amur, and the fifth only in being somewhat larger, and in the deeper yellow of the ground colour.

P. machaon, L.—One female; August 3rd, 1897. Vladimar Bay. Differs in nothing from ordinary large European specimens; expanse, 3¼ in. Certainly not to be considered as var. *hippocrates*.

P. bianor, Cram.—One female. Port Hamilton, Corea, June 16th, 1897. The ordinary typical form.

P. bianor var. *maackii*, Mén.—Vladimar Bay. Two males, August 8th and 9th, 1897; two females, August 9th, 1897. These resemble specimens from Japan.

Parnassius nomion, Fisch.—Vladimar Bay. Two males, August 5th and 6th, 1897; three females, August 5th and 9th, 1897.

Pieridæ.

Pieris rapæ, L.—Vladimar Bay. One female, August 8th, 1897—usual typical form; one female, August 8th, 1897—var. *orientalis*,

Oberth. Larger, bases of anterior wings dusky; resembles some of Pryer's specimens from Japan.

P. melete, Mén.—Vladimar Bay. One male, August 5th, 1897.

Leptidia sinapis, L., gen. æst. *diniensis*, B. — Vladimar Bay. One male, August 9th, 1897. This specimen differs in no way from European examples.

L. amurensis, Mén.—Vladimar Bay. Two specimens, August 5th; two, August 8th; one, August 9th; two without date. These seven specimens do not differ from those in a series of twenty-eight specimens taken by Pryer at Oiwaki, Japan, or from others received from the late Dr. Staudinger from the Amur. I have never been able to understand why Staudinger should suggest that *amurensis* is a var. of *sinapis*, and yet gives *duponcheli* specific rank. From Vladimar Bay it will be noticed that we have *sinapis* in its summer form, taken at the same time as *amurensis*, which is altogether different in its appearance and conformation.

Colias hyale var. *poliographus*, Mots.—Port Hamilton, Corea. June 6th, 17th.

C. aurora, Esp.—Vladimar Bay. August, 1897. One worn female.

Nymphalidæ.

Limenitis sydi var. *latefasciata*, Mén.—Vladimar Bay. One female, August 8th, 1897.

Melitæa plotina, Brem. — Vladimar Bay. One female, August 6th, 1897.

Argynnis selene, Schiff.—Vladimar Bay. One female, August 6th, 1897.

A. daphne, Schiff.—Vladimar Bay. Ten males, August 5th; one male and three females, August 8th. The males are smaller, and both sexes are less vividly fulvous than the specimens taken by myself in Provence and Hungary.

A. aglaia var. *fortuna*, Jans.—Vladimar Bay. One female, August 9th, 1897.

A. adippe var. *xanthodippe*, Fixs. — Vladimar Bay. Two males, August 5th; one, August 3rd, one female which I put down to this var., as the silvery markings are absent except the marginal lunules. Some specimens of this come very near to the Spanish ab. *cleodippe*. This form differs from the next, not only in the absence of the silvery spots, but in having the androconia on veins 2 and 3 of the fore wings. A form received from Staudinger in 1898 from Kentei resembles the above, and was named *cleodippe*. The present edition calls it *xanthodippe*, retaining *cleodippe* for the Spanish var.

? A. adippe var. *pallescens*, Butl. — Vladimar Bay. Two males on August 1st, and six on August 5th; one female, August 3rd. I place these under this head on the strength of Staudinger's remark, "♂ lunul. marginalibus argenteis." All these males have the androconia only on vein 2. Mr. Elwes (Trans. Ent. Soc. 342, 1899) says: "Those with the androconia only on vein 2 seem to occur in Amurland, Korea, and in North and Central China and Japan." He expresses an opinion that they may belong to another species. It is to be remarked that typical *adippe* and vars. *cleodoxa* and *chlorodippe* have

the androconia on veins 2 and 3. In 1898 I received a form from the Transbaical named *chrysodippe*, with the androconia as in the present form.

A. laodice, Pallas.—Vladimar Bay. Four males, August 5th, 8th, 9th, 1897. These do not differ from European specimens except in the paleness of the colour of the upper surface.

Melanargia halimede, Mén.—Vladimar Bay. Three males, three females, August 5th, 1897.

M. meridionalis, Feld. — One male, Port Hamilton, Corea, June 17th; two males, four females, Vladimar Bay, August 3rd, 5th, and 8th.

Satyrus dryas, Esp. — Vladimar Bay. Four males, August 8th, 1897. Three of these have the under side of hind wings unicolorous.

Pararge achine, Sc., var. *achinoides*, Butl. — Two females, rather worn, August 5th, 1897, Vladimar Bay. ("Var. major, ocellis majoribus," St. Cat.).

Aphantopus hyperanthus, L., var. *ocellatus*, Butl. — One male, three females, August 5th, 1897, Vladimar Bay. These agree with Staudinger's remark, "major, subt. obscurior, ocellis majoribus," as regards the ocelli, which are larger; but the ground colour is certainly not "obscurior," but rather lighter than usual.

Cœnonympha œdippus, F.—Vladimar Bay. Two males, August 5th, 1897. These do not in any way differ from European specimens. I think that it is worthy of remark that the three species last enumerated, which have so strong a superficial resemblance to one another, should have all been taken in the same locality, and at the same time.

Lycænidæ.

Chrysophanus dispar, Haw., var. *auratus*, Leech. — One male, one female, August 8th, 1897, Vladimar Bay. These exactly tally with Staudinger's diagnosis ("♂ supra impunctatus, ♀ al. post. nigricantoribus; sub. al. post. griseis, non cærulescentibus"). This appears to me much nearer the true British type than the Euro-Asiatic *rutilus* in the general appearance and size, and in the width of the submarginal band on the under side hind wings; but there is only a trace of a discoidal spot in the male, and an entire absence of the blue basal shading found in true *dispar*. The hind wings of the female above more resemble those of female *hippothoe*.

C. hippothoe, L., var. *amurensis*, Stgr.—Two males, rather worn, Vladimar Bay, August 8th and 9th, 1897. This var. is distinguished from the type by its larger size, more brilliant colour, and by a double discoidal spot on the hind wings. It greatly resembles var. *caudens* as far as the male is concerned, but has less of the violet reflection seen in that form.

Lycæna aryyyronomon, Bgst. — Vladimar Bay. Two males, rather large and brightly coloured, August 5th, 1897.

L. cleobis, Brem.—Vladimar Bay. Two males, five females, August 8th, 1897. A very variable species.

L. euphemus, Hb., var. *obscurata*, Stgr. — Vladimar Bay. Three females, rather worn, August 6th.

PAPILIO STEINBACHI, SPEC. NOV.

By the Hon. Walter Rothschild.

Allied to *P. quadratus*, Staud.

♂. Fore wing a little broader than in *quadratus*; no fringe-spots; a white patch divided by M^3, not reaching to M^1, but occasionally extending to SM^2. Hind wing strongly dentate, subcaudate; a row of spots round apex of cell from R^2 to (SM^1), and a dot in cell, which is sometimes missing, posterior spot and base of spot M^1–M^2 white, the other spots red; fringe-spots white; wool in abdominal fold short, dirty grey, no tuft of spreading hairs at base of fold as is the case in *quadratus*; vein M^2 much less distal than in *quadratus*. Under side like upper, a little paler, white spots of fore wing somewhat larger, spots of hind wing much paler, an additional red spot at anal angle. Palpus and abdomen quite black.

♀. Fore wing with a large white patch traversed by veins M^1 and M^2, and a minute spot in cell; no fringe-spots. Hind wing with white fringe-spots; a red band distally of cell from near R^1 to (SM^1), spot R^3–M^1 being the longest, last spot slightly white at posterior edge. Under side of fore wing like upper, but paler; band of hind wing pale rosy pink, last spot and bases of the two preceding ones whitish pink, a separate red spot close to anal angle. Palpus black, eighth sternite of abdomen and edge of seventh red (vaginal spot).

Herr J. Steinbach found four males and one female of this interesting species near Santa Cruz de la Sierra, East Bolivia, between February and June, 1904.

NOTES ON LEPIDOPTERA IN 1904.

By J. C. F. & H. F. Fryer.

As far as our experience went the season of 1904 was below the average, especially in "Micros," possibly owing to the cold and wet of the previous year.

Two facts were remarked, and are perhaps worth mentioning —a greater tendency than usual in all variable species to produce dark forms—and the prevalence in many species of more than the usual number of broods, the latter perhaps on account of the long hot summer. For instance, among such species as *Orrhodia ligula* (*spadicea*) and *Anchocelis pistacina* several freshly emerged *Leucania pallens* seemed sadly out of place. Various localities such as Monk's Wood, Wicken, and the Norfolk Broads were well worked, but only in the daytime, and nothing of general interest was obtained. Sugar and light were also given a good trial in the neighbourhood of Chatteris, but the fact that there are no woods or fens near probably accounts for the

absence of any species worthy of remark, for, although most of the commoner Noctuæ were abundant, one specimen of *Acronycta strigosa* was the only rarity taken. The number of species observed was upwards of four hundred, but the following only seem to deserve mention :—

Sesia formiciformis.—This species appears to occur plentifully in nearly all willow-holts, but we find it hard to obtain in good condition. *Trochilium bembeciformis*, which usually occurs with it, is easily bred, but the few larvæ of *S. formiciformis* which we have taken have died in the willow-stumps before becoming pupæ.

Acronycta strigosa.—One specimen at sugar near Chatteris. As far as we are aware, this is the only record for some thirty years in this district. When it is remembered that its food-plant (hawthorn) is so universally distributed, and that the species is reported to be not hard to breed in confinement, it seems curious that it should occur so infrequently.

Senta maritima (*ulvæ*).—Although the food-plant is common in the district, this species occurs in one locality only, and that one of extremely limited extent. It would seem natural to attribute the absence of this and other reed species such as *Leucania straminea* and *L. obsoleta* to the fact that the reeds are cut nearly every year when the dykes are cleansed, but if this be so, it is difficult to explain the profusion of *Calamia phragmitidis*, which feeds in a very similar way.

Cœnobia despecta.—The above remark applies as to locality, but *despecta* occurs there in much greater numbers. The insect appears to be confined to that part of the habitat where the food-plant is liable during a considerable portion of the year to be covered with water. Last year we succeeded in breeding several specimens from plants of *Juncus lamprocarpus* (?).

Hydræcia nictitans.—Noted only on account of the occurrence of the greyish yellow form at Hunstanton, and one of a dark chocolate at Waxham. It is strange that, considering that the localities are so very similar in character, that not a single dark specimen was taken at Hunstanton, nor yellow one at Waxham.

Noctua xanthographa.—Occurred at Waxham in immense numbers. On each of thirteen posts there was an average of over thirty insects on several evenings, so that there was really no room for any other species.

Aglossa cuprealis. — Plentiful in one cake and meal granary. We have endeavoured to establish "colonies" in similar situations, but hitherto without much success.

Accentropus niveus. — About thirty years ago this occurred in large numbers at light. Since then, although the dykes containing its food-plant have many times been diligently searched, no specimen has been seen. Our surprise was therefore great on taking a single specimen at an acetylene light exposed on the top of a house between fifty and sixty feet high, the house itself standing some twenty-five feet above the level of the surrounding fen-land. One would hardly associate such powers of flight with this insect.

Crambus salinellus. — A single specimen at Weybourne, and that a variety. Although we have collected in salt-marshes for years, we have not found the way of taking this species.

Bactra furfurana. — Hunstanton. Very local and very small in size in the locality in which we found it.

Ephippiphora inopiana. — Weybourne, among *Inula* and *Artemisia*. Both have been mentioned as its food-plant, but we are uncertain on which it feeds.

Xanthosetia zœgana. — Chatteris. Besides the type there was a noticeable proportion of the form *ferrugana*, as well as forms intermediate between the two.

Conchylis alternana.—Waxham. Taken on heads of *Centaurea*.

Anesychia funerella.—Common in the fen-dykes around Chatteris, both larva and imago, but for some reason we have not succeeded in breeding it.

Depressaria flavella.—For the last two years we have bred this species, together with Sciaphilæ, from the spun-up heads of *Ranunculus*, as well as from rolled leaves of *Centaurea*. Two kinds of larvæ were noticed, a pink one and a dark green; neither of these, however, on pupation, attained the size of the *flavella* larva when feeding on its usual food-plant, *Centaurea*.

Depressaria badiella.—A curious form of this species was also bred from the buttercup-heads above referred to, the larva having been probably introduced by mistake.

The Priory, Chatteris: April 6th, 1905.

CURRENT NOTES.

By G. W. Kirkaldy.

(Continued from p. 58.)

1. E. Krodel: "Durch Einwirkung niederer Temperaturen auf das Puppenstadium erzielte Aberrationen der Lycænaarten" (Allgem. Zeitschr. für Entom. ix. pp. 49–55, 103–110, 134–7; text-figs. 1–21. (Feb. to April, 1904) [Lepidoptera]).
2. H. Schouteden: "Faune entom. de l'Afrique tropicale: Rhynchota æthiopica" i. (Ann. Mus. Congo Zool. (iii.) i. pp. 1–131; Index and Corrigenda; pls. i. and ii. (Nov. 1903) [Hemiptera]).
3. W. W. Froggatt: "Locusts and Grasshoppers, part 2" (Agr. Gaz. N.S. Wales, xv. pp. 240–3, with coloured plate (unnumbered) (March 2, 1904) [Orthoptera]).
4. F. M. Jones: "Pitcher-Plant Insects" (Ent. News, xv. pp. 14–7; pls. iii. and iv. (Jan. 1904)).
5. M. Gillmer: "Ein gynandromorphes Examplar von dem Hybriden *Smerinthus hybridus*, Stephens" (1850) (Allg. Zeitschr. f. Ent. ix. pp. 140–3; text-figs. 1–3. Apl. 15, 1904) [Lepidoptera]).
6. E. P. Van Duzee: "Annotated list of the Pentatomidæ

recorded from America, North of Mexico," &c. (Trans. Amer. Ent. Soc. xxx. pp. 1–80 (1904) [Hemiptera]).

7. W. M. Schoyen: "Beretning om Skadeinsekter og Plantesygdomme"; 1903 (Aarsher, Offent. Foranst. Landbr. Fremme; [sep. p. 1–36] (1904).
8. T. W. Kirk: "Rep. Biology," &c. (11th Rep. Dep. Agr. 1903, pp. 363–461; 40 plates and 5 text-figs. (1903)).
9. "Proc. 16th Annual Meeting Assn. Economic Entomologists" (Bull. Div. Ent. U.S. no. 46, pp. 1–113; plates i. and ii.; 1 text-fig. (1904)).
10. E. D. Sanderson: "Report of the Entomologist" (14 Ann. Rep. Delaware Agr. Exp. Sta. for 1902, pp. 109–51; figs. 10–16 (1903)).
11. W. E. Britton: "3 Rep. State Entom." (Rep. Connecticut Agr. Exp. Sta. for 1903, pp. i–iv and 199–286, pls. i.–viii.; text-figs. 27–42 (1904)).
12. C. S. Banks: "Preliminary Bulletin on Insects of the Cacao" (Bul. Biol. Lab. Dep. Interior Philippine Isles, no. 1, pp. 1–58; coloured frontispiece, and figs. 1–60 (totalling 51 plates) (1904)).
13. J. H. Maiden: "The Flora of Norfolk Island, part 1" (Proc. Linn. Soc. N.S.W., xxviii. pp. 692–785, pl. 38 (April 28th, 1904)).
14. F. L. Washburn: "Injurious Insects of 1903" (Bull. Minnesota Agr. Exp. Sta. 84, pp. i–viii and 1–184; coloured plate and text-figs. 1–119 (Dec. 1903)).
15. H. A. Ballou: "Further Notes on Pests attacking the Cotton Plant in the West Indies" (West Indian Bull. iv. pp. 326–48 (1904)).
16. D. Sharp: "Description of a new Genus and Species of Coleoptera (Family Hispidæ) from New Britain" (Proc. Linn. Soc. N.S.W. xxviii. pp. 924–5 (April 28th, 1904)).
17. F. Muir & D. Sharp: "On the Egg-cases and Early Stages of some Cassididæ" (Tr. Ent. Soc. Lond. pp. 1–23, pl. i.–v. (April 27th, 1904) [Coleoptera]).
18. C. L. Marlatt: "Importations of Beneficial Insects into California" (Bull. U.S. Div. Ent. 44, pp. 1–99, text-figs. 1–19 (1904)).
19. O. F. Cook: "An Enemy of the Cotton Boll Weevil" (Rep. U. S. Dep. Agric. 78, pp. 1–7 (May 27th, 1904) [Hymen. and Col.]).
20. C. Sasaki: "On the Wax producing Coccid, *Ericerus pe-la*, Westwood" (Bull. Col. Agr. Tokyo Imp. Univ. vi. pp. 1–13, pl. 1–2 (coloured) (March, 1904)).
21. F. E. Bemis: "The Aleyrodids, or Mealy-winged Flies, of California, with references to other American Species" (Proc. U.S. Mus. xxvii. pp. 471–537, pls. 27–37 (1904)).
22. T. Pergande: "On some of the Aphides affecting Grains

and Grasses of the United States" (Bull. U.S. Div. Ent. 44 pp.).

23. G. Leonardi: "Generi e specie di Diaspiti" (Ann. Scuola Agric. Portici, v. 1903) [Hemiptera]).
24. P. Spaulding: "Two Fungi growing in Holes made by Wood-boring Insects" (15th Ann. Rep. Missouri Bot. Gardens, pp. 73–7, pls. 25–7 (1904) [Col.]).
25. H. Osborn: "The Economic Status of the Fulgoridæ" (Proc. 25th Meeting Soc. Prom. Agr. Sc. pp. 32–6 (1904) [Hem]).
26. A. H. Kirkland: "Usefulness of the American Toad" (Farmers' Bull. 196, U.S. Dep. Agr. pp. 1–16 (1904)).
27. H. E. Hodgkiss: "The Life-history Treatment of a Common Palm Scale (*Chrysomphalus dictyospermi*, Morgan)" (41st Ann. Rep. Massachusetts Agr. Coll. [Publ. Doc. 31], pp. 95–106, pls. 1 and 2 (Jan. 1904)).
28. R. A. Cooley: "First Annual Rep. State Entom." (Bull. Montana Agr. Exp. Sta. 51, pp. 199–274; frontispiece and pls. i.–vii.; text-figs. 2–10 (Jan. 1904)).
29. G. A. Baer: "Note sur un Membracide, myrmécophile de la République Argentine [Hemipt.]" (Bull. Soc. Ent. France, 1903, pp. 306–8).
30. J. G. Sanders: "Coccidæ of Ohio, I." (Ohio State Acad. Sci., Special Papers 8, pp. 25–92, pls. 1–9 (May 16th, 1904) [Hem.]).
31. J. R. de la Torre Bueno: "A Palæarctic Notonecta" (Ent. News, xv. 220–1 (June, 1904) [Hem.]).
32. C. Sasaki: "On the Feeding of Silkworms with the Leaves of *Cudrania triloba*, Hance" (Bull. Coll. Agr. Tokyo Imp. Univ. vi. pp. 15–9, pls. 3 and 4 (March, 1904)).
33. Ditto: "Corean Race of Silkworms" (*op. cit.* 21–6, pl. 5).
34. Ditto: "The Beggar Race (Kojikiko) of Silkworms" (*op. cit.* 27–31).
35. Ditto: "Double Cocoon Race of Silkworms" (*op. cit.* 33–6, pl. 6).
36. Ditto: "On the Feeding of the Silkworms with the Leaves of wild and cultivated Mulberry-trees" (*op. cit.* 37–41).
37. Ditto: "Some Observations on *Antheræa* (*Bombyx*) *yamamai*, G. M., and the Methods of its Rearing in Japan" (*op. cit.* 43–50, pl. 7).
38. C. M. Weed: "The Brown-tail Moth in New Hampshire" (Bull. N. H. Agr. Sta. 107, pp. 45–60, text-figs. 1–10 (Feb. 1904) [Lepid.]).
39. Ditto: "The Pernicious or San José Scale in New Hampshire" (*op. cit.* 109, pp. 73–83, text-figs. 1–3 (March, 1904) [Hem.]).

Krodel (1) discusses the aberrations of *Lycæna corydon* and *damon* caused by low temperature experiments on their pupæ. Twenty-one under sides are figured.

Schouteden (2) has published the first part of a proposed monograph of the Ethiopian Hemiptera, prepared on the largest scale. In this the Scutellerinæ and Graphosomatinæ subfamilies of the Cimicidæ are detailed, with two finely coloured plates.

E. P. Van Duzee (6) has given us a much-needed list of the Cimicidæ (or Pentatomidæ as he calls them) of North America, twelve species and one variety being here added. 191 species are recorded, 163 being known to the author. The paper is characterized by extreme care and precision in the description and notes, but it is regretted that the author has rejected the nomenclature of Bergroth and Kirkaldy, based upon priority, and fallen back on the irregular nomenclature of Lethierry and Severin.

Schoyen (7) discusses the injurious insects of Norway during 1903, on corn, grass, cabbage, fruit-trees, &c. There are extended notes on the biology of many of the species, most of which are also British.*

T. W. Kirk's Report (8) is largely concerned with fruits and their inspection; as regards entomology, *Phylloxera* is, as usual, dealt with at some length, and there is also a brief notice (with figures) of the Fulgorid *Pochazia australis*, the vinehopper. There are also interesting notes, with photographs, of some of the South Sea Islands. "Pests and diseases are worst on the Island of Rarotonga, which appears to be a perfect paradise for all species. We understand that there is a little scale on Aitutaki, but the other islands visited are, so far as our observations went, practically free from pests, except black aphis."

The Proceedings of the recent meeting of the Association of Economic Entomologists (9) contain, as usual, a mass of interesting details on all topics. O. H. Swezey presents observations on the life-history of *Liburnia campestris* and *lutulenta* (Hemiptera), which are parasitised by a Proctotrypid Hymenopteron, *Gonotopus bicolor*. This is the form which has recently been introduced into the Hawaiian Islands to check the ravages of *Perkinsiella saccharicida*, a Fulgorid pest on sugar-cane.

Sanderson's Report (10) deals principally with Hemiptera; the seventeen-year Cicada (*Tibicen septendecim*) and the harlequin cabbage-bug (*Murgantia histrionica*); both these are illustrated by photographs.

Britton (11) details at length the fight with the San José scale (*Aspidiotus perniciosus*) during 1903, with shorter notes on various insects.

Banks (12) publishes a bulletin on Cacao insects. This is the result of only three months' investigation, and naturally many

* I believe the reference quoted (7) is correct, but the copy before me, which I owe to the kindness of the author, has only the appearance of a separate publication. The title-page is dated 1903, but the last page is "6te Januar, 1904."

of the insects are not fully determined. The principal enemies of Cacao in the Philippines are a Cicadid which attacks the roots; a Cerambycid larva and Termites which destroy the trunk and branches; and various caterpillars and aphides ravishing the leaves.

In a monographic paper on the "Flora of Norfolk Island"—a small island almost equidistant from New Zealand and New Caledonia—Maiden (13) notes (pp. 769–70) that at present the islanders are little cursed with insect-pests. He noticed "mealy bug" on oranges and lemons, and "black scale" on Lisbon lemons. Onions are liable also to the attacks of a scale-insect, while water-melons are attacked by aphids. White ants are absent, and mosquitoes very rare.

Washburn's latest Bulletin (14) contains much information upon various entomological topics; the coloured plate contains fourteen drawings of larvæ of Lepidoptera and Hymenoptera. Ballou (15) discusses at some length the recent serious outbreaks of the cotton-worm (*Aletia argillacea*) that have been experienced in the West Indies, St. Vincent being the only cotton-growing island to escape. D. Sharp (16) describes a new beetle which has severely ravaged young palms in Beraia; "the insect deposits its eggs upon the young shoots of the plant upon which the larvæ feed."

The same author collaborates with F. Muir (17) in an important and well-illustrated paper on the metamorphoses of certain Coleoptera.

Marlatt (18) notes that the Coccinellid *Vedalia cardinalis* is maintaining its usefulness in California, being regularly bred up by Mr. Craw and others. "The rapidity with which a colony of scales is cleared up by these insects is something marvellous, a few weeks only being sufficient for it to clear up a considerable area of infestation." Of more recent importations, *Scutellista cyanea* "is apparently duplicating against the black scale the wonderful work of the *Vedalia* against the white scale in California."

O. F. Cook (19) has discovered a formidable enemy in Guatemala of the destructive cotton-boll weevil (*Anthonomus grandis*). This foe is an ant, which spreads over the cotton-fields, and, attacking the weevils, paralyses them after the manner of so many other Aculeate Hymenoptera. Arrangements are apparently being made to introduce this beneficial insect into Texas, where the ravages of the weevil have been so appalling.

Sasaki (20) concludes that the Chinese wax-scale is a native of both China and Japan. His excellent paper is illustrated by two fine plates. Miss Bemis (21) adds nineteen species of Aleyrodidæ to the North American fauna, these being described in, mostly, all their stages very fully. Pergande has (22) unravelled a vast amount of confusion in certain Aphidæ. He has

proved that *Siphocoryne avenæ*, Fabr., feeds on a great number of plants, including apple, pear, cherry, hawthorn, celery, wheat, oats, and various grasses, and is the *Aphis mali*, Fitch, *pruni-foliæ*, Fitch, &c. The genuine *Aphis mali*, DeGeer, has only quite recently appeared in America. *Macrosiphum granaria*, Buckton* (formerly confused with *Siphocoryne avenæ*), *M. cerealis*, Kalt., and *trifolii*, Perg., n. sp., are fully discussed. It seems a pity to introduce "vulgar" names with almost every species, as is the custom with the American entomologists; "German grain louse," "English grain louse," and "European grain louse" are not only not distinctive, but even misleading.

The School of Agriculture in Portici, near Naples, are rapidly turning out entomological studies second to none in accuracy and thoroughness. Two of the recent publications embrace a monographical revision (23) of the *Parlatoria* and *Mytilaspis* (recte *Lepidosaphes*) groups of the Coccidæ. Unfortunately only reprints (separately paged, alas!) are before me, so that it can only be said that the *Parlatoria* paper extends to 59 pages with 16 cuts, the *Mytilaspis* 114 with 42 cuts.

Spaulding (24) remarks that the relations existing between some of the fungi and the wood-boring insects is as yet but little understood, and its economic significance probably much underrated. He states that on rotting logs of *Pinus palustris*, in Texas, two species of fleshy Agaricoid fungi were growing out numerously from the holes of wood-boring insects. The latter are present in every log in large numbers, and, although many of the holes had no fungus growing in them, the two fungi were, with a single exception, never found growing otherwise. Various other cases are cited, including the "Ambrosia-beetles," which prepare beds for and plant the spores, feeding exclusively, so far as is known, on the fruiting portions of the fungi.

Osborn (25) discusses the prominence into which the Fulgoridæ have risen through the comparatively recent discovery of their economic importance.

Montana is one of the last of the United States to appoint an entomologist, in the person of Mr. R. A. Cooley, the well-known student of Coccidæ. A large portion of his first report (28) deals with "Locusts," and with notes on fruit-pests, &c. It is largely illustrated. Baer (29) publishes a brief note on the relations between *Enchenopa ferruginea*, Buckton, and *Campo-notus punctulatus*, Mayr, with remarks on other Myrmecophiles. Bueno (31) records the occurrence, in British Columbia, of *Noto-necta lutea*, Müller, a European form.

* This name cannot be considered valid, as Buckton refers his species to *granaria*, Kirby. I propose *avenivorum*, n. n.

A LIST OF THE "MACRO-LEPIDOPTERA" OF LANCASTER AND DISTRICT.

By C. H. Forsythe.

(Continued from p. 110.)

Nonagria arundinis (*typhæ*).—"Near Cockerham in September" (G. Loxham).

Tapinostola fulva.—Local near Rush-a-lee in September. Our local form is nearly white.

Gortyna ochracea.—"The larvæ are common near Cockerham Moss in July and August" (G. Loxham).

Hydræcia nictitans.—Common and fairly well distributed in July, August, and early September.

H. petasitis.—Near Hest Bank and Carlisle Bridge. The larvæ occur in the roots of the butter-bur (*Petasites vulgaris*) in June and July.

H. micacea.—Common everywhere in August and September, and comes to sugar and bloom freely.

Xylophasia rurea.—Common everywhere in May and June; the var. *combusta* is fairly common.

X. lithoxylea.—Comes to sugar in the County Asylum grounds, at Bowerham, Blea Tarn, &c., end of July and August.

X. sublustris.—Uncommon; near Halton, County Asylum grounds and Witherslack, in June and July.

X. monoglypha (*polyodon*).—Abundant and very variable in colour—from light grey to black—in June, July, and August.

Epineuronia (*Neuronia*) *popularis*.—Fairly common some years, not so in others; Halton, Quernmore, Blea Tarn, County Asylum grounds, &c., in August and September.

Charæas graminis.—Generally distributed but nowhere common, in July and August.

Luperina testacea.—Comes freely to street lamps in August and September, and is generally distributed.

Mamestra furva.—Local, near Clougha at sugar in July. "Fairly common at Witherslack" (G. Loxham).

M. brassicæ.—Plentiful everywhere; all through August and September the larvæ are to be found feeding upon cabbage and other Cruciferæ in nearly every garden.

M. persicariæ.—I have only bred this species from Methop and Witherslack larvæ taken in September. The imago appears in June and July.

Apamea basilinea.—Fairly common in Grimshaw Lane, Blea Tarn, Bowerham, &c., in June.

A. gemina.—Fairly common and generally distributed in June and July.

A. didyma (*oculea*).—Abundant and very variable; comes freely to sugar everywhere in July and August.

Miana strigilis.—Fairly plentiful at sugar, County Asylum grounds, Halton, near Clougha, Blea Tarn, Bowerham, &c., in June and July. The var. *æthiops* is common.

M. fasciuncula.—Fairly common at sugar at Blea Tarn, Halton, Quernmore, County Asylum grounds, &c., in June.

M. literosa.—Not common but generally distributed; comes to sugar and bloom in July and August.

M. furuncula.—Uncommon, County Asylum grounds in July.

Phothedes captiuncula.—Local, near Whitbarrow (Witherslack) and at Arnside in July and August.

Celæna haworthii.—Uncommon; I have taken odd examples at Methop and near Clougha in July.

Grammesia trigrammica (*trilinea*).—Not plentiful; comes to bloom and sugar in July in the County Asylum grounds and near Blea Tarn. I have bred it from Methop larvæ taken in May.

Caradrina morpheus.—Uncommon; I have only taken it in Grimshaw Lane, and bred it from larvæ (same locality) taken in September. The moth appears in June.

C. quadripunctata (*cubicularis*).—Fairly plentiful at sugar in late May and again in September. County Asylum grounds, Halton, Blea Tarn, Quernmore, Freeman's Wood, &c.

Rusina tenebrosa.—Fairly common at sugar, County Asylum grounds, Blea Tarn, and Halton, and I have bred it from Methop larvæ. The moth appears in June and July.

Agrotis vestigialis (*valligera*).—Fairly plentiful at Heysham on the flowers of ragwort (*Senecio jacobæa*), in July and August.

A. puta.—Not plentiful at Heysham in late July.

A. suffusa.—Comes to sugar in September; County Asylum grounds, Blea Tarn, &c., and is fairly common.

A. saucia.—Comes to sugar in September. Not common.

A. segetum.—Common at sugar in September; some of the forms show a tendency to melanism.

A. exclamationis.—Common at Heysham in June; comes to sugar and bloom.

A. cursoria.—Occurs at Heysham in July.

A. corticea.—Not common about Heysham in early July.

A. nigricans.—Comes to ragwort flowers freely in July; Heysham, &c.

A. tritici.—Fairly common about Heysham in July. Comes to the flowers of the ragwort.

A. aquilina.—Uncommon; about Heysham in July and August.

Noctua glareosa.—Not common. I have taken odd specimens at Blea Tarn and in the County Asylum grounds, and bred it from Witherslack larvæ. The moth appears in August and September.

N. augur.—Common at sugar in July; Blea Tarn, Quernmore, County Asylum grounds, &c.

N. plecta.—Fairly common at sugar in July; County Asylum grounds, Grimshaw Lane, Halton, &c. I have also bred it from Methop and Witherslack larvæ.

N. c-nigrum.—Fairly common at sugar everywhere during late summer and autumn.

N. brunnea.—Generally distributed but not plentiful; comes to sugar in July.

N. festiva.—Fairly common throughout the district. I have taken it at sugar in July in nearly all the localities in which I have collected.

N. rubi.—Plentiful at sugar during August; County Asylum grounds, Quernmore, Blea Tarn, &c.

N. umbrosa.—Comes to sugar and bloom in August; County Asylum grounds, Grimshaw Lane, Blea Tarn, Freeman's Wood, &c.

N. baja.—Fairly common and generally distributed in July.

N. xanthographa.—Abundant at sugar everywhere in late July and August.

(To be continued.)

NOTES AND OBSERVATIONS.

On behalf of the late Mr. C. G. Barrett's family, I have great pleasure in announcing that we have been able to persuade Mr. Richard South to superintend the publication of the remaining manuscripts of the 'Lepidoptera of the British Islands,' which will carry the work to the completion of the Tortricina.—C. G. B.

Note on Agrotis puta.—Larvæ of *A. puta*, a brood of which I have been rearing, were full-fed early in December, about the 10th, I think. They are only just beginning to pupate. The first changed on March 17th, and so far only three out of about eighty have pupated.—H. V. Plum; The College, Epsom, March 20th.

Notes on Tortrix podana.—Some weeks ago, finding I wanted a few specimens of *Tortrix forsterana* to complete my series, I collected about half a dozen larvæ from ivy, and placed them in a warm greenhouse to hasten their emergence. The moths began to appear early in the present month, and I was greatly surprised to find not only *T. forsterana* in the breeding-cage, but also *T. podana*. It is well known that *T. podana* is extremely polyphagous in its habits, but, with the exception of once breeding the species from yew, I have never before known it to occur on an evergreen plant. For the past two or three years *T. podana* has been very troublesome in the vineries here. The larvæ, when young, feed between united vine-leaves, and in the warmth necessary for forced vines quickly attain their full development, and if not checked thus produce two or three broods in a season. When the larvæ are about half-grown they frequently forsake the leaves of the plant and attack the fruit. At the present time, when the bunches of grapes are just setting, they not infrequently bite through the tender stalks, thus ruining the entire bunch. Later, when the grapes are about half-developed and still green, they bore into the individual berries, causing each one attacked to mould and decay. During last year I frequently noticed, in the pages of 'The Garden' and 'Gardener's Chronicle,' queries respecting a Tortricid larva which was causing great havoc in vineries. The answers almost invariably given were that the species was referable to *T. forsterana*. Judging from my own experience, I have little doubt that *T. podana* was the real culprit. The larvæ of both species are much alike, and might readily be mistaken for one another by anyone not very well acquainted with Tortricid larvæ. Whilst, however, it is most unusual for *P. podana* to be found on evergreen plants, it is equally unusual to

find *T. forsterana* on deciduous ones. Ivy is, of course, its usual food-plant, and I have also found it on laurustinus; honeysuckle is given by many authorities, but, so far as my experience goes, this is no exception to the rule, as it only occurs on *Lonicera fragrantissima*, which is an evergreen species.—E. Maude Alderson; April 11th.

The Mason Collection.—Fifteen specimens of *Deiopeia pulchella* sold at from 8/- to a guinea apiece. An example of *Emydia grammica*, from E. Shepherd's coll., together with a specimen of *D. pulchella*, said to have been taken at Camden Town, only made 10/-. A male *E. grammica* (Tunbridge Wells) 14/-, and a female of the same species from Windsor 9/-. A black aberration of *Callimorpha dominula* realized £3 10s. while another variety, with brown hind wings, made 30/-. There were a good many interesting aberrations of *Arctia caia*, and thirteen of the best of these brought in a total of £27 17s. The highest price being 5 guineas for one example, and the lowest 20/- for two specimens. The type of *Spilosoma menthastri* var. *walkeri*, Curtis, went for 21/-. Twenty-four specimens of *Lælia cœnosa*, put up in pairs, sold at from 10/6 to £3 per pair. Of *Epicnaptera* (*Gastropacha*) *ilicifolia* there were ten examples, and the price for these ranged from 25/- to 70/- a couple. Twelve specimens of *Drepana harpagula* (*sicula*) from the Bristol locality made 20/- to 40/- per pair, while three males were secured for 1 guinea. *Cerura bicuspis*, of which there were eighteen Tilgate specimens, made 5/- to 15/- each. A specimen of *Glyphisa crenata* ("Isle of Man, E. G. Meek, 1870"), when offered alone did not obtain a bid, but when included with ninety-nine other specimens of desirable species, the round hundred made 20/-. Four specimens of *Leucodonta* (*Notodonta*) *bicolor* (three from Staffs, and one from Ireland), realized £8 10s. For a specimen of *Notodonta trilophus*, "reared from a larva found in Essex, J. W. Douglas," the bidding rose to £6 10s.; but another example of the same species ("Ergham, Norfolk, Gurney"), only made £2 10s., and a third specimen (from E. Brown's coll.) had to be put up with two other lots of nice Notodonts, when the combined lots sold for 17/-. Five *Synia musculosa* were disposed of at 5/- to 11/- each. *Leucania vitellina* sold at 7/- and 9/- a couple but single specimens included with half-a-dozen *L. turca* produced 8/-, 10/-, and 11/- per lot. The specimen of *Leucania extranea* recorded by the late Mr. W. P. Weston (Entom. xii. 19), only realized 9/-. *Nonagria sparganii*, from Dover, made 4/- to 8/- each, but four other specimens without data went for 8/-. One example of *Luperina dumerili* and one of *L. guenéei*, each with a history, fetched 12/-, and for one specimen of the last-named, from Sang's coll., 5/- was given. Four *Hydrilla palustris*, with data, sold at 22/- and 24/- per pair, while two lots, each including two males of this species, with other things, only made 7/- and 8/- the lot. The specimen of *Noctua subgothica*, from which the figure in Stephens' "Illustrations" was drawn, with another example of the same species, brought in a guinea; but the type of *Agrotis lunigera*, Steph., was bought for the Tring Museum at £3. Of *Noctua subrosea*, a moth that appears to be now extinct in Britain, there was a nice series of fourteen specimens. The first of these were the male and female types from Yaxley Fen, described by Stephens; these made £5 10s., and go into the Tring

Museum. The others were offered singly, and realized all sorts of prices, from 30/- up to £4, for specimens that might be described as decent to fine; two somewhat poor specimens only made 10/- and 14/- each.

CAPTURES AND FIELD REPORTS.

Hertfordshire Coleoptera.—Eight new species have been added to the Hertfordshire list during 1904 by Mr. E. G. Elliman, of The Broadway, Chesham. They are :—*Harpalus sabulicola* (Rossway, near Berkhampstead), *Cercyon nigriceps* (Tring), *Homalota consanguinea* (two examples in much-decayed beech-leaves at Tring), *Placusa pumilio* (under bark of oak at Rossway), *Myllæna minuta* (Wiggington), *Catops sericatus* (taken by sweeping at Aldbury), *Coccinella hieroglyphica* (Aldbury Owers), and *Hister bissexstriatus* (St. Albans). With the exception of the last-named species, which was captured by myself, all the above were discovered by Mr. Elliman. — A. E. Gibbs ; Kitchener's Meads, St. Albans.

Lepidoptera in Hertfordshire.—At a meeting of the members of the Hertfordshire Natural History Society and Field Club, held at Watford on March 29th, Mr. A. E. Gibbs, F.L.S., of St. Albans, presented a report on the Lepidoptera observed in the county chiefly during 1904. Although the season, generally speaking, was an unfavourable one, seven additional species, mostly recorded during 1904, were added to the county list. They are :—1. *Xylina semibrunnea ;* four specimens taken at sugar at Baldock, in August and September, by Mr. A. H. Foster, of The Grange. 2. *Melanippe galiata*, taken by Miss Alice Dickinson at New Farm, St. Albans. 3. *Anticlea sinuata*, taken both at St. Albans by Miss Dickinson, and at Hexton by Mr. Foster ; at the latter locality five specimens were beaten from a hedge on the chalk-hills. 4. *Cidaria siderata*, taken at Tring in the larval stage by Mr. A. T. Goodson. 5. *Scoparia angustea*, captured at Watford in 1900 by Mr. V. P. Kitchin. 6. *Aceptilia galactodactyla*, taken at St. Albans by Miss Dickinson. 7. *Tinea granella*, caught at St. Albans by Mr. Gibbs. These seven records brought up the total number of species on the list kept by the Society to 1165. So far as the Rhopalocera were concerned, Mr. Gibbs said he had little to report, most of his correspondents being agreed as to their comparative scarcity, the only exception to this being *Pieris rapæ*, the second brood of which were stated by Miss Dickinson to have been unusually abundant. Mr. Gibbs showed a series of specimens of males of the early brood of this species, taken in his garden at St. Albans, in which the black markings were either very faintly indicated or entirely wanting. The extreme form was known as ab. *immaculata*, and by way of contrast some strongly marked specimens of the second brood were also exhibited. Alluding to the occurrence of *Deilephila livornica* in the British Isles in 1904, Mr. Gibbs said he could not hear of any stragglers having reached Hertfordshire, but he exhibited a specimen taken by Miss Ada Selby in her garden at Bottler's Green in 1898, and mentioned that a second example has since been taken by her at

the same place. The only previous record of which he was aware of the capture of this moth in the county was at Cheshunt, where Mr. W. C. Boyd was fortunate enough to secure one on August 25th, 1868. *Sphinx convolvuli* was several times reported during 1904, and *Chærocampa porcellus* was taken on July 2nd by Mr. Arthur Cottam, of Watford, flying over a honeysuckle-bush. The rapid spread of *Plusia moneta*, which was becoming one of the commonest garden insects in the district, was alluded to, and a long series of specimens reared from larvæ captured on aconite in the recorder's garden at Kitchener's Meads, St. Albans, was shown, a short account of the life-history of the species being given. Among the records of the year was the capture of *Panolis piniperda* near St. Albans, an insect which possessed a special interest for them, as the first British specimen was taken at Hertford in 1810 by Mr. J. F. Stevens, the father of English entomology. Detailed reports of observations made during 1904 by Miss A. Dickinson, of New Farm, near St. Albans; Mr. Arthur Cottam, of Eldercroft, Watford (who is unfortunately leaving the neighbourhood very shortly to reside in Somersetshire); Mr. P. J. Barraud, of Bushey Heath; Mr. V. P. Kitchin, of Watford; Mr. A. T. Goodson, of Tring; Mr. W. C. Boyd, of Waltham Cross; Mr. A. H. Foster, of Hitchin; and the recorder were then presented to the Society. — A. E. Gibbs; Kitchener's Meads, St. Albans.

Erratum.—P. 120, line 14 from bottom, for "early in March" read "on February 21st."

SOCIETIES.

Entomological Society of London.—*March 15th*, 1905.—Mr. F. Merrifield, President, in the chair.—Señor Don Ignacio Bolivar, of Paseo de Recoletos Bajo, 20, and Calle Jorge Juan, 17, Madrid, was elected an Honorary Fellow of the Society, in the place of Professor F. M. Brauer, deceased. Mr. Frank P. Dodd, of Kuranda, *via* Cairns, Queensland; Mr. Cecil Floersheim, of 16, Kensington Court Mansions, S.W.; Mr. Joseph Lane Hancock, of 3757, Indiana Avenue, Chicago; and Mr. Herbert C. Robinson, Curator of the State Museum, Kuala Lumpur, Selangor, were elected Fellows of the Society.—Mr. C. O. Waterhouse announced that the late Mr. Alexander Fry, a Fellow of the Society, had bequeathed his large and important collections of Coleoptera to the British Museum.—Dr. F. A. Dixey exhibited some butterflies from Natal which had been presented by Mr. G. A. K. Marshall to the Hope Department at Oxford, illustrating certain experiments made with a view to determine whether the assumption of the wet or dry season form of various African butterflies could be controlled by exposure in the pupal state to artificial conditions of temperature and moisture.—Mr. W. E. Sharp, a specimen of the North American Longicorn, *Neoclytus erythrocephalus*. He said the species had been discovered in a sound ash-tree seven inches from the bark, grown in the neighbourhood of St. Helens, Lancashire. Some palings of American ash in the vicinity suggested the origin of the progenitors

of the colony; but it was not known how long they had been erected. He also showed examples of *Amara anthobia*, Villa, with a series of *A. familiaris*, Duf., and *A. lucida* for comparison. They had been sent him by the Rev. G. A. Crawshaw from Leighton Buzzard, where they occurred not infrequently at the roots of grass in sandy places.—Mr. M. Burr, a number of multilated *Stenobothrus* from the Picos de Europa, Spain. Of the grasshoppers occurring on this spot, almost every specimen had the wings and elytra more or less mutilated, sometimes actually torn to shreds, entirely altering their appearance. A notable exception was *S. bicolor*, of which no single specimen was found mutilated. This species also frequently indulged in flight, which the others were unable to do; and he suggested that its immunity might be due to the vitality which has enabled it to become the most abundant and widespread grasshopper in Europe.—Mr. F. W. Pierce, drawings of the genitalia of Noctuid moths, and also with the lantern a number of slides showing the respective peculiarities of many members of the genus.

April 5th.—Mr. F. Merrifield, President, in the chair.—The decease of Dr. Alpheus S. Packard, an Honorary Fellow, and of Mr. Alfred Beaumont, and M. Alfred Preudhomme de Borre, Fellows of the Society, was announced.—Mr. H. St. J. Donisthorpe exhibited specimens of a melanic *Grammoptera*, discovered by Mr. J. C. T. Poole at Enfield, which appeared to be quite distinct from any member of the genus taken in Britain.—Mr. M. Jacoby brought for exhibition a specimen of *Megalopus melipoma*, Bates, an insect which so much resembles a bee that Bates had said they were indistinguishable in nature.—Mr. A. Bacot exhibited, on behalf of Dr. Culpin, specimens of *Papilio macleayana* and *Hypocysta metirius* captured in Queensland, illustrating the use of "directive" markings in the Rhopalocera in influencing their enemies to attack non-vital parts.—Mr. G. J. Arrow, an example of *Ceratopterus stahli*, Wast., a beetle from Australia possessing notable powers of crepitation.—Mr. A. H. Jones and Mr. H. Rowland-Brown showed a series of *Erebia alecto* (*glacialis*) var. *nicholli*, Obth., taken by them at about 8000 ft., at Campiglio, South Tyrol, with specimens of *Dasydia tenebraria* var. *wockearia*, caught in the company of the Erebias in the same localities. Mr. Jones also exhibited examples of *Erebia melas* from the Parnassus Mountains, Greece, for comparison, and fine forms of butterflies found at Mendel, near Botzen.—Mr. W. J. Kaye exhibited a series of bred *Morpho adonis* from British Guiana, with the very rare dimorphic black-and-white female.—Dr. F. A. Dixey, the social web and pupal shells of *Eucheira socialis*, Westw., together with specimens of the perfect insect, being the actual nest from Mexico described and figured by Westwood in the Transactions for 1836, in connection with which exhibit the Rev. W. T. Holland, of Pittsburgh, U.S.A., gave an account of a social silk cocoon spinning species he had met with also from Mexico.—Professor E. B. Poulton, F.R.S., read a note recently received from Mr. S. A. Neave, giving further interesting evidence of the superstitious dread of larvæ with terrifying eye-like markings entertained by the natives of Rhodesia.—The President read a note on experiments conducted by him to ascertain the vitality of pupæ subjected to submersion.—Mr. H. A. Byatt, B.A., read a paper on "*Pseudacræa poggei* and *Limnas chrysippus*; the Numerical Proportion

of Mimic to Model."—Mr. G. Bethune-Baker contributed "A Monograph on the Genus *Ogyris*."—H. Rowland-Brown, M.A., *Hon. Sec.*

South London Entomological and Natural History Society.—*March 9th.*—Mr. Hugh Main, B.Sc., F.E.S., President, in the chair.—Mr. Harrison exhibited a living specimen of a large green orthopteron found among bananas imported from Jamaica.—Mr. Main, a box in which a living Javan spider had been kept. A number of ova had been deposited, and a brood of young spiders had emerged. These had spun a dense mass of web, and then shed their skins. He also showed a photograph of the larva of *Apatura iris* in its hybernating position on a leaf of sallow.—The remainder of the evening was spent in an exhibition of lantern slides by Messrs. Dennis, Lucas, Tonge, Harrison, and Main.

March 23rd.—The President in the chair. —Mr. H. Moore, a large globe-fish (*Tetrodon fahaka*) from the Red Sea, and contributed notes.—Messrs. Harrison, Main, and Cowham, long bred series of *Colias edusa*, from ova deposited by an example of *helice* sent by Dr. Chapman from South France in 1904. Seventy-nine were males, seventy-one females. Of the latter, nineteen were typical, fifty-two *helice*. Only one or two specimens were in any degree intermediate in shade. Mr. Edwards, *Papilio peranthus* from Java, *P. gelon* from New Caledonia, *P. enclades* from Celebes, and *P. acauda* from the United States. —Mr. West (Greenwich), some large species of Homoptera and Heteroptera from South Africa.—Mr. Kaye, preserved larvæ of *Triphæna interjecta*, and pointed out the distinguishing characters from the larva of *T. orbona*, also exhibited.—Mr. J. W. Tutt gave an address on "Our British Plumes," illustrating his remarks on classification by a philogenetic tree.—Hy. Turner, *Hon. Rep. Sec.*

Entomological Club.—A meeting was held on March 21st, 1905, at 58, Kensington Mansions, South Kensington, the residence of Mr. Horace St. John K. Donisthorpe, the president and host of the evening. The members present were—Messrs. Adkin, Chitty, Donisthorpe, and Verrall, and there were about a dozen visitors.

RECENT LITERATURE.

Works on Mosquitoes.

The Mosquitoes or Culicidæ of New York State. By E. P. Felt. Bull. 79, Entom. 22. New York State Museum. Pp. 400+ 57 plates. Albany (1904).

This work deals in a most able and sound scientific manner with the mosquitoes of the State of New York. The plates, taken from photos of the wings, male genitalia, scales, and larval characters, are beautiful reproductions. It forms an almost complete natural history of the New York State species of a high scientific standard. A most interesting part is the appendix, which consists of a "Generic Revision of Culicidæ" of the State. Only true *Anopheles* occur, but of the

Culicinæ we find *Janthinosoma*, *Psorophora*, *Grabhamia*, *Stegomyia*, *Culex*, *Uranotænia*, *Wyeomyia*, and *Ædes* recorded. To these the author adds some new genera split off from the unwieldy genus *Culex*. For *Culex serratus*, Theobald, he proposes the genus *Protoculex*; in another, *Culiseta*, he includes *Culex incidens*; this comes in Neven-Lemaire's genus *Theobaldia*, so some modification must be made for the others he includes, or the genus must sink. *C. dyari*, Coquillett, is taken as the type of a genus *Culicella*; *C. sylvestris*, Theob., the type of *Ecculex*; and Meigen's *cantans* the type of *Culicada*, a most necessary separation. The common North and South American and West Indian *Culex tæniorhynchus*, Wied., he places in a genus *Culicelsa*.

The work is so sound and excellent that it should prove one of the greatest advances in recent years. It is unfortunate that the author lays such stress on the male genitalia, as males are often so difficult to obtain.

Report on the Mosquitoes occurring within the State of New Jersey, their Habits, Life-History, &c. By John B. Smith, Sc.D. Pp. 482+ 133 figs. and 4 maps. Trenton, New Jersey (1904).

This is a large and valuable work, dealing with mosquitoes generally, and especially with those of New Jersey State. The work is divided into four parts. The first deals with Mosquito Characteristics and Habits; the second, Checks and Remedies; the third, Classification and Descriptions; the fourth, Local Problems and Surveys. The genera dealt with are true *Anopheles*, *Janthinosoma*, *Psorophora*, *Culex*, *Uranotænia*, *Wyeomyia*, and *Ædes*. No genera related to *Culex* are given, *Grabhamia* not being employed, nor *Tæniorhynchus*.

The illustrations, like the text, are excellent, and there is much valuable matter regarding the destruction of Culicid larvæ.

A Monograph of the Anopheles Mosquitoes of India. By S. P. James, M.B., I.M.S., and W. Glen Liston, M.D., I.M.S. Pp. 123+ 30 plates. Calcutta (1904).

This work deals with most of the known Indian *Anopheles*. It is excellently got up as far as binding and plates go, and has evidently been issued after much painstaking research. The book is divided into two parts. The first deals with "General Matter," the second is "Systematic." Part of the former is excellent, the latter shows a superficial knowledge. The information is not up to date, so the work loses much of its value; for instance, the primitive classification given on page 5 is now considerably altered (*vide* 'Genera Insectorum.' Family Culicidæ). Some pages (19 to 21) are devoted to showing the invalid nature of scale-structure; they need no further notice, as they show such want of knowledge that one is really surprised at reading them.

Chapter II. deals with collecting, mounting, examining, and the identification of *Anopheles* larvæ. The authors give a table for identifying species, partly based on the colour banding of the palpi. This is no more uniform in Indian Anophelinæ than it is in any others,

according to recent examinations. For some reason the authors miss out Walker's *A. vanus*, and in a weird way ignore a distinct genus and marked species (*Aldrichia error*). On page 112 they say: "This genus is based on a single specimen which was found amongst the TYPES of *A. rossii* deposited in the British Museum." We should like to know which therefore they consider *rossii*. Is it *Aldrichia error*, or one of the *other five specimens* left under *A. rossii*? If *Aldrichia error*, which is *not* a unique specimen, is only an abnormality of *rossii*, why not place *Stegomyia fasciata* as an abnormality of *Culex pipiens*? There is quite as much similarity. The authors apparently have not seen the types. In a similar vein these investigators state (p. 61): "Another instance of a monstrosity even more marked than the above is the specimen upon which Mr. Theobald has founded a new subfamily called Heptaphlebomyia. The single insect," &c. The authors are evidently quite ignorant of the fact that the single insect is a very common species in Sierra Leone; they are also equally unaware that Ventrillon has described two very marked species of Heptaphlebomyia from Madagascar, and that a third occurs there. They also do not seem to be aware of the fact that *types* are *single* specimens. Such matters as these make us at once chary of the whole work.

The authors in a most painstaking manner describe the larvæ, but unless we know the exact stage described such work is of no value. The frontal hairs, as Dr. Grabham has found, vary in form in different stages of the same species. Do they or do they not do so in India? Until we have a more sound account of these Indian larval Anophelines we cannot accept the validity of "frontal hair" characters. Let the authors by all means go back for *medical* purposes to *Anopheles*, *Culex*, and *Ædes*, and let them alter the original descriptions to suit themselves, but it will not do for *zoological* purposes.

It is regrettable to write this of such a book; but where there is such unsound judgment and such errors it is impossible to look upon it as a whole in any other way.

The coloured plates (fifteen) are beautifully drawn by Dr. D. A. Turkhud, M.B., of which some of the wings were reproduced from the original drawings (given to the British Museum) in error by the artist who illustrated the present writer's monograph without proper acknowledgment in the work.

FRED. V. THEOBALD.

Twenty-eighth Annual Report and Proceedings of the Lancashire and Cheshire Entomological Society. Session 1904. Pp. 56.

THIS well-known local Society is to be congratulated not only on the considerable progress it has made in the matter of membership, but also as regards the useful nature of the work its members are engaged upon. Not the least valuable of the Society's efforts is the proposed compilation of accurate lists of the insect fauna of the counties which it represents. An important contribution to this series is "A Preliminary List of the Orthoptera," by Mr. E. J. B. Sopp, published in the volume before us. Another interesting paper by this author is on the "Callipers of Earwigs." In an address Mr. Robert Tait (Vice-President) discourses most pleasantly and instructively

on a lepidopterist's work during 1904. The volume contains an excellent portrait of Mr. Samuel J. Capper, F.E.S., the perennial President of the Society.

Entomologen-Adressbuch. Pp. 296. Berlin: W. Junk. 1905.

This exceedingly useful Entomologist Directory gives the names and addresses of some 9000 individuals living in various parts of the world who are occupied in the study of Entomology or are interested in collecting insects. Of these about 2000 are credited to Germany, something like 1300 to Great Britain, and rather less than 1000 to France. The number for the United States very slightly exceeds that for our own country.

OBITUARY.

Alpheus Spring Packard.

This celebrated American entomologist died at Providence, Rhode Island, on February 14th last, having held the position of Professor of Zoology and Geology in Brown University since 1878. He was born at Brunswick, Maine, where his father, who bore the same name as himself, was then a Professor. He graduated there in 1861, and subsequently qualified in medicine, and served as Assistant-Surgeon during 1864 and 1865 in the United States Army; but otherwise he devoted his time wholly to science, and very largely to entomology, where he won for himself a position not unlike that so long filled by Prof. Westwood in Britain; and it is only of his entomological work that we propose to speak here.

Entomologists of the present day do not perhaps know that fifty years ago there was a small penny paper, 'The Entomologist's Weekly Intelligencer,' edited by H. T. Stainton, which ran for ten volumes, and was the immediate ancestor of the 'Entomologists' Monthly Magazine.' The influence of this small forgotten paper on the progress of entomology both in Britain and America was almost incalculable, and in vol. vii., pp. 14, 15 (Oct. 8th, 1859), we find a letter from young Packard, saying that he wished to make a special study of the Geometrinæ, and appealing to British entomologists for assistance. Packard was thus one of the earliest of the great band of entomologists—Scudder, W. H. Edwards, H. Edwards, Grote, Cresson, Osten-Sacken, Walsh, Riley, and others—who have worked during the last half-century till the insects of the United States are more thoroughly and exhaustively studied and known than those of any part of the world, not excepting Britain itself. To this result Packard himself very largely contributed. He was one of the founders of the 'American Naturalist,' which he edited for twenty years. (Part of the information in the present article is taken from the March number of that Journal.) From 1868 to 1872 Packard edited a 'Record of American Entomology,' and his contributions to leading American scientific

periodicals on insects of all orders, Crustacea, Myriopoda, Economic Entomology, Zoology in general, Anatomy, Embryology, Anthropology, Geology, Palæontology, and other allied subjects are extremely numerous. The list of Packard's entomological books and papers fills nearly ten pages of the Library Catalogues of the Entomological Society of London; but among the most important of these are perhaps the following:—'A Monograph of the Geometrid Moths or Phalænidæ of the United States,' 4to, 1876, thirteen plates; 'Guide to the Study of Insects,' 1869, a thick 8vo volume, profusely illustrated, which has gone through many editions, and did for America what Westwood's 'Modern Classification' did for general entomology; 'Monograph of the Bombycine Moths of America, North of Mexico; Part I. Notodontidæ,' 4to, 1895, with forty-nine plates, mostly beautifully coloured, and maps; and 'Text-book of Entomology, including the Anatomy, Physiology, Embryology, and Metamorphoses of Insects, for use in Agricultural and Technical Schools, as well as by the working Entomologist,' 8vo, 1898. One of his last books was on 'Lamarck, the Founder of Evolution; his Life and Work.'

W. F. K.

A. U. Battley.

It is with the deepest regret that we record the untimely death of Mr. Arthur Unwin Battley, which took place at his residence at Herne Bay, on April 1st, at the early age of thirty-nine. Mr. Battley had been an ardent field-naturalist from his boyhood, and although the Lepidoptera were his favourite study, his acquaintance with ornithology was of no mean order, and botany and geology also claimed a share of his attention. Notes from his pen are scattered in our magazines and transactions of societies, the latest being "On Assembling in *Lasiocampa quercus*" (Entom. xxxvii. 320), whilst another very interesting contribution was the careful paper, "Notes on the Life-history of *Aporia crataegi*" (*ibid.* xxxvi. 249). Thoroughly practical in everything in which he interested himself, he was always ready to impart information and advice whenever it was within his power; and his geniality and unselfishness endeared him to a wide circle of acquaintance. Perhaps some of his best work was in the promotion of nature study through his encouragement of the smaller societies, and especially his interest in, and help to the young beginners. He was a Secretary of the City of London Entomological and Natural History Society from 1890 to 1895, President of the North London Natural History Society in 1893, and a valued member of that society up to the time of his death. During his residence at Hanwell and at Herne Bay he was associated with the Ealing Natural Science Society and the East Kent Natural History Society respectively; and only just before his death he had organized a new "Herne Bay and District Field Club," of which he was to act as Hon. Secretary and Treasurer. His loss will be keenly felt by many who had come under the magnetic influence of his enthusiasm, or who were indebted to his unvarying kindness.

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NEW AND LITTLE-KNOWN AMERICAN BEES.

By T. D. A. COCKERELL.

PERDITA MENTZELIARUM, Ckll., var. LAUTA, n. var.

♀. Anterior and middle femora without dark markings, or slightly marked with black or blackish in front; abdomen creamy-white, with the bands much reduced, usually represented by two pairs of lateral or sublateral spots on the first segment, and one pair each near the hind margins of the second and third; lateral face-marks usually pointed above.

♂. Head very large; cheeks with a short spine; yellow going above level of antennæ in median line, the process blunt.

Hab. Collected by Professor E. O. Wooton "on *Mentzelia* (*wrightii* or *multiflora*), five or six miles above Tularosa, New Mexico, on road to mountains, end of August"; seven females, two males. Flying with them, over the same flowers, were *P. mentzeliarum*, Ckll., two females; *P. mentzeliæ*, Ckll., one male, one female; and several *P. wootonæ*, Ckll.

The *mentzelia* (i. e. *Touterea*) species of *Perdita* are very variable. At Raton, N. M., Aug. 29th, I took a variety of *P. mentzeliæ*, much larger in both sexes than that found near Tularosa, the male having a very large head, like the *pulchrior* form of *P. pallidior*. At flowers of *Touterea multiflora*, at La Cueva, Organ Mts., Sept. 2nd, Prof. C. H. T. Townsend took a male *P. mentzeliarum*, in which the abdomen is orange, wholly without bands or spots, except an arched dark band on the first segment.

MELISSODES AGILIS, Cresson, var. SUBAGILIS, n. var.

♂. Length about 8½ mm.; labrum entirely black, mandibles without a yellow spot; third submarginal cell less narrowed above; eyes (when dry) light green.

Hab. Fort Collins, Colorado, Aug. 21st, 1903. (Colorado Agricultural College.)

By the black labrum and spotless mandibles this agrees with the Mexican *M. floris*, Ckll.; it differs from *floris* by the rufous

edge of the clypeus, absence of black hairs on thorax, and generally lighter colour. The type specimen was taken at flowers of *Grindelia squarrosa* by Mr. F. C. Bishopp.

MELISSODES MYSOPS, n. sp.

♂. Length nearly 14 mm., pubescence dull white, some black on scutellum, and black on the basal parts of the abdominal segments except the first; clypeus lemon-yellow, its upper margin black; labrum black; mandibles without a yellow spot; flagellum red beneath. Very close to *M. cnici*, Rob., from which it differs thus: yellow of clypeus only obscurely trilobed; face broader; eyes (when dry) pale bluish-grey; antennæ darker; ventral hair of thorax not black; scutellum with black hair in middle; hair of legs not black; disc of mesothorax and scutellum more shining, the punctures more separated; abdomen narrower and longer, with weak light hair-bands, failing in the middle; lateral subapical teeth longer and narrower.

♀. Length about 14 mm.; face broad, facial quadrangle much broader than long; eyes light grey; flagellum stained with red beneath; hind part of mesothorax, and scutellum, shining, with well-separated punctures, and sparsely clothed with erect black hair; pubescence of legs black, but scopa on outer side of hind tibiæ and base of tarsi long, strongly plumose, and light reddish, in striking contrast; hair on under side of abdomen and lower part of pleura black, that at apex of abdomen dark fuscous or black. Differs from *M. cnici*, Rob., by the conspicuous black hair on disc of thorax, the more shining and less closely and coarsely punctured scutellum, and the narrower abdomen, with distinct pale hair-bands, especially on the third and fourth segments.

Hab. Maybell, Colorado (type locality), Aug. 1st, 1904, both sexes; Virginia Dale, Colorado, Aug. 2nd, 1903, two females. *M. cnici* is an oligotropic visitor of thistles; the pollen collected by the present species at Maybell looks like thistle-pollen. My *M. cnici*, used for comparison, are Nebraska specimens received from Mr. J. C. Crawford. In dry specimens the eyes of *M. mysops* are light grey in both sexes; in *M. cnici* they are light reddish; in *M. denticentris* (female) they are light green.

Since writing the above I have ascertained that the Maybell material was collected by Mr. S. A. Johnson at flowers of thistle, while the Virginia Dale specimens were collected by Mr. F. C. Bishopp at flowers of white thistle.

SYNHALONIA TERRITELLA, n. sp.

♂. Length slightly less than 10 mm.; black, the head, thorax, base of abdomen, and legs with abundant long erect greyish-white hair, not at all fulvous, even on mesothorax; eyes (dry) dark plumbeous; facial quadrangle about square; clypeus lemon-yellow, without any black border above, but with the usual narrow brown anterior edge; antennæ long, entirely black, third joint comparatively long, considerably over twice length of second; labrum light yellow, with the lateral margins black; mandibles black; last joint of maxillary

palpi long, apparently a little longer than the fifth, fourth and fifth together about as long as third; tegulæ dark; wings clear; abdomen subglobose, black, the erect white hair covering first segment and basal two-thirds of second, the apical third of second covered with black hair; third and fourth segments with short black hair, and no pale hair-bands; fifth with a subapical band of very thin light hair; sixth with a more pronounced band or fringe; last ventral segment with the lateral margins elevated; legs normal, hair on inner side of basal joint of tarsi orange.

Hab. Palisade, Colorado, May 7th, 1901, two males. (Colorado Agricultural College.)

Similar in many respects to *S. edwardsii*, but smaller, with the third antennal joint longer, the yellow of the clypeus paler, &c. The type specimen was taken by Prof. C. P. Gillette at flowers of plum.

SYNHALONIA TRUTTÆ, n. sp.

Synhalonia frater (not of Cresson), Ckll., Amer. Naturalist, vol. 36, p. 815 (no description).

♂. Length about 12 mm.; black, the head, thorax, base of abdomen and legs with abundant long erect greyish-white hair, not at all fulvous, even on mesothorax; eyes (dry) reddish-black; facial quadrangle broader than long; clypeus very bright lemon-yellow, the upper border narrowly black, this black broadening before it ends laterally; narrow anterior margin very pale brownish; labrum retracted in the specimen described; mandibles black; last joint of maxillary palpi at least as long as the fifth; antennæ long, entirely black, third joint of moderate length; wings slightly dusky; abdomen quite without light hair-bands; first two segments with erect light hair, but extreme apical margin of first, and base and apex of second, with black hair; last ventral segment with no distinct lateral elevations; legs normal; pectinigerous spur on anterior tibia ending in two long slender spines, one of which terminates the comb, while the other is prolonged in the line of the spur; hind spurs normal. Although the abdomen is without hair-bands, properly speaking, the sides of the third and fourth segments, viewed laterally (obliquely) show glittering white hairs. This is extremely like the male of *S. edwardsii*, but the pubescence is paler, and the second abdominal segment has it black at base; the scape also is considerably less swollen.

♀. Differs from that of *S. frater* by its rather smaller size; reduced abdominal hair-bands, those on the third and fourth segments being narrow and more or less broken in the middle line; apical plate much more rounded, less conical in outline; hind spur of hind tibia long and straight, not curved at the tip; mandibles without a light streak. The reduced abdominal bands, the shape of the apical plate, and the long straight hind spur, also distinguish it from *S. belfragei*. The ventral abdominal segments are fringed with pale hair, greyish-white at the sides, more or less fulvous in the middle. The second dorsal abdominal segment has a complete transverse area covered with light hair to the exclusion of the black, which is before and behind it, but this light hair is thin and erect, so that it does not seem to form

a band when the insect is seen from above, as it does in *frater* and *belfragei*; this area of light hair is gently concave behind, and is considerably narrowed laterally.

Hab. Trout Spring, Gallinas Cañon, New Mexico, May 24th (Cockerell). It visits the flowers of *Iris missouriensis*. Evidently the New Mexico representative of *S. edwardsii*, Cresson.

SYNHALONIA SPECIOSA (Cresson).

♂. Length about 14 mm.; black, with dull white pubescence, tinged with ochreous on thorax above; facial quadrangle longer than broad; clypeus bright lemon-yellow, the yellow notched deeply on each side above; labrum pale yellow; mandibles black, with the apical part reddish, and furnished below with a number of shining red hairs; maxillary palpi 6-jointed, the second and third joints long and about equal, the last three together about as long as the third, and successively smaller, the last being narrow and minute; antennæ reaching to base of abdomen, entirely black, apical part of flagellum crenulated, and obscurely longitudinally ridged above; scape short and broad; third joint about one-third length of fourth; mesothorax and scutellum with very close shallow punctures; tegulæ dark anteriorly, pallid and subhyaline posteriorly; wings tinged with brown, the nervures piceous; abdomen with black hair mixed with the pale on the basal parts of segments three to six; apex of second segment with coarse black hair; third to sixth segments with apical or subapical bands of white tomentum (such as are seen in females of *Synhalonia*), these bands successively stronger on each segment going backwards; apical plate black, broadly truncate, very little narrowed posteriorly; last ventral segment with a short square tooth or process on each extreme lateral margin; legs black, the tarsi ferruginous, the basal joints black or blackish on the outer side, the hair on inner side of basal joints orange-ferruginous; middle tarsi slender but normal, first joint with no apical process; both spurs of hind tibiæ hooked apically; basal joint of hind tarsus with a couple of red curved bristles at apex, simulating a curved spine.

Hab. Fort Collins, Colorado, May 29th, 1901, and May 28th, 1901 (Colorado Agricultural College); Boulder, Colorado, May 17th, 1902 (S. A. Johnson, 496).

Allied to *S. gillettei*, Ckll., but easily distinguished by the smaller size, hooked spurs, &c. The May 29th example is recorded as from mountain ash, taken by Mr. Titus. I had described this as a new species, but having some misgivings lest the remarkable character of the hind spur might have been overlooked in the description of one of Cresson's, I asked Mr. Viereck to examine Cresson's types with this question in mind. He has very kindly done so, and reports that in *S. frater*, *dilecta*, *lepida*, and all the other species of *Synhalonia* in the collection at Philadelphia the spurs are simple; except in the male of *S. speciosa* as determined by Robertson, who has taken the sexes *in coitu*. In this male *speciosa* the spurs and the peculiarities of the hind tarsi are just as described above, and it is evident that the species

is the same. It had not occurred to me to refer the insect to *speciosa*, because the only description of that species given by Cresson is that of a female, and Robertson had published the opinion that it is a synonym of *frater*. It is now evident that *frater* can readily be distinguished from *speciosa* in the male by the character of its spurs.

Boulder, Colorado: March 6th, 1905.

STRAY NOTES ON ACULEATES.

By Percy E. Freke, F.E.S.

I have always found *Vespa vulgaris* more numerous than other wasps. In some places *V. germanica* seems to be as abundant or, indeed, more so, but this is, I believe, more apparent than real, the latter coming much more into houses and shops in search of sweets. At Tramore, Co. Waterford, it seemed to be almost the only wasp in the town, but on examining the country hedgerows, I found *V. vulgaris* maintained its numerical superiority. *V. germanica* might well be called the "house-wasp," or the "town-wasp," and *V. vulgaris* the "country-wasp." At Borris, Co. Carlow, I examined many nests, and found that *V. vulgaris* was responsible for 81·5 per cent. of them, *V. germanica* coming next, but a long way behind. There *V. rufa* and *V. sylvestris* are about equally common, probably rather less so than *V. germanica*, whereas about Dublin *V. rufa* is rare, and *V. sylvestris* and *V. norvegica* (the last the least common at Borris), are about equal, and *V. germanica* is about half as common as *vulgaris*. In one place one seems more numerous, whereas in another place the reverse is the case, but always *vulgaris* holds the lead more or less. Why is this? I believe because it is the most "hardy" of our wasps. I have noticed it flying in some numbers quite late in the season, when others of its genus had ceased to appear weeks before, and I think it probable that this character enables a larger proportion of females to survive the winter. I believe *vulgaris* has also a larger family. Certain it is that the males of this species are more commonly seen on the wing in autumn than *germanica* even in the latter's most favoured districts.

With regard to the face-markings, I have found the females and workers of *germanica* to vary more than *vulgaris*, and I believe variation is by nests, and not individually. I examined a nest of rather abnormally marked *germanica*, and found 80 per cent. of the workers were thus marked. In the normally marked nests I found no abnormally marked individuals.

Generally, wasps are very good-tempered, unless the nest

itself is actually attacked, or they have been irritated by former attacks upon their home. I have often stood in front of the nest and captured numbers of the inmates as they came or went, without the others interfering. I have never know a wasp make a totally unprovoked attack. Hive-bees constantly do so, and are far worse tempered than wasps. A wasp, on coming into a room, shows far more sagacity than a hive-bee about getting out again. The latter seems to lose its head completely and, being frightened, gets very cross. But a wasp may lose its temper, even when its safety is not threatened. I saw one of them feeding on fallen apples, in company with some large flies. One of the flies carelessly jostled the wasp, who turned savagely upon it and bit off one of its wings and then left it and returned to the apple.

I think *V. sylvestris* is perhaps our most savage wasp, and *V. norvegica* the least so. Indeed, when a boy, I have, with the help of one of the grooms, cut away a nest of *norvegica*, and carried it home half a mile, defending ourselves with pieces of brushwood, and have not received a single sting. We ran all the way home, and any wasps that were in the nest when we started, came out, but did not attack us.

Wasps are very gentle towards individuals of their own species. I have seen them, having fallen into the gardener's bottle of sugar and water, and have noticed that when one tried to save itself by climbing on to its neighbour, the latter would turn on it with open jaws, yet if it were one of its own species (possibly its own nest), it was never attacked. Not so, however, if one of them were *vulgaris* and the other *germanica*. Then they closed in mortal combat, and I have often seen them lying drowned, locked in each other's grasp.

When a wasp attacks a large fly, it attempts to disable it by biting through the principal nervures of one wing. This is not as easy as one might suppose, and I have often seen the contest last a considerable time. I once saw a wasp attack a large fly (*Sarcophaga carnaria*), and it seemed incapable of disabling it thus. The fly dragged it about over the ground for some time, until at last the wasp, desparing of success in the usual way, shifted its grasp forward, and seized the fly by the neck and bit its head off at once. Why is not this the usual mode of attack? It seemed so much easier than the other. Probably it offers more chance for the victim to slip from its antagonist's grasp before she can seize the neck.

Generally, a wasp bites its captive almost into a shapeless mass, and then carries it home to its nest. I saw one attempt to fly across a river with an unusually heavy burden of that kind. It started from a high bank, but was not equal to the task, and got lower and lower, until, just as they touched the water, a big trout rose and sucked them both down.

The males of some of the Aculeates are very quarrelsome. I have seen a pair of *Pompilus gibbus* fight furiously for the possession of a female which was present, and, on examining them, have found that they had both suffered severely; indeed, the smaller of the two had no wings left, only the remnants of nervures.

I have seen the males of *Mellinus arvensis*, when cruising up and down in front of the burrows of their females, seize each other and, fighting fiercely, roll down the bank together. The most combative of our Aculeates is, I think, *Andrena wilkella*. I have often seen the males fight with each other in a most determined manner. But they do not confine their quarrels to those of their own race. I once saw a large female of *Bombus terrestris* struggling on the ground, buzzing, and trying to get away from something that held her. I found a male of *A. wilkella* had seized her by the hind leg, and refused to let go, until I captured them both. She was able to crawl about, but could not fly away with her antagonist holding on, and did not appear to offer any resistance. I put the angry *Andrena* into a bottle which already contained a worker of *Vespa vulgaris*, thinking he would soon have the tables turned on him, but he unhesitatingly attacked the wasp, which, to my surprise, seemed quite afraid of him, and disposed to keep out of his way, and he renewed the attack every time the wasp came near him, and drove it off. I cannot help thinking that this wasp was timid from finding himself in the bottle, but that does not detract from the valour displayed by the little *Andrena*.

The males of *Bombus* sometimes quarrel among themselves, and I have seen those of *B. lapidarius* fighting on the ground, and tumbling over each other like two dogs, although I could not see any female in the neighbourhood. Also when they are presumably seeking the females, they often fly up and down a hedge on a hot day, and will attack any one who passes near them. In this way I have been persistently attacked by males of *B. agrorum* and *B. terrestris*, the latter even striking my hat as they dashed at me.

I saw a fierce battle near Cæsar's camp at Folkestone, between four large females of *B. lapidarius*. Three of them were on the ground when I first saw them, and the fourth came to join in the fight while I was looking on. At first I thought they must be males fighting for a female, but this was certainly not the case. Then I thought perhaps it was a contest between *Bombus* and *Psithyrus*, but they were undoubtedly all *B. lapidarius*. This is contrary to all my former experience. Generally, the females of the social Hymenoptera are rather gentle outside their nest. But these were fighting on the open ground, on the grass.

I once watched a bank where many small solitary bees had

their nests in a colony. The parasitic *Nomada alternata* were busy examining their burrows. They appeared extremely careful, stopping at the mouth of the holes, with their antennæ directed forward, and carefully watching for any symptom from within of the presence of the rightful owner. I saw the head of an *Andrena* at one burrow, and it was presently withdrawn. Very soon *Nomada* came and inspected the hole, but promptly departed. However, in the case of one returning, *A. trimmerana*, I thought the intruder had been caught inside. There was a terrible scuffle at the mouth of the hole. It lasted just two minutes, which appeared a long time as I watched it. *Andrena* pulling with all her might, and something within which as steadily resisted. At last, suddenly, out came something which she thrust backwards beneath her between her legs, and which rolled to the bottom of the bank, while she entered the burrow triumphantly. I picked up the vanquished insect, which seemed to be very seedy, and was surprised to find it was not a *Nomada*, but a female *Halictus rubicundus*.

I have watched females of *Mellinus arvensis* catching flies on cow-dung. *Mellinus* ran about until it saw a fly, advanced to within from two to three inches of it, paused for an instant, like a dog pointing, as if it were taking aim, and then sprang forward, rarely more than about two inches. The fly was often missed, but, if caught, they both rolled over, *Mellinus* biting its prey. I noticed it did not attack every species. The little flies, *Sepsis cynipsea*, it passed by contemptuously. *Lucilia cornicina* it often passed unnoticed, though I saw it attempt to catch several, only in one case successfully, and then the fly was released immediately, seemingly none the worse, *Mellinus* running off apparently disgusted at having made a mistake. *Musca* was greedily seized. I did not see any "blue-bottles," which I know are a favourite prey, but there was present a specimen of *Mesembrina meridiana* which *Mellinus* avoided, giving it a wide berth, and I frequently saw this big fly chase it for a few inches from one place to another. I do no not know why this should be, for I have often seen *Mellinus* carry off blue-bottles just, or nearly, as large, and I have seen wasps attack this fly readily.

Sometimes the tables are turned, and I have seen a little *Andrena minutula*, when busily engaged rifling a dandelion-head, pounced on by one of the bloodthirsty red "cow-dung flies." The little bee was taken unfairly at a disadvantage, as it was seized from above, and a desperate struggle ensued, until *Andrena* reversed herself, when the fly decamped with most ludicrous promptitude.

Southpoint, Limes Road, Folkestone.

DESCRIPTIONS OF TWO NEW ACULEATE HYMENOPTERA FROM THE TRANSVAAL.

By P. Cameron.

Tachytes transvaalensis, sp. nov.

Black, the apical two joints of the four front tarsi reddish; the tibial and tarsal spines pale testaceous; the calcaria testaceous; head and thorax densely covered with grey hair; the apices of the abdominal segments with broad bands of silvery pile; the pygidium covered with fulvous, mixed with silvery pubescence. Wings clear hyaline, highly iridescent, the costa, stigma, and nervures pale testaceous; the second abscissa of radius shorter than the third; the second recurrent nervure is received in the middle of the cellule; the apex of radius is rounded below, obliquely sloped; the first transverse cubital nervure is roundly curved backwards to the cubitus. Eyes distinctly converging above, where they are separated by the length of the antennal scape and pedicle. Apical half of mandibles pallid testaceous, the base thickly covered with silvery pubescence. Base of fore tarsi with six spines. Pygidium clearly longer than it is wide at the base, gradually narrowed towards the apex, as in *T. mira*, Kohl (*cf.* Ann. Hof. Mus. Wien, 1894, pl. xiii. f. 32). The second joint of the flagellum is three times longer than its thickness in the middle. The furrow on the base of the metanotum is irregularly transversely striated; it is indistinct; on top of the apical slope is a closely, distinctly, transversely striated space; the apical slope is transversely rugose. The long spur of the hind tibiæ is as long as the metatarsus. ♀. Length, 14 mm.

Transvaal.

Palpi dark testaceous. The pubescence on the hind tibiæ behind has a golden tinge. On either side of the clypeus are three stumpy, not very clearly defined, teeth or ridges. The pubescence on the pygidium is close, short, and depressed. The second abscissa of the radius is shorter than the space bounded by the recurrent nervures.

It is possible that this may be *T. hirsutus*, Sm. (Cat. Hym. Ins. Brit. Mus. iii. p. 300), of which only the male has been described; but the description is not sufficiently precise to enable me to decide this without an examination of the type; the pubescence of the head and thorax is certainly different, it being yellow and "rich golden" on the face.

Odynerus vaalensis, sp. nov.

Black; the scape below, clypeus, labrum, a mark wider than long, transverse above, roundly narrowed below and slightly incised in the middle, a band, narrowed in the middle, on the first abdominal segment above, a broader one, irregular behind and slightly incised in the middle there, on the second above and below—the under line trilobate—and the apices of the other segments, yellow. Legs bright fulvous red, the coxæ and trochanters black. Wings almost hyaline, the radial and cubital cellules smoky violaceous; tegulæ rufous. ♂. Length, 8 mm.

Vertex rugosely punctured, the front closely longitudinally reticulated-striated. Clypeus as long as it is broad, rounded broadly above, the apex with an incision on its apex, where it is wider than its greatest length; it becomes gradually wider towards the apex, the sides being sharply pointed. Apices of mandibles rufous. Temples reticulated-punctured closely. Apex of pronotum transverse, the lateral angles not acute. Pro- and mesopleuræ more coarsely rugose than the mesonotum; the metapleuræ, except near the base above, closely striated obliquely, the striæ intermixing and forming almost reticulations in places. Lateral angles of metanotum forming, with the base, almost a triangle, *i.e.* the sides are produced into a blunt point in the middle. Scuteilum quadrangular, broader than long, its base obliquely sloped. Apex of post-scutellum smooth, obliquely sloped. Centre of metanotum hollowed, smooth; the keel in the centre widened towards the apex. Basal abdominal segment cup-shaped; the second slightly longer than the width at the apex, which is smooth and turned up. The flagellum of antennæ is brownish beneath; the hook is brown, stout, reaching to the apex of the joint. There are two lines on the post-scutellum.

Comes near to *O. posticus* and *O. silvaensis*. The former I do not know in nature, but the latter may be separated from my species as follows:—

Apical segments of abdomen and basal half of antennæ red, a yellow line in the eye-incision, the sides of the median segment not dilated in the middle (sometimes yellow) . . . . . *silvaensis*, Sauss.

Apical segments of abdomen and antennæ not red, no yellow line on the eye-incision, the sides of median segment dilated in the middle . . . *vaalensis*, sp. nov.

The specimens of *silvaensis* which I have seen (there is a specimen from the Transvaal in the Albany Museum, Grahamstown) is Saussure's variety, they having the post-scutellum and sides of metanotum yellow. The tibiæ, too, are yellow on the outer side (*cf.* Saussure, 'Vespides,' i. p. 214).

NEW CULICIDÆ FROM THE WEST COAST OF AFRICA.

By Fred. V. Theobald, M.A.

(Concluded from p. 104.)

Genus Ædimorphus, Theobald.

(Mono. Culicid. iii. p. 290, 1903; Genera Insectorum, Culic. p. 20, 1904.)

Ædimorphus alboannulatus, n. sp.

Head dark brown; proboscis black, with a white band on the apical half. Thorax deep rich brown, with scanty golden scales; a silvery white spot on each prothoracic lobe; pleuræ pale brown, with

silvery white puncta; scutellum silvery white. Abdomen deep brown, unbanded, with basal white lateral spots. Legs deep brown, with apical silvery white bands, most pronounced in the hind legs, the last hind tarsal being all white.

♀. Head deep brown, clothed with dusky flat scales over most of the surface, and some flat creamy ones at the sides; around the eyes rather large golden narrow-curved scales, and smaller and duller ones at the back; over the whole surface very long deep black upright forked scales. Proboscis black, with a pale ochreous band slightly towards the apical half. Palpi deep brown and densely scaly; clypeus brown. Thorax rich deep chestnut-brown, with scattered small golden curved scales; silvery white flat scales on the prothoracic lobes; numerous black bristles over the roots of the wings; scutellum brown, clothed with silvery white flat scales and black border-bristles, six to the mid lobe and some smaller ones with them; pleuræ brown, with prominent silvery white puncta composed of flat scales; one large spot of these scales seems to project outwards, and can be seen when the insect is viewed from above, looking almost like a silvery spot close to the roots of the wings. Abdomen deep brown, with basal white lateral spots and pale venter. Legs black, with apical silvery white bands as follows: small but prominent on the femora and tibiæ of all the legs, on all the metatarsi, and on the fore and mid first tarsal segment; in the hind legs prominent on all the segments, the last tarsal being pure white. All the ungues equal and uniserrated. Wings with the first submarginal a little longer and narrower than the second posterior cell, its base nearly level with that of the second posterior, stem of the first submarginal cell about two-thirds the length of the cell, stem of the second posterior cell as long as the cell; posterior cross-vein nearly twice its own length distant from the mid. Halteres with pale stem and fuscous and white knot. The scales are dark brown, especially along the costa, with deep violet reflections towards the base, and a white patch of scales at the base of the costa and first long vein. Length, 4·5 mm.

♂. Palpi about the same length as the banded proboscis, the two apical segments small and about equal, a pale band at the base of the apical segment; on both apical segments, and on the apex of the antepenultimate, a few long brown hairs. Fore and mid ungues unequal, the mid more so than the front ones, both uniserrated, the tooth of the larger mid unguis near the base and small. Length, 4 to 4·5 mm.

Habitat. Sierra Leone, West Africa.

Observations.—Described from two specimens (a male and female) in perfect condition. It is a very marked species, the general ornamentation of the thorax and legs being characteristic. I cannot be certain as to the exact structure of the male ungues, as there is only one specimen, nor the genitalia, which are hidden in hairs and scales. No notes were sent with the specimens.

Genus Culex, Linnæus.

(Syst. Nat. 1738, Linnæus; Mono. Culicid. i. p. 326, 1901, Theobald.)

Culex hirsutipalpis, Theobald.

(Mono. Culicid. i. p. 378, 1901.)

Several males and females from Bihé, Angola. The males differ from the type in that there is no pale band at the apex of the palpi.

My figure of the male ungues (Mono. Culicid. i. p. 378) were drawn from a pinned specimen in which they could not clearly be seen. When mounted and examined flat the tooth of the larger fore and mid ungues is seen to be large and outstanding, almost at right angles to the claw, and the tooth of the smaller one is more pronounced and nearer the base. The series also shows great variation in size, some specimens being one-third less than the type.

Genus Heptaphlebomyia, Theobald.*

(Mono. Culicid. iii. p. 336, 1903.)

This genus was described from a single female. The fresh material sent from Angola by Dr. Creighton Wellman has enabled me to add fresh generic characters to those already given. The males sent by the collector do not agree with the females, and I am not sure if they are of the same species.

Characters of the Genus.—Head clothed with narrow-curved scales, and upright forked ones, except at the sides, where they are small and spathulate. Palpi of the female small but prominent, in the male acuminate, the last two segments hairy. Thorax clothed with narrow-curved scales, and also the scutellum and prothoracic lobes; the pleuræ in the female with patches of flat scales, which end in a sharp point; in the male they are rounded apically. The wings have the typical *Culex* venation, but the females have a distinct seventh long vein, scaled for part of its length with rather large elongated flat scales, which apparently vary in number from ten to fifteen. The scales of the wing are rather broader than in *Culex*, especially in the apices of the veins, including the branches of the fork-cells. In the males there does not seem to be a scaled seventh vein, but the sixth is markedly bent at right angles near the edge of the wing.

The two chief features in the genus are the presence of a scaled seventh vein in the female, and the peculiar form of the scales on the pleuræ, which I have not seen in any other Culicids. There is a superficial resemblance between the males and females, but the absence of the scaled seventh vein in the males makes it doubtful if they really belong here, although evidently they were taken together by the collector.

* Since this was sent to press, two very marked new species have been sent me from Madagascar. The descriptions will shortly appear in the 'Archiv der Parasitologie,' in a paper on Madagascan Culicidæ by M. Veutillon.

Heptaphlebomyia simplex, Theobald.

Head deep brown, with greyish scales; palpi of female thin, black, and white-scaled, of male thin, black; proboscis black, unbanded. Thorax deep brown, with small reddish golden narrow-curved scales, brown pleuræ with snowy white puncta. Abdomen deep brown, with basal white curved bands, and basal white lateral spots. Legs deep brown, unbanded; white femoral and tibial apical spots and traces of a very fine indistinct white line on femora and tibiæ. Ungues of female small, equal, and simple.

♀. Head deep brown, with narrow-curved grey scales, somewhat largest in the middle of the head, and black upright forked scales; small white flat lateral scales and a row of rather long and prominent deep brown bristles projecting from the front of the head, those of each side pointing inwards; clypeus and proboscis deep black; palpi thin, rather irregular in form, and clothed with black and white scales. Thorax deep brown, clothed with narrow-curved reddish golden scales, some grey ones in front near the head, another small patch in front of the roots of the wings, pale ones over the roots and before the scutellum; scutellum with pale dull creamy narrow-curved scales, with two series of border-bristles, the larger deep brown, the smaller pale golden; prothoracic lobes with narrow-curved pale scales, and some brown chætæ; pleuræ deep brown, with patches of flat-pointed white scales and short golden bristles here and there. Abdomen deep orange-yellow, clothed with deep blackish brown scales with violet reflections, and with basal white curved bands, those of the second, third, and fourth segments being in the form of almost median curved spots; all the segments with basal white lateral spots; border-bristles small and pallid, many pallid hairs at the sides of the body; venter mostly white, scaled with black. Legs deep black, the apices of the femora and tibiæ with a white spot; also on the femora and tibiæ is a rather indistinct ventral white line; ungues small, equal, and simple. Wings with the first submarginal cell longer and narrower than the second posterior cell, its base nearer the base of the wing than that of the latter, its stem varying from one-third to one-half the length of the cell; stem of the second posterior about two-thirds the length of the cell; the posterior cross-vein from one and a half to twice its own length distant from the mid; the seventh vein with scales which vary in number from ten to about fifteen. Length, 3·5 to 4 mm.

♂. Head clothed with narrow-curved pale scales, a more or less prominent median bare line; clypeus and proboscis deep brown; antennæ grey, with deep brown bands and verticillate hairs. Palpi deep brown, the apical segment acuminate, last two segments hairy, the antepenultimate segment thin and weak, with a trace of a pale band upon it, hairs black; two apical segments equal. Thorax very similar to the female, but does not show the pale scales. Abdomen banded as in the female, narrow, with rather scanty long pale brown hairs; the apical segment with scattered creamy scales, the penultimate with the pale basal band extending down each side of the segment. Fore and mid ungues unequal, both uniserrated, hind equal, simple, and small. Wings with the seventh vein apparently not scaled (*i. e.* only a fold and no true vein). The first submarginal cell consider-

ably longer and narrower than the second posterior cell, its base nearer the base of the wing than that of the second posterior cell, its stem about half the length of the cell; stem of the second posterior cell not as long as the cell; posterior cross-vein nearly twice its own length distant from the mid; sixth vein curved almost at right angles at the apex. The male genitalia have rather a narrow basal lobe, with a long curved lateral process composed of several narrow laminæ, and nearer the clasper another process, shorter, and composed of finer parts; the clasper terminates in a small jointed process. Length, 3·5 to 4 mm.

Habitat. Bihé, Angola, Portuguese West Africa (Dr. Creighton Wellman).

Observations.—The four females sent by Dr. Creighton Wellman all show the marked seventh scaled vein, but the males do not. There is variation in size, showing, as usual, that exact measurements of Culicids are of no diagnostic value. This species might easily be mistaken at first for *Culex fatigans*, Wied., and, on more careful examination, to be near *C. creticus*, Theob., owing to the white scaled line on the femora and tibiæ; but a microscopic, or even a careful hand-lens, examination will at once reveal the seventh scaled vein.

The original type is in the British Museum, and all the specimens redescribed here. There were three males sent with the females.

Further notes on this genus will shortly be issued in the 'Archiv der Parasitologie' on important material collected and described by M. Veutillon.

A LIST OF THE "MACRO-LEPIDOPTERA" OF LANCASTER AND DISTRICT.

By C. H. Forsythe.

(Continued from p. 135.)

Triphæna ianthina.—Generally distributed throughout the district; comes to sugared ragwort flowers in July and August.

T. interjecta.—Uncommon. I have only taken examples near Heysham, Hest Bank, and in the County Asylum grounds in July.

T. comes (*orbona*).—Comes freely to sugar in July and August, and is generally distributed. This species is very variable.

T. pronuba.—Abundant at sugar in July and August everywhere. This is another very variable species in colour—from silver-grey to black-brown

Amphipyra tragopogonis.—Fairly common everywhere at sugar in August.

Mania maura.—Comes to sugar in Aqueduct Wood and other localities on the banks of the Lune at the end of July. I have also taken specimens in the County Asylum grounds.

Panolis piniperda.—Not common; comes to sallow-bloom in April: Corporation Wood, Quernmore, County Asylum grounds, near Clougha, Blea Tarn, &c.

Pachnobia rubricosa.—Fairly common at sallow-bloom, and generally distributed throughout the district.

Tæniocampa gothica.—Common at sallow-bloom in March and April, everywhere. This species shows considerable variation. The var. *gothicina* is scarce.

T. incerta (*instabilis*).—Common everywhere at sallow-bloom in March and April.

T. populeti.—Not common; comes to sallow-bloom in March and April, near Clougha, the County Asylum grounds, Quernmore, Halton, &c.

T. stabilis.—Plentiful everywhere at sallow-bloom in March and April. This species shows considerable variation of ground colour.

T. pulverulenta.—Generally distributed and fairly common. Comes to sallow-bloom in March and April.

Dyschorista (*Orthosia*) *suspecta*.—I have only taken this species near Clougha at sugar in July.

Orthosia lota.—Fairly common at sugar, and generally distributed, in September.

O. macilenta.—Fairly common at sugar in September; Halton, Grimshaw Lane, County Asylum grounds, Blea Tarn, Freeman's Wood, &c.

O. helvola (*rufina*).—Fairly common at sugar in September and October; County Asylum grounds, Grimshaw Lane, Halton, Aqueduct Wood, &c. This species varies considerably.

O. pistacina.—I have bred this species from Witherslack and Methop larvæ, and have taken it at sugar in the County Asylum grounds in September and October, but it is not plentiful.

O. litura.—Common at sugar in September; Witherslack, Methop, County Asylum grounds, Blea Tarn, Freeman's Wood, Corporation Wood, &c.

O. circellaris (*ferruginea*).—Abundant at sugar in late September and October in the County Asylum grounds, Grimshaw Lane, Aqueduct Wood, Corporation Wood, &c.

Orrhodia vaccinii.—Abundant everywhere at sugar and ivy-bloom in September, October, and November.

O. ligula (*spadicea*).—Abundant everywhere at sugar and ivy-bloom in September, October, and November.

Scopelosoma satellitia.—Fairly common at sugar in September and October. This species varies much in ground colour—from red to dark dull brown, and with a white, red, or yellow reniform.

Xanthia fulvago (*cerago*).—Fairly common and generally distributed in July, August, and September.

X. flavago (*silago*).—I have taken this species in September at Methop, Witherslack, Grimshaw Lane, County Asylum grounds, and Blea Tarn.

Cirrhædia xerampelina.—Not common; Blea Tarn, Clougha, Lancaster, Arnside, Halton, Caton, &c., end of August. The var. *unicolor* is rare, odd examples occasionally at Clougha and Arnside.

Cosmia paleacea (*fulvago*).—Scarce. I have only bred it from Methop larvæ taken from oak in early June. The imago appears in August.

Calymnia trapezina.—Fairly common and generally distributed throughout the district in August.

Dianthœcia cucubali.—I have only taken this species between Caton and Quernmore in June.

Polia chi.—Abundant on the walls about Clougha, Lancaster, Quernmore, Halton, and Caton, &c., in September and October. The var. *olivacea* is scarce.

Miselia oxyacanthæ.—Abundant at sugar in September; Halton, Grimshaw Lane, Blea Tarn, County Asylum grounds, &c. The var. *capucina* occasionally.

Agriopis aprilina.—Not common, but occurs in most of the localities throughout the district. Comes to sugar in October.

Euplexia lucipara.—Fairly common at sugar in June and July, and again in September; County Asylum grounds, Clougha, Witherslack, &c.

Phlogophora meticulosa.—Common at sugar in September and October; County Asylum grounds, Halton, Aqueduct Wood, Freeman's Wood, Witherslack, &c.

Aplecta nebulosa.—Common, but local; Witherslack and Methop. Comes to sugar in June. This species varies considerably in ground colour—ranging from light grey to nearly black (the latter is rare—var. *robsoni*).

A. tincta.—Local; near Witherslack end of June.

Hadena protea.—Fairly plentiful near Clougha, Quernmore, Blea Tarn, &c., in September.

H. glauca.—Local and not common. I have only taken this species at rest on the rocks near Clougha in June and early July.

H. dentina.—A few at sugar, but more frequently at rest on the stone walls and rocks in the vicinity of Clougha in July.

H. dissimilis (*suasa*).—Not common; odd examples come to sugar in the County Asylum grounds, and I have bred specimens from Methop larvæ. The imago appears in June.

H. oleracea.—Common at sugar and privet-bloom in July; and generally distributed.

H. pisi.—Fairly common at Witherslack and Methop in June. This species is very variable.

H. thalassina.—Not common; examples come to sugar in most seasons at Blea Tarn, County Asylum grounds, Quernmore, &c., in June.

Xylocampa areola (*lithorhiza*).—Fairly common in some seasons; appears in March and April, and comes to sallow-bloom.

Calocampa vetusta.—Uncommon; comes to sugar and ivy occasionally in October in the County Asylum grounds, at Blea Tarn, and Quernmore.

C. exoleta.—Fairly common and generally distributed; comes to sugar and ivy-bloom in October and November.

C. solidaginis.—I have only taken this species near Clougha and in the County Asylum grounds; end of July.

Xylina conformis.—Very rare. I took two specimens at ivy-bloom on October 22nd, 1902, near Lancaster; *vide* 'Entomologist,' vol. xxxv. p. 25.

(To be continued.)

NOTES AND OBSERVATIONS.

Dytiscids in the New Forest.—Mr. Ansorge (Entom. xxxvii. 241) asks if anyone knows of the occurrence of *Deronectes latus* in the New Forest. I may therefore say that there is a stream in the forest in which it may always be found in early June. I was very much surprised when I first found it there, a good many years ago. Another rare Dytiscid occurring in the forest I think has not been recorded, *viz. Hydrovatus clypealis*. This lives in a pond near Lyndhurst, in company with *Pelobius hermanni*.—D. Sharp; Cambridge, May 9th, 1905.

London Lepidoptera.—I should be very grateful if any of your readers would kindly supply me with the names of Macro-Lepidoptera actually seen or captured inside the "four-mile radius" at any time since, and including, 1900. I trust it will be noted that I desire personal experiences only.—George Lock; 41, Nithdale Road, Plumstead, S.E., May 16th, 1905.

Eupithecia stevensata.—When collecting in Freshwater, Isle of Wight, last September, I captured a *Eupithecia* which puzzled me to name. I have just shown the specimen (which is in perfect condition) to my friend Mr. L. B. Prout, and he informs me that it is undoubtedly *E. stevensata*. The specimen was caught while dusking along an ordinary hedgeside where a few tamarisks were growing, but certainly no juniper. This substantiates the statement, made some time ago by Mr. Sydney Webb, that the insect appears in September, and that the larva does not feed on juniper. As the insect had never to my knowledge been caught outside the Dover district, I thought the record might prove of interest.—J. P. Mutch; 415, Hornsey Road, N.

[Barrett, in 'British Lepidoptera,' treats *stevensata* as a form of *E. sobrinata*. "If this form," he remarks, "when reared, should appear to be distinct from *E. sobrinata*, it will be an exceedingly difficult species to describe, seeing that although the shade of colour is peculiar, the markings, though differing in intensity, are accurately the same."—Ed.]

Apamea ophiogramma.—Is *Poa aquatica* a usual food-plant for this species? I have found no less than six larvæ this year feeding upon it. Both *Phalaris arundinacea* and *Poa aquatica* grow together along the margins of the streams here, and I get larvæ of *A. ophiogramma* in both, although mostly in the *Phalaris*. *A. didyma* (*oculea*) feeds commonly on *Poa aquatica*, but is not very abundant on *Phalaris arundinacea* in this district.—Francis C. Woodbridge; Northcroft, Uxbridge.

Note on Haworth's Type-specimen of "Noctua subfusca."—At the sale of the first portion of the Mason Collection, Lot 498—which included Haworth's original type-specimen, bearing his own MS. label "*subfusca*," of his *Noctua subfusca*—became my property. The moth, which was first described by him in Lep. Brit. p. 114, as "*Bombyx subfuscus*," but was afterwards, on p. 219 of the same work, assigned a more correct position under the name "*Noctua subfusca*," is an obscurely-marked fuscous example of *Agrotis corticea*, Hb., and the name has been rightly sunk as a synonym of *corticea*. I observe, how-

ever. that in the Entom. Syn. List, p. 7 (1884), *subfusca* is specially indicated as being referable to the female sex of *A. corticea*, and is not entered as a variety, whereas the type-specimen, which I am about to present to the National Collection, is unquestionably a male, as proved both by the antennæ and the frenulum, and represents a decidedly aberrant form, for which the name *subfusca* must be retained, of this species.—Eustace R. Bankes; Norden, Corfe Castle, May 11th, 1905.

The Mason Collection.—With reference to the notice (*antea*, p. 136) of the sale of this collection, it seems advisable to mention that the MS. label on the pin of the Norfolk specimen of *Notodonta tritophus*, Esp. (rendered as "*trilophus*," loc. cit.), read "Ersham, Norfolk, Garneys." "Ersham" is obviously a mistake for "Earsham," in south-east Norfolk, which is close to Bungay (in Suffolk), where Messrs. Charles and W. Garneys used to reside (*vide* Ent. Ann. 1856, p. 18). In the sale catalogue "Garneys" was incorrectly rendered "Gurney," and the attempt to quote (*antea*, p. 136) the exact data given in the catalogue has further resulted in "Ersham" of the catalogue appearing as "Ergham." I also notice that it is stated (*antea*, p. 136) that "Five *Synia musculosa* were disposed of at 5/- to 11/- each," but would point out that whereas this is true of the last four of the five specimens sold separately and apart from other species, the first of the five fetched 22/-.—Eustace R. Bankes; Norden, Corfe Castle, May 10th, 1905.

Entomological Club.—A meeting was held at Wellfield, Lingards Road, Lewisham, the residence of Mr. Robert Adkin, the host and chairman of the evening. Other members present were Messrs. Donisthorpe and Porritt. Mr. Lucas exhibited a living example of each sex of *Agrion armatum* from Cambs.

CAPTURES AND FIELD REPORTS.

Deilephila livornica in Cornwall.—On April 16th last, at Charlestown, there was taken a specimen of *D. livornica*, which is now in my possession. I believe that four other specimens were taken about the 17th inst. *viz.*:—one Grampound Road, one Helston, one Falmouth, and one at Hayle; all in Cornwall. For three days preceding the 16th inst. very strong south-south-east and south winds prevailed here, so I assume that these insects, at least, were helped along thereby, on their long journey.—H. D. Kenyon; Lamorna Villas, Mount Charles, St. Austell, April 28th, 1905.

Deilephila livornica in Wales.—On April 20th last, a good specimen of *D. livornica* was brought to me by a little girl. She had found it in a hole in the garden. It was alive, and quite perfect, although the girl carried it in a small tumbler. There is no doubt about its being a true British specimen of that somewhat rare species. I would have sent a record of this capture before, but I have been away from home.—L. Stafford; Gold Croft, Caerleon, near Newport, Monmouth, May 16th, 1905.

NOTES FROM THE CHESTER DISTRICT FOR 1904. — Contrary to the predictions of certain, or, more accurately speaking, uncertain weather prophets, the summer of 1904 turned out to be sunny, warm, and enjoyable. The months of June, July, and August had especially high temperatures and clear atmospheres, and August 4th, when Londoners sweltered in 91° (shade reading), had the distinction of being the hottest day for four years. As usual, the weather became unsettled about August 12th, summer returning towards the end of the month. It was an especial matter of interest to me to see if the two previous cold wet summers would have any appreciable effect on the numbers of the butterflies. The following species were conspicuous by their absence, either as larvæ or imagines :—*Vanessa io* (I saw none).—*V. urticæ* (I do not remember seeing one).—*V. atalanta* was represented by a few specimens. Mr. J. Thompson took five larvæ and one pupa off nettles just outside Chester. One of the butterflies was seen, September 11th, in the Grosvenor Park ; one in Delamere Forest, August 30th ; two in Delamere Forest, September 10th ; and I saw six feeding on heather-bloom, September 17th, in the same locality. I did not see *V. cardui* at all. But, as all other butterfly species of the district seemed up to their usual numbers, it was evident that the failures in Vanessidæ could hardly be attributed to the two preceding seasons. Much more likely are they due to the growing practice of cutting down almost every available nettle and thistle, just when the larvæ are most dependent upon these food-plants.

Electric lamps were almost a failure—certainly not worth working. My best capture was an example of *Cirrhædia xerampelina*, August 30th. Several specimens of *Sphinx convolvuli* were taken in September. In connection with moths being attracted by light, it may be worth recording that a *Plusia gamma* flew into a farmhouse during a fall of snow on the night of November 21st.

I will only mention the most interesting moths that I obtained in various localities :—*Sesia scoliiformis*. I was well within striking distance of a fine fresh female at rest on birch in Delamere Forest, June 4th. Although it was a good shot for the net, I unfortunately missed it. This is, to my knowledge, the second specimen seen in Delamere Forest.—*Cœrocampa porcellus*. A freshly emerged specimen netted by Mr. J. Thompson at flowers of white campion, Delamere Forest, on the night of June 17th.—*Rusina tenebrosa*. Common in Delamere Forest in June. All specimens melanic forms.—*Hepialus velleda* var. *carnus* (almost unicolorous brown, markings indistinct). One, Delamere Forest, July 8th.—*P. iota*. A melanic specimen, Delamere Forest, July 8th.—*Stilbia anomala*. One, the Leet, Valley of the Alwyn, Denbighshire, July 30th. — *Acidalia dilutaria*, Hübn. Previously recorded in the district by Gregson only. One netted by me in Delamere Forest on the night of July 8th.—*A. aversata*. A rosy-brown form blotched with darker instead of bands on the upper wings, Delamere Forest, July 1st.—*Emmelesia decolorata*. Plentiful about Chester and in Delamere Forest, June and July.—*Boarmia repandata*. A black specimen taken near Chester, July 5th.—*B. rhomboidaria*. A melanic form taken near Chester, August 2nd. It laid a number of red eggs. (The eggs of *B. repandata* are dull green.)—*Hypsipetes elutata*. A beautiful green form (upper wings), August 4th.—*Pericallia syringaria*.

One, Delamere Forest, July 8th.—*Eupithecia trisignaria*, H.-S. I had the good fortune to net one (Delamere Forest) on the night of July 1st. The previous occurrence in the district rests on a doubtful record.—*Mimæseoptilus bipunctidactyla*, Haw. Common on the Leet carboniferous limestone, Denbighshire, August 12th. — *Aciptilia tetradactyla*, L. A small whitish plume not previously recorded. Common on the Leet, Denbighshire, July.—*Pterophorus monodactylus*, L. One beaten out of Scotch fir in Delamere Forest, October 1st. — *M. pterodactylus*, L. Common in Delamere Forest, July 8th, but rather worn.

The following Micros were taken, or bred from larvæ, in or near Chester:—*Orthotelia sparganella*, Thnb.; common on marshy places in August. *Depressaria liturella*, Schiff., and *Aphelia osseana*, Sc.= *pratana*, Hb.; both on the Lache Eye in August. *Epiblema similana*, Hüb.; *Acalla hastiana*, modification of var. *autumnana*, Steph.; *A. hastiana*, L., var. *radiana*, Hüb.; *Endrosis lacteella*, Schiff.=*fenestrella*, Stt.; *Ancylis biarcuana*, Steph.; *E. subocellana*, Don.

From Delamere Forest:—*Depressaria applana*, Fabr.; *Pandemis corylana*, Fabr.; *Cerostoma radiatella*, Don., a very variable species; *Pandemis heparana*, Schiff.; *Pleurota bicostella*, Cl.; *Scoparia ambigualis*, Tr.; *Olethreutes corticana*, Hüb.; *Cacœcia lecheana*, L.; *Acompsia pseudospretella*, Stt., almost black (also Chester examples).

From the Leet, Denbighshire:—*A. osseana*, Sc. = *pratana*, Hb.; *C. radiatella*, Don.; *Acalla variegana*, Schiff.

Hybrids between *Smerinthus ocellatus* (female) and *S. populi* (male): From the eight pupæ referred to (Entom. xxxvii. 25) six fine moths emerged in June—three on the 4th, one on the 5th, one on the 6th, and the sixth on the 17th—all apparently males. As the sexes of the parent moths were the same as those referred to by Mr. P. Kirk, of Dundee (Entom. Record, i. 95), I was curious to see how my hybrids would compare with those reared by Mr. Kirk. Mr. Tutt's description of five of the latter (Entom. Record, i. 203) fits so accurately with my hybrids that I give his description *verbatim*:—"They are perfectly intermediate between the two species. The fore wings have all the characters of both species, the basal line as in *populi*, but with distinct traces of a shade showing the angulation of the basal line in *ocellatus*, the hind wings have the fulvous basal patch of *populi* (no red colour), and indistinct eye-spots characteristic of *ocellatus*."

S. tiliæ.—From the fifteen pupæ referred to (Entom. xxxvii. 25), I got ten moths in May—two females on the 18th, a male and female on the 20th, a male on the 21st, a male and female on the 22nd, a crippled female on the 23rd, and a male and female on the 24th; four males and six females in all. This moth might more accurately be named the "elm moth," as I found, in agreement with the experience of others, that the larvæ prefer elm to lime.

Arctia caia.—A third brood of imagines (forced) began to appear November 18th, and continue now (February). As in the second brood, which began to emerge on September 4th, the perfect insects were in company with caterpillars of the same brood in every stage of growth. With the exception of a fine female, in which the cream-coloured area of the upper wings is increased, all the moths so far have been typical. The insect does not seem to vary perceptibly in this district, even with forced successive broods. The eggs laid by moths

of the third brood have, in my case, all turned out infertile, although a friend tells me his experience of the same brood has been quite the reverse. I kept my larvæ in cages placed on a warm kitchen shelf by the fireplace, and fed them on dock and groundsel.

(To be continued.)

SOCIETIES.

Entomological Society of London.—*May 3rd*, 1905. — Mr. F. Merrifield, President, in the chair.—Mr. J. Butterworth, B.Sc., was elected a Fellow of the Society. Mr. M. Jacoby exhibited a series of *Xenarthra cervicornis*, Baly, from Ceylon, and drew attention to the curious structure of the antennæ of the male, that of the female being simple.—Mr. G. T. Porritt, specimens of *Tephrosia consonaria*, ab. *nigra*, and melanic examples of *Boarmia consortaria*, all from a wood in West Kent, by Mr. E. Goodwin. These forms were exactly on the same lines as the melanism in West Yorkshire, and it is curious they should occur in such widely separate localities. The two genera, however, are evidently prone to melanism, as Mr. Porritt stated that he had now seen black or almost black specimens of all the British species except *Tephrosia punctulata*.—Commander J. J. Walker (1) two specimens of the very rare Staphylinid, *Medon castaneus*, Grav., taken in the Oxford district during the last week of April, 1905; (2) several examples of both sexes of the giant flea *Hystrichopsylla talpæ*, Curtis, from field-mouse nests in the same district; and (3) the type-specimen of the Bostrichid beetle, *Dinoderus ocellaris*, Steph. (taken by the late Prof. Westwood at "Little Chelsea" previous to 1830), from the Hope Collection at Oxford.—Professor E. B. Poulton, F.R.S., read a note on "Heliotropism in *Pararge* and *Pyrameis*," communicated by Dr. G. B. Longstaff, M.D.—Professor L. C. Miall, F.R.S., communicated a paper on "The Structure and Life History of *Psychoda sexpunctata*, Curtis," by John Alexander Dell, B.Sc.—Dr. D. H. Hutchinson gave an address on "The Three-colour Process as applied to Insect Photography," illustrated by lantern slides of British and Indian Rhopalocera, the exhibits showing a marked advance in excellence upon any yet shown at the Society's meetings. The President, at the close of the proceedings, heartily congratulated Dr. Hutchinson upon the results of his work.—H. Rowland-Brown, M.A., *Hon. Sec.*

South London Entomological and Natural History Society.—*April 13th*.—Mr. Hugh Main, B.Sc., F.E.S., President, in the chair.—Mr. Winkworth, of Burdett Road, E.; Mr. Wright, of Woolwich; and Mr. Penn Gaskill, of Wandsworth Common, were elected members.—Mr. Harrison, living larvæ of *Agrotis ashworthii* from North Wales.—Mr. West, *Lebia cyanocephala* and *L. chlorocephala* from Box Hill.—Mr. Edwards, a number of species of the South American groups of *Papilio*, *Endopoyon*, *Hectorides* and *Parides*.—Mr. Kaye, long series of *Heliconius numata*, showing extensive variations, in the hind wings particularly; and also pairs of *H. sylvana* and *H. noratus* (?); all were from British Guiana.—Mr. Turner, cases of *Cleophora saturatella*

on broom.—Mr. Sich read a paper entitled, "The Spot we stand on," and illustrated it with lantern slides.

April 27th.—The President in the chair.—Mr. Bevins, of Ongar, was elected a member.—Messrs. Harrison and Main exhibited larvæ of *Nemeophila russula* in their last stage; they were from ova laid by a Cheshire female, and were feeding on dandelion. Mr. Cowham had reared a brood in the autumn from spring ova. Mr. Main showed his method of holding a twig with a larva or imago in position for photographing, by means of a compound clamp or test-tube holder and retort stand, such as are used by practical chemists. He also exhibited a ball-and-socket arrangement for fitting on a camera-stand to allow of inclination of the camera in any direction.—Mr. Adkin read a paper on "Belated Emergences," and exhibited various species in illustration. Hy. J. Turner, *Hon. Rep. Sec.*

Lancashire and Cheshire Entomological Society. — The third ordinary meeting was held in the Society's rooms, Royal Institution, Liverpool, on March 20th, Mr. Richard Wilding, Vice-President, in the chair.—Donations to the Library were announced from Messrs. B. H. Crabtree, F.E.S.; H. B. Score, F.R.G.S.; Jas. Fletcher, LL.D., F.L.S., and C. M. Adams, F.I.C. This meeting took the form of a microscopical, lantern, and general exhibitional meeting, and proved to be a most popular and successful innovation, the number of members and their friends present being considerable, and including several ladies. In addition to the various microscopical exhibits of members, ten members of the Liverpool Microscopical Society contributed greatly to the success of the evening by their exhibits, and the Society is much to be congratulated on securing their invaluable co-operation. The first half of the meeting was devoted to the microscopes and general exhibits.—Mr. J. M. Williams's slides included the suckers of *Dytiscus* and the head of the jumping spider, *Salticus tardigradus*; Mr. Garnett showed the "fairy fly," *Anagrus incarnatus*, and the Hessian fly; Mr. F. N. Pierce, the chirping drum and file of the common house-cricket; Mr. D. Whittaker, the strigil of *Corixa geoffroyi* and other slides of Aquatic Hemiptera; Mr. J. E. Turner, head of plumed gnat, and ichneumon flies; Mr. A. H. Dudley, the circulation of protoplasm in *Nitella* and *Elodea*, and a *Cyclops* carrying eggs; Mr. C. M. Adams, the larva, and male and female imagines of the itch-insect, *Sarcoptes scabiei*; Mr. W. T. Haydon, sections showing development of embryo of *Pinus sylvestris*; Mr. E. J. B. Sopp, larva of *Meloë proscarabæus* and spiracles of *Dytiscus marginalis*. Among other interesting slides on view were the tracheal system of silkworm; parasite of mouse, showing its victim's blood in its stomach; wing-case of tiger-beetle; transverse section of caterpillar, showing its last meal, &c. The general exhibits were varied and instructive. The President, Mr. S. J. Capper, sent his well-known educational collections, representing all the orders of insects; Mr. W. A. Tyerman, a series of bred *Selenia illunaria*, and some beautiful moths from Winburg, Orange River Colony; Mr. F. R. Dixon-Nuttall, specimens of the North American Longicorn *Neoclytus erythrocephalus*, found seven inches below the bark of an ash supposed to have grown in the St. Helens district; Dr. W. Bell, preserved larva of *Noctua triangulum*; Mr. Horton, larvæ of *Tro-*

chilium bembeciformis in willow stems; Mr. J. R. le B. Tomlin, a case of exotic *Cetoniidæ* and one of goliath beetles, including *Goliathus druryi*, *G. giganteus*, and *G. cacicus*; Mr. R. S. Bagnall, *Leptura pubescens*, *Sinoxylon anale*, *Chrysobothris chrysostigma*, and a number of other foreign beetles introduced into the Hartlepool district in timber. Mr. Sopp, British burying-beetles, borings of *Hylesinus fraxini* in ash and locusts; Mrs. Sopp, the leaf insect, *Phyllium scythe*; Mr. Whittaker, *Gerris canalium*, from the canal at Marple; Mr. Pierce, a large wasp, probably *Vespa mandarina*, captured by Mr. Wm. Johnson in the district about sixty years ago; Mr. H. R. Sweeting, a model-map of the "Liverpool District," taken from the one-inch ordnance map, revised to 1895, &c. Refreshments were served at 8.30, after which there was an excellent lantern demonstration. Among excellent photographs of insects, by Mr. Henry Ball, Mr. Whittaker, and Mr. Oulton Harrison, one of *Helops striatus*, showing bifurcated antenna, exhibited by Mr. Harrison, was especially interesting.—E. J. B. Sopp and J. R. le B. Tomlin, *Hon. Secretaries.*

Manchester Entomological Society.—*January 4th*, 1905.—The President, Dr. W. E. Hoyle, presided over a large gathering of members on the occasion of the Annual Meeting. A general outline of the work of 1904 was read by the Secretary, and the Treasurer's statement showed a balance in hand of nearly £4. Four friends were nominated for membership. The following officers were elected for 1905:—President, B. H. Crabtree, F.E.S.; Vice-President, R. Tait, Jr.; Hon. Treasurer, W. Buckley; Hon. Secretary, R. J. Wigelsworth; Librarian, C. F. Johnson; Council, J. Ray Hardy, Geo. O. Day, F.E.S., and W. Warren Kinsey. In a brief address the retiring President, after congratulating the Society on its successful career, said a word of warning was necessary. The reading of papers and exhibiting of specimens were good and helpful, but the usefulness of the Society would be impeded if a wider outlook of the insect world was not taken. To do useful work, members must take up other orders of insects besides Lepidoptera, some of the less known groups, read and carefully study them, and ultimately become authorities regarding them. The following exhibits were shown:—Mr. Geo. O. Day, cocoons of *Hemerophila abruptaria*.—Mr. R. Brauer, case containing species of *Argynnis*, from the United States of America.—Mr. L. Krah, Lepidoptera bred from ova obtained from the Continent: *Catocala fraxini*, *C. nupta*, *C. sponsa*, *C. elocata*, and *C. paranymphæa*. The members afterwards attended a demonstration on "Recent Researches in Mimicry," delivered by Dr. W. E. Hoyle.

February 1st.—The President, B. H. Crabtree, F.E.S., presided. The following were elected members of the Society:—Messrs. C. E. Iveson, C. Camp, Herbert M. Leach, and Harold S. Leigh. Mr. W. Warren Kinsey was elected Assistant Secretary, and Dr. W. E. Hoyle was elected to fill the office left vacant on the Council. A paper entitled, "Extracts from an Accentuated List of British Lepidoptera," was read by Geo. O. Day, F.E.S. The pronunciations of the Latin names were based on the authority of a publication by the Entomological Societies of Oxford and Cambridge. Many groups of Lepidoptera were dealt with, and in some cases the original meaning of the names were explained. Messrs. B. H. Crabtree, R. Tait, Jr., L. Krah, and other members commented upon the essay, and at the conclusion

a hearty vote of thanks was passed to Mr. Day. The following exhibits were shown:—Mr. B. H. Crabtree, specimens of *C. plantaginis*, showing var. *hospita*, in which the orange colouring is replaced by white.—Mr. R. Tait, Jr., Lepidoptera bred from ova and larvæ: *Boarmia repandata*, well-marked examples, bred from Welsh larvæ; *Aplecta advena*, two specimens bred in November from forced larvæ; *A. australis*, taken in the Isle of Wight by Dr. Dewar, of Stanley; *Nyssia lapponaria*, bred by Mr. A. E. Cockayne from Rannoch ova.—Mr. J. Ray Hardy, specimens of *Vanessa io* from Grange-over-Sands, fed on nettle and lettuce, showing difference in imago,—wings being in some cases semi-diaphanous, the upper being of a dark purple colour; photograph of the larvæ of *Morpho epistrophis*.—Mr. H. S. Leigh, parasite of *Saturnia pyri* (July, 1904); *Sphinx convolvuli*, in perfect condition, taken near Worsley, Sept., 1904.—Mr. G. Kearey, fifteen species of Coleoptera taken on a small plot of ground near Philips Park, Bradford, near Manchester.

March 1*st*.—In the absence of the President and Vice-President, the chair was occupied by Mr. C. F. Johnson. After the formal business of the meeting, an adjournment was made to another part of the Manchester Museum, when one of the members, Mr. A. E. Thomson, delivered a lecture (to which the public were invited), entitled, "The House Fly" (illustrated by lime-light views). This was enjoyed by an exceedingly good gathering of persons, and at the close was followed by discussion.—Robert J. Wigelsworth, *Hon. Secretary*.

Birmingham Entomological Society.—*March* 20*th*, 1905.—Mr. G. T. Bethune-Baker, President, in the chair.—Sir George Hampson was elected an honorary member of the Society.—Mr. A. H. Martineau showed a specimen of *Zeuzera pyrina*, L., taken at light at Solihull; also an entirely black specimen of *Formica rufa*, L., from Hay Woods.—Mr. S. H. Kenrick, a fine lot of Pyralidæ from New Guinea, including some new and many rare species.—Mr. H. W. Ellis, a specimen of the rare beetle *Platydema dytiscoides*, L., from the New Forest.—Mr. Colbran J. Wainwright, four specimens of *Ptilops nigrita*, Fall., a species of the Tachinidæ new to the British list, which Dr. J. H. Wood had found in various localities in Herefordshire. He said that since receiving Dr. Wood's specimens he had seen one taken by the late Rev. T. A. Marshall near Teignmouth.—Mr. H. W. Ellis, a number of the late John Sang's exquisite colour drawings of insects.—Mr. Gilbert Smith, a specimen of *Callidium violaceum*, with two tibiæ and two tarsi on the left hind leg; the supernumerary tibia left the normal one in about the middle, but was traceable below that; it had normal metatarsi, thickened tarsi, and two claws, so that there were three claws on that leg. He also showed the rare Longicorn *Mesosa nubila* from the New Forest; also a number of an ichneumon found in the refuse stuff of an old tree-trunk infested by *Rhagium bifasciatum* upon which it most likely lived; they were in great numbers, and all huddled together for hybernating.—Colbran J. Wainwright, *Hon. Sec.*

Erratum.—The notice of Prof. Packard, referred to in our last, appeared, not in the 'American Naturalist,' but in the 'American Journal of Science' for March, 1905, p. 264.


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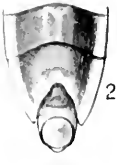
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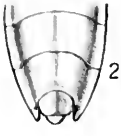
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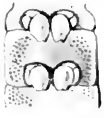
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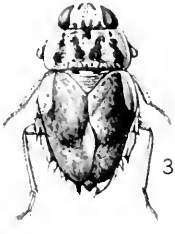
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BRITISH WATERBUGS.

THE ENTOMOLOGIST

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DESCRIPTION OF A NEW SPECIES OF LYGÆIDÆ FROM SOUTH AFRICA.

BY W. L. DISTANT.

SOME time since a Lygæid was sent to me from the Cape Colony which was described as "injurious to peach." Many occupations prevented my identifying it at the time, and I was recently reminded of my obligation by an enquiry from Mr. F. V. Theobald, who had received the species from another African habitat, where it was destructive to "cotton seed." I therefore examined the insect, which appears to be undescribed.

Oxycarenus exitiosus, sp. n.

Black; posterior lobe of pronotum and corium testaceous; a black spot at posterior angle to corium, and the lateral margins to corium sometimes distinctly lutescent; membrane pale grey hyaline; body beneath (imperfectly seen in the carded specimens from which this description is made) black; the abdomen beneath—excluding apex and a central longitudinal medial fascia—sanguineous; posterior angular areas of prosternum testaceous; the coxæ, a central annulation to intermediate tibiæ, and the posterior tibiæ—excluding base and apex—luteous; head and pronotum rugosely punctate, scutellum finely punctate, clavus longitudinally punctate, corium very finely and obscurely punctate; membrane extending beyond the apex of the abdomen; antennæ moderately robust, second joint longest and slender towards base, third and fourth subequal in length, third distinctly narrowed at base; head and pronotum laterally rather longly pilose. Long. 3 to 4 millim.

Hab. Cape Town; Seapoint. "South Africa" (Mansell Weale).

DESCRIPTIONS OF THREE UNDESCRIBED GENERA OF ICHNEUMONIDÆ FROM BORNEO.

By P. Cameron.

ACŒNITINI.

Phalega, gen. nov.

Wings without an areolet; second recurrent nervure received behind the transverse cubitus, widely distant from it; disco-cubital nervure broken by a stump of a nervure, transverse median nervure received beyond transverse basal; transverse median nervure in hind wings broken at the middle. Wings longer than the body. Basal joint of hind tarsi fully longer than the following two united. Parapsidal furrows deep; the mesonotum clearly trilobate. Metanotum with a keel above the apical slope. Petiole stout, three times longer than wide, clearly separated from the second; ovipositor not much longer than the abdomen. Four front claws cleft. The second abdominal segment is wider than long; the hypopygium in the female does not project beyond the tip of the abdomen. Head not much wider than the thorax; apex of clypeus with a small but distinct tubercle in the middle of the apex. Hind coxæ short, about twice longer than wide. Colour uniformly rufous. First joint of flagellum nearly as long as the following two united.

Comes closest to *Collyria* and *Chorischizus*.

Phalega lutea, sp. nov.

Rufous-luteous, the flagellum of antennæ and apex of tibiæ fuscous; the hind tarsi black. Wings bright luteous hyaline, the apex of the fore wings behind and of the hind pair all round, smoky; the nervures and stigma bright luteous. ♀. Length, 12 mm.; ovipositor, 6 mm.

Matang. August (R. Shelford, M.A.).

Face and clypeus strongly and closely punctured; the face roundly projecting in the middle; the clypeus with a tubercle on either side above. Vertex almost smooth. Front deeply excavated in the middle, its centre with a distinct longitudinal keel; the sides punctured. Thorax closely punctured, smooth on the apex of the mesopleuræ and on the base of metapleuræ. Base and apex of metanotum smooth; the middle punctured and with some striæ. Abdomen smooth. Recurrent nervure distant from the transverse cubital by three-fourths of the length of the latter; its front half roundly curved. Hind legs very long; the femora not greatly thickened, but still clearly thicker than the much longer tibiæ.

Dinocryptus, gen. nov.

Areolet large, square, not narrowed in front; transverse median nervure almost interstitial; disco-cubital nervure not broken, the radial cellule elongate; transverse median nervure in hind wings broken below the middle. Wings uniformly fuscous violaceous. Median segment without keels; the apical slope tuberculate on the

sides above; spiracles large, linear. Abdominal petiole stout, becoming gradually slightly wider towards the apex, where it is twice the width of the base; the post-petiole not separated; the spiracles placed close to the middle; those on second placed at the apex of the bssal third. Clypeus clearly separated, its apex in the middle with two short rounded teeth; the sides with a hollowed rounded dilatation. Fore tibiæ thickened, narrowed at the base; basal joint of tarsi longer than all the rest united.

This genus, like *Echthrus*, *Torbda*, &c., is intermediate between the Cryptinæ and the Pimplinæ; from the position of the spiracles on the abdominal segments, they may be placed in the Xoridini. The mesopleuræ, as in the Cryptinæ, are bordered by a furrow; and, as in that group, there are parapsidal furrows. Its affinities are clearly with *Torbda*, Cam., from which it may be known (the coloration being also very different) by the bidentate apex of clypeus, smaller square areolet, tuberculate apex of metanotum, and longer metatarsus. *Echthrus* and *Nyxeophilus* are placed by some authors in the Cryptinæ; by others in the Pimplinæ; probably there will be also a difference of opinion as to the position of *Dinocryptus* and *Torbda*.

Dinocryptus niger, sp. nov.

Black; thorax, base of abdomen and of legs thickly covered with short black pubescence; wings uniformly fuscous violaceous. ♀. Length, 21 mm.; ovipositor, 10 mm.

Kuching. April (R. Shelford, M.A.).

The entire body is closely punctured. Basal part of metanotum slightly carinate in the middle, and slightly depressed on either side of the centre. There is a pale white line in the centre of the orbits on the outer and inner. The second to fifth abdominal segments have transverse impressions near the middle. The last segment is large, depressed at the base; the apex is depressed above, and is thickly covered with long black hair. Antennæ long, slender, the basal two joints of flagellum equal in length.

XORIDINI.

Cœnostoma, gen. nov.

♂. Upper part of clypeus short, obliquely projecting; the lower part longer, not obliquely projecting, obliquely narrowed, the apex transverse. Labrum large, semicircular, fringed with long hair. Mandibles edentate, broad at the base, narrowed towards the apex. Malar space furrowed, as long as the antennal scape. A furrowed keel between the antennæ. Head cubital, temples broad, occiput transverse, margined. Thorax four times longer than wide, largely developed before the wings; mesonotum 3-lobate. Scutellum flat, two large deep foveæ at its base. Post-scutellum stoutly keeled on the sides. Metanotum longer than broad, flat, with the apex rounded, longitudinally reticulated; the spiracles longish oval. Wings without an areolet, the recurrent nervure received beyond the transverse

cubital, the transverse median behind the transverse basal. Radial cellule long, lanceolate. Transverse median nervure in hind wings broken below the middle. Abdomen narrow, as long as the head and thorax united; the first segment long, the basal half narrowed; it is nearly as long as the following three segments united; spiracles placed behind the middle; a triangular depression at its apex; the second and third raised in the middle, the raised part bordered behind by furrows. Hind coxæ about six times longer than thick; the trochanters long; both united are longer than the femora, which are stout; tibiæ long, calcaria short; basal joint of tarsi longer than the others united. Claws simple. Antennæ slender, filiform, longer than the body, narrowed towards the apex. Palpi long. The antennæ are not densely haired; the first abdominal segment is transverse at the apex; the second longer than wide; the head is not dilated behind the eyes; the front tibiæ slender, not inflated. At the apex, laterally, the metanotum projects into blunt teeth. Stigma distinct, linear.

The affinities of this genus may be left over for discussion when the female becomes known. Very probably the female antennæ are broken, as in *Cyanoxorides* and *Spiloxorides*. The hind legs (and especially the coxæ) are much longer than they are with these genera.

Cœnostoma filicornis, sp. nov.

Black; lower part of clypeus, labrum, palpi, the orbits—the hinder broadly—edge of pronotum, scutellum, the metanotal tubercles, and the apices of the abdominal segments—the first band dilated at the sides—the second, third, and fourth in the middle, and the ventral surface, pale yellow. Legs pale yellow, the hind femora fulvous; the apex of hind coxæ, trochanters, apex of femora and of tibiæ more broadly, yellow. Antennæ much longer than the body, fuscous, a broad white band before the middle. Wings hyaline, the stigma and nervures black, the former white at the base. ♂. Length, 13 mm.

Kuching. November (R. Shelford, M.A.).

Antennæ towards the apex covered with depressed hairs. Face punctured and more or less striated; the rest smooth and shining. Middle lobe of mesonotum transversely striated; the depressed apical middle part with three longitudinal keels. There are five rows of irregular, longish longitudinal reticulations; the apical slope with three areæ, of which the central is the larger. Pro- and mesopleuræ smooth, the metapleuræ coarsely reticulated. Base of first abdominal segment smooth, bicarinate in the middle, the rest closely reticulated; the white apical part obscurely striated laterally, the centre smooth; the basal part of the second segment punctured, strongly, but not closely, the basal central furrow stoutly, transversely striated, the raised central part longer than its width at the apex, triangular; that on the third shorter, broader, rounded at the narrowed base.

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

By G. W. Kirkaldy, F.E.S.

(Plate II.)

(Continued from vol. xxxiii. p. 152.)

Since publishing the last instalment of this "Guide," Mr. Halbert informs me that a dead *Aphelocheirus* was taken by Mr. Buckle from Loch Neagh in Ireland. I presume this was recorded in the 'Irish Naturalist' at the time, but I have unfortunately no access to this journal.

Ilyocoris cimicoides (Linné).

In *Ilyocoris* the same general appearance obtains as in *Aphelocheirus*, but the dorsal part of the head is bent under in front, the antennæ shortened and thickened, the anterior femora greatly thickened, and the posterior tibiæ and tarsi somewhat modified for natatory purposes.

The rostrum is considerably shortened, not extending beyond the anterior coxæ. The antennæ are composed of four segments, and do not reach, when extended, beyond the lateral margins of the head; the head is excavated [viewed from below] beneath the apical segments of the antennæ, forming what is probably an auditory chamber for the intensifying of sounds.*

The anterior femora are greatly thickened, as mentioned above, but are *not* suddenly ampliated in a right angle at the base beneath and then narrowed. Also internally beneath there is a broad pad of hair the whole length (fig. 45).

There is only one British species, *I. cimicoides* (Linn.); the head, pronotum, scutellum, connexivum, legs, under side, &c., are pale greenish testaceous; the head, pronotum, &c., irregularly punctured with brown. The intermediate and posterior legs are well furnished with brown spines. The elytra dark greyish brown, very closely and finely punctured. Abdomen black above.

It is excellently figured by Douglas and Scott, and also very well by the old author A. J. Rösel von Rosenhof ('Der Monatlich-

* I have noted in the 'Entomologist' (xxxii. p. 114) that *Microvelia pygmæa* does not use the antennæ as tactile organs. Newport ("On the Use of the Antennæ in Insects," 1840, Trans. Ent. Soc. Lond. ii. p. 235), however, considers that the antennæ in water cimices (i. e. *Ilyocoris*) and *Notonecta* are auditory, sometimes also tactile, certainly not smell organs. They are of great though not of vital importance. He frequently observed the above-named bugs sticking to the sides, and lying beneath the wall of an outhouse that had recently been covered with coal-tar, which emits an odour of carburetted hydrogen, the gas that is so abundantly formed in stagnant pools.

herausgegebenen Insecten-Belüstigung,' iii. pl. 28 (1755)) under the name of the "broad-bodied black-brown waterbug."*

It is generally common and widely distributed all over England, and the lowland parts of Scotland. It is the *Nepa cimicoides* of Linnæus, the *Nepa naucoris* of De Geer, and the *Naucoris cimicoides* of most authors.

It is a somewhat lazy swimmer, though it can attain to a very considerable speed upon occasion, and it often takes to wing at night. It is very voracious, and, though generally vanquished by the more powerful *Notonecta*, it is sometimes even the victor. The imagines hibernate, and the ova are deposited at the end of March or during April on leaves of water-plants; they are whitish, oblong, subcylindrical, obliquely truncate anteriorly. They have been described at length by Rathke ("Studien zur Entwicklungsgeschichte der Insekten," 1861, 'Stettiner Ent. Zeitung,' xxii. pp. 172–4), who, however, gives July as the month of deposition, and says that they are laid in somewhat great numbers near one another on the under side of the leaves of *Polygonum amphibium*.

The method of oviposition seems to vary. Régimbart (1875, Ann. Soc. Ent. France, pp. 204–6) states that an incision is made in the stems of plants with the ovipositor, about 2 or 3 mm. long, and that the egg is enclosed about three-quarters of its length; one of the ends (corresponding to the cephalic extremity of the embryo) is almost entirely free. Bueno, however, states that in *Pelocoris* the "majority have been found attached axially to the stems or leaves of *Ceratophyllum*, and secured to them by a glue in which the ovum is set, and which surrounds the slender stem or leaf to a variable extent. The adhesion is not very firm, however, and the ova are readily detached." This corresponds to my own observations on *Ilyocoris*, as well as those of Dufour. I have also observed varying conditions in *Notonecta*.

The nymphs, which Rathke states feed on Confervæ, are very similar in all stages to the imago, the tarsi, however, being unjointed, and the lateral margins of the abdominal segments not produced spinosely. I have observed five nymphal instars, thus agreeing with Bueno, who states that there are five in the allied *Pelocoris femorata*, an American bug which he has discussed recently ("Brief Notes towards the Life-history of *Pelocoris femorata*, Pal. B., with a few Remarks on Habits," 1903, Journ. New York Ent. Soc. xi. pp. 166–73, text-figs. 1–2). Bueno gives a total of about seventy-seven days for the metamorphoses, twenty-four of these being in the egg-state.†

* It was also discussed by an old "pre-Linnean" author under the name of *Pygolampis lacustris*! (Johann von Muralto, 1684, 'Ephemeræ Acad. Nat. Curios, Dec. ii. Ann. ii. Obs. 80, p. 197').

† Extensive researches have recently been made by R. Heymons on the

Ilyocoris, like most waterbugs, is subject to the attacks of watermites (family Hydrachnidæ). After what d'Herculais terms a "bizarre copulation," the eggs are laid in spring in incisions in soft-stemmed aquatic plants, or on the under side of the leaves. The young larva is pale red, six-legged, each leg composed of six segments. These young larvæ, upon hatching, move about in the water, and fasten themselves, often in large numbers, to different water insects by means of sharp hooks at the end of the palpi. Once fixed, the head and mouth-parts stretch until they become separated by a neck from the main body, the transparent skin of which rapidly swells and elongates so as to form a bag, with the more solid dark-red parts visible anteriorly. The elongated maxillæ penetrate and extend beneath the chitinous covering of the host until they form a long pointed thread. The legs curl up, become useless, and are more or less withdrawn. The larva gradually passes to the pupa state within this bag, which becomes more and more swollen and rounded posteriorly, and finally bursts to release the adult eight-legged mite. These bag-like larvæ were looked upon as the eggs of the waterbugs by many old authors, and the bugs were likened to the Surinam toad (*Pipa pipa* (Linn.)), that hatches its eggs on the skin of its own back. The adult swims actively about in the water, but before attaining maturity fixes to some plant, and undergoes another moult without material change of form. On the smaller aquatic bugs only three or four larvæ are perhaps seen, but on certain giant exotics a much greater number are found, as many as five hundred having been counted on a single specimen of *Belostoma fluminea*, Say. The commonest British species appear to be *Hydrachna geographica*, Koch, the imago of which is scarlet and black, and *Hydrochoreutes globulus* (Müll.), a rich purple in the imago state. The American species mentioned above was described as *Hydrachna belostomæ*, Riley; Mr. A. D. Michael examined for me some larval Hydrachnids on a Sinhalese waterbug (*Amorgius indica*) about four years ago, and considered them probably the same as the American form. He concluded: "The watermites, when parasitic, do not usually confine themselves to a single host, but are often found on several species; and the geographical distribution of *Acari* is usually very wide, often astonishingly so." *

embryology and anatomy of *Ilyocoris* (see "Beiträge zur Morphologie und Entwicklungsgeschichte der Rhynchoten," 1899, in Nova Acta Leop. Carol. Deutsch. Akad. lxxiv. pp. 355–81, text-figs. ii., and pl. xv. figs. 1, 4, 9, pl. xvi. figs. 15–17, 21–22, pl. xvii. figs. 29.

* Note by G. W. Kirkaldy in E. E. Green, "Biologic Notes on some Ceylonese Rhynchota.—No. 1," 'Entomologist,' xxxiv. p. 116 (1901). See also U.S. Entom. Commission, First Report (1878), p. 313; Künckel d'Herculais, "Les Insectes" in Brehm's 'Merveilles de la Nature,' ii. pp. 757–8 (1883); and Andrew Murray, 'Economic Entomology. Aptera,' pp. 151–2. Mr. J. N. Halbert, of Dublin, is studying the British Hydrachnidæ, and would be glad of material.

The power of stridulation, so marked a characteristic of certain groups of Dermaptera, and present indeed in most if not all insect orders, occurs also in many Hemiptera, and apparently in all or most waterbugs. The phenomenon, however, still requires considerable investigation.

Stridulation, or the making of certain "musical" sounds, is a term that should apparently be restricted to sounds resultant from two mutually developed interacting surfaces, one of which is the recipient and is usually striated, the other the acting agent and sometimes striated, sometimes consisting of a series of more or less isolated spines or pegs. It may be taken for granted that there must always be *two* specially developed parts of the stridulatory organ, and that these must be interacting and mutually developed. A violin with its bow is a good example (from an insect point of view) of stridulatory apparatus.

The first to call attention to the phenomenon in waterbugs was J. L. Frisch,* who remarks that this species produces with its neck a fiddling noise like the Longicorn beetles. Swinton,† a century and a half later, described the results of his investigations, and declared that he had detected minute *f*-shaped limæ, thickly set with striæ, on the antero-lateral angles of the mesonotum. Handlirsch ‡ reinvestigated the whole subject four or five years ago, and ridiculed Swinton, calling the imaginary limæ a "Swintonophone." At the same time, however, Handlirsch discovered on the sixth and seventh abdominal tergites of the male numerous transverse striations which are not present in the female. If these are part of a stridulatory apparatus, the other portion and also the *modus operandi* remain as obscure as in the case of the Corixid strigil, presently to be discussed.

It is usually stated that no openings have yet been discovered to the stink-glands in aquatic Hemiptera, the odour appearing in these insects to be connected with the anal parts.

In *Ilyocoris* this is distinctly tart, and I have discovered a minute single opening (between the posterior coxæ), to which I will recur later on.§

Naucoris maculata, Fabricius.

The claim of this common European bug to admission to the British lists rests upon a single specimen in Buchanan White's collection at the Perth Museum, labelled "England." There is

* 1727, "Beschreibung von allerley Insecten in Teutschland," vi. p. 32.

† 1877, "On Stridulation in the Hemiptera-Heteroptera" (Ent. Mo. Mag. xiv. pp. 29–31, 2 figs.; and 1880, "Insect Variety," pp. 108 and 203).

‡ 1900, "Neue Beiträge zur Kenntniss der Stridulationsorgane bei den Rhynchoten" (Verh. Zool. bot. Ges. Wien, l. pp. 555–60, figs. 1–7).

§ Leidy (1847, J. Ac. Sci. Philadelphia, n. s. i. 64, mentions a similar opening in the Belostomatidæ.

no reason, apparently, why it should not occur with us, as it is very common in France as near as Paris, and also in Belgium. I have taken it plentifully in South Brittany. As it is a possible British inhabitant, it is now described and figured (fig. 35). It is smaller than *Ilyocoris cimicoides*, greenish testaceous, marked with brown. The pronotum is marked with a distinct, inverted, brown W. The tibiæ are longer, less robust, and not so spinose as in the common species. The most marked difference, however, lies in the anterior femora, which are very greatly thickened, and suddenly ampliated in a right angle at the base beneath, then narrowed (fig. 36); the pad of hair on the femora is also much smaller, and occurs only near the base. The species, unlike *I. cimicoides*, is dimorphic. While *I. cimicoides* varies from 12–16 millimetres in length, *N. maculata* averages about 10. The brachypterous form was described as a distinct species by Dufour under the name of *Naucoris aptera*.

This bug is the type of the genus, and was described originally by Geoffroy (1762, 'Histoire abrégée des Insectes de Paris,' p. 473, pl. ix. f. 5) as *Naucoris cimicoides*, under the impression that it was Linné's species. There is also a coloured figure in Herrich-Schäffer's 'Wanzenartigen Insecten,' ix. pl. ccxciii. f. 899, and detail F. E. D. (1849). It is said by Léon Dufour* to lay its eggs at the end of April in a similar situation to those of *Ilyocoris*. They are obtuse oval, not truncate. Dufour, in the same work, gives much information on the digestive apparatus, sexual glands, &c., of both these genera.

Explanation of Plate II.†

FIG.

15. *Gerris canalium*, ♂, apical abdominal sternites.
16. ,, ,, ♀, ,, ,, ,,
17. *G. naias*, ♂, ,, ,, ,,
18. ,, ♀, ,, ,, ,,
19. *G. rufoscutellata*, ♂, ,, ,, ,,
20. ,, ♀, ,, ,, ,,
21. *G. lateralis*, ♂, ,, ,, ,,
22. *G. thoracica*, ♂, ,, ,, ,,
23. ,, ♀, ,, ,, ,,
24. *G. costæ*, ♂, ,, ,, ,,
25. *G. gibbifera*, ♂, ,, ,, ,,
26. *G. lacustris*, ♀, ,, ,, ,,
27. *G. odontogaster*, ♂, apical abdominal segments, viewed from the side.
28. ,, ♀, apical abdominal sternites.
29. *Ilyocoris cimicoides*, showing articulation of anterior legs.
30. *Notonecta glauca*, ,, ,, ,, ,, ,,

* "Recherches Anatomiques sur les Hémiptères," 1833, Mém. Savans-étrangers Acad. Roy. Sci. France, iv. pp. 349. 413, &c., pl. xvi. figs. 180–2.

† This plate includes "Pl. iii.," mentioned in vol. xxxii. pp. 202–3 (1899). (Figs. 33, 37–44 are omitted.)

34. *Aphelocheirus montandoni*, anterior legs.
32. ,, ,, rostrum, &c.
31. ,, ,, ,, in profile.
35. *Naucoris maculata.*
36. ,, ,, anterior legs.
45. *Ilyocoris cimicoides*, ,, ,,

(To be continued.)

DRAGONFLY SEASON OF 1904.

By W. J. Lucas, B.A., F.E.S.

Little of fresh interest has to be recorded in connection with the dragonfly season of 1904. No new species was discovered, and all the critical species, which were known to be really British, but about whose status there was uncertainty, had before this season been re-established.

On April 24th, in the New Forest, I met with the first specimen, an Agrionid, which flew by out of reach; the next day I took three *Pyrrhosoma nymphula*. This early promise, however, was not kept up. The next species seen was *Enallagma cyathigerum*, in small numbers at the Black Pond on Esher Common, and at the same time and place, one of a larger species, probably *Libellula quadrimaculata*, was sighted. On May 29th a male *Agrion puella* was taken near Ashtead. By June 4th this species was plentiful on Bookham Common, where also a larger dragonfly, probably *Libellula depressa*, was seen. The next day, June 5th, *L. quadrimaculata*, *A. puella*, *E. cyathigerum*, and *P. nymphula* were out at the Black Pond, and *Pyrrhosoma tenellum* was apparently just appearing. Till near the beginning of June, therefore, it could scarcely be said that the dragonfly season had commenced in earnest.

At the Black Pond, on June 5th, I found a nymph of *L. quadrimaculata*, from which the imago had just commenced to emerge. It happened to be near the bank, and, though it was tedious and tiring to stoop and watch the process, I stayed till emergence was complete. The nymph was discovered about 11 a.m., and by 11.40 the imago had completely emerged. Out of this time the "rest," with head hanging vertically downwards, lasted nearly or quite half an hour. The "spring-back" was quite sudden, the abdomen being pulled out of the nymph-skin almost immediately afterwards. While hanging at "rest" the lower lip seemed to expand. When an emerging dragonfly hangs head downwards, does it do so to allow of the filling out and expanding of the fore parts?

On June 19th a visit was paid to Frensham Ponds, in Surrey, to test its dragonfly fauna, but unfortunately the day was generally dull and unsuitable. Numbers of *E. cyathigerum* were

found, one *Ischnura elegans*, and one teneral male *Orthetrum cancellatum*. The day was not wasted, however, for a few nymph-skins of the last were discovered, and, as these were little known previously—scarcely at all in Britain—they were at least of equal value with the rather scarce imagines of the same species.

At or near the Black Pond, on June 22nd, one or two *Anax imperator* and one *Cordulia ænea* were seen ; this was the only *C. ænea* that I noted during the season. On June 26th, on Esher Common, I caught a male of *L. depressa*, a species of which I met with very few during 1904. On the same day *Pyrrhosoma tenellum* was very numerous at the Black Pond. There also, on July 16th, I took a very nice var. *prænubila* of *L. quadrimaculata*.

Mr. G. T. Porritt again visited the Norfolk Broads in search of *Æschna isosceles*, and the other good dragonflies to be found there in early summer. He met with fair success as regards *isosceles*, and, writing on June 25th, said that he had taken one hawking on land, as *Æ. cyanea* does, when it was nearly dark.

On July 23rd a visit was paid to the Basingstoke Canal, near Byfleet Station, when the species found were the usual ones for that part of the season, though some that should have been there were absent or unnoticed. There were present *Æschna grandis*, *Calopteryx splendens*, *Platycnemis pennipes*, *Erythromma naias*, *Ischnura elegans* and its var. *rufescens*, *Agrion pulchellum*, and *Enallagma cyathigerum*.

Some weeks spent in the New Forest revealed little new there. A worn female *Orthetrum cancellatum* was taken on August 1st, and a female *Æschna juncea* on August 9th. A *Calopteryx virgo* was seen as late as September 3rd. On September 2nd *Cordulegaster annulatus* was seen on the wing at Becton Bunny, on the coast, and a female *Æschna cyanea* was caught at Milton.

Wisley Ponds, in Surrey, were visited on September 10th. *Lestes sponsa*, a few Æschnas, and *Sympetrum striolatum* were found at the smaller pond, but none of the better species of *Sympetrum* were met with. There was, however, very little sun.

On September 18th an *Æschna juncea* was taken at the Black Pond, where for one or two seasons this species had been seen by me very seldom, if at all.

Mr. F. B. Browne was good enough to give me a female specimen of *Agrion armatum* from the Broads. Of the species he took about ten specimens in the spring, one only being a male.

My last record for the season was *Sympetrum scoticum* and *S. striolatum*, at the Black Pond, on October 9th. The latter, however, probably continued well into November, and not improbably the former may have lasted almost as long.

A LIST OF THE "MACRO-LEPIDOPTERA" OF LANCASTER AND DISTRICT.

By C. H. Forsythe.

(Continued from p. 160.)

Cucullia umbratica.—A few examples in most seasons in June. This species is generally distributed, but nowhere common.

Gonoptera libatrix.—Comes to sugar in September in County Asylum grounds, Grimshaw Lane, Halton, Quernmore, &c.

Abrostola tripartita (*urticæ*).—Comes to sugar and privet-bloom in July; Arnside, Witherslack, Methop, and Lancaster (generally).

A. triplasia.—Not plentiful; comes to sugar and bloom in August, and is generally distributed throughout the district.

Plusia chrysitis.—Common about Methop and Witherslack, less so at Arnside and Hest Bank, not common about Lancaster, in July.

P. festucæ.—Scarce and local; near Heysham in September. "I used to take the larvæ and pupæ of this species commonly near Heysham some years ago" (G. L.).

P. iota.—Odd specimens come to bloom in June and July; nowhere common, but generally distributed.

P. pulchrina.—Comes to cultivated flowers at dusk in late June in the County Asylum grounds, and I have also taken examples near Halton, Quernmore, Arnside, Witherslack, Methop, &c.

P. gamma.—Comes freely to bloom in August and September, and I have seen worn (hybernated) examples in early June. It is common and generally distributed.

P. interrogationis.—Local; I have only taken this species on the moors near Clougha Pike in June.

Anarta myrtilli.—Common on all the moors and mosses, as at Clougha, Witherslack, Methop, &c., in June, July, and August.

Heliaca tenebrata (*arbuti*).—Local; near Hornby, Deep Cutting Bridge, and between Torrisholm and the river Lune. The imago appears in May.

Phytometra viridaria (*ænea*).—Local, but common near Clougha in June, occasionally at Arnside, Witherslack, &c.

Euclidia mi.—Generally distributed; common near Clougha in June; I have found the larvæ feeding upon yellow melilot (*Trifolium procumbens*) in August.

E. glyphica.—Local; near Carnforth and Galgate on the L. & N. W. Railway batters. The larvæ feed upon *Trifolium repens* (Dutch or white clover). The moth flies in the sunshine in late May and June.

Rivula sericealis.—Occurs at Witherslack in early July.

Zanclognatha grisealis.—Fairly common near Clougha, Blea Tarn, Arnside, and in the County Asylum grounds in June and July.

Z. tarsipennalis.—Uncommon; at Arnside, Heysham, and County Asylum grounds in June and July.

Hypena proboscidalis.—Common in most of the lanes among nettles (*Urtica dioica*) in July.

Tholomiges turfosalis.—Local; I have only taken specimens near Clougha in July.

Brephos parthenias.—I have only bred specimens from Witherslack larvæ. "Common on Methop and Witherslack Mosses in March and early April" (G. L.).

GEOMETRIDÆ.

Urapteryx sambucaria.—Common and generally distributed in July and August.

Epione apiciaria.—I took a specimen in the County Asylum grounds in July, 1900; at Witherslack it is local, and not uncommon in one locality near Methop. The moth flies late at night at the end of July and beginning of August.

Rumia luteolata (*cratægata*).—Abundant everywhere throughout the summer months.

Venilia maculata (*maculata*).—Fairly common near Carnforth on the L. & N. W. Railway batters. The moth flies in June.

Metrocampa margaritaria.—Fairly common in Grimshaw Lane, County Asylum grounds, Blea Tarn, &c., in July. Abundant in Arnside.

Ellopia prosapiaria (*fasciaria*).—Common at Arnside in July.

Eurymene dolabraria.—Local and uncommon; Corporation Wood, Quernmore, County Asylum grounds, Arnside, and Witherslack, in June.

Hygrochroa (*Pericallia*) *syringaria.*—"Local, near Hornby in July" (G. L.).

Selenia bilunaria (*illunaria*).—Fairly common and generally distributed in April and July.

S. lunaria.—A male specimen taken at Warton, near Carnforth, on June 8th, 1905.

Odontopera bidentata.—Common in Grimshaw Lane, Corporation Wood, County Asylum grounds, Blea Tarn, &c., in May.

Crocallis elinguaria.—Common and generally distributed in July and August.

Ennomos (*Eugonia*) *alniaria* (*tiliaria*). — Comes freely to light in August, and is common about Quernmore, Blea Tarn, &c.

E. quercinaria (*angularia*).—Occurs about Methop and Witherslack in September and October.

Himera pennaria.—Comes freely to light in September and October at Blea Tarn, Quernmore, County Asylum grounds, &c. This species is subject to considerable variation—from light brown to rich rufous red, in colour, and some specimens are strongly suffused with black scales.

Phigalia pedaria (*pilosaria*).—Common in Corporation Wood, Quernmore, County Asylum grounds, Blea Tarn, &c., on the tree-trunks in March; also comes freely to the street-lamps. We get a fine dark unicolorous grey variety of this species in the first-named locality.

Amphidasys strataria (*prodromaria*).—Uncommon; I have bred examples from Methop larvæ taken in July. "It occurs sparingly in Corporation Wood, Quernmore" (G. L.).

A. betularia.—I have bred both the type and var. *doubledayaria* from Methop and Witherslack larvæ taken from birch in September. I have only taken specimens on the wing near Lancaster on three occasions—near Rush-a-lee in June—and these have all been the black variety.

Hemerophila abruptaria.—Comes to light in May in several localities in the district, but nowhere plentiful.

Boarmia repandata.—Occurs in June and July at Arnside, Methop, near Clougha, Corporation Wood, &c.

B. gemmaria (*rhomboidaria*).—Common throughout the district in June and July.

B. roboraria.—Local and scarce. "Corporation and Quernmore Woods in June" (G. L.).

B. consortaria.—Local and scarce. "Corporation and Quernmore Woods in June" (G. L.).

Tephrosia consonaria.—Local. Witherslack and Quernmore at the end of May. The imagine may be found sitting on the fir-tree trunks.

T. crepuscularia.—Corporation Wood and near Methop in April.

T. biundularia.—I have bred some fine dark forms of this species from Methop larvæ beaten from birch and oak-trees in June. "Corporation Wood in April" (G. L.).

Gnophos obscuraria.—Local; at Methop and Witherslack in July.

Cabera pusaria.—Plentiful everywhere in July and August.

C. exanthemaria.—Occurs abundantly in nearly every locality in July and August.

Bapta temerata.—Fairly common at Arnside (on the Knott), Witherslack, Methop, &c., in June.

Macaria notata.—Local; this species occurs at Arnside in June, but is not common.

M. liturata.—Fairly common in the fir-woods at Arnside, Grange, and Methop in July.

Halia vauaria (*wavaria*).—Generally distributed, and common in July.

Strenia clathrata.—Local; near Warton, on the L. & N.W. Railway batters, in May and early June.

Penagra petraria.—Common at Clougha, Quernmore, &c., in June.

Numeria pulveraria.—Not common; occurs at Arnside, Methop, and Witherslack in April and May.

Scodiona belgiaria.—Fairly common at Witherslack; less so and very local near Clougha in June.

Selidosema ericetaria (*plumaria*).—Fairly common on the Witherslack mosses in July.

Ematurga atomaria.—Abundant on the mosses at Witherslack, Methop, Heysham, &c., and on the moors at Clougha and Quernmore from May to August.

Bupalus piniaria.—Common at Grange, Methop, Arnside, and Quernmore, in the fir-woods in June. Our form has a white ground colour.

Perconia (*Aspilates*) *strigillaria*.—Plentiful on Methop and Witherslack Mosses; less common at Heysham in June.

Abraxas grossulariata.—Abundant everywhere in lanes and gardens in July and August. This species is subject to great variation; I have forms bred from larvæ found near Warton on blackthorn (*Prunus spinosa*) which are very dark, with coalesced spots, and others from Grimshaw Lane, very light with few spots.

A. sylvata (*ulmata*).—Local; near Halton and Methop and about Yealand. The moth is on the wing in June and July.

Lomaspilis marginata.—Generally distributed and fairly common throughout the district in June and July.

Hybernia rupicapraria.—Abundant about hedgerows in February and March.

H. leucophæaria.—Fairly common in Aqueduct Wood, Quernmore, near Clougha, Blea Tarn, &c., in February and March.

H. aurantiaria. — Generally distributed; Arnside, Witherslack, Clougha, County Asylum grounds, &c., in late October.

H. marginaria (*progemmaria*). — Generally distributed and very common; comes to light freely in February and March.

H. defoliaria.—Fairly plentiful and generally distributed in October.

Anisopteryx æscularia.—Local; Aqueduct Wood and near Clougha in April.

Cheimatobia brumata.—Plentiful about hedgerows, and comes freely to light in October, November, and December.

C. boreata.—Generally distributed, and comes freely to light in November.

Oporabia dilutata.—Generally distributed, and common everywhere, end of October.

O. filigrammaria.—Uncommon. I have only taken this species on the moors near Clougha in August.

Larentia didymata.—Abundant in Grimshaw Lane, County Asylum grounds, Clougha, &c., in July.

L. multistrigaria.—Not common; near Blea Tarn, Clougha, Rush-a-lee, &c., in April and May.

L. cæsiata.—Abundant on the rocks about Clougha in July.

L. flavicinctata.—I have only taken this species about Clougha—where it is scarce—in July.

L. salicata.—Generally distributed; Silverdale, Blea Tarn, Clougha, &c., in August.

L. olivata.—Fairly common at Witherslack and Arnside; not common near Clougha in July.

L. viridaria (*pectinitaria*).—Generally distributed and common in July.

Emmelesia affinitata (*rivulata*).—Fairly common about Lancaster, Blea Tarn, Arnside, Witherslack, &c., in July.

E. alchemillata.—Local; near the County Asylum and at Witherslack in July.

E. albulata.—Fairly common; Clougha, Grimshaw Lane, &c., in June.

E. decolorata.—Fairly common and generally distributed in June.

E. tæniata.—Local; near Arnside and Silverdale in early July.

Tephroclystia (*Eupithecia*) *venosata.*—Uncommon; near Witherslack and at Arnside in June.

T. (*E.*) *linariata.*—Local; near Witherslack in June.

T. (*E.*) *pulchellata.*—Occasionally in Grimshaw Lane, at Arnside and Silverdale in June.

T. (*E.*) *castigata.*—Fairly common at Witherslack and near Methop Bank in July.

T. (*E.*) *virgaureata.*—Not common; occasionally near Methop in early June.

T. (*E.*) *constrictata.*—Local at Witherslack in early July.

T. (*E.*) *nanata*.—Fairly common at Clougha, Quernmore, &c., in May and June.

T. (*E.*) *vulgata*.—Fairly common near Clougha, Grimshaw Lane, &c., in June.

T. (*E.*) *minutata*.—Common near Clougha, Witherslack, &c., in June.

T. (*E.*) *abbreviata*.—I have only bred this species from larvæ beaten from oak near Clougha in June. The moth appears in April.

T (*E.*) *exiguata*.—Common about hedgerows of whitethorn in June.

T. (*E.*) *sobrinata*.—Common at Warton, Witherslack, and Arnside about juniper (*Juniperus communis*) in July.

Chloroclystis (*E.*) *rectangulata*.—Common at Witherslack, County Asylum grounds, &c. The larvæ feed in the buds of pear and apple-trees in May; the moth appears in June.

Lobophora carpinata (*lobulata*).—Common in Corporation Wood, Quernmore, in April.

L. polycommata.—Local, I have only taken this species near Methop in May.

Thera juniperata.—Local. "Near Warton about junipers in October" (G. L.)

T. simulata.—Arnside in August.

T. variata—Local. I have only taken this species in a fir-wood near Quernmore in late May and early June.

Hypsipetes sordidata (*elutata*).—Abundant everywhere; very variable in colour and markings. Some of the moorland forms—from near Clougha—are very beautiful.

Melanthia bicolorata (*rubiginata*). — Local. I have only taken specimens in the County Asylum grounds in July.

M. ocellata.—Generally distributed throughout the district in July.

M. albicillata.—Common near Warton; less so at Witherslack, Lancaster, and Halton, in late June.

Melanippe hastata.—"Scarce at Witherslack in June" (G. L.)

M. tristata.—Local, but common near Clougha in June.

M. sociata (*subtristata*). — Abundant everywhere in May and July.

M. montanata.—Abundant throughout the district in June and July.

M. galiata.—I took this species in June, 1904, for the first time, in Grimshaw Lane; probably overlooked previously for *montanata*.

M. fluctuata,—Abundant on walls, &c., in July and August.

Anticlea badiata.—Fairly common in the County Asylum grounds, near Blea Tarn, Quernmore. &c., in May.

A. nigrofasciaria.—Not common: Arnside, Witherslack, Lancaster, in April.

Coremia designata.—Uncommon; Quernmore, Witherslack, &c., in July.

C. ferrugata.—Common everywhere in May and August.

C. unidentaria.—Less common than the preceding species; Blea Tarn, Quernmore, County Asylum grounds, &c., in August,

Camptogramma bilineata.—Abundant at Heysham, Arnside, Halton, &c., in July. This species shows considerable variation.

Phibalapteryx vitalbata.—Local; at Witherslack and near Methop in July and August.

Triphosa dubitata.—Common at Witherslack and Lower Kellet; comes freely to ragwort flowers in August and September.

Eucosmia undulata.—Local; I have only bred this species from Methop and Witherslack larvæ taken in September. The moth appears in June.

Cidaria siderata (*psittacata*).—Not common. "Witherslack and Methop in October. This species comes to ivy-bloom" (G. L.)

C. miata.—"Not plentiful in Witherslack in October at ivy-bloom" (G. L.)

C. corylata.—I have bred this species from larvæ beaten from blackthorn (*Prunus spinosa*) in Grimshaw Lane. Fairly common at Witherslack in June.

C. truncata (*russata*).—Fairly common about hedgerows in Grimshaw Lane, Rush-a-lee, Halton, Arnside, &c., in August.

(To be continued.)

NOTES AND OBSERVATIONS.

Exotic Earwigs Wanted.—I am preparing a revision and monograph of the Dermaptera or Forficularia of the world, and would very gladly receive any material for examination, especially from Australia, China, and Central and South Africa.—Malcolm Burr; 23, Blomfield Court, Maida Vale, W., June 24th, 1905.

Ova of Butterflies Wanted.—I should be greatly obliged to anyone who would kindly give or lend me the ovum of any of our butterflies, except those mentioned below, for the purpose of figuring. Micro-photographs, or ordinary photographs if the object is clear and well-defined, would be useful. Species of which the ovum has been figured:—*Euchloë cardamines*, *Gonepteryx rhamni*, *Argynnis euphrosyne*, *Vanessa urticæ*, *Pararge egeria*, *P. megæra*, *Cœnonympha pamphilus*, *Callophrys* (*Thecla*) *rubi*, *Chrysophanus phlæas*, *Lycæna icarus*, *L. bellargus*, *Hesperia malvæ*, *Thanaos tages*.—Richard South; 96, Drakefield Road, Upper Tooting, S.W.

Note on Zanclognatha grisealis.—Barrett (vol. vi. p. 300) throws doubt on a remark of Buckler to the effect that *Z. grisealis* passes the winter in the pupal state. I beat three or four larvæ of this species from oak in August last; they all pupated in September, and emerged end of May to June.—H. V. Plum; Epsom College, June 7th, 1905.

Larva of Thecla rubi on Dogwood.—Early in July last I beat from dogwood some half-dozen larvæ of what I thought at the time were *Lycæna argiolus*; they fed well on the berries, quite ignoring the leaves; in due course they pupated, and last month produced fine specimens of *Thecla rubi*. Is not this an unrecorded food-plant for this species?—E. C. Joy; 34, Fairholt Road, Stoke Newington, N.

Aberration of Euchelia jacobææ. — At Warton, on June 8th, I boxed a fine aberration of *Euchelia jacobææ*. The specimen, which is a female, has the fore wings rosy red, with a shaded black central band. The left fore wing is slightly rubbed, otherwise the example is in fine condition. She had deposited a batch of ova when I reached home at night.—C. H. Forsythe; The County Asylum, Lancaster.

CAPTURES AND FIELD REPORTS.

Deilephila livornica in Gloucester, 1905.—Last year I reported the capture of one specimen of this species, which was subsequently notified from many other localities widely separated. This year I was shown another specimen caught in the yard of some ironworks here by one of the workmen, and given to a friend of mine. I notice in the current number of the 'Entomologist' that the species has already been noticed from other districts again, so that it appears likely that *D. livornica* may become firmly established with us.—A. Lionel Clarke; Gloucester, June 1st, 1905.

Cerura bicuspis in Lancashire.—At Haverthwaite Moss, on June 9th, I took a male specimen of *Cerura bicuspis* at rest on a birch twig. It was in the finest condition. — C. H. Forsythe; The County Asylum, Lancaster.

Selenia lunaria in the Lancaster District. — While collecting at Warton, near Carnforth, on June 8th, I took a male example of *Selenia lunaria*. This species is new to me in this district.—C. H. Forsythe; The County Asylum, Lancaster.

Notes from Australia.—I have recently spent a short holiday in Southern Queensland after insects, and doubtless some short account would be of interest to readers of the 'Entomologist.' Leaving Wellington on Dec. 24th, 1904, by the s.s. 'Wimmera,' we had a pleasant run across to Sydney, which was reached the following Wednesday morning. Here, whilst waiting for the northern train, I took a walk in the beautiful Botanical Gardens, where I noticed *Papilio sarpedon*, *Vanessa kershawii*, and several small Lycænidæ; also several examples of the beetle *Anoplognathus pectoralis* lying dead on the paths. The run north is mostly through open country, with gum-trees scattered sparingly about. The following day I reached Warwick, on the Darling Downs, where I stayed a day or two, Here a large dark *Papilio* (*P. egæjeus*) was fairly common, and was especially fond of coming into the shade under the balconies. The male of this insect was difficult to catch when in good condition, although its flight was generally slow and floppy. I also obtained *P. sthenelus*, *Acræa andromache*, *Terias smilax*, *Junonia veleda*, and the beautiful *Talmenes evajous*. I next went on to Brisbane, where *Papilio sarpedon* was very common, and almost impossible to catch. Here I obtained a beautiful example of *Charaxes sempronius*. There is very little to be done just around Brisbane, although a fair number of beetles are to be obtained about the electric lights at the railway station. One day I visited the coast, but insects (except mosquitoes) were very scarce: a few Euploces and *Danais archippus* and *D. affinis* were our only captures. I then decided to go on to Eumundi, about seventy miles further north, which is in a belt of dense tropical scrub which occurs here. This country is entirely different to that through which I had recently passed, and consisted of figs, palms, and climbing plants; whilst many of the trees supported epiphytes and parasites, amongst which were a few orchids and the handsome stag-horn fern. Here I found many more insects, amongst which were

Papilio capaneus and *P. leosthenes* (somewhat worn), *Hypocysta metirius*, *Danais taygetus*, and a curious butterfly with a beautiful leaf-like under side (*Doleschalia australis*), which was fond of taking short flights and then returning to some favourite perch; but my finest capture was a male (unfortunately slightly chipped) of the magnificent *Ornithoptera richmondii*. This latter was fairly common round a group of trees bearing a white flower very like orange-blossom, but seldom descended within reach of the net. I also obtained a fair number of Coleoptera, including some very rare species, and one or two fine Longicorns which seem to be unknown. I then returned south, again staying a few days at Warwick, where I now found *Charaxes sempronius* fairly common, and managed to capture three more examples. The weather, which during the first part of my trip had been very hot (about 103° or 104° in the shade), had now become much cooler (80° or 85° in the shade), and the sky had clouded over, so that few insects were obtainable whilst here. The previous hot dry weather had had a very unfavourable effect upon both beetles and butterflies, a very large number of the latter being worn, whilst both were scarce. After a pleasant run across from Sydney, I arrived in Wellington Jan. 18th, having had a most enjoyable holiday. I may add that immense numbers of locusts occurred everywhere, many of them with very beautiful under wings, especially one brilliant yellow one on the Darling Downs.—Hubert W. Simmonds; 17, Aurora Terrace, Wellington, N. Z., March 23rd, 1905.

Notes from the Chester District for 1904 (*concluded from* p. 165).

Aplecta nebulosa.—From June 8th to the 18th twenty-three moths were reared from black parents with grey fringes (var. *robsoni*, Collins). Four were of the type-form, five were intermediate between the type and var. *robsoni*, ten were *robsoni*, and four were the form *thompsoni* (Arkle)—that is, jet-black, with white margins and white fringes. Another typical specimen emerged on the 29th—total, twenty-four insects. From twelve larvæ from type parents twelve moths emerged, June 14th to June 27th. Eleven were typical, and the twelfth an intermediate between vars. *robsoni* and *thompsoni*. The curious thing is that the black forms were, as a rule, the first to appear. All my larvæ were kept in a couple of breeding-cages, with plenty of moss at the bottom for them to hide in by day. They began to wander about the cages early in January, occasionally eating, very sparingly, of dock or dried sallow-leaves up to March, when they began actively feeding on dock. The larvæ prefer spinning up in dry moss. All were kept in a cold outhouse, with plenty of ventilation. A number of larvæ from *thompsoni* parents are now (February, 1905) showing themselves after their short hybernation. The chief object is to see if the white margins will be increased in the resultant moths. It has been found that the variety *robsoni* may occur at the rate of ten per cent. from wild Delamere larvæ, and the form *thompsoni* in the proportion of three per cent.; therefore, although the chances are at present small, the result, whatever it may be, with reference to the white margins, may occur in nature. In fact, I should not be surprised if one or other of these forms of *A. nebulosa* ultimately supplants the type, as in the case of *Amphidasys betularia*. At any rate, it is significant that melanism has already been referred to, in the Chester district, as

being "rampant." Whatever be the cause, it cannot be attributed to smoke, and there are those who claim that we have not an excess of moisture.

Boarmia repandata.—The larvæ mentioned (Entom. xxxvii. 74) from mid-Northumberland were kept through the winter, as in the case of *A. nebulosa*, but in flower-pots covered with gauze. They did well until March, when they nearly all died off, and I only reared nine moths (June 8th to June 18th), but beautiful specimens, well marked, blotched, and dusted with brown-black on a grey ground—four males and five females. The larvæ showed signs of awakening from hybernation on February 22nd, swaying to right and left, but not relaxing hold of the withered sallow-leaves and twigs, which they grasped by their anal claspers. Like *A. nebulosa*, they are night-feeders, and prefer to spin up in dry moss.

Abraxas grossulariata.—I had two dozen black larvæ, but the moths reared were as typical as they well could be.

Amphidasys betularia.—A dozen of the green form of the larva, taken in Delamere Forest, all produced the black variety of the moth (*doubledayaria*); in fact, we appear to get the black form of this species.

Odontopera bidentata.—Common in Delamere Forest, on Scotch fir, in September and October. The pine-feeding *bidentata* are very unlike the smooth light brown larvæ found earlier on birch; they are rougher, with tubercles. They vary in colour—sooty black, ochreous brown, with dorsal diamond pattern, and reddish or dark green patches. The moths reared from these pine-feeders show a marked tendency towards melanism. I have a sooty brown, almost black, specimen.

Bupalus piniaria.—Plentiful on Scotch fir, Delamere Forest, in September and October. On October 1st I took an example of the yellowish olive-green form.

Thera firmata and *Ellopia prosapiaria=fasciaria.*—Very common on Scotch fir, Delamere Forest, in September and October. They are then very small, and hybernate on the branches among the foliage, but are difficult to bring through the winter in confinement. They are best obtained after hybernation, in April, although their numbers are then apparently thinned.

Macaria liturata.—Fairly common in Delamere Forest, on Scotch fir, in September and October. The usual colour is green, with whitish yellow lines and stripes and reddish head. The last mentioned feature easily separates the species from the other pine-feeders; but there is a variety almost as common as the type, to the discovery of which I am indebted to my friend Mr. J. Thompson, of Chester. Some three or four years ago, to prove their identity, he placed twelve in a flower-pot by themselves. The results were nine dark imagines (var. *nigrofulvata*, Collins); two types and the remaining pupa died. The following is a description of this variety of the larva:—Pale pinkish grey or brownish, green entirely absent. Head dark purplish black-brown, almost black. Lines and stripes as in the green form, but paler grey than the general colour of the caterpillar. The side stripes are interrupted by triangular patches of dark purplish brown. The dorsal segment divisions are the same dark purplish brown. Legs and claspers brown.

Dragonflies:—There was no appreciable diminution in the numbers of the district species, except in the case of *Æschna grandis*. Why this dragonfly should have been comparatively scarce it is difficult to say.—J. Arkle; Chester, Feb. 17th, 1905.

SOCIETIES.

Entomological Society of London.—*June 7th*, 1905. — Mr. F. Merrifield, President, in the chair. — Herr Ludvig von Gangelbauer, of the Vienna Museum, was elected an Honorary Fellow; and Mr. Charles J. Grist, of "Apsley," Banstead, Surrey; Mr. Vernon Parry Kitchen, of the Priory, Watford, Herts; and the Rev. W. Mansell Merry, M.A., of St. Michael's, Oxford, were elected a Fellows of the Society. — Mr. M. Burr exhibited an earwig, *Apterygida arachidis*, Yers., found by Mr. Annandale, of Calcutta, in a box of specimens received from the Andaman Islands. When placed in a small box, it was alone, but next morning there were five larvæ present; two disappeared, apparently being consumed by the parent; and the remaining three were those exhibited. — Mr. Burr also showed a locustid of the family Pseudophyllidæ from Queensland, taken among twigs and plants which it greatly resembled, together with a photograph of the insect in its natural position.—Mr. E. C. Bedwell showed three examples of *Gnorimus nobilis*, L., taken at Woolwich; and a malformed specimen of *Lochmæa suturalis* which had the left posterior tibia bifid for about one-third of its length, and two tarsi, one of which had the joints considerably enlarged.—Mr. O. E. Janson brought for exhibition a living specimen of *Omophlus betulæ*, Herbst, a beetle not known to occur in Britain, found by his son near Covent Garden, and probably imported.—Mr. W. J. Lucas exhibited one male and three females of *Agrion armatum* taken this year by Mr. F. Balfour Browne, and sent to him alive.—Mr. G. C. Champion showed four specimens of the rare *Acrognathus mandibularis*, Gyll., captured on the wing towards sunset near Woking at the end of May.—Mr. Selwyn Image exhibited two aberrations of *Biston hirtaria*, Cl., both females, taken at rest on tree-trunks at Mortehoe, North Devon, April 23rd, 1905. The first aberration was tolerably normal in general coloration, but the anterior half of the fore wings was much suffused with fuscous, and at the costa broadly emphasized with rich black. The second aberration was semi-transparent black all over both fore and hind wings, the veins strongly delineated with black, powdered with ochreous.—Mr. W. J. Kaye showed a number of empty pupa-cases of *Zonosoma pendularia* to demonstrate the wide variation of methods in the placing of the silken girth round the pupa.—Professor E. B. Poulton, F.R.S., exhibited leaves of strawberry, *Berberis japonica*, and cherry-laurel, which had been sent to him by Mr. W. B. Grove, of Handsworth, Birmingham. The leaves had been attacked by a minute fungus, which, in the case of the *Berberis*, had been identified by Prof. S. H. Vines, F.R.S., as *Phyllosticta japonica*, Thnem. The attack was local, and followed by the death and disappearance of the central portion of the leaf-tissue of each patch, leaving a roundish or oval

window outlined with brown, sometimes in the form of a narrow line, sometimes spreading peripherally into the leaf for a greater or less distance. In the strawberry leaves the edges of the windows were somewhat ragged, but those of the other two leaves had smooth contours and strikingly resembled the oval transparent areas upon the fore wings of *Kallima inachis*, *paralekta*, &c.—surrounded most conspicuously with a marginal zone of modified colour varying greatly in tint and in extent in different individuals. Professor Poulton had believed that these "windows" of *Kallima* represented holes gnawed by larvæ, and that the altered marginal zone reproduced the effect of the attacks of fungi entering along the freshly exposed tissues of the edge. But he now desired to withdraw his earlier hypothesis in favour of the more probable and convincing suggestion made by Mr. Grove.—Professor Poulton also showed a photograph of the fungus-like marks on the wings of the Oriental Kallimas prepared under his direction by Mr. Alfred Robinson, of the Oxford University Museum. — Dr. Karl Jordan communicated a note upon the variability of the genitalia in Lepidoptera.—Dr. G. B. Longstaff detailed his observations on scents in the male of *Gonepteryx*, and mentioned that whereas in the male *G. cleopatra*, the odour was strong, he had been unable to detect any appreciable fragrance in *G. rhamni*. Such a difference, he said, seemed to imply a physiological difference of the two forms pointing to specific distinction. — Dr. F. A. Dixey, in connection with Dr. Longstaff's observations, exhibited the several forms of *Gonepteryx* occurring in the palæarctic region, and demonstrated the variation of wing coloration in the respective forms ranked as species. — Mr. H. J. Elwes, F.R.S., read a note on the geographical affinities of Japanese butterflies, numerous examples of which, taken by himself, he also exhibited. Summing up his remarks, he said that during the winter and spring months the plants and insects of Japan were, like the climate, palæarctic in character, yet during the summer and autumn they were tropical. — Professor Christopher Aurivilius communicated a paper on "New African Lasiocampidæ in the British Museum."—Mr. G. W. Kirkaldy communicated a "Memoir on the Rhynchota taken by Dr. Wyllie chiefly in Beira and Lifû." — H. Rowland-Brown, M.A., *Hon. Sec.*

South London Entomological and Natural History Society.—*May 11th.* — Mr. Hugh Main, B. Sc., F.E.S., President, in the chair.—Mr. Bevins, of Ongar, Essex, was elected a member. — Mr. Sich exhibited the flowering spike of an asphodel which had grown in a sheltered position in his garden at Chiswick. It originally came from the West of France, but Dr. Chapman said it was not the same species which formed the pabulum of *Hastula hyerana* in the Esterels. — Mr. R. Adkin, the lantoscope recently brought out by Dr. Connold to facilitate the examination of lantern-slides. — Mr. F. Noad Clark, an old work on Microscopy, dated 1771, 'Micrographia Illustrum,' by Geo. Adams, and called attention to the curious illustrations. — Dr. Chapman, a short series of a moth, *Metoptria monogramma*, allied to *Euclidia glyphica*. They were taken in Sicily at the end of April.—Mr. Main, enormous larvæ in spirits from the West Coast of Africa, probably of some large species of Longicorn.— Mr. Lucas, the delicate

and beautiful Entomostracon, *Branchipus stagnalis*, taken on May 10th from a cart-rut of water at Claygate. It is generally rare in this country.—Mr. Gilbert J. Arrow, various species of Coleoptera to illustrate an address which he afterwards gave, entitled "Some Social Beetles." A discussion took place as to the use of sound apparatus in larvæ, the suggestion being that they were more or less directly protective.

May 25th. — The President in the chair. — Messrs. Harrison and Main exhibited a large number of species of Lepidoptera captured or bred this season, comparing those from South of England localities with those from the neighbourhood of Liverpool.—Mr. Carr, series of spring Lepidoptera from the New Forest.—Mr. Joy, a short bred series of *Thecla rubi* from Folkestone, the larvæ of which fed on dogwood, which had led him to think they were *Cyaniris argiolus*. — Mr. Hy. J. Turner, a short series of *Cucullia lychnitis*, bred from larvæ taken at Box Hill in June, 1904. The larvæ were fed up in the hottest sunshine in a conservatory, and grew extremely fast. When found they were studded with ova of ichneumons, but after considerable trouble these were successfully removed. He also showed larvæ of *Leioptilus septodactylus* (*lienigianus*), a local plume moth, feeding on *Artemisia vulgaris*. They were found at Croydon feeding in the open. — Mr. Edwards, specimens of the *Amphioxus*, and read notes on their structure, position in nature, and habitat. — Dr. Chapman, a series of *Depressaria thapsiella*, bred by him from larvæ obtained in Sicily, where it fed in countless numbers on *Thapsia gargania*. — Mr. Sich, larvæ and pupæ of *Aciptilia spilodactyla* from the Isle of Wight, feeding on *Marrubium vulgare*. — Mr. Wright, a larva of a large species of Coleoptera feeding in the wood of a sugar-box from the West Indies.— Hy. J. Turner, *Hon. Rep. Sec.*

Lancashire and Cheshire Entomological Society. — The fourth ordinary meeting of the Session was held in the Royal Institution, Liverpool, on April 17th, Mr. Rd. Wilding, Vice-President, in the chair. — Drs. Wm. Bell, J.P., of Rutland House, New Brighton, and P. F. Tinne, of Mostyn, Aigburth, were elected members of the Society. An invitation to exhibit at the meeting of the Liverpool Microscopical Society to be held on May 5th was accepted with thanks, the following amongst others promising to represent the Society:—Miss Birch, and Messrs. F. N. Pierce, F.E.S., H. B. Prince, H. B. Score, F.R.G.S., Rd. Wilding, and E. J. B. Sopp, F.R.Met.S. Donations to the library were received from Professor T. Hudson Beare, B.Sc., F.E.S., and Messrs. Score and Sopp; and a donation to the micro-slide cabinet from Mr. C. M. Adams, F.I.C. — The paper of the evening was by Dr. Geo. E. J. Crallan, M.A., F.S.A., of Bournemouth, "On the Life-history of *Ophiodes* (*Pseudophia*) *lunaris*," which was illustrated with beautiful coloured figures by the author, including the egg in three stages (actual size and magnified thirty-two diameters), the larva in six stages, imago, upper and under side of both sexes, &c. In opening, Dr. Crallan referred to the fact that this is the only species of the genus that has occurred in Britain, the first specimen having been taken in Hampshire in 1832, and several having occurred since. In Spain it is said to be common in the cork woods, and in Austria occurs amongst oaks. In

confinement the moth appears from April to June from eggs laid on oak or poplar; when laid the egg is of a beautiful green colour, but after a week the colour changes to red or plum, and still later to drab. The changes in colour and appearance of the larva at the different ecdyses were graphically described, and much interesting information given on habits throughout the life of the insect in all its stages. On the motion of the chairman a very cordial vote of thanks was accorded Dr. Crallan for his valuable contribution to our knowledge of the life-history of this rare British moth.—Among exhibits shown were a box of insects from Trinidad, exhibited by Miss Birch on behalf of her brother; eggs of *T. opima* on hawkweed by Mr. H. B. Prince, and on yarrow by Mr. Mollinson, who also showed larvæ of *L. litoralis*; *Plusia moneta* (bred) and *Lycæna arion* from S. Devon, by Mr. Pierce; and a queen wasp in a state of hybernation, by Mr. Score. — E. J. B. Sopp and W. D. Harrison, *Hon. Secretaries.*

Birmingham Entomological Society. — *April 10th.* — Mr. G. T. Bethune-Baker, President, in the chair. — Mr. E. C. Rossiter was elected a member of the Society. — Mr. J. T. Fountain gave an account of some work he had been doing, which showed how much collecting might be done in the winter. On December 2nd he saw at Sutton more moths than he had ever seen before, chiefly *Cheimatobia brumata*, L., but including also *Scopelosoma satellitia*, L., and *Orrhodia vaccinii*, L. On March 4th he sugared at Chelmsley Woods, and the last two species came in numbers.—Mr. W. E. Collinge showed Collembola; *Sminthurus malmgreni*, Tulbb., from Knowle, a species new to England; and *Lipura ambulans*, L., from Solihull, where it occurred in thousands in connection with some cauliflowers suffering from finger-and-toe disease.—Mr. Gilbert Smith gave an account of the coleopterous genera *Eriocephalus* and *Asenum*, illustrating it by drawings and specimens of the species in various stages.—Colbran J. Wainwright, *Hon. Sec.*

RECENT LITERATURE.

Proceedings of the South London Entomological and Natural History Society. 1904–5. Pp. i-xvi, 1-104. The Society's Room, Hibernia Chambers, S.E. 1905.

Contains several interesting contributions on entomological subjects, the most important perhaps being a paper on the genus Coleophora by Mr. Alfred Sich, F.E.S. In his address the President (Mr. Sich) first reviews the principal events of the year, so far as these concern the British Fauna; he then discourses on "the joy of animal existence" and the triumph of animal life.

Several field-meetings were held during the year, and reports of these are given. That referring to the Eynsford meeting is accompanied by a capital map of the district.

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DESCRIPTION OF *LYCÆNA ARION* PUPA, ♂.

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

While collecting on July 12th, in company with Mr. A. L. Rayward, in Cornwall, we determined on a systematic search for the pupa of *Lycæna arion*, and were rewarded by the discovery of a living pupa, of which I have the pleasure of giving the following description and above figures.

It bears a general affinity to the pupa of *L. ægon*, excepting its much larger size, measuring half an inch long.

FIG. 1.—DORSAL VIEW. Across the middle its greatest diameter is $\frac{3}{14}$ in. The head is obtuse, base of wings slightly angular and swollen, wing slightly concaved, abdomen swollen at third and fourth segments, then attenuating and rounded posteriorly. Fig. 2.—SIDE VIEW. It measures $\frac{3}{16}$ in. across the middle, the head rounded, thorax convex rising into a slight dorsal ridge, meta-thorax and first abdominal segment sunken, abdomen swollen at the middle and curving to posterior segments which are rounded; anal segment is compressed to ventral surface, cremastral hooks absent; wing ample, swollen, and rounded across the middle and extending to the fifth abdominal segment.

The entire surface is minutely granulated and covered with very fine reticulations of a deep amber colour; spiracles are prominent and

blackish, the surface posteriorly adjoining them is beset with a number of shining raised bead-like processes, some bearing minute amber-coloured spines, which have the apical half branched with extremely small bristles.

The colour when first found was uniformly ochreous, with the eyes dark leaden grey; it gradually turned darker on the head, thorax, and abdomen; the wings remained ochreous, but showed leaden-grey hind margins; then the median wing-spots appeared, and soon the whole pupa began to deepen more uniformly, until it assumed a deep leaden-grey all over, and remained unchanged for over thirty hours; finally a perfect male emerged at 8.30 a.m. July 16th.

With the interesting discovery of this hitherto unknown pupa Mr. A. L. Rayward's name must be coupled, for we had the joint pleasure of not only finding the living pupa, but also, in close proximity, a pupa-case of a freshly emerged female, which my friend detected at rest, and which paved the way to our success.

DESCRIPTION OF A NEW SPECIES OF ARADIDÆ FROM CEYLON.

By W. L. Distant.

The following description refers to a species which I received from my ever-helpful friend Mr. E. E. Green, subsequent to my dealing with the Aradidæ in the Rhynchota of British India, and which, for that wide area, constitutes the second known species of *Aneurus*.

Aneurus greeni, sp. n.

Head, pronotum, scutellum, and sternum, black; abdomen, apex of head, coxæ, and apices of tibiæ piceous-brown; tarsi ochraceous; corium stramineous, its base black, its apex and longitudinal veins very dark fuscous; membrane pale hyaline and reflecting the pale brown disk of the abdomen above; head finely punctate, most strongly so behind eyes, distinctly longitudinally sulcate on each side of the median lobe; antennæ with the basal joint very strongly incrassate, second joint longer than third, fourth longest; pronotum with a broad central transverse depression, the anterior angles prominently rounded, the lateral margins moderately concavely sinuate, the posterior angles broadly rounded, a little prominent, centrally very finely transversely striate, obscurely punctate, most distinctly so on lateral areas and at anterior and posterior angles; scutellum very finely and thickly granulate, about as broad as long, its margins very obscurely piceous-brown.

Hab. Ceylon; Pundaluoya (Green).

Differing from the Burmese *A. indicus*, Bergr., the only other known species in the fauna of British India, by the absence of the central carination to the scutellum, the more

rounded and less prominent posterior pronotal angles, the more strongly incrassated basal joint of the antennæ, the stramineous corium, &c.

CURRENT NOTES.

By G. W. Kirkaldy.

(Continued from p. 132.)

1. C. P. Lounsbury: "Report of Govt. Entom. for 1903" (Cape of Good Hope Dep. Agr. pp. 1–46; pls. i–vii (1904)).
2. Ditto: "Transmission of African Coast Fever" (Agr. Journ. Cape of Good Hope [sep. pp. 1–7] 3 plates (1 coloured) (Apl. 1904) [Arachnida]).
3. C. J. S. Bethune [Ed.]: "Thirty-fourth Ann. Rep. Ent. Soc. Ontario, for 1903" (Ontario Dep. Agr. pp. 1–116; portrait, pls. i–iii and text-figs. 1–60 (1904)).
4. A. L. Herrera [Ed.]: "Las Plagas de la Agricultura" (Com. Paras. agric. Mexico; pp. 1–705, pls. i–xvi, and many text-figs (1904)).
5. A. Zimmermann: "Untersuchungen über tropische Pflanzenkrankheiten" i. (Ber. Land- Forstwirtschaft Deutsch-ostafrika ii. pp. 11–36, pls. i–iv (1904)).
6. E. P. Felt & L. H. Joutel: "Monograph of the genus Saperda" (Bull. N. York State Mus. 74, pp. 1–86; pls. 1–7 coloured and 8–14 plain; text-figs. 1–7 [Col.]).
7. L. de la Barreda: "El picudo del Algodón" (Circ. Com. paras. agric. Mexico, 6, pp. 1–35 (Apl. 7 1904) [Col.]).
8. C. Dawydoff: "Note sur les organes phagocytaires de quelques Gryllons tropicales" (Zool. Anzeiger xxvii. pp. 589–93, text-figs 1–3 (June 3, 1904) [Dermapt.]).
9. C. P. Lounsbury: "A new Oak-tree Pest" (Agric. Journ. Cape Good Hope [sep. pp. 1–4] 1 plate (Dec., 1903) [Hem.]).
10. A. W. Morrill: "Notes on the immature stages of some Tingitids of the genus *Corythuca*" (Psyche, x. pp. 127–34, pl. 3 (1903) [Hem.]).
11. S. Mokrzecki: Thryptocera (Gymnopareia) pomonellæ Schnabl & Mokrz., sp. nov., male and female (Diptera, Muscidæ) [sep. pp. 1–4] (1903) [Lep. & Dipt.]).
12. R. E. Snodgrass: "The Hypopygium of the Tipulidæ" (Trans. American Ent. Soc. xxx. pp. 179–236, pls. viii–xviii (Aug., 1904) [Diptera]).
13. T. W. Kirk: "Report of . . . Biologist" (Ann. Rep. New Zealand Dep. of Agriculture, xii. pp. 247–309 [Diptera] (1904)).

14. M. E. Fountaine: "The Butterfly hunter in search of a long-lost local rarity" (Pall Mall Mag. xxxiii. pp. 253–8; 2 text-figs. (June, 1904)).
15. E. Zander: "Zum Genitalapparat der Lepidopteren" (Zool. Anzeiger xxviii. pp. 182–6, text-figs (Oct. 21, 1904)).
16. O. Schultz: "Uebersicht ueber die bisher bekannt gewordenen Fälle von Gynandromorphismus bei paläarktischen Macrolepidopteren nach Familien, Gattungen und Species" (Allg. Zeitschr. für Entom. ix. pp. 304–10 (Aug. 15, 1904)).
17. C. Schröder: "Kritische Beiträge zur Mutations, Selektions- und zur Theorie der Zeichnungs-phylogenie bei den Lepidopteren iii" (*op. cit.* pp. 281–97; text-figs. 19–28 (Aug. 15, 1904)).
18. L. C. H. Young: "The distribution of Butterflies in India" (Journ. Bombay Nat. History, xv. pp. 594–601 (June 27, 1904)).
19. R. S. Hole: "Two notorious Insect Pests" (*op. cit.* pp. 679–97, pls. A to E (June 27, 1904) [Lepidoptera]).
20. K. Malkoff: "Die Cicade Tettigonia viridis L. als Schädiger der Obstbäume in Bulgarien" (Zeitschr. für Pflanzenkrankheiten, xiv. pp. 40–3; 1 text-fig. (March 7, 1904) [Hemiptera]).
21. A. L. Embleton: "*Cerataphis lataniæ*, a peculiar Aphid" (Journ. Linnean Soc., Zool. xxix. pp. 90–107, pl. 12 (Oct. 31, 1903) [Hemiptera]).
22. E. Röhler: "Die Antennalen Sinnesorgane von Tryxalis" (Zool. Anzeiger, xxviii. pp. 188–92; text-figs. 1–4 (Oct. 21, 1904) [Dermaptera]).
23. G. Enderlein: "Die Copeognathen des Indo-Australischen Faunengebietes" (Ann. Mus. Nat. Hungar. I. pp. 179–344, pls. iii–xiv (7 of these coloured) and text-figs. 1–12 (1903) [Neuroptera]).
24. Ditto: "Zur Kenntniss Amerikanischer Psociden (Zool. Jahrb. Abth. für Syst." xviii. pp. 351–64, pls. 17 (coloured) and 18 (1903) [Neuroptera]).
25. Ditto: "Zur Kenntniss Europäischer Psociden" (*op. cit.* pp. 365–82, pl. 19 (col.) and text-figs. A—J (1903) [Neuroptera]).
26. N. Ya. Kusnenov: "O rasvitii glastshatikh pyaten gusenits *Dilephila nerii*, Linn., i. *Pergesa porcellus*, Linn." (Russkoe entom. obosr. iv. pp. 154–62; text-figs. 1–6 (Aug. 1904) [Leipdoptera]).
27. D. Pomerantsev: "Biologisheskiya samyitki o zhukakh polesnikh b' lyisovolstv, zhivoshtchikh pod koroi derevev VII." (*op. cit.* pp. 85–9 (May, 1904) [Coleoptera]).
28. S. Alferaki: "Byigliya krititcheskiya samyitki k' katalogu tchemuekrilikh gg. Staudinger'a i Rebel'ya 1901, g." (*op. cit.* pp. 1–10 (Feb., 1904) [Lepidoptera]).

29. A. A. Yakhontov: "O *Pieris napi* L. var. *intermedia* Krul." (*op. cit.* pp. 15–8 [Lepidoptera]).

The title of the finely illustrated paper of Felt and Joutel (6) is slightly misleading, as it is really a monograph of the American species only, some of which, however, are also European. The descriptions, synonymy and bibliography, habits, &c., are very fully worked out, and the numerous plates are well executed. Barreda (7) discusses the cotton boll-weevil (*Anthonomus grandis*) in a practical manner. He mentions that one estate in Coahuila lost one thousand seven hundred dollars in four years, while another in San Luis Potosi lost one hundred thousand dollars last year. Morrill (10) has given us valuable information on a subject very little studied, the metamorphoses of heteropterous Hemiptera.

It is well known that in certain forms there exist, as well as free leucocytes, very curious special structures named by Dawydoff (8) "phagocytary organs" (lymphatic glands). Apparently these glands are not circumscribed and defined in the cockroaches and mantids (at least in some of them), the same being the case in the nymphs of *Gryllodea*. In certain adults of the latter suborder these organs are well defined and limited; in others, however, this is not the case (*Gymnogryllus*).

Lounsbury's latest publications deal principally with ticks, the Annual Report (1) treating specially of malignant jaundice in dogs. The transmission of African Coast fever (2) is attributed to the tick *Rhipicephalus appendiculatus*, which is considered "the principal, and, perhaps, the only natural transmitter of a highly fatal cattle disease."

Phylloxera corticalis is noted as a new oak-tree pest in South Africa, where it has been causing considerable damage (9). Owing to the fact that the South African oak (*Quercus pedunculata*) has been propagated in that country only from seed, it has remained singularly free from pests, only one other insect, and that also an aphid (*Callipterus quercus*), being confined to it.

Zimmermann's paper (5) deals mostly with fungous diseases, but also with noxious insects, viz.: *Sphinx nerii* on *Cinchona* (pl. iv. figs. 6–8), *Disphinctus* on *Piper eapense* (figs. 3–5), *Helopeltis* sp. on *Bixa orellana* (figs. 9–12), and *Thrips* spp. on coffee.

The Commission of Agricultural Parasitology in Mexico has issued a substantial volume (4) of over seven hundred pages on the pests to Agriculture in that country. These are assembled under plant headings, the latter being arranged alphabetically. Sixteen crowded plates and a number of text-figures illustrate the written matter. The introduction is dated Nov. 1901, the cover 1903, but the title-page 1904! Mokrzecki (11) describes

in Latin and Russian a new dipterous parasite from Taurian Belbek, bred from pupæ of *Carpocapsa pomonella*, L.

Snodgrass (12) restricts the term "hypopygium" to the ninth abdominal segment only—that is, the segment that carries the intromittent and clasping organs of the male. The general shape in the Tipulidæ is that of a cup opening posteriorly, the cavity being the genital chamber, which is produced simply by the invagination of the posterior face of the segment, which carries into the depression the tenth segment, which morphologically terminates the abdomen. After a general description of the parts, seventeen genera are discussed at length and illustrated by one hundred and sixty-one figures.

T. W. Kirk's report (13) is specially mentioned here, since it contains (pp. 306–9) descriptions of three new Diptera by T. Brown, viz.: *Tephrites xanthodes*, introduced from Rarotoga and Viti; *Lonchæa splendida*, introduced from New South Wales; and *Drosophila ampelophila*, from Australia.

Miss Fountaine (14) describes a brief tour in Crete, and the chase of *Lycæna psylorita*. Zander (15) discusses the genital apparatus of *Gastropacha quercifolia*. Schultz (16) catalogues the known cases of gynandromorphism in palæarctic Macro-Lepidoptera; while Schröder (17) continues his papers on pattern-phylogeny in the same order. Young (18) considers the distribution of Indian butterflies.

Hole (19) discusses very fully two dangerous enemies of the teak-tree, *viz.*, the moths *Pyrausta machæralis* and *Hyblæa puera* There are five excellent plates, of which one is coloured.

Malkoff (20) describes the damage done to fruit-trees by *Tetigonia viridis*; while Miss Embleton (21) discusses at length the remarkable Aleyrodid-like aphid, *Cerataphis lataniæ*. This has also recently occurred on *Latania* near Honolulu.

Röhler (22) describes and figures some sensory organs on the antennæ of *Acrida* (*Tryxalis*).

Enderlein (23–25) has published three interesting articles on Psocidæ, illustrated by excellent plates. No. 23 is prefaced by a general introduction to the family. Kusnezov (26) discusses in Russian the development of ocellated spots in the larvæ of the sphingids *Deilephila nerii*, Linn., and *Pergesa porcellus*, Linn. Pomerantsev (27) furnishes biological notes, also in Russian, on Cantharidæ and Tenebrionidæ living under bark, and useful in sylviculture. Two further papers in Russian (28 and 29) may be commended to the Lepidopterist: Alferaki's contains critical observations on Staudinger and Rebel's 1901 Catalogue, while Yakhontov discusses at some length the variety *intermedia* of *Pieris napi*.

A LIST OF THE "MACRO-LEPIDOPTERA" OF LANCASTER AND DISTRICT.

By C. H. Forsythe.

(Concluded from p. 160.)

C. immanata.—Common and generally distributed in July.

C. suffumata.—Fairly common in the County Asylum grounds, Blea Tarn, Quernmore, &c., in April and May. This species comes to light.

C. silaceata.—Fairly common at Arnside and Witherslack in May.

C. fulvata.—Common everywhere about hedgerows in July and August.

C. dotata (pyraliata).—Not common; Halton, County Asylum grounds, Blea Tarn, &c., in July.

Lygris (Cidaria) prunata.—Not common; Arnside, near Quernmore and County Asylum grounds in June.

L. (C.) testata.—Abundant on the moors at Clougha and Quernmore in August.

L. (C.) populata.—Local; it is abundant near Clougha in July and August.

L. (C.) associata (dotata).—Fairly common and generally distributed in June. This species comes freely to light.

Pelurga comitata.—Plentiful in some years in the County Asylum grounds, Grimshaw Lane and Blea Tarn, July and August.

Eubolia cervinata.—This species comes to light, but is not common; Halton and County Asylum grounds in late August and September.

E. limitata (mensuraria).—Generally distributed; abundant in Grimshaw Lane, near Halton, in August.

E. plumbaria (palumbaria).—Common at Heysham, Torrisholme, Blea Tarn, &c., in June.

Carsia paludata (imbutata).—Locally plentiful at Heysham and Witherslack on the mosses in July.

Sterrha sacraria.—Extremely rare, "I took a specimen at Witherslack some years ago. It went into Mr. J. B. Hodgkinson's collection" (G. L.)

Anaitis plagiata.—Common at Arnside, Witherslack, &c., in July.

Tanagra atrata (chærophyllata).—Common near Carnforth and Witherslack about chervil (*Chærophyllum temulum*) at the end of June.

Hyria muricata (auroraria).—Local but abundant at Witherslack; less common at Heysham in July.

Asthena luteata.—Uncommon; near Clougha and at Witherslack in June.

A. candidata.—Fairly plentiful and generally distributed in June.

Acidalia dimidiata (scutulata).—Common in Grimshaw Lane, Quernmore, Halton, &c., in June.

A. bisetata.—Plentiful in Grimshaw Lane, Halton, Heysham, Clougha, &c., June and July.

A. subsericeata.—Uncommon; odd examples at Witherslack in June.

A. immutata.—Uncommon; occasionally at Witherslack and Methop in June.

A. remutaria.—I have only taken this species near Clougha and at Heysham, and bred it from Methop larvæ. The imago appears in May.

A. fumata.—Common; at Heysham, Clougha, and Witherslack in July.

A. aversata.—Common everywhere in July and August; also var. *spoliata.*

Pseudoterpna pruinata (*cytisaria*).—Fairly common in Grimshaw Lane, County Asylum grounds, Halton, Quernmore, &c., in July.

Geometra papilionaria.—Not common; I have only taken examples at light near the County Asylum in July.

Nemoria viridata.—Local, but common at Methop and Witherslack in June.

Thalera (*Iodis*) *lactearia.*—Common in Grimshaw Lane, Ridge Lane, Halton, Arnside, &c,, in July.

Hemithea strigata (*thymiaria*). — Fairly common in Freeman's Wood, and at Heysham, in June and July.

THE LEPIDOPTERA OF BERLIN.

By E. M. Dadd, F.E.S.

One constantly reads in the magazines of the experiences and captures made by entomologists in Switzerland, the South of France, Italy, Spain, the Balkan Peninsula, Asia Minor, and other distant places, which are mostly quite beyond the reach of the ordinary entomologist with probably only a short holiday at his disposal.

Having read with avidity the brilliant successes achieved by his more fortunate brethren in the Eldorados above mentioned, it may occur to him that perhaps if he did not go quite so far afield he might yet enjoy a good deal of sport, and at the same time not waste a large portion of his holiday in travelling.

It has always been somewhat of a surprise to me that none of the gentlemen who make annual trips to the Continent have thought Germany worthy of their attention. Although its butterfly fauna is certainly not so rich as that of Switzerland, still it is very rich, and on any sunny day during the summer insects swarm in such countless numbers that one is at a loss what to catch next.

It has been my good fortune to be removed from London to Berlin, a district which is remarkably rich in Lepidoptera, as will be seen from the fact that the latest list of the Macro-Lepidoptera (Bartel and Herz) records eight hundred and thirty-two species as occurring in the district, to which have since been added several more; and in the present paper I should like to give entomologists an idea of what can be had here all the year

round. As I have collected here fairly regularly from June 1st, 1902, till the end of the 1904 season, I think I may fairly claim to have a good idea of what can be done in this district.

What is understood as the Berlin district is the tract of country contained within about a twenty-mile radius of the centre of the city. This includes a very varied country both as to soil and vegetation, which accounts for the richness of the fauna. The greater portion is of course the usual sandy soil of the Great Plain of Prussia, but by Rüdersdorf in the east there is an outbreak of chalky limestone, forming downs fairly similar to our Kentish or Surrey ones, and it is here, of course, that such species as *Lycæna corydon*, *L. minima*, the three rare Zygænæ, &c., appear. The whole district is fairly well wooded, the greater portion being pine or fir woods, but there are also magnificent oak and beech woods, and in the swampy portions, which are fairly frequent, alder and birch predominate. Here and there over the whole district, and especially by Bernau in the north, there are extensive heaths, and these are sometimes covered with juniper bushes. In the larger pine woods there is frequently a thick undergrowth of bilberry; in the deciduous woods, of raspberry and buckthorn. Whitethorn, blackthorn, and the wild briar are conspicuous by their absence; only on the downs at Rüdersdorf do they appear to grow wild. Bramble and sallow much rarer than in England; willow is also extremely rare. Aspen, lime, and black poplar are all common all over the district. The commonest tree after pines and firs is undoubtedly the birch. Notable absentees amongst low plants are the primrose, foxglove, bracken, and gorse. By far the commonest plant on open uncultivated land is *Artemisia vulgaris*, the food-plant of *Cucullia argentea* and *C. artemisiæ*, *Eupithecia innotata*, &c.

Fenland and water-side vegetation is frequent, seeing that two rivers, the Spree and the Havel, and about ten large lakes are in the district.

During the winter months very little collecting could be done, but searching the trunks of oaks and alders produced cocoons of *Hoplitis milhauseri* and *Cerura bicuspis*, and, when the lakes are frozen over, and one can get at the reeds, the larvæ of *Senta maritima* and *Leucania obsoleta* may be secured in numbers. The former is obtained by searching the old burrows of *Nonagria geminipuncta*, in which they conceal themselves; the larvæ are easily reared on shredded steak, apple, and other unlikely substances, but must be provided with reeds to hide in, as they otherwise die. *L. obsoleta* is far easier detected; the reeds inhabited by the larvæ, probably owing to its having eaten through the skin to form its exit, are generally bent over, probably by wind, and all one has to do is to cut the reed low down. This larva hybernates full-fed, and is easily reared; it

is, however, advisable to split the reed, or keep it standing in water, as otherwise it contracts and kills the pupa.

On February 28th I made my first outing after moths; for some days the temperature had been fairly mild, and the early Geometers, such as *Phigalia pedaria*, *Hybernia leucophæaria*, and *H. marginata*, were not uncommon. I was away during nearly the whole of March, and it was not until the 22nd of that month that I again had an opportunity of collecting. Besides the species above mentioned, which were now getting over, *Brephos parthenias*, *Asphalia flavicornis*, *Tephrosia crepuscularia*, and *Asteroscopus nubeculosus* were obtained. Of the latter rare species eleven specimens were found sitting on alder-trunks. On the 29th the first male *Endromis versicolor* and one *B. notha* were the only new species, sallowing in the evening being an absolute failure. On April 12th an outing to Buch was very unremunerative, the weather being too cold; one male *Endromis versicolor*, four *Tephrosia crepuscularia*, and two *Larentia carpinata* being the total bag, except a few larvæ of *Sesia scoliæformis* from birch-boles. The next day was even worse, only two *Tephrosia punctularia* and one *Boarmia cinctaria* being seen; sallows still being quite useless. On the 19th, at Spandau, *T. punctularia* was fairly common, and two *E. versicolor* and a very fine variety of *Strenia clathrata* were also obtained; this appears to me a very early date for the latter species.

On April 22nd, 23rd, and 24th sallows at Spandau were well visited, *Tæniocampa opima*, *T. gracilis*, *T. incerta*, *T. gothica*, *T. pulverulenta*, *T. stabilis*, *Pachnobia rubricosa*, *Dasycampa rubiginea*, *Orrhodia erythrocephala* and *O. vaccinii*, *Xylina furcifera*, *Calocampa vetusta*, and *C. exoleta* all being plentiful. I saved the two *D. rubiginea* for ova, but was unsuccessful. The *P. rubricosa* were remarkable, all being of a deep bluish black colour, with just a tinge of red in them. They are also much smaller than our English *rubricosa*, which is here classified as var. *rufa*, and I should not be surprised if they proved to be a distinct species.

On May 3rd, a delightfully warm day, a visit was paid to Finkenkrug, the locality for *Aglia tau*, in the hope of obtaining this species, and it was soon observed flying wildly about in the beech woods, and several males, all more or less worn, were captured. Other insects were scarce; *Pieris napi* and *Anthocharis cardamines* were flying in the meadows, one *Araschnia levana* was netted over nettle, and *Larentia tristata*, *Minoa murinata*, and *Ematurga atomaria* were observed.

May 10th was very rainy, so that nothing could be done during the morning, but it cleared up during the afternoon, and we paid a visit to the bilberry-scrub growing amongst the pine-woods. Sweeping produced the larvæ of *Halia brunneata* in numbers, but the desired *Eupithecia coronata* was not found.

Larvæ of *Anchocelis helvola* were also obtained, as well as one solitary *Lasiocampa quercus*. The only imagines seen were *Larentia* (*Coremia*) *ferrugata* and *Thalera putata*, both common. The latter was still emerging, and a nice series of fresh specimens were boxed; unfortunately, it seems quite impossible to preserve the exquisite green tint of this species. It is perhaps worth noting that this species leaves the pupa between four o'clock and dusk, and are easily observed drying their wings under bilberry-leaves; they quickly lose their colour, and during the forenoon only faded specimens will be seen. The eleven specimens I set, in spite of the greatest care, have all somewhat faded. Is there no way of preserving their colour?

On May 24th I went for a walk round one of the lakes in the neighbourhood of Potsdam with my friend Mr. Wadzeck, and we found that the spring Geometræ were commencing to get common, *Acidalia remutata*, *Asthena candidata*, *A. luteata*, *Eupisteria heparata*, *Larentia fluctuata*, *L. designata*, *L. ocellata*, and *Bapta taminata* all being more or less common. Sugaring in the evening was fairly unproductive, *Hadena genistæ* and *H. oleracea*, *Dipterygia scabriuscula*, *Cymatophora or*, and *Hypena proboscidalis* being the only visitors.

May 31st is a day I shall never forget. My friend Herr Zobel, my brother, and myself started, about 11 a.m., from Spandau through the oak and pine woods to Niederneundorf. I have never seen Geometræ so common, or in such variety. One really did not know what to take and what to leave, and my "glass tops" had to be emptied several times to make further collecting possible. Amongst the bilberry, *Acidalia fumata*, *A. remutata*, *Thalera putata*, *Ematurga atomaria*, *Epione advenaria*, and *Larentia hastata* were everywhere, and I devoted myself especially to the two latter, and soon had a fine series. A small *Noctua* was seen dashing about, but was very difficult to capture; at length one was boxed, and it proved to be *Erastria deceptaria*. We had originally started with the intention of visiting a locality for the Hesperid *Carterocephalus sylvius*, which had been added to the Berlin fauna the previous year by Herr Zobel, and which he had succeeded in turning up in considerable numbers during the present spring. Arrived on the scene, we were disappointed in only finding one worn female, it evidently being over. Other butterflies were, however, well in evidence, and, besides the three common whites and *A. cardamines*, *Chrysophanus dorilis* and *C. phlæas*, *Cyaniris argiolus*, *Lycæna semiargus* and *L. icarus*, *Hesperia malvæ*, *Augiades comma*, *Argynnis selene*, and hybernated *Vanessa io* were abundant.

We then turned our attention to a wood composed mostly of oak, alder, and birch, but with a sprinkling of other trees, and notably a fairly thick undergrowth of bramble, raspberry, and nettles. To say that Geometræ swarmed will give really no idea

of their abundance. At the edge of the wood *Acidalia immutata*, *A. immorata*, and *Strenia clathrata* had been netted; in the wood itself we were kept constantly busy with *Ephyra punctaria*, *Timandra amata*, *Larentia ocellata*, *L. variata*, *L. fluctuata*, *L. montanata*, *L. ferrugata*, *L. sociata*, *L. unangulata*, *L. albicillata*, *L. tristata*, *E. obliterata*, *A. luteata*, *Hypsipetes trifasciata*, *Cidaria corylata*, *Tephroclystia satyrata*, *Collix sparsata*, *Abraxas marginata*, *Deilinia pusaria* and *D. exanthemata*, *Semiothisia notata* and *S. alternata*, *Boarmia luridata*, *T. punctulata*, and *Pechipogon barbalis*; while one male specimen of *Macrothylacia rubi* was found drying its wings, and another was netted, and a pair of *Phalera bucephala* were found *in cop.*

On the way home a few additions were made, notably one specimen of *Triphosa dubitata*, *M. murinata*, *Panagra petraria*; and also, flying in the dusk, one each of *Drepana falcataria* and *D. binaria* were netted.

Monday, June 1st, being the Whitsun Monday, I had arranged with several friends to visit the beech woods of Brenau, our principal quarry being *Tephrosia consonaria*. Although sunshine was scarce, it was a very close hot day, and not at all agreeable for collecting. To reach the beech woods in question we first had to traverse a fairly long stretch of tall pine woods, which had a thick undergrowth of bilberry. Here and there were also open patches of heather. Butterflies were not much in evidence, the principal ones noted being *Callophrys rubi* (very worn), and *Chrysophanus dorilis* and *C. phlæas*.

Geometræ by no means swarmed as they had done on the day previous, and, with the exception of *T. putata* and *A. remutata*, very little was seen at first; however, in the first patch of bilberry a fine *Larentia hastata* was netted, and almost immediately afterwards something started up out of the bilberry, which was not recognized. After a long stern chase this was netted, and proved to be apparently *Ortholitha plumbaria*, a very large bluish-grey form, and quite different to our English ones. As the time of appearance—beginning of June—and getting worn are so entirely different to the habits of what we know as this species in England, where I have always found it at the end of July and during August, and besides which the insect seems quite different to our English *plumbaria*, being larger, more bluish in colour, and not so variegated, I consider that this may possibly be a distinct species. My friend Herr Herz, to whom I mentioned my doubts, is also of opinion that there is something queer here, as he had captured our English form at the end of July on the sea-coast. I would be much obliged if some English entomologist would obtain eggs of *O. plumbaria* during the coming season, and I will try and elucidate the matter.

Several specimens of this interesting form were obtained; meanwhile *L. hastata*, *Epione advenaria*, and *Eucosmia undulata*

were fairly common, the latter being by no means easy to capture, as, although a conspicuous insect, its colour harmonizes well against a background of bilberry and pine-trunks, and it is more often lost sight of than captured. Another conspicuous species easily lost sight of is *L. hastata*; its habit is to fly about twelve feet from the ground, and it has a very undulating flight; consequently, when flying amongst trees with the light shining through them, it easily eludes capture. Nothing further of interest was observed until we reached the restaurant where we were to dine, when my brother, who had been for a stroll round the lake, brought me a fine fresh specimen of *Lithostege farinata*, Hufn.

After dinner we made tracks for the beech woods, and while crossing a small meadow I observed *Ino statices* in some numbers on flower-heads. The beech woods unfortunately proved a failure as far as *T. consonaria* was concerned, not a single specimen being found by four diligent searchers; but *Demas coryli*, *Dasychira pudibunda*, *Lithosia aureola*, and *Ephyra trilineata* were found in odd specimens, and an occasional *Tephrosia luridata* raised our hopes in vain. *Larentia variata* was found in a small pine wood, but nothing further of note. On the way home *E. undulata* was more easily captured, as it adopted the habit of flying lazily along the road. Amongst the bilberry, *T. putata* was, as usual, freshly emerging, and I started up, but lost a fine specimen of *Bomolocha fontis*.

On June 6th, 8th, and 11th I sugared, with my friend Zobel, in the neighbourhood of Bernau; the locality chosen, at first sight, did not look at all promising, the sugared trees being on the border of an extensive pine wood; adjoining was a barren waste of land, overgrown with rank grass and, what appealed especially to us, patches of heather; the insect we had hope of getting being *Agrotis molothina*, an ally of *A. strigula*, and up to then only known in four or five specimens by Berlin. We had already sugared this spot about five times without any result worth speaking about. However, patience was at length rewarded, as on the three nights in question not only did we get our *A. molothina* in thirty to forty specimens, but also discovered four other insects, which are reckoned amongst Berlin's rarities; they were *Mamestra aliena*, *Hadena adusta* var. *baltica* (probably a good species, as it is quite different to English *adusta*), *Caradrina selini* var. *milleri*, and *Agrotis candalarum*. All these species were abundant; in one evening alone my take was forty-four *C.* var. *milleri*, twelve *M. aliena*, and fifteen var. *baltica*. But this by no means ends the list; other lesser stars were also in abundance:—*Acronycta abscondita*, *A. rumicis*, *Agrotis strigula*, *A. linogrisea*, *A. orbona* (*subsequa*), *A. cinerea*, *A. exclamationis*, *A. ypsilon*, *A. segetum*, *A. prasina*, *A. occulta*, *Mamestra leucophæa*, *M. advena*, *M. nebulosa*, *M. brassicæ*, *M. albicolon*, *M.*

oleracea, M. dissimilis, M. thalassina, M. contigua, M. pisi, M. trifolii, M. dentina and var. *latenai, Neuria reticulata, Miana strigilis, Hadena sordida, H. rurea* and var. *alopecurus, H. basilinea, H. gemina* and var. *remissa, Dipterygia scabriuscula, Trachea atriplicis, Leucania pallens, L. comma, L. conigera, Grammesia trigrammica. Rusina tenebrosa,* and *Cymatophora or.*

During the latter part of June and the first fortnight in July the butterfly season is at its height, and we made many excursions to the localities above mentioned. The 13th was a lovely sunny day, which we again spent at Finkenkrug. One of the first butterflies captured was a fine specimen of *Papilio machaon* ; a specimen of *Mamestra glauca* was found at rest on a tree-trunk, and almost immediately afterwards we were in the thick of the Melitæas—at present only *M. aurinia* and *M. cinxia* ; while *Lycæna amanda, L. icarus, Chrysophanus hippothoë,* and *C. alciphron* are abundant. The tree-trunks are now frequently tenanted by Psychid cases—*Sterrhopteryx hirsutella, Acanthopsyche opacella, Canephora unicolor, Bacotia sepium, Epichnopteryx pulla,* and *E. nitidella.* A peculiarity about *C. unicolor* is that only the males select tree-trunks to spin up on ; the female cases are always found spun up amongst herbage. Geometræ seem to have tailed off, the only Larentias observed being *tristata, ocellata,* and *sociata.* In the meadows, however, *Acidalia immorata* was fairly common, with occasional *A. ornata* and *A. immutata, S. clathrata* and *M. murinata.* On tree-trunks, *Acronycta psi, A. leporina, A. abscondita, Moma orion, Sphinx pinastri,* and *Boarmia consortaria* were frequent : one specimen of *Drymonia chaonia* and two of *Lophopteryx camelina* beaten out of oak, and *D. lacertinaria* netted. Larva-beating was almost too trying owing to the heat, and very little worth mentioning obtained. Oak produced *Catocala sponsa* (full-fed), and *Zephyrus quercus,* while Herr Wadzeck was fortunate enough to beat a larva of *Arctornis* (*Laria*) *l-nigrum* from lime. In the afternoon a case of *Psyche viciella* was found among herbage, several worn specimens of *Hemaris bombyliformis* netted, while a grove of old aspens produced the larvæ of *Trochilium melanocephalum* in plenty. The method of obtaining these latter is fairly simple ; the lower twigs and branches die off in the same manner as do those of firs, and all one has to do is to break off these twigs, and examine the fracture for the fresh galleries of *T. melanocephalum.* In this manner we obtained about a dozen larvæ in a very short time. The smaller aspens were beat for larvæ of *Apatura ilia* and *Limenitis populi,* and a few of each were obtained.

Sugaring one night at Wusterhausen was very successful, and the following were obtained in numbers :—*Acronycta psi, A. menyanthidis, A. auricoma, A. abscondita, A. rumicis, Agrotis obscura, A. simulans, A. cinerea, A. exclamationis, A. segetum, A. primulæ, Mamestra leucophæa, M. nebulosa, M. brassicæ, M. albi-*

colon, M. oleracea, M. genistæ, M. dissimilis, M. thalassina, M. dentina, Neuria reticulata, Hadena sordida, H. basilinea, H. gemina, D. scabriuscula, Hyppa rectilinea, Trachea atriplicis, Euplexia lucipara, Leucania pallens, L. albipuncta, G. trigrammica, Rusina tenebrosa, Tæniocampa incerta (very worn), *Erastria fasciana, Plusia gamma, Pseudophia lunaris,* and *Metopsilus porcellus.* The sugaring was so good that we kept at it all night, and were rewarded by a good series of *P. lunaris* each, though they were getting over.

As soon as it was daylight we commenced bumping trees for "prominents," and the following were brought down:—*Hoplitis milhauseri* (worn), *Drymonia chaonia, Notodonta dromedarius, N. trepida, Spatalia argentina, Lophopteryx camelina, Hylophila prasinana, H. bicolorana, Dasychira pudibunda, Boarmia consortaria, B. extersaria,* &c.

Towards the end of June the butterfly season commenced in earnest, and a long day spent in the woods near Spandau produced the following in abundance:—*Pieris brassicæ, P. napi, P. rapæ, Leucophasia sinapis, Gonepteryx rhamni* (worn), *Apatura iris, A. ilia* and var. *clyte, L. populi* (the four latter attracted by Limburger cheese), *Araschnia levana, Melitæa aurinia* (worn), *M. cinxia, M. didyma, M. athalia, M. aurelia, M. dictynna, Argynnis selene, A. ino, A. lathonia, A. dia, A. aglaia, A. niobe, Pararge egeria, Cœnonympha iphis, C. arcania, C. pamphilus, C. tiphon, Chrysophanus hippothoë, C. alciphron, C. dorilis, C. phlœas, Lycæna astrarche, L. eumedon, L. icarus, L. amandus, L. semiargus, L. alcon, Heteropterus morpheus, Adopæa lineola, A. thaumas, Augiades comma, A. sylvanus, Hesperia alveus, H. malvæ.* The burnets were also commencing to get about, though only *Zygæna meliloti* and *Z. trifolii*; *Lithosia muscerda* and *L. griseola* were common. *Acidalia emarginata* and *A. aversata* were perfect scourges, single examples each of *Ephyra pendularia, Hemithea strigata,* and *Geometra papilionaria* were netted. While beating a small birch tree I had the good fortune to beat out a freshly emerged *Sesia scoliæformis.*

In the marshy spots favoured by *C. tiphon* and *M. dictynna, Bankia argentula, Hydrelia uncula,* and *Erastria venustula* were not infrequent, as also a large "fanfoot," which turned out to be *Herminia tentacularia.* Tree-trunk searching results in a few odds and ends, *Moma orion, Boarmia consortaria, B. roboraria* and var. *infuscata,* and *Larentia trifasciata* being turned up; but Geometræ, for some unknown reason, appeared to be very rare at this season, only *L. sociata* being at all common. On the homeward journey two *L. quadrifasciaria* were found at rest.

Another outing at the beginning of July found most of the above-mentioned butterflies getting over, but *C. dispar* var. *rutilus* was in fine condition; one specimen of *L. sibylla* was netted, and *Dryas paphia* was fairly frequent.

During the latter half of June and the beginning of July we sugared pretty regularly in oak and alder woods by Spandau; most of the insects above mentioned continued to come, but the weather was unfavourable, and we did not have more than two or three favourable nights. The new arrivals were as follows :— *Acronycta tridens, A. leporina, Agrotis signum, A. ianthina, A. linogrisea, A. fimbria, A. augur, A. pronuba, A. brunnea, A. triangulum, A. prasina, A. occulta, Mamestra advena, M. tincta, M. nebulosa, M. persicariæ, M. splendens, M. contigua, Dianthœcia cucubali, Hadena monoglypha, H. lateritia, H. lithoxylea, H. sublustris, H. scolopacina, H. unanimis* and *H. pabulatricula, Cloantha polyodon, Nœnia typica, Leucania impudens, L. impura, L. straminea, L. l-album, L. lithargyrea, L. turca, Toxocampa pastinum, Lithosia complana, L. muscerda, Cymatophora or,* and *Asphalia duplaris.* A somewhat unexpected visitor was a large female *Cossus ligniperda* (*cossus*) ; is this species frequently attracted to sugar ?

About the middle of July we deserted our sugaring ground at Spandau, and selected a new one at Buch. The ground in question was the border of an extensive pine wood which ran for about half a mile along a rye field. About the middle of this field was a small pond overgrown with rushes, reeds, and marsh-grass, and the extreme border of the field was bounded by a small stream overgrown with alder, oak, and other deciduous trees. Beyond one end of the wood was an extensive clearing which had been recently deforested, and was now covered with rank growth. At the further end the ground was again crossed by another brook, about which were several reed-grown meadows. We sugared this spot fairly regularly from the middle of July to the end of August, and, taken all round, the results were very good. Quite a different lot of insects were obtained here. *H. lateritia* and *H. furva* were in countless numbers ; *H. monoglypha* and *H. lithoxylea* were also abundant, but *H. sublustris*, which had been so common at Spandau, was never seen. Other absentees were *A. prasina, L. turca, L. pudorina,* and *L. impura.* A fine variety of *C. or* was taken here, the figure of 80 being bright yellow.

Among others, we captured during this period *Acronycta leporina, A. megacephala, A. auricoma, A. abscondita, A. rumicis* (all second brood), *Agrotis obscura, A. orbona, A. baia, A. c-nigrum, A. xanthographa, A. plecta, A. tritici, A. obelisca, A. segetum, A. occulta, Mamestra advena, M. oleracea, M. aliena* (one female, second brood), *M. dissimilis, M. trifolii, M. dentina, Miana ophiogramma, M. strigilis, M. bicoloria, Bryophila algæ, H. furva, H. monoglypha, H. lateritia, H. lithoxylea, H. gemina, H. secalis, T. atriplicis, B. meticulosa, H. leucostigma, H. nictitans, Tapinostola hellmanni, T. fulva, L. pallens, L. comma, L. conigera, L. albipuncta, L. lithargyrea, Caradrina quadripunctata, C.*

milleri, *C. morpheus*, *C. alsines*, *C. taraxaci*, *C. ambigua*, *Amphipyra tragopogonis*, *A. pyramidea*, *Calymnia trapezina*, *Cosmia paleacea*, *Dyschorista suspecta*, *D. fissipuncta*, *Pyrrhia umbra*, *Catocala nupta*, *Aventia flexula*, *Zanclognatha tarsipennalis*, and *Z. emortualis*. A fine specimen of *Cerura furcula* was found at rest on a pine-trunk. *Neuronia cespitis*, *N. popularis*, *Plusia chrysitis*, *P. festucæ*, and *G. papilionaria* came to light. *Rhodostrophia vibicaria*, *Scotosia vetulata*, *Cidaria prunata*, *C. populata*, *C. associata*, *C. dotata*, *C. truncata*, *Larentia fumata*, *L. didymata*, *L. vittata*, *L. bilineata* and *L. comitata*, *Phibalapteryx polygrammata*, *Ellopia prosapiaria*, *Semiothisa liturata*, *Boarmia roboraria*, *B. lichenaria*, *Gnophos obscuraria*, *Bupalus piniarius*, *Perconia strigillaria*, *Acidalia bisetata*, *A. deversaria*, *A. emarginata*, and *A. marginepunctata* were netted while putting on the sugar.

On July 27th a visit was paid, with a couple of friends, to the limestone hills of Rüdersdorf. The day was delightful, and butterflies were in profusion. *Dryas paphia*, *Argynnis aglaia*, and *A. niobe* were in fine condition; *Epinephele jurtina*, *C. arcania*, *C. iphis*, and *C. pamphilus* were in countless numbers. *Chrysophanus virgaureæ* was in fine condition. The blues were somewhat scarce, only two *Lycæna cyllarus*, two *L. arion*, and about a dozen *L. argus* being boxed. Up a stony path a fine *A. lathonia* was netted as it was sunning itself on a stone, and then I saw for the first time that fine butterfly, *Satyrus alcyone*, sailing majestically through the air. It is fairly difficult to capture; one must wait till it settles, and then approach carefully. In about half an hour four fine specimens were netted. Its near relative, *S. semele*, was also about. Both these species have the habit of settling on pine-trunks, and are then quite invisible. Later in the season we frequently found *S. alcyone* sitting on the old sugar patches when putting on the sugar, and a good series were thus secured. A few worn *M. athalia* and *M. didyma* were also obtained. All this time a small Hesperid had been dashing about; this we at first left severely alone, believing it to be the common *A. thaumas*, but a chance capture apprise us of the fact that it was *A. actæon*, and a fine series was soon obtained. Butterflies are common enough, but they cannot compete with the burnets, which are now out in full force. *Zygæna meliloti*, *Z. purpuralis*, *Z. loniceræ*, *Z. trifolii*, and *Z. filipendulæ* are all about equally common, the latter being perhaps the commonest; *Z. meliloti* and *Z. trifolii* were getting worn.

Our objective being the limestone hills, we had to leave this Eldorado, and for about an hour our way led through a fairly gloomy pine wood. Much to my astonishment, a species of *Melitæa* was fairly common, together with *C. arcania*, all through these woods. I captured a good many, and they proved very variable, some striking varieties being amongst them; but the question is what are they—*M. athalia* or *M. aurelia*? I confess

I cannot say, and my Berlin friends all differ. We at length came to the edge of the lake, and a few each of *S. alcyone*, *S. semele*, and a freshly emerged *Vanessa polychloros* were netted.

A steamer carries us across the lake, and in ten minutes we are on the limestone hills, which remind one very much of our Kentish or Sussex downs. Here the entire fauna is changed as if by magic. *Lycæna corydon*, *L. minima*, *Melanargia galatea*, *Vanessa urticæ*, and *Epinephele jurtina* seemed to be the only butterflies about; an occasional worn *L. icarus* was observed. To make us appear more at home, *Ortholitha* (*Eubolia*) *bipunctaria*, *O.* (*E.*) *limitata*, and *L.* (*M.*) *galiata* are frequent. Burnets are still common, and as three special species occur here, and constitute our quarry, these are all netted for examination. *Z. purpuralis* seems to be the favourite here, and many are netted and let go, until finally we are rewarded by the first *Z. achillæ*. It seems to be too early for this species, and there are no signs of *Z. carniolica* and *Z. ephialtes* var. *berolinensis*; so we decide to shift our quarters. A fairly thick spinney attracts our attention next, and we beat patiently through it in the hope of Geometræ, but nothing but *Larentia bilineata* rewards our efforts. Sweeping the herbage at this point produces *Sesia ichneumoniformis* in some numbers; also a male of *Malacosoma castrensis*. *Prothymnia viridaria* is fairly common; one *Emmelia trabealis* and one *Acontia luctuosa* are netted, and one *Endrosa irrorella* and *Cybosia mesomella* found at rest on herbage.

While my two companions are still engaged with *S. ichneumoniformis*, I discovered a deep dell in the hillside which had escaped the scythe. A large "skipper" is flying about, which proves to be *Hesperia carthami*, and another is captured a few minutes later; and, the other two coming up, a systematic search is made for it without further result. Shortly after this the first *Z. carniolica* is secured, and other specimens are obtained sparingly. *Z.* var. *berolinensis* is also found in a few odd specimens, but it is evidently too early for these two species. It now being nearly five o'clock, all our boxes being full to overflowing, and we very tired and hungry, we decide to give up collecting for the day, which for the writer of these notes, at least, had been a very prolific one.

As my bag of *Lycæna arion* had been confined to one specimen, and as I was very desirous of getting a long series of this beautiful "blue," I decided to devote the following Sunday (August 3rd) to a visit to Bernau, where I was told the insect abounded. This is rather an awkward locality to reach, as after leaving the train one has a good hour's walk through open cornfields before reaching the woods, and this is no fun when the sun is doing his best. On the roadside few butterflies were in evi-

dence—chiefly *E. jurtina* and *C. phlœas*—the only thing I netted being a worn specimen of *Emmelia* (*Agrophila*) *trabealis*.

Arrived at length at the woods, things soon commenced to improve; *Dryas paphia* was everywhere, though somewhat worn, and the patches of thyme were covered with *E. jurtina*, *C. arcania*, *C. phlœas*, *C. virgaureæ*, and *L. argus*; as yet, however, no signs of *L. arion*.

At length a worn specimen was netted; a fine *Grapta c-album* is next added to the bag, and then my attention was caught by a very small *E. jurtina*, which on being netted turned out, to my delight, to be the local *E. lycaon*. A good series of this insect was soon collected, and of *L. arion* some dozen specimens were captured, all, however, considerably worn. A very worn specimen of *C. rubi* showed the second brood of this insect was getting over, and then, to my utter surprise, I netted a fine female *Zephyrus quercus* on the thyme. I had never seen this species so low before, and, to make matters still more extraordinary, there were no signs of oak for miles, so to speak. A specimen of *Pararge megæra* was netted; this species, as far as my experience goes, seems to occur everywhere in isolated specimens.

Whilst searching the heather a specimen of *Agrotis strigula* was started up and netted; two more were secured in the same manner, as also a specimen of *A. vestigialis*. On a piece of waste ground a few specimens of *Coscinia striata* and *C. cribrum* were netted, and here *Argynnis niobe*, *A. aglaia*, *Satyrus alcyone*, and *S. semele* were abundant. Geometræ were conspicuous by their absence, only an odd *E. atomaria* of the second brood being observed.

During this month the lamps in the Thiergarten proved very attractive, and were regularly besieged by *Euproctis chrysorrhœa*, whose larvæ had defoliated the Thiergarten earlier in the year. The visitors were principally Lymantrids—*E. chrysorrhœa*, *E. auriflua*, *Stilpnotia salicis*, *Lymantria dispar*, and *L. monacha*; but I also saw a specimen of *Rhyparia purpurata*, and obtained a few specimens each of *Œnistis quadra*, *Malacosoma neustria*, *Odonestis pruni*, *Dendrolimus pini*. *Luperina testacea*, *Epineuronia popularis*, *Hydræcia micacea*, and *Caradrina morpheus* seemed to be the only Noctuæ attracted, *Boarmia repandata* (worn), and *Ennomos quercinaria* the only Geometræ.

About this time I went for a short holiday to the Glätzer Gebirge, a portion of the Riesengebirge. Everything in the butterfly line seemed worn to rags. *D. paphia*, *Argynnis lathonia*, *A. niobe*, *A. aglaia*, *Melitæa athalia*, *Chrysophanus virgaureæ*, *C. hippothoë*, *Lycæna hylas*, *L. semiargus*, *L. icarus*, *L. amanda*, and *Melanargia galatea* were all practically over, and scarcely a good specimen could be obtained. *Pararge mæra* was, however, just nicely out, and I was very pleased to meet with

Erebia ligea for the first time. This insect was fairly common everywhere on the lower slopes, but unfortunately getting worn, and a good many had to be netted and examined before a nice series of both sexes was obtained. Geometræ were fairly plentiful, however, and especially on the hillsides amongst the bilberry a good many could be beaten out. By diligent working I obtained a fair series of the following:—*Acidalia perochraria*, *A. straminata* and *A. degeneraria*, *A. immutata*, *Ortholitha limitata* and *O. bipunctaria*, *Anaitis præformata*, *Lygris populata*, *L. reticulata* and *L. associata*, *Larentia didymata*, *L. cæsiata*, *L. unidentaria*, *L. verberata*, *L. unifasciata*, *L. adæquata*, *L. minorata*, *Gnophos obscuraria*, *Thamnonoma wavaria*, and *Odezia atrata*.

I did not sugar once, but tried light, with very indifferent results—two *Arctia caia*, one *Amorpha populi*, several *Plusia chrysitis*, *Œ. quadra*, *B. lichenaria*, and some common Noctuæ.

Once we made an excursion to the top of the Schneeberg, 5600 ft., but the day was unfavourable, and very little was about. As one commenced to get higher up *Erebia ligea* was replaced by *E. euryale*, and I obtained a fine series of this species in grand condition. *Pyrameis cardui* was everywhere, but difficult to capture; *Pararge mæra* was also in fine condition, and several pupæ of this species were found attached to boulders.

A sight I will never forget was a single isolated boulder with an overhanging surface about two yards square. Settled on this surface I counted no less than forty-seven specimens of *Larentia cæsiata* in all sorts of conditions. I secured about a dozen whilst the rest were decamping.

Arrived at the top of the Schneeberg, the sun disappeared for good, and only a few isolated specimens of *Erebia euryale* were observed. The flora was quite alpine here—yellow violets, a very hairy *Campanula*, a large hairy hawkweed, and, above all, a fine large pinky-white spike (a species of knotgrass), which was growing everywhere. This latter proved exceedingly attractive to a species of *Agrotis*, which was here flying about in broad daylight, and settling on these flowers. I secured a fair series, but have not yet determined the species, but it is probably *A. collina*.

The last entomological experience was the discovery of an immense colony of *Vanessa antiopa*, which produced in good time seventy-four imagines, all perfectly typical. They were feeding on birch and sallow, and, as far as I could see, were perfectly free from ichneumons.

(To be concluded.)

NOTES AND OBSERVATIONS.

The University of Oxford has already conferred academic honours on more than one entomologist. To the ranks of the Masters of Arts must now be added Commander J. J. Walker, R.N., F.L.S., and one of the Secretaries of the Entomological Society of London, upon whom was conferred the degree "honoris causa," at a Convocation held in the Sheldonian Theatre on Thursday, June 29th. Introduced in a Latin speech which did justice to the recipient's world-wide work in the service of entomology, Commander Walker, as he emerged in his crimson hood and Master's gown, received the congratulations of several members of the Council of the Society who were present for the occasion, including Professor E. Poulton, D.Sc., F.R.S.; Dr. F. A. Dixey, M.D.; Mr. H. Rowland-Brown, M.A.; and Mr. G. C. Champion, F.Z.S. Meanwhile it is pleasant to note the encouragement given to entomologists in Oxford just now; and it is only to be hoped that the sister university will presently develop a similar enthusiasm. The Entomological Society of London, indeed, has found a number of valuable recruits of late years at Oxford, in rather striking contrast to the small number of resident graduates enlisted at Cambridge.—H. R. B.

Phalonia (Argyrolepia) badiana, Hb.—Stainton (1859) says in Manual, "Larva in the stems and roots of burdock." Wilkinson (1859) says, "The larva feeds in the stems and roots of *Arctium lappa*." Meyrick (1895) says, "Larva in stems and roots of *Arctium lappa*." Last autumn I brought home a few *seed-heads* of burdock which had some *Tortrix* larvæ feeding in them. From these I have just bred this species.—T. A. Chapman; "Betula," Reigate, June 26th.

Ova of British Butterflies Wanted.—Among other ova that I am anxious to obtain figures of are those of *Argynnis aglaia*, *A. adippe*, *Limenitis sibylla*, *Apatura iris*, *Erebia æthiops*, *Satyrus semele*, *Epinephele tithonus*, *Cyaniris argiolus*, *Augiades comma*, *Adopæa thaumas*, *A. actæon*, and *Pamphila palæmon*. If any one has an egg or two of either of these to spare, and would kindly send them to me, I should be greatly obliged.—R. South; 96, Drakefield Road, Upper Tooting, S.W.

The National Collection of British Lepidoptera.—Among some useful insects presented by Mr. Eustace Bankes is the type of *Noctua subfusca*, Haw., which the donor recognizes as a dark form of *Agrotis corticea*. Mr. Prout has also added some specimens from ancient collections, and of them one is *Phytometra lutescens*, Haw. (*arcuosa*, Haw., var.).

The Entomological Club.—A meeting was held at the 'Hand and Spear' Hotel, Weybridge, on July 11th, 1905. Mr. G. T. Porritt, of Huddersfield, was the chairman and host of the evening. Of the seven guests Messrs. Adkin and Donisthorpe were the only other members of the Club present.

Migration of Lepidoptera.—Living, as I do, on the south-east coast of England, I take an interest in this question and lose no opportunity of watching any fresh species that comes in my way. The wind here is a great drawback to the collector of Lepidoptera, but possibly it is a benefactor as well. For some years past I have watched

the gas-lamps close to my house, one of which is conveniently situated under the trees at my front door, and early this month I was suprised to notice, inside a lamp, three or four specimens of *Euchelia jacobææ*, an insect I have never seen in Margate during the twenty-five summers that I have been resident here; nor have I heard of one being seen by any other collector—novice or otherwise. I examined ten or twelve gas-lamps, and *E. jacobææ* had found its way into several of them, and in all I saw about a dozen specimens. I may say that our gas-lamps are fitted with incandescent burners, so that insects cannot well reach the flame, but I should say suffer from the heat; and the posts are not suitable for "swarming." One specimen only was outside a lamp, and this I captured. Considering that there is not much ragwort on the outskirts of Margate, I am wondering whence these specimens came. The following day we had a drenching rain (two inches in a little over the twenty-four hours), and I have not seen another specimen since. I am inclined to think the trains may bring the parents of visitors of this kind, as the specimens were all seen within a hundred yards of the railway, and most of them within fifty yards—at lamps on each side of the railway. The wind and rain have hindered entomological work very much this June, but on Thursday (the 15th inst.) we had an ideal "lamp" night. One lamp—on the railway-bridge—occasionally attracts *Neuria saponariæ* (*reticulata*) early in June; on this evening it produced six examples, and the ironwork was well carpeted with *Acidalia promutata* (*marginepunctata*). First broods were also in evidence at other lamps: for example, *Aspilates citraria* (*ochrearia*), *Agrotis puta*, and *Acontia luctuosa*, besides a goodly number of common species; but I was most interested in the novelties which appeared. The first was a shark, inside the lamp, so I fetched my ladder, and to my satisfaction it proved a good specimen of *Cucullia chamomillæ*, and this was followed by *Hadena genistæ*, also good, both fresh to my local list. But what surprised me most of all, just as I decided to go to bed, was a *Sphinx*, in a very wild state—I almost took it for a bat at first. I had the good fortune to get it in my net, and it proved to be a male *S. convolvuli*. I have taken this insect once before in June, at rest on a post near Worth Mill, Sandwich, but in that year I had no autumnal specimens brought to me. The question arises, Is this specimen a migrant, or has the pupa lain over for the winter in this country? *Vanessa cardui* has been commoner in Margate lately than in ordinary seasons; the specimens are very thinly scaled, which also points to migration.—J. P. Barrett; St. John's Villas, Margate, June 18th, 1905.

CAPTURES AND FIELD REPORTS.

Pitheochroa (Commophila) rugosana in Surrey.—On June 2nd, 1904, when walking over the Kenley downs, a small moth took wing from among the long grass, and settled again a few yards away. It was ultimately secured, and proved to be a fine fresh example of *P. rugosana*. So far as I could ascertain, there was no bryony, the larval food-plant, in the immediate vicinity. The only previous Surrey record that I am aware of is that in the 'Victoria History of the

Counties of England,' vol. i. Insecta, p. 138, where it is stated that this species was once taken by Mr. Sydney Webb near Dorking.—Richard South; 96, Drakefield Road, Upper Tooting, S.W.

Limacodes testudo in Gloucestershire.—As I find that Mr. Barrett does not mention this county as a locality for this species, it may be of interest to record that a very fine female example was beaten out of an oak-tree on June 5th last near here by the Rev. E. M. Smith.—C. Granville Clutterbuck; Gloucester.

Cymatophora octogesima (ocularis) in Epping Forest.—It may be of interest to record the capture of two specimens of *C. octogesima*, one on the evening of June 30th, and the other on the following evening (July 1st). I believe that this species is found, as far as Epping Forest is concerned, only at the south end of the wood, and my two were taken on sugar in the garden at "Normanhurst," Chingford, where I am residing. I might mention that I took the female on June 30th, and, thinking that a male might be in the neighbourhood, I sugared again on the following night, and was successful in taking a very good example of that sex. I believe there are few records of *C. octogesima* having been taken in Epping Forest.—R. T. Baumann.

Leucania favicolor, Barrett.—A fine example of this species flew into my room, attracted by the light, on July 4th, at 10.50 p.m. An example of the red form, ab. *rufa*, Tutt, flew into the same room, and at about the same time, last September. Of the six or seven individuals which I have previously captured at different times here, all have been ab. *rufa*. I am indebted to Mr. Eustace Bankes for having last autumn first called my attention to the fact that I had taken *favicolor*, always having supposed these red forms to be a variety of *L. pallens*, and I think it quite probable that I have hitherto overlooked the type.—(Rev.) A. P. Waller; Henley Rectory, Woodbridge, July 19th, 1905.

Aporia cratægi.—Lovers of the Diurni will be pleased to learn that the present season has been the best I have known for the "black-veined white" since I first took it in this corner of Kent in 1901. On June 28th I went prospecting. This means discovering an orchard, with a clover field adjoining, preferably white Dutch clover, for the combination of these two things appears a requisite in order to get more than a stray specimen. I was lucky enough to capture a single male specimen which had just emerged from the chrysalis, and was quite limp, and which fell an easy prey outside an orchard of big plum-trees. On July 3rd (the first sunny day afterwards) I got to the clover field nearest the spot, and bagged sixteen. Rain and cloud kept me at home for several days, and at my next visit the clover had been cut, and this necessitated a long walk in the broiling sun, for the "combination" is not common. However, I discovered another field, where I beat record, and secured twenty-one specimens. Again the horse-mower dogged my heels, and sport was gone. A third spot was discovered, and that field produced a dozen. I had to make haste, for the driver was having his dinner preparatory to cutting, in this case, a crop of mixed red clover and lucerne. Last Monday I got a few stray specimens, but when I reached my *fifty* I decided to leave the rest in peace.—J. P. Barrett; St. John's Villas, Margate, July 12th, 1905.

SOCIETIES.

South London Entomological and Natural History Society.—*June 8th*, 1905. — Mr. Hugh Main, B. Sc., President, in the chair.—Mr. Kaye exhibited a bred series of *Zonosoma pendularia*, shewing considerable variation, with pupa-cases *in situ* on the leaves, and referred to the variable position of the girth.—Mr. West (Greenwich), examples of the rarely met with *Coccinella distincta*, which he had taken at Darenth Wood, together with *Mordellestina abdominalis*, a coleopteron parasitic in bees' nests. — Mr. Sich, the exceedingly small ovum of *Lithocolletis quercifoliella*. — Mr. Main, the tracheal tubes of the silkworm, which had been dissected out by means of a solution of potash. He also shewed a case of insects from West Africa. — Mr. Step, a photograph of the party who attended the Field Meeting at Seal Chart on May 27th.

June 22nd.—Mr. Alfred Sich, F.E.S., Vice-President, in the chair.—Mr. Rayward exhibited a larva of *Thecla w-album* spun up for pupation, and also a pupa, and shewed the remarkable mimetic resemblance to a crumpled, shrivelled leaf. — Mr. Turner, a long series of *Colias erytheme* vars., including var. *eriphyle* and var. *keewaydin?* sent to him by Mr. A. J. Croker, from Assiniboia, and read a short paper on the species and its allies. He also shewed *C. philodice*, *C. palæno*, *C. erate*, *C. hyale*, *C. edusa*, *C. electra*, *C. phicomene*, and *Meganostoma cæsonia*.—Mr. Edwards, a number of species of *Colias*. — Mr. Stonell, (1) a specimen of *Euchelia jacobææ* from Oxshott, with the apical, hind marginal, and costal streaks united; (2) a very pale *Amorpha populi*; (3) *Angerona prunaria*, females with male coloration; (4) *Boarmia abietaria* var. *sericearia*; (5) *Acidalia humiliata* from the Isle of Wight; (6) larvæ of *Nyssia lapponaria* from Rannoch; and (7) larvæ of *Apatura iris* from North Hants.—Dr. Chapman, larvæ of *Arctia villica* from ova laid by a female captured in April at Taorina, in Sicily; and also imagines of *Graëllsia isabellæ* bred from larvæ taken at Bronchales, together with ova laid by them. — Mr. Adkin gave a short account of the Annual Congress of the S.E. Union of Scientific Societies held at Reigate, June 6th to 10th.—Hy. J. Turner, *Hon. Rep. Sec.*

Birmingham Entomological Society.—*May 15th*, 1905.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. A. H. Martineau exhibited a rare sawfly (*Schizocera furcata*, female), taken by Mr. C. J. Wainwright in Wyre Forest on May 26th, 1890. It had been named for him by Rev. F. D. Morice, who told him that only two specimens had previously been known from the British Isles. He also shewed a specimen of *Tenthredo livida*, male, which had only one antenna with the normal white tip to it, the other being quite black. He also shewed various exotic Aculeates, &c. — Mr. J. T. Fountain shewed a series of *Biston hirtaria*, Cl., bred from ova received from Yorkshire. He said that the females were decidedly later than the males in emerging (about ten days on the average). He also shewed a beautiful series of *Dianthœcia albimacula*, Bkh., from a locality he could not mention. — Mr. G. T. Bethune-Baker exhibited a collection of butterflies of the genus *Ogyris* from the Australian region, and gave an interesting account of their peculiar life-history, their association with ants, &c.—Colbran J. Wainwright, *Hon. Sec.*

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NEW AUSTRALIAN BEES OF THE GENUS *NOMIA*.

BY T. D. A. COCKERELL.

TEN species of *Nomia* have been recorded from Australia, all described by F. Smith, and published in Trans. Ent. Soc. Lond., one in 1862, and nine in 1875. Smith remarked that *N. generosa* was probably the male of *N. mœrens*, and I believe that *N. rufi-cornis* (*smithella*, Gribodo, 1894) is the male of *N. nana*; so the list probably includes only eight valid species. It is evident, however, that it does not do justice to the actual facts, for the British Museum collection contains quite a series of hitherto unreported forms, which I describe below. The Austro-Malay islands (including Celebes, the Moluccas, New Britain, the Aru islands, &c.) are rich in species of *Nomia* (twenty-one described), but, so far as I am able to ascertain, none of these are quite identical with those of Australia, nor is any species very widely spread among the islands.

The following table separates the species now described :—

Hind margins of abdominal segments pearly green ; hind femora incrassate and humped above (♂) *pulchribalteata* subsp. *austrovagans*, Ckll.

Hind margins of abdominal segments not so . . 1.

1. Tegulæ very large, light fulvous ; sides of face covered with white tomentum (♀) . . . . *lepidota*, Ckll.

Tegulæ not especially remarkable . . . . 2.

2. Tibiæ and tarsi red, the former with a suffused blackish mark in front ; face covered with fulvous tomentum ; abdomen with rufo-fulvous hair-bands ; hind legs hardly deformed (♂) . . . . *rufocognita*, Ckll.

Tibiæ and tarsi not red, or not distinctly so . . . 3.

3. Black species ; abdomen without well-developed hair-bands (♂) . . . . . *tenuihirta*, Ckll.

Abdomen distinctly banded with hair, or the segments whitish margined . . . . . 4.

4. Black . . . . . 5.
   Wholly or in part green or blue . . . . . 6.
5. Hind margins of second and following abdominal segments broadly yellowish white; second submarginal cell extremely small (♀) . . . . *semipallida*, Ckll.
   Hind margins of second and following abdominal segments not white; second submarginal cell larger (♂) *hypodonta*, Ckll.
6. Mesothorax black (♂ ♀) . *australica*, Sm., var. *reginæ*, Ckll.
   Mesothorax green or blue . . . . . 7.
7. Mesothorax yellowish green (♂) . . . *flaviviridis*, Ckll.
   Mesothorax blue or greenish blue (♂ ♀) *flaviviridis* var. *doddii*, Ckll.

Nomia (*Hoplonomia*) *pulchribalteata*, var. *austrovagans*, n. subsp.

♂. Length about 8½ mm. (the position of the specimen makes it difficult to measure); black, head and thorax with sordid yellowish-white pubescence, the scanty short hair on thorax above dark; tongue long and slender; eyes red; face very broad above, strongly narrowed below; clypeus with a keel; mandibles and antennæ black, the latter not especially long, not crenulate; vertex dullish, granulo-punctate; mesothorax dull, very densely punctured; scutellum with a pair of widely separated short (subpyramidal) spines; post-scutellum covered with white tomentum, and provided with two long black spines, much closer together than those of the scutellum; basal area of metathorax extremely short, with little transverse (antero-posterior) ridges; tegulæ fuscous in the middle, then fulvous, and the margin white-hyaline; wings rather yellowish, the apex a little darker; stigma and nervures piceous, second submarginal cell higher than broad, but not far from square; legs black, hind tarsi and outer and apical part of hind tibiæ ferruginous, the red brightest on the tibiæ; hind femora swollen, strongly humped above, but not toothed beneath; hind tibiæ gradually broadened to the apex, with a prominent convex keel on the outer side, but the inner apex is blunt, not toothed; abdomen black, strongly and coarsely punctured, the hind margins of the first five segments with smooth pearly light green bands, shining purple in some lights, and appearing white in others, the first band narrowest; sixth segment with a very broad and deep semicircular median emargination; apical part of venter ferruginous. The third and following abdominal segments have black hairs overlapping the bands.

Hab. Adelaide (F. Smith collection, 79. 22).

This is the first Australian *Hoplonomia*. It is very close to *N. westwoodii*, Gribodo, from Bengal, and *N. pulchribalteata*, Cameron, from New Britain; it is, in fact, so close to the latter that for the present I treat it as a subspecies. It will be known by the purple tints of the abdominal bands, resembling in this respect *N. formosa*, Sm., from Celebes.

Nomia lepidota, n. sp.

♀. Length, 7 mm. or rather more; black, the hind margins of the abdominal segments narrowly reddish; head broad, minutely

rugoso-punctate, eyes strongly converging below ; sides of face, adjacent to the eyes, with very broad bands of white tomentum, but clypeus and middle of face without this tomentum; anterior margin of clypeus with some shining pale golden hairs ; mandibles faintly reddish in the middle; flagellum obscure ferruginous beneath; tubercles covered with white tomentum ; pleura with white hair, not entirely concealing the surface ; mesothorax and scutellum bare, with very large punctures; post-scutellum entirely covered with white tomentum ; metathorax with large punctures, its basal area reduced almost to nothing ; tegulæ very large (about three-quarters the length of mesothorax), being broadly produced backwards, light fulvous, dark only about the base of attachment; wings slightly dusky, stigma rufous, nervures dark, second submarginal cell rather large; legs very dark reddish, with white hair, that on inner side of basal joint of hind tarsi very pale orange; abdomen with a thin white pubescence, but no distinct hair-bands, but on each side of the first segment is a very conspicuous patch of white tomentum.

Hab. Sydney; F. Smith collection, 79. 22. The numbers cited are the accession-numbers of the British Museum. Readily known by the large tegulæ and bandless abdomen.

Nomia rufocognita, n. sp. (or *generosa*, var. ?).

♂. Length about 9 mm. ; black, the tibiæ and tarsi bright ferruginous, the tibiæ with a blackish spot in front; head broad ; face covered with fulvous tomentum, occiput with fulvous hair ; mandibles simple, curved and very sharp, ferruginous, blackened at the apex; labrum ferruginous; antennæ very long, wholly dark, flagellum crenulated, the apical part very strongly; hair of thorax fulvous, tubercles covered with tomentum, as also the post-scutellum, but on the latter it is white ; mesothorax and scutellum with strong close punctures of moderate size ; tegulæ ordinary, bright ferruginous, the margins subhyaline ; wings rather yellowish, ample, stigma and nervures dark reddish brown, second submarginal cell much higher than broad ; legs with thin fulvous hair ; hind legs scarcely deformed, their femora rather stout, their tibiæ flattened, the posterior edge convex, the anterior concave ; abdomen strongly and very densely punctured, with fulvous pubescence, the hind margins of the segments whitish hyaline (those of the second and third very broadly so), and having thin bands of fulvous hair ; venter simple.

Hab. Queensland, 94. 61 ; also marked 312, and what looks like Hy. Closely allied to *N. generosa*, Sm., but distinguished by the fulvous pubescence ; it may possibly be only a variety. The scutellum is bigibbose.

Nomia tenuihirta, n. sp.

♂. Length about 8 mm. ; black, even to the tarsi, the flagellum obscure brownish beneath ; front rugoso-punctate ; face covered with white tomentum, except the anterior part of clypeus, and a median longitudinal band below the antennæ, in the middle of which is a raised shining line; mandibles black; last antennal joint with an

oblique shining truncation; mesothorax and scutellum with extremely close minute punctures; scutellum not at all bigibbose or depressed in the middle; mesothorax with a good deal of appressed white hair, very conspicuous but not covering the surface; tubercles and post-scutellum covered with coarse white hair; basal area of metathorax reduced to a narrow band, with little transverse keels; punctures on posterior face of metathorax large; tegulæ reddish brown centrally, otherwise yellowish hyaline; wings almost clear, a little dusky at apex; stigma rufous, nervures dark rufous; second submarginal cell much higher than broad, receiving the first recurrent nervure before its end; legs with white hair; spurs black; hind legs scarcely modified, the tibiæ somewhat produced at apex beneath, the spurs arising from beneath the point; abdomen shining but well punctured, the punctures large on the first segment, smaller on the second, and successively smaller and fainter on the following ones; no distinct hair-bands, but a scattered white pubescence, especially on the apical half, and conspicuous erect white hair on the base and sides of the first segment; apex broadly truncate, with rounded corners; no ventral teeth, but first ventral segment raised in the middle.

Hab. Queensland, 94. 61; also labelled Ridg., and 638. Easily known from *N. argentifrons* by the normally formed hind legs and the absence of pale reddish colour on the clypeus, legs, &c.

Nomia semipallida, n. sp.

♀. Length about 8 mm.; black, the tarsi dark reddish, the claws fulvous tipped with black; head broad; eyes yellowish brown; face covered with white tomentum, which appears yellowish white and dull seen from in front, but shining snow-white seen obliquely from the side; a longitudinal keel between antennæ; cheeks with yellowish-white hair, and a very narrow silvery band along the orbital margin; vertex dull; antennæ wholly dark; mandibles light ferruginous with the apex black; tongue long and slender; hair of thorax white at sides and beneath, pale ochreous above, rather abundant but inconspicuous on mesothorax; post-scutellum covered with a dense band of white tomentum, and an oblique band of the same at each side of the scutellum; basal area of metathorax shining, with transverse ridges; punctures of mesothorax distinct, uniform, and very close; tegulæ pale rufous, with a dark basal spot; wings dull hyaline, iridescent, stigma and nervures rufous, second submarginal cell very small and narrow, receiving the first recurrent nervure before its end; marginal cell bluntly rounded at end; legs with white hair; spurs ferruginous; abdomen broad, rather shining, rugoso-punctate, the first segment rounded, and with much erect white hair; hind margins of second and following segments broadly whitish hyaline, not provided with well-defined hair-bands; ventral segments also white-margined.

Hab. Queensland, 91. 16; also labelled 315 Hy. Easily known by the whitish margins of the abdominal segments.

Nomia hypodonta, n. sp.

♂. Length about 8 mm.; black, the abdomen blue-black, with the hind margins of the segments pure black; pubescence of head and

thorax white, a little yellowish on face, vertex, mesothorax, and scutellum; the mesothorax and scutellum, seen from above, look bare, but viewed from the side they are seen to have rather abundant short fuscous hair; mandibles black, ferruginous at apex; labrum shining black, strongly emarginate; vertex granular; antennæ long and slender, entirely black, third joint shorter than fourth; mesothorax dullish, minutely granulo-punctate; post-scutellum with a delicate white tomentum; sides of metathorax with a large patch of loose white fluff; basal area of metathorax rather large, shining, with numerous raised lines or keels, its hind margin in the middle with a pair of rounded excavations; tegulæ rather large, deep red-brown, the inner hind angle pointed; wings hyaline, the apical margins faintly dusky, stigma and nervures fuscous; second submarginal cell higher than broad, but not small, receiving the first recurrent nervure at its apical corner; legs black, with white pubescence, the basal part of the claws ferruginous, the spurs light ferruginous; second to fourth joints of anterior tarsi triangular; hind femora extremely swollen and convex above, beneath with a concave area, flattened in a transverse direction; hind tibiæ much thickened, with a large and a small tooth beneath towards the base, and the spur-bearing apical lobe incrassated; abdomen minutely roughened, with a subsericeous surface, the apical margin of the first segment minutely punctured, and having a little patch of white hair at each extreme side; the apical margins of the second and following segments with bands of pure white hair, but that on the second is extremely widely, that on the third rather widely, and that on the fourth slightly, interrupted; third ventral segment with a pair of prominences, each terminating in a short sharp spine; fourth ventral segment emarginate, with the hind lateral angles pointed.

Hab. Queensland (E. Saunders), 93. 49; also marked Hy, 308. Close to *N. dentiventris*, Sm., but the pubescence is of a different colour, the hind femora do not present a large swelling beneath, and the ferruginous colour on the legs is lacking.

Nomia australica, Sm., var. *reginæ*, n. var.

♀. Length about 11½ mm.; flagellum ferruginous beneath; scape dark rufous; face with a slender keel or raised line extending from level of antennæ to apex of clypeus; clypeus all black, the anterior part shining, with very large punctures; tongue dagger-shaped, very broad at base; mesothorax shining black, with large scattered punctures, and very minute close ones; tegulæ testaceous and subhyaline, fuscous basally, fulvous in the middle; second submarginal cell almost square; abdomen dark blue, the broad hind margins of the second to fourth segments brass-colour, with hair-bands which are fulvous except laterally, where they are white; the hair-band on the second segment is entire, but thin in the middle; spurs black, those of hind legs curved at apex.

♂. Mesothorax very densely and quite strongly punctured, the punctures not of two sizes; anterior part of clypeus whitish hyaline, the extreme edge ferruginous; truncate process on hind tibiæ not so long as Smith figures for the type.

Hab. Queensland; one female, five males. The female is

marked E. Saunders, 93. 49, and 317. The males are marked as follows : (1.) 91. 16, Hy. 316 ; (2.) 91. 16, 317 ; (3.) E. Saunders, 93. 49, 317 ; (4.) same as 3 ; (5.) F. P. Dodd, 1902. 319 ; Townsville, 22. 10. 01.

The Adelaide form of this insect is to be considered the type ; Smith himself remarked on the geographical variation of this species. The Queensland race is readily distinguished in the female by the wholly dark clypeus and the entire hair-band on the second abdominal segment.

Nomia flavoviridis, n. sp.

♂. Length about 7½ mm. ; head and thorax dull yellowish green ; abdomen blue-green (largely blue on first segment), with the hind margins of the second and following segments broadly yellow-green, or the yellow-green colour may suffuse the segments broadly ; vertex and mesothorax granulo-punctate ; face and cheeks covered with snow-white hair, that on vertex dull pale yellowish grey ; antennæ long, flagellum dull brown beneath ; anterior part of clypeus pale yellowish hyaline, the edge ferruginous ; apical half of mandibles dark ferruginous ; tongue dagger-shaped ; hair of mesothorax and scutellum yellowish fuscous, not conspicuous, hind edge of mesothorax with two patches of white tomentum ; post-scutellum covered with white tomentum ; a large patch of white hair on each side of metathorax, and hair of pleura white ; area of metathorax rather large, covered with ridges, the posterior margin at middle with two slight excavations (as in *N. hypodonta*, but less marked) ; tegulæ rufo-fulvous, the inner hind angle pointed ; wings clear, stigma sepia brown, nervures dark brown ; second submarginal cell nearly square, first recurrent nervure meeting second transverse-cubital ; legs with white pubescence ; femora metallic green, the knees ferruginous ; tibiæ ferruginous with more or less green suffusion ; tarsi entirely ferruginous ; spurs white ; hind femora swollen ; hind tibiæ broadened, long-triangular, the inner edge sharply keeled ; hind margins of abdominal segments with white marginal bands, that on first represented only by a patch on each extreme side ; venter not dentate.

Hab. Queensland, 91. 16 ; two specimens, both numbered 434. Distinguished from *N. ænea*, Sm , by its strongly metallic colours, the stouter femora, and the pure white abdominal hair-bands.

Nomia flavoviridis var. *doddii*, n. var.

♂. Length about 7 mm. ; dark blue, with the third and following abdominal segments olive-green ; legs coloured as in *N. flavoviridis*, the tarsi variable, sometimes dark, sometimes quite bright ferruginous ; tongue dagger-like ; second submarginal cell square, the first recurrent nervure meeting second transverse-cubital.

♀. Length about 7½ mm. ; head, thorax, and abdomen entirely dark blue ; apex of abdomen fringed with pale chocolate hair ; anterior half of clypeus black ; legs very dark rufo-fuscous ; mesothorax with minute punctures, and scattered larger ones, in the manner of *N. australica*.

Hab. One female, Parry Harbour, C. Bougainville, 92. 4; six males, Townsville, Queensland, 8. 12. 01 (F. P. Dodd); 1902. 319. The colour is uniformly very different from that of *N. flavoviridis*, but there are no satisfactory structural characters.

Nomia rubroviridis, n. sp.

♀. Length about 10½ mm., rather broad; black, the hind margins of the first four abdominal segments with very broad entire emerald-green bands, the first two being suffused on their anterior half with vermilion; the fifth segment has a dense fringe of ochreous hair, and the apical segment is covered with the same. Sides of face, area between antennæ, cheeks, prothorax including tubercles, pleura, post-scutellum, and nearly all of metathorax covered with coarse sordid-white, more or less tinged with ochreous; a delicate raised line extends down middle of face to apex of clypeus; antennæ dark; mandibles with the subapical region dark red, the apex feebly bidentate; mesothorax dull, with dense small punctures; scutellum also dull, slightly depressed in the middle, but not tuberculate or spined; *post-scutellum with a prominent bifid median process, directed backwards, having much the shape of a fish-tail;* tegulæ large, the inner hind corner pointed, the base fuscous, the middle ferruginous, the outer hind part broadly creamy white; wings somewhat dusky, stigma and nervures dark rufo-fuscous; second submarginal cell fairly large, a little higher than broad, receiving the first recurrent nervure much before its end; legs black, with pale pubescence; *anterior spur of hind tibia longer than the other, stout and nearly straight, with a little divergent reddish spine arising from the side of its apex;* hind spur curved, simple; black parts of abdomen dull, only moderately punctured; hind margins of ventral segments dark and fringed with hair.

Hab. Australia, north-west coast; 69. 50. A very distinct and beautiful species, superficially resembling a small *Anthophora* of the *zonata* group, with which, in fact, I had accidentally mixed it. It is not precisely a *Hoplonomia*, but it is probable that the diagnosis of that group should be modified to permit its inclusion. In the colour of the abdominal bands it strongly recalls *N. opulenta*, Sm., and *N. elegans*, Sm., from Morty Island and Celebes respectively.

Boulder, Colorado: May 7th, 1905.

DESCRIPTION OF A NEW SPECIES OF *PSEUDAGENIA* (HYMENOPTERA—POMPILIDÆ) FROM NATAL.

By P. Cameron.

Pseudagenia natalensis, sp. nov.

Black, the prothorax, except the sternum, mesonotum, scutellum, the mesopleuræ above the oblique furrow at the base and slightly below it, the post-scutellum and a line on either side of it, reaching to the pleuræ, rufous; the sides of the first abdominal segment testaceous;

the four anterior knees testaceous; the fore tibiæ and tarsi obscure white behind; the calcaria and the apical segment of the abdomen, clear white; wings hyaline, a cloud along the transverse basal and transverse median nervure, one in the basal third of the radial cellule, extending into the cubital cellule below, occupying it, except the lower basal corner, and into the upper apex of the discoidal cellule, where it becomes fainter; and there is a faint cloud in the apex of the wings. ♂. Length, 7 mm.

Covered with a silvery pubescence; the apex of the clypeus narrowly white, broadly rounded. Hind ocelli separated from each other by a distinctly less distance than they are from the eyes, which converge above where they are separated by about the length of the second and third antennal joints. Palpi black. Apex of pronotum arcuate, narrowly edged with yellow. The second abscissa of radius is about one-fourth shorter than the third; the first transverse cubital nervure is roundly curved; the second is straight, obliquely sloped; the first recurrent nervure is received at the apex of the basal third of the cellule; the accessory nervure in hind wings is received shortly behind the transverse median. The long spur of the hind tibiæ is half the length of the metatarsus.

Bassus lætatorius, Fab., IN CAPE COLONY.—This common British ichneumon I find in the collection of the South African Museum from Cape Town, where it has been taken so far back as 1874. It has now been found in nearly every part of the globe and in many of the islands. It would be interesting to know what its host may be outside Europe. Probably some equally cosmopolitan dipteron.

A NEW *STEGOMYIA* FROM THE TRANSVAAL.

By FRED. V. THEOBALD.

STEGOMYIA SIMPSONI, nov. sp.

Head black, with a median white area and white at the sides. Proboscis black, unbanded. Thorax deep brown with a large silvery-white anterior lateral patch, a smaller one behind just before the root of the wing, a small silvery median spot close to the head, two yellowish median parallel lines, a short silvery one on each side over the smaller lateral patch, a silvery line on each side of the bare space in front of the scutellum. Scutellum with silvery-white scales in three patches. Pleuræ with white puncta. Abdomen blackish with basal silvery-white bands. Legs basally banded white.

♀. Head clothed with black scales except for a median white area and grey lateral areas, a few white scales bordering the eyes. Antennæ deep brown, the basal segment black with a patch of silvery-white scales on the inside; clypeus and proboscis black. Palpi black-scaled with white-scaled apices. Thorax black, clothed with bronzy, broad elongate curved scales and ornamented with a large patch of broader silvery-white scales on each side in front, a smaller patch on each side

just before the roots of the wings, and a small white median spot near the head, from which run two parallel dull yellow median lines to the bare space in front of the scutellum, and a short silvery line on each side over the roots of the wings; the sides of the bare space in front of the scutellum bordered with white. Prothoracic lobes with flat white scales. Scutellum with the large median lobe black-scaled, with a prominent border of silvery-white ones, lateral lobes with large flat white scales, border-bristles brown. Metanotum deep brown. Pleuræ deep brown with prominent silvery-white puncta. Abdomen deep blackish-brown with silvery-white basal bands, except the first segment, which is all deep brown with pallid bristles, large basal lateral white spots to each segment; posterior border-bristles brown, inconspicuous. Legs with the anterior femora and tibiæ black, metatarsus and first tarsal with broad basal white bands, last three tarsi black, a trace of a pale basal area on the tibia; in the mid legs the femora are pale at the base and have a small round white spot towards the apex which is white, remainder as in the fore legs; hind legs with the femora white along the basal half, an oval elongate silvery-white spot towards the apex, the latter snowy white, base of metatarsus and first and second tarsi broadly white-banded, third tarsus all black, fourth pure white. Ungues all equal and simple. Wings with the first submarginal cell longer and narrower than the second posterior cell, its base nearer the base of the wing than that of the second posterior, its stem about one-third the length of the cell, stem of the second posterior cell about as long as the cell; posterior cross-vein about two and a half times its own length distant from the mid cross-vein; the median vein-scales on the fifth, where the branch arises, in two prominent lines. Halteres with pallid base and dusky scaled knobs. Length, 3·5–4·5 mm.

♂. Thoracic adornment similar to that of the female. Palpi black with a white patch at the base of the two apical segments on one side only, that at the base of the apical one largest, and a broader white band towards the base, and another small one still nearer the base; the two apical segments nearly equal, the apical one slightly the shorter, both and the apex of the antepenultimate with long scattered brown hairs, apical segment rounded at the tip. Antennæ with deep brown plume hairs and pale internodes. Abdomen and legs as in the female. Fore and mid ungues unequal, simple, the larger one in the fore pair rather more curved than the larger of the mid; the hind pair small, thick, curved, and equal. Claspers of male genitalia shortish and rather broad, straight on one side, curved on the other, with a very small nearly terminal dark process; between the basal lobes a large spine with expanded base. Length, 3·5–4·5 mm.

Habitat.—Transvaal (collected by Mr. Simpson, Government Entomologist).

Observations.—Evidently common from the large number sent in a collection forwarded by Mr. Simpson. It superficially resembles *S. fasciata*, but the thoracic ornamentation, the simple female ungues, the different adornment of the male palpi at once separate it. The female palpi are composed of three segments, of which the apical is very marked, being suddenly contracted at the tip and ends in a round truncated surface.

A NEW RACE OF *MORPHO ADONIS*, Cram.

By Percy I. Lathy, F.Z.S., F.E.S.

Morpho adonis var. major, nov.

♂. Much larger than typical *M. adonis*, measuring 32 millim. more than the largest specimen in Mr. Adams' series; the white markings on costa of fore wings above larger and a submarginal row of white spots, in this respect approaching ab. *adonides*, Stgr.; the wings of a deeper blue and not so silvery as in *adonis*. Under side with the pale bands silvery.

♀. Also much larger than typical *adonis*, and the pale yellow markings reduced.

Exp. ♂, 148–152 millim.; ♀, 160 millim.

Hab.—La Merced, Peru; 2500 ft.

I received two males and one female of this very beautiful form of *M. adonis* from Mr. H. Watkins, my collector in Peru; the three specimens are now in the collection of Mr. Herbert J. Adams. One of the two males has traces of a second row of submarginal spots.

THE LEPIDOPTERA OF BERLIN.

By E. M. Dadd, F.E.S.

(Concluded from p. 212.)

During the latter part of August very little entomological work was done. An outing to Bernau found the heather just commencing to bloom, and a piece of waste ground overgrown with thistles proved to be very productive. *Lycæna argus* and *L. ægon* were both abundant, the males easily distinguished by the breadth of the black border to the wing; the females practically indistinguishable. Several *ægon* var. *unipuncta* were among the captures; besides these two interesting "blues," *Chrysophanus virgaureæ*, *L. dorilis* (two females), *C. phlœas*, *Hesperia thaumas*, *H. lineola*, *Epinephele lycaon*, *Satyrus semele*, *S. alcyone*, *Argynnis latona*, and *Thalera fimbrialis* were obtained. The last-named is an especially fine "emerald," and the two specimens I obtained were in the pink of condition. *Rhodostrophia vibicaria* was obtained in the pine woods, but mostly worn.

A week later, at Potsdam, *Erebia æthiops* and *Colias hyale* were the only new species.

Sugaring was of very little use during the latter part of August and commencement of September. *Catocala sponsa*, *C. promissa*, and *Amphipyra pyramidea* came to sugar in oak woods. An avenue of all sorts of trees along a country road was more productive, *Acronycta menyanthidis*, *A. rumicis*, *A. megacephala*,

A. auricoma, Dychorista suspecta, Agrotis vestigialis, A. baia, Hadena scolopacina, H. monoglypha and dark vars. being obtained.

About the middle of September sugaring again became productive, and we sugared the ground at Buch and Schulzendorf alternately with great success until about the middle of October, when bad weather set in. *Acronycta rumicis, Agrotis pronuba, A. c-nigrum, A. xanthographa, A. plecta, A. nigricans* (worn), *A. tritici* (worn), *A. ypsilon, A. segetum, Charæas graminis, Epineuronia popularis, E. cespitis* (more to the lamps), *Mamestra oleracea, M. dissimilis, M. trifolii, Calæna haworthii, C. matura, Hadena porphyrea, Aporophyla lutulenta, Ammoconia cæcimacula, Dichonia aprilina, Dryobota protea, Brotolomia meticulosa, Nænia typica, N. jaspidea, N. celsia, Hydræcia nictitans, Tapinostola fulva, Leucania pallens, L. album, L. albipuncta, Caradrina ambigua, Amphipyra tragopogonis, Orthosia lota, O. circellaris, O. helvola, O. nitida, O. lævis, O. litura, Xanthia citrago, X. lutea, X. fulvago, X. ocellaris* and var. *lineago, Orrhodia erythrocephala* and var. *glabra, X. vaupunctatum, X. vaccinii, O. rubiginea, Scopelosoma satellitia, Xylina socia* (*furcifera*), *X. ornitopus, Calocampa vetusta, C. exoleta, C. solidaginis, Catocala fraxini,* and *C. nupta. Luceria virens* was not unfrequent at rest on grass-stems in pine woods, and by the aid of an acetylene lamp a fair series of this beautiful insect was captured. *Eupithecia sobrinata* swarmed on the street-lamps, as also one worn *Dendrolimus pini. Ennomos angularia* and *E. autumnaria* were frequently netted.

Very little was to be done during the daytime; butterflies were as good as over, only *Vanessa antiopa, V. io, V. urticæ, Grapta c-album,* and *Argynnis lathonia* still being worth capturing. In the pine woods *Larentia* var. *obeliscata* was fairly common, and occasional larvæ of *Macrothylacia rubi* were picked up.

Beating *Rhamnus* was fairly productive; full-fed larvæ of *Eupithecia abbreviata, Macaria alternata,* and *Cyaniris argiolus* were obtained. Heather produced larvæ of *Eupithecia nanata, E. goossensiata, Anarta myrtilli, Acronycta menyanthidis,* and *Nemeophila sanio.*

DESCRIPTION OF A NEW SPECIES OF *GASTERUPTION* (EVANIIDÆ) FROM CAPE COLONY.

By P. Cameron.

Gasteruption lissocephalus, sp. nov.

Black, the mandibles, four anterior femora, tibiæ and tarsi, and the narrowed basal part of the hind tibiæ, and the apices of the second, third, and fourth abdominal segments broadly, rufous; wings hyaline, the stigma and nervures, testaceous. ♂. Length, 11 mm.

Head shining, the front and vertex smooth, the former with a deep furrow on its upper half; the face and clypeus closely, but not strongly punctured, covered with a white down. Apex of clypeus with a round wide incision. Malar space distinct, fully as long as the second antennal joint. First antennal joint slightly shorter than the third, about one-third longer than the second, which is twice longer than wide; the fourth slightly, but distinctly longer than the third. Temples shorter than the eyes; abruptly, obliquely narrowed behind; the occiput roundly incised. Collar very short, keeled down the middle; irregularly reticulated. Mesonotum irregularly rugosely punctured, the centre at the base finely closely transversely striated; the sides closely punctured. Scutellum closely punctured, its apex irregularly reticulated and bounded by two curved keels laterally. Metanotum transversely reticulated; more distinctly in the centre than on the sides; the middle with a fine distinct longitudinal keel. Propleuræ irregularly striated above, sparsely punctured below. Upper part of mesopleuræ irregularly punctured and striated, the rest and the metapleuræ closely longitudinally rugosely punctured. First abdominal segment finely closely rugose, as long as the following two segments united. Hind metatarsus somewhat shorter than the four following joints united; covered below with a dense fulvous pile. Anterior discoidal cellule narrowed sharply at the apex; longish; the posterior is shorter than it, being clear of its base and apex. Hind coxæ closely distinctly punctured, the punctures running into striæ towards the apex.

The head and collar are shorter, and the mesonotum more coarsely distinctly rugosely punctured-reticulated than in any of the African species known to me.

LEPIDOPTERA COLLECTED IN CENTRAL AMERICA.

By Arthur Hall.

During the summer of 1904 I made an entomological trip to Central America, spending some six weeks in Southern Mexico, about the same time in Western Guatemala, and a month in Costa Rica. The results were fairly successful, nearly seven hundred species of Rhopalocera being obtained. The following were among the most interesting of those met with:—

Papilio asclepius, Hübn.—This fine species is not uncommon at Cuautla, Mexico, at an elevation of about 4000 ft. It frequents gardens on the borders of the town, and is fond of flying at a great height round the tall mango trees which abound there.

P. pharnaces, Doubl., is peculiar to the Mexican plateau and was not uncommon in the State of Oaxaca in June. It has a curious habit of flying with great rapidity round in a circle, and very seldom settles.

P. americus, Kolt.—A number of specimens were bred in Costa Rica, from larvæ feeding on the leaves of orange.

Archonias tereas, Godt.—Appears to mimic *Papilio mylotes*, which it resembles in flight and habits.

Eurema mexicana, Bois.—A specimen with the fore wings entirely black was captured at Orizaba, Mexico.

E. westwoodii, Bois.—In the drier parts of Mexico this species and several others of the same genus congregate in damp cavities in the rocks, where as many as a hundred may sometimes be found together.

Perrhybris viardi, Bois., was found only on the Pacific slope of Guatemala. The male is of the usual Pierid pattern, but the rare female mimics the common *Heliconius charitonia*, L., for which I at first mistook it.

Kricogonia lyside, Gdt., which was common at Salina Cruz, Mexico, and in parts of Guatemala, has a habit of hiding in thick bushes, from which it may be driven out by beating. An entirely yellow aberration of the female was not uncommon.

Clothilda insignis, Salv.—A specimen was found near the summit of the volcano of Cartago in Costa Rica, at an elevation of nearly 12,000 ft.

Microtia elva, Bates.—A local race occurring at Salina Cruz, Mexico, has the fulvous markings much more extensive than in the typical form.

Chlosyne hyperia, Fabr.—This species, which was very abundant in the State of Morelos, Mexico, shows much less variation than some of its allies, but several specimens have a large red blotch on the hind wings, thus forming a transition to *C. janais*, Dru. The latter species, although abundant in many places, was not found in the same localities.

C. gaudialis, Bate.—An extraordinarily local species. It was abundant in one field at Escuintla in Guatemala, but not another specimen was seen nearer than Mazatenango, 170 miles distant, where it was again abundant.

Pyramcis atalanta, Linn.—This old familiar friend was found at Orizaba, Cuautla, and Cuernavaca, in each case at an elevation of about 4000 ft. In the last-named locality *Vanessa antiopa* also was met with.

Junonia cœnia, Linn.—In the table-land of Western Mexico I obtained specimens of a melanic form, some having the upper side almost entirely black.

Bulboneura sylphis, Bates.—Met with only in the State of Guerrero, Mexico, where it was rare. It is fond of settling on the rocky sides of the cañons.

Catagramma pitheas, Latr.—Specimens from the Pacific slope of Guatemala have much more red on the hind wings than Colombian examples.

Ageronia atlantis, Bates.—Occurs in the States of Oaxaca and Guerrero, Mexico, but very scarce.

Ectima liria, Fabr.—Rather common in Costa Rica. It settles on tree-trunks, with the wings expanded after the manner of the Ageronias.

Adelpha demialba, Butl.—This curiously marked species is peculiar to Costa Rica. It is apparently a mimic of *Megalura merops*, Bois.

Smyrna karwinskii, Hübn.—Common in Southern Mexico. It much resembles the Vanessæ in its habits, having a partiality for fruit-trees, sunny walls, and gardens, and will also come to sugar. It will conceal itself under the leaves of bushes and fly out suddenly on being approached.

Anæa callidryas, Feld.—Three specimens were obtained in different localities in Western Guatemala. It cannot be distinguished from a white *Catopsilia* when on the wing, a fact which may partly account for its rarity.

A. clara, Godm. & Salv., Trans. Ent. Soc., 1897, p. 244.—Two pairs of this, the largest of the "green" Anæas, at Carrillo, in Costa Rica. The female is tailed, as Messrs. Godman and Salvin rightly assumed.

Zaretes ellops, Mén.—The female of this species, which is common in Guatemala, undoubtedly mimics the same sex of *Catopsilia eubule*, L.

Hypna iphigenia, H.S.—A specimen of this Cuban species was taken on the Isthmus of Tehuantepec.

Siderone ide, Hübn.—Two specimens, taken at Escuintla, Guatemala, do not differ in any respect from the Colombian form.

Protogonius cecrops, Doubl. & Hew.—Evidently a mimic of *Lycorea atergatis*, Doubl. & Hew. Both species fly together in the same localities in Guatemala and Costa Rica, and are difficult to distinguish on the wing.

Morpho polyphemus, Doubl. & Hew.—Widely distributed in Southern Mexico, but scarce. It has a very slow, graceful flight, but generally keeps twenty or thirty feet above the ground.

M. octavia, Bates.—Not uncommon on the Pacific slope of Guatemala, but extremely local. I found it from sea-level up to an elevation of nearly 4000 ft. Unlike most species of the genus it flies close to the ground, but its flight is rather fast and very erratic.

M. cypris, Westw.—Met with near Santo Domingo, on the Pacific slope of Costa Rica; rare.

Caligo memnon, Feld.—Common at Escuintla and other parts of Guatemala. During rain it often comes into houses, apparently for shelter.

Lymnas acroleuca, Feld.—Common in the State of Morelos, Mexico, where it evidently mimics an abundant moth of the genus Melanchroia.

Mesene macularia, Bois.—A little butterfly which is exceed-

ingly like the common European *Venilia maculata*, L. in size and colouring. It occurred in Costa Rica, but was scarce.

Pythonides sallei, Feld.—This is the most interesting of the one hundred and sixty species of Heperidæ obtained. My specimen was taken at Escuintla, Guatemala, and one was seen at Cuautla, Mexico; as it is recorded from Eastern Peru, its range would seem to be very extensive.

Thysania agrippina, L.—This giant Noctuid, one specimen of which is ten inches in expanse, was captured at Old Guatemala, a locality which must be very near the most northern limit of its range.

In conclusion I may remark that the comparative scarcity of Lepidoptera at moderately high elevations was very striking, and difficult to explain. At upwards of 5000 ft. very few species were to be found, whilst above 7000 ft. a few small Lycænidæ alone were met with, despite the fact that the vegetation is luxuriant up to an elevation of above 10,000 ft. Neither the Alpine species of the Neoarctic region, nor the Andean forms of Colombia and Peru, have more than a few isolated representatives in Central America.

June 24th, 1905.

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

By G. W. Kirkaldy.

(Continued from p. 178.)

The Corixidæ form a well-marked group, which has sprung, apparently, from a Naucoroid stem. They are characterized by the narrow, somewhat flattened form, the obscurely segmented rostrum,* modified anterior legs, &c. The head is strongly deflexed, and varies in form in the sexes, except in *Micronecta*. The pronotum is usually large, the anterior margin being more or less concealed by the posterior margin of the vertex, while its posterior margin conceals all but a very small part of the

* Börner ("Zur Systematik der Hexapoden," 1904, in Zool. Anzeiger, xxvii. 522) has instituted a special suborder—Sandaliorrhyncha—for the Corixidæ, on account of the short obscurely segmented rostrum, deeming it a link between the Homoptera and the Heteroptera. This is far from correct, the Corixidæ being, as Handlirsch properly points out ("Zur Systematik der Hexapoden," 1904, in Zool. Anzeiger, xxvii. 746), a terminus of one of the heteropteral lines. The rostrum is merely a protecting sheath for the piercing and sucking organs, and has no functions, apparently, as a pump. In certain terrestrial forms with flexible rostrum (Miridæ, &c.) the living bug may be seen bending its rostrum at the junction of the second and third segments, at more or less of an acute or obtuse angle, according as the bug desires to pierce more or less deeply into the food substance.

scutellum, except in *Micronecta*, where the scutellum is almost entirely exposed. The tegmina (elytra) are usually ornamented with more or less regular, vermiculate or straight, transverse lines, these being often broken up into series.* In *Micronecta*, &c., there are few markings, these being generally more or less longitudinal and generally more or less obscure. In *Micronecta*, *Cymatia*, and *Corixa*, the tegmina, and also the pronotum, are more or less smooth and polished, sometimes punctured; but in the other genera these parts are either partly, or wholly, very finely rastrate (*i. e.* striated like a file, this character being seen best in an oblique position). The anterior legs and their stridulatory areas have already been described and figured by me †; the intermediate legs are long and slender, and are terminated by two long claws; the proportionate lengths of these parts form good secondary characters for the discrimination of certain species. The posterior legs are modified for swimming, even more than are those of the Naucoridæ; they are flattened, dilated, and thickly fringed with ciliate hairs.

In the females the abdominal segments are regular, but in the males are broken up and disordered. The asymmetry is to the left in *Corixa*, to the right in all the other genera. The *strigil* has been discussed in my paper cited last.

Although the Corixidæ are so well known and have so often been dealt with systematically, their biology has been little studied in detail.

The whitish ova of *Corixa geoffroyi* are to be found in any suitable piece of water from March onwards to June attached to the stem or leaves of various pondweeds by means of a glutinous substance; the pedicle seems to be extensile. They are more or less onion-shaped, the apical end being drawn out into a point. They have been briefly described and figured by Dufour (p. 350, pl. xvi. f. 186, under the specific name of *striata*), and by Leuckart (1855, Müller's Archiv. pl. viii. f. 23, as *Coriza* (?) *striata*). The internal development of the egg has been studied by Metshnikov at some length (1866, Zeitschr. Wiss. Zool. xvi. pp. 129 and 422–36, pls. 26 and 27 A); a very brief *précis* is given by Packard (1898, 'Text-book of Entomology,' fig. 493). Leuckart also describes the egg of *Arctocorisa nigrolineata*, while Dufour describes that of *A. lateralis* (*hieroglyphica*, Duf.) as being pointed, elongate oval (fig. 187). The ova of *A. mercenaria* have been for centuries used for food by the Mexicans; while an Egyptian species, un-

* This pattern is not modern, being well shown in "*Corixa*" *elegans*, Schlechtendal (1894, Abh. Naturf. Ges. Halle, xx. 216; pl. xiii. f. 4), from the Aquitanian (Kainozoic) formations of the Siebengebirge in Germany.

† See "The Stridulation of *Corixa*" in Entom. xxxiv. 9 (1901), and "The Stridulating Organs of Waterbugs (Rhynchota), especially of Corixidæ" in Journ. Quekett Micr. Club (2), viii. 33–46, pls. 3 and 4, where other papers are referred to.

described, has been mentioned by Motschulsky as being utilized for similar purposes. I have discussed this at some length, and have also figured an egg of *A. mercenaria*.*

The nymphal stages are not specially remarkable. De Geer (tom. 3, pl. 20, figs. 16 and 17) figures some, but modern detailed figures are needed. The metamorphosis of the Corixidæ takes some three months or so, or perhaps less; the species all hybernate in the adult stage except (according to F. B. White) those of *Micronecta*.

The Corixidæ have a distinctly "buggy" smell—and taste! Dufour says that they are carnasial: I think that small worms, *Rotifera*, &c., form a large part of their food. The internal anatomy is described by Dufour, also by Burmeister (1835, Handb. der Entom. ii. 186), for *punctata* (i. e. *geoffroyi*).

The Corixidæ breathe in a peculiar manner, which has been well described † by A. S. Packard, whose recent death everyone will deplore. The Corixid "takes in the air so suddenly that it is impossible without long and patient observation to see the mode, which we have been unable to find described. It rises to the surface in a horizontal position, and no sooner is the surface reached than it darts to the bottom, and in one instance remained there for ten minutes by the watch, and then darted up again, leaving an air bubble in its wake, which rose to the top afterwards. It carries down with it a broad silvery streak along the side of the body. The air is really introduced under the head and front thorax. The head is large and very movable, as well as the prothorax. It slides back and forth on a thin membrane, from the surface of which it can be raised. So with the hinder edge of the prothorax, which rides over the membranous hind thorax, which it nearly conceals. When the *Corixa* rises to the surface it floats in a horizontal position, the hind edge of the head and the prothorax rising slightly above the surface. Now slightly raising the back of the head and the hind edge of the prothorax, a space appears in front of and behind the prothorax, by which the air passes into the breathing-holes beneath. This is proved by the small bubbles of air remaining in these two cracks. Two minute spiracles may be detected in deep pits, one on each side, just above the insertion of the legs, and from which the tracheæ arise, each one dividing into three irregular short branches, as may be seen by detaching the segment and holding it up to the light."

Corixidæ are often used as hosts by Hydrachnid larvæ, which are attached as in the Naucoridæ. Ouchakoff describes, but

* See "An Economic Use for Waterbugs" in Ent. Mo. Mag. (2) ix. 173–5 (1898), and "Sur quelques hémiptères aquatiques nouveaux ou peu connus" in Revue d'Entom. 1899, p. 95, and fig. 6.

† "Half-hour Recreations in Natural History—Half-hours with Insects," p. 141.

does not name, a form found on *C. geoffroyi* (as *striata*),* but his note is of little value.

Six genera of Corixidæ are British, and may be separated as follows:—

Males.

1. Minute species; scutellum covered by pronotum only at anterior margin; face convex; [strigil present] (1) Micronecta, Kirkaldy.

1*a*. Larger species; face excavated; scutellum more or less membranous, concealed, except at posterior angle, by the pronotum . . . . . 2.

2. Strigil present . . . . . 4.

2*a*. Strigil absent. . . . . 3.

3. No stridular area; posterior tarsus not marked with black . . . . . (2) Cymatia, Flor.

3*a*. Stridular area present; posterior tarsus marked conspicuously with black [the tarsal segment itself, not the hairs only] . . . . (4) Callicorixa, White.

4. Palar stridulator composed of pegs ranging in form from short peg-top shape to bristly, the transition gradual . . . . . (3) Glænocorisa, Thomson.†

4*a*. Palar stridulator composed of more regular pegs, never bristle-like, although elongate . . . 5.

5. Asymmetry to right. Pronotum and tegmina more or less rastrate . . . . (5) Arctocorisa, Wallengren.

5*a*. Asymmetry to left. Pronotum and tegmina smooth, shining . . . . . (6) Corixa, Geoffroy.

Females.

1. Face flattened . . . . . 2.

1*a*. Face convex . . . . . 3.

2. Shining, smooth; pronotum without markings (2) Cymatia, Flor.

2*a*. Rastrate, dull; pronotum with impressed transverse lines . . . . . (3) Glænocorisa, Thomson.

3. Scutellum not covered, except at anterior margin, by pronotum . . . . . (1) Micronecta, Kirkaldy.

3*a*. Scutellum concealed, except posterior angle, by pronotum . . . . . 4.

4. Pronotum and tegmina smooth, shining . (6) Corixa, Geoffroy.

4*a*. Pronotum and tegmina more or less rastrate . . 5.

5. A conspicuous black spot on posterior tarsus (4) Callicorixa, White.

5*a*. Posterior tarsi pale, fringing hairs often black (5) Arctocorisa, Wall.

* "Notice sur un Insecte parasite" in Bull. Soc. Imp. Nat. Moscou, vii. 392 (1834).

† The chief generic character in this is that in the female the face is flattened.

Micronecta, Kirkaldy.*
(= *Sigara* of some former authors.)

Face convex in both sexes. No apparent stridular area on anterior femora. Palæ subovate, terminated by a powerful knife-shaped claw (in the male), which is jointed with the pala and is turned right back, in repose, into an excavation in the pala; on the pala there are only bristly hairs. In the female the palæ are elongate cultrate. A character separating this genus from all the other British genera is that the metapleura are simple, while in the others they are deeply impressed posteriorly, so deeply in fact that Fieber mistook the impression for a true suture, and termed the posterior lobes the "parapleura." The venation of the wings is also much simpler.

Little is known of the habits of *Micronecta* beyond the fact that it stridulates. F. B. White states that it hybernates in the nymphal instars †; and Westwood ‡ has described *M. ovivora* (as a *Corixa*) from the Canara River, Madras, naming it from its supposed destructive habits of devouring fish ova.

There are two British species :—

1. Length, 1½–2 mill.; pronotum nearly as long as vertex; the lateral margins of the former longer than half the posterior margin of an eye (1) *minutissima* (L.).
2. Length, 2–2⅓ mill.; pronotum much shorter than the vertex; lateral margins of the former scarcely perceptible . . . . . (2) *scholtzii* (Scholtz).

1. M. minutissima (Linné).

This species is the *Notonecta minutissima* of Linné, the *Sigara minuta* of Fabricius, and the *S. lemana* of Fieber. A slight variety is the *S. poweri* of Douglas and Scott. It is figured by Douglas and Scott, by Saunders, by Herrich-Schaeffer (1850, Wanz. Ins. ix. pl. 295, f. 907), and by Fieber (1845, "Entomologische Monographien" in Abh. böhm. Ges. Wiss. (5) 3, pl. 1, figs. 11–19). Further figures may be found in Duda's "Analyticky prehled ceskych plostic vodnich" in Klubu prirodov. Praze 1890 (1891), fig. 6 (on p. 30).

Distributed from Hastings to Braemar and Norfolk to Ireland. It is not uncommon in the south of Surrey.

2. M. scholtzii, Scholtz.

This is the *S. meridionalis*, Costa, 1860, of Puton's 'Catalogue'; it was also fully described the same year—whether

* Greek *mikros*, small; *nektes*, a swimmer. See 'Entomologist,' 1897, 260.

† "Notes on *Corixa*" in Ent. Mo. Mag. x. 80 (1873).

‡ Proc. Ent. Soc. Lond. 1871, p. iv.

earlier or later I do not know—by Fieber as *S. scholtzi*, and mentioned by Scholtz in 1847,* who says that it is larger than *minutissima*, and has different habits, *i. e.* it lives in still water with muddy bottom [*minutissima* does live here, though!], not in clear river water. He further mentions that he has not heard a perceptibly audible chirp like *minutissima* utters.†

I have never seen this alive, but Saunders states that it occurs from Lincoln to Sussex, from Somerset to Norfolk.

(To be continued.)

NOTES AND OBSERVATIONS.

The Habits of Asilidæ. — There are certain insects, such as the Meloid beetles of the genus *Cantharis*, and the Pentatomid bugs, which appear to be generally protected from enemies by their disagreeable odour or taste. I was interested to observe, when at Pecos, New Mexico, that this protection apparently did not extend to the robber flies or Asilidæ. At Pecos I found a specimen of *Ospriocerus abdominalis*, Say, preying on *Cantharis biguttatus*; and in the Pecos Canyon (at 7300 ft. alt.) I found *Stenopogon inquinatus*, Loew, preying on adult *Thyanta perditor*. In both cases I am indebted to Mr. Coquillett for the names of the flies, and it may be added that both are new to the fauna of New Mexico.—T. D. A. Cockerell.

The Name Aldrichia. — With reference to the Culicid *Aldrichia error* (cf. p. 142), it may be noted that the name *Aldrichia* is a homonym, having been previously used twice—by Coquillett in 1894, and by Vaughan in 1900.—T. D. A. Cockerell.

Collecting Diptera at Light. — Being in the City of Washington on the night of June 10th, I opened my window wide, hoping to get some moths which might be of service to the British Museum. For some unexplained reason, not a single moth appeared, but, instead, a great number of small flies, all Chironomidæ. I collected a series, and they have been very kindly identified by Mr. Coquillett. He tells me that they are all common; but little seems to be known of the distribution of these minute things, as will be seen by the published records, quoted from Aldrich's 'Catalogue of North American Diptera,' which has just been published:—(1) *Chironomus modestus*, Say. Pennsylvania, New Jersey, New Hampshire, Montreal, Canada. (2) *Tanytarsus tenuis*, Meigen. Europe, Greenland. (3) *Tanytarsus* sp. (4) *Tanypus bellus*, Loew. District of Columbia. (5) *Tanypus choreus*, Meigen. Europe, "North America." (6) *Tanypus monilis*, L. Europe, Pennsylvania,

* "Prodromus zu einer Rhynch.-Fauna von Schlesien pt. 1" in Uebers. Arb. Schles. Ges. Vaterl. Kultur, 1846, p. 106 (p. 2, sep. copy, usually quoted).

† "ob unsere art, gleichwie *S. minuta*, eindeutlich wahrnehmbares Schwirren hören lasse, nahm ich bisher noch nicht wahr." I have only recently refreshed myself with this reference, which has been ignored in the papers devoted to hemipterous stridulation.

Wisconsin, New Jersey, New Hampshire. No doubt this list of six species could be much increased by a little more collecting. With one exception, all the species are boreal, which I should not have expected so far south as Washington.—T. D. A. Cockerell.

Migration of Lepidoptera. — The interesting note of your correspondent Mr. J. P. Barrett in the current number of the 'Entomologist,' referring to a possible migration of *Euchelia jacobææ*, induces me to place on record an observation which I should not otherwise have considered very remarkable. About 11 p.m. on May 31st I saw several specimens of this species (*E. jacobææ*) settled on and flying round the incandescent gas lamps near here. Two of these were captured, and proved—somewhat to my surprise, considering the date—to be a good deal rubbed. During a residence of seven years I had not noticed this species in the neighbourhood previously; there is, moreover, no ragwort near where they were taken. Is it possible that my specimens formed part of a migratory flight from the Continent, which also reached Margate? In this connection I may add that in September, 1903, when *V. cardui* was extremely plentiful in Essex, while sailing off the Essex coast I saw several specimens out at sea, an easterly wind prevailing at the time. It would be interesting to know the direction of the wind off the south-east coast on the date mentioned above; but I have not the information at hand, and made no note of it at the time. — W. S. Gilles; The Cottage, Bocking, near Braintree, Essex, Aug. 9th, 1905.

Notes on Larvæ of Nyssia lapponaria and Orgyia antiqua. — I exhibited at the meeting of the South London Entomological and Natural History Society on about June 23rd three larvæ of *Nyssia lapponaria*; they were chosen on account of their fine size, the largest specimen attaining a growth of 2¼ in. before going down. These were from a large batch of ova from a wild Rannoch female, and were sleeved on birch almost from the egg. Six or seven of the larvæ grew more rapidly than their fellows, so I removed the smaller specimens to another sleeve, and opened the bottom of the sleeve containing the large ones to a receptacle holding about eighteen inches of light earth, into which they descended in the course of a day or two. One of the rest of the brood that had been removed, having suddenly attained a length of about 2 in., was placed back in the sleeve over earth, and soon went down, the remainder of the brood being then about 1½ in. in length, some rather under this measurement. Imagine my surprise on examining the sleeve three days later to find that one larva had pupated on the gauze, and four others were lying at the bottom shortened and shrivelled, apparently perishing for want of earth in which to go down. I at once changed them into the sleeve containing earth, and several went down at once, none of which exceeded 1½ in. in length. Surely this disparity in the size of the full-fed larvæ of this species is very strange! Perhaps some of our Scottish collectors can give us further information on this interesting subject. Last season the willow tree that I usually reserve for nearly full-fed larvæ of *Smerinthus ocellatus* seemed to be the chosen favourite of every willow-feeding gall-fly in Clapham, for by the middle of July I think I can safely say every leaf had a gall on it, and on some leaves

I counted six and seven. These galls soon became the homes—if I may be allowed the expression—of a number of larvæ of *O. antiqua*; these ate out the interiors of the galls, and then ensconced themselves in the space thus provided. As they increased in size their habitations became too small for them; but this difficulty was overcome by eating a hole opposite that by which they entered the gall, and they then rested with the head projecting from one side of the gall, and the last segments and anal tuft from the other. They presented a most curious appearance when in this position, reminding me irresistibly of a tortoise. B. Stonell; 25, Studley Road, S.W., July 9th, 1905.

Abundance of Pieris brassicæ in West Meath. — I should like to call the attention of practical naturalists to the swarms of *Pieris brassicæ* which are at present hovering over the cabbage-plots and fields in West Meath, and laying millions of eggs, the caterpillars from which, the moment they are hatched, begin devouring the young plants. In our own case, after paying fifteen shillings for the cabbage-plants, we do not expect to save even a portion of the crop. This is bad enough, but it is far worse for the poor people who have planted their little gardens and lost all their cabbages. Handpicking seems to be the only effectual remedy, and day-labourers cannot spare time for that. Lime, washing soda, &c., and many other remedies have been tried in vain; and now the caterpillars are swarming up the walls of the houses to form chrysalids, and doubly devastate next season, unless some real remedy can be suggested. Where can the clouds of butterflies have come from, as of late years *brassicæ* has been rather scarce, and what is to be done?—Francis J. Battersby; Cromlyn, Rathowen, West Meath.

We understand that Mr. G. O. Day, of Knutsford, who is no doubt known to many of our readers, is going abroad to reside in Vancouver Island, B.C., and has placed his valuable and extensive collection of British Lepidoptera in the hands of Mr. Stevens for sale by auction shortly. Mr. Day has been an occasional contributor of articles to this magazine, and, although he is leaving England, we trust that his interest in the pursuit of entomology will be continued, and that he may find in the new country something noteworthy for these pages.

CAPTURES AND FIELD REPORTS.

Cymatophora ocularis and Agrotis ravida at Hitchin. — Thinking it may be of interest, I am writing to report the capture here at sugar of *C. ocularis* (*octogesima*) on the following dates, *viz.* June 20th, 21st, and 28th; July 2nd, 11th, and 28th. I have also been taking *A. ravida* at sugar.—H. R. Grellet; Orford Lodge, Bancroft, Hitchin, Aug. 1st, 1905.

Plusia bractea in Selkirk.—On July 12th, as a friend of mine and I were netting *P. chrysitis*, which were swarming over some tall plants of *Stachys palustris*, he caught a fine specimen of *P. bractea*, which I recognized while bottling. *P. iota* and *P. pulchrina* were very common at the time, and also in a less degree *Abrostola urticæ*.—B. Weddell.

Lepidoptera captured at Clapham. — I have much pleasure in adding three species to my list published *ante*, p. 66. On June 3rd I took a specimen of *Bapta temerata* at rest on a shop window in the Clapham Road, and on June 29th a specimen of *Larentia pectinitaria* in practically the same spot; but I think the most interesting addition is *Abraxas ulmata*. A specimen of this species, in poor condition, was given me alive by Mr. Broomfield, enclosed in a cardboard box with a few specimens of other species. He captured the specimen on July 7th on the window of his shop at 266, Clapham Road, and, not knowing it to be something uncommon, took no special care of it. I should like to add I have never reared *A. ulmata*, and, so far as my knowledge extends, there is no other collector residing in the neighbourhood from whom it might have escaped.—B. Stonell; 25, Studley Road, Clapham, S.W., July 9th, 1905.

Phtheochroa rugosana in Surrey. — This insect used to occur on Wimbledon Common. I find that I took it in that locality on July 4th, 1876, and again on May 15th, 1878. — F. G. Whittle; 7, Marine Avenue, Southend, Aug. 5th, 1905.

Phtheochroa rugosana in Surrey. — I have taken *P. rugosana* at Nunhead some years ago, but this year I obtained the species in Coombe Warren. — Percy Richards; "Wellesley," Queen's Road, Kingston Hill.

Phtheochroa rugosana in Surrey. — I note in this month's 'Entomologist' that *P. rugosana* seems to be regarded as a rarity in this county. Certainly one seldom finds the imago, although it may be found at rest in the hedgerows where bryony is common (the female plant), and sometimes on the wing at dusk; and on two occasions I have taken worn specimens in the kitchen here, attracted by light. During August is the time to get the very much more often found larva; I usually have a look for it during the first week of the month. Find a field hedge where the female (*i. e.* the berried) plant is growing, and pull out the long trailers well laden with berries; if the larva is there, it will generally be found in the little bunches of spun-together berries, or sometimes between the stem and a leaf drawn over it. They are not difficult to breed if kept in the open in a flower-pot half full of mould, and a few pieces of bark on the top; but they are often very restless, and spin a lot of useless web round the rim of the pot. They sometimes spin up on the sides of the pot, sometimes on the book-muslin cover, and sometimes amongst the bark, and nearly always come out most disappointingly small. — A. Thurnall; "Mascotte," Whitehall Road, Thornton Heath, Aug. 2nd, 1905.

Phtheochroa rugosana in Surrey.—Referring to Mr. South's note (*ante*, p. 214), I would like to say that I find from my note-books that during the month of June, 1887, I netted six specimens of *P. rugosana* in a field at Sanderstead; and in the month of June, 1888, I netted seven examples of the species in the same field. — W. D. Cansdale; Sunny Bank, South Norwood, S.E., Aug. 17th 1905.

Notes from Cornwall.—I should like to record a curious variety of *Eupithecia rectangulata*, which I took in North Cornwall this year. The

ground colour of all the wings is white, the basal half of fore wings blotched with light green, and of the hind wings with grey. The specimen was quite fresh, and looks as if it had been bleached. Most of the *E. rectangulata* in the same locality have a lovely pink tinge, but it is very fugitive. We noted a remarkable abundance of *Acidalia subsericeata* in the finest condition. One could hardly move a step without stirring up a specimen or two. *Lycæna arion*, at least in the early part of its season, was distinctly less plentiful than in former years. Is it not time that this insect should be placed on the protected list? In 1903 I know that something like a thousand specimens were taken away from the district, and I should imagine that not many butterflies could stand much of that kind of thing. *E. jasioneata* occurred rather sparingly, but perhaps was not fully out. *Agrotis lucernea* was taken flying, and the form is a very dark one, considerably darker than some I have from Aberdeen. All common insects seemed to be very abundant.—W. Claxton; Navestock, Romford.

Dichorampha flavidorsana, *Knaggs* = D. quæstionana, *Zeller*, at Folkestone.—On the evening of July 28th, whilst being wheeled round my garden, I noticed a number of little Tortrices flying over a clump of tansy, and, on securing some of them, identified them as my *D. flavidorsana*, a decision in which Mr. Purdey subsequently agreed. I believe that this once overlooked insect will prove to be an abundant species, and also probably widely distributed. — H. G. Knaggs; Folkestone.

OBITUARY.

It is with much regret that I announce the death, in his ninetieth year, of my venerable and valued friend Mr. W. Johnson, who passed away on August 6th at his residence at Wigan. About fifty or sixty years ago there existed in Lancashire and Cheshire a well-known and enthusiastic band of entomologists, amongst whom were W. Johnson, N. Cook, B. Cook, L. S. Gregson, N. Greening, J. B. Hodgkinson, &c. Mr. Johnson was one of the eleven who met at my house on February 24th, 1877, when the Lancashire and Cheshire Entomological Society was founded. He always took a deep interest in the Society, and was a regular attendant at the meetings, and on his removal to Wigan in 1889 he was honoured by being appointed an honorary member. Mr. Johnson was thorough in anything he undertook. I believe he was for thirty years in the engineering department of the Mersey Docks and Harbour Board, from whom he was in receipt of a pension up to the time of his death. Mr. Johnson leaves behind him a collection of Lepidoptera, which is now for sale. Amongst a number of interesting specimens is one of *Eromene ocellea*, which is one of the three recorded by Mr. Barrett as captured near Liverpool, and I believe was taken by himself.

Samuel James Capper.

Huyton Park: August 25th, 1905.

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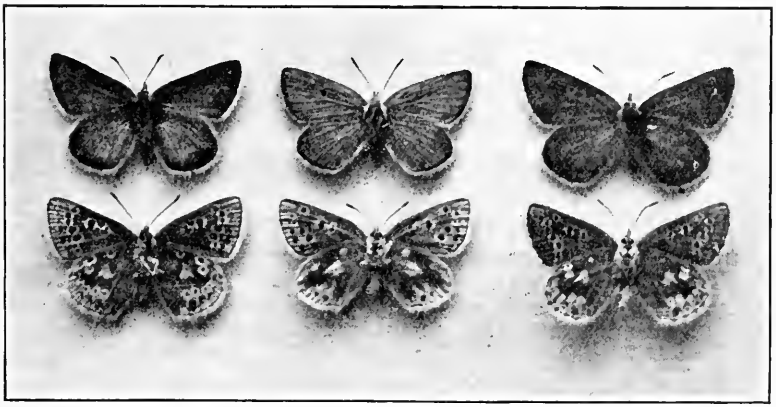
LYCÆNA ORBITULUS, PRUN., *L.* VAR. *OBERTHURI*, STGR., AND *L. PYRENAICA*, B.

BY H. ROWLAND-BROWN, M.A., F.E.S.



1. *L. orbitulus*, ♂. 3. *L. pyrenaica*, ♂. 5. *L.* var. *oberthuri*, ♂.
2. ,, under side. 4. ,, under side. 6. ,, ,, under side.

Of the examples figured, 1 and 2 are from Bérisal; 3 and 4 from Gavarnie; 5 and 6 from Cauterets. Both species are subject to considerable variation, but I have endeavoured to bring out the main points of difference as they present themselves in the specimens included in my cabinet series.

L. orbitulus, Prun., of the Alps and Eastern Pyrenees.

♂. Upper wings almost wholly suffused, or sprinkled with hyacinthine blue on a light cinnamon-brown ground. Marginal border broadish and brown-black. Discoidal spot whitish *ocellated*. Lower wings: same coloration; peacock eyes on hind margin discernible on

most of my specimens more or less strongly—generally more. Under side upper wings: yellowish grey. Unbroken line of ocellated antimarginal spots and marginal spots ⊃ -shaped, faint and ill-defined; two discoidal spots, black ocellated white. Under side lower wings: very variable, darker brownish grey to dark brown; two costal spots black, *ocellated* white. Outer margin yellowish-ochre peacock eyes, and interiorally white spots ocellated black. Broad white fringes all the wings.

L. orbitulus var. *oberthuri*, Stgr.

Described in Staudinger's Catalogue "major," but I have specimens from the Swiss Alps equal in size to those taken by me at Gavarnie and the Lac de Gaube, as figured. Superficially an entirely different insect to *pyrenaica*, with which it sometimes flies, *e.g.*, at Gavarnie.

♂. Ground colour of all the wings upper, and under side deeper; and blackish rather than brown. The discoidal spot on the upper side of the hind wings very much more definite than in the type, which does not occur, according to M. Rondou, in the Central and Western Pyrenees. Under side: in most of my specimens the costal spot on the lower wings is not ocellated, thus suggesting a connecting-link with *pyrenaica*.

L. pyrenaica, B.

♂. Upper wings uniform slaty-blue with faint brownish shading at outer margins. Marginal border sharply defined, and dead black. Discoidal spot dead black, and *not ocellated*. Lower wings: same coloration. Hardly any trace of peacock eyes; in most of my specimens, none. Under side upper wings: faint dove-grey coloured; series of antimarginal spots, more curved outwardly than in *orbitulus*, and wanting in some examples between the nervures occupied interiorally by the discoidal spots. Marginal spots round. The second in the outer margin duplicated, thus . . but ? constant. Under side lower wings: colour yellowish grey. Trace of very slender black marginal border at anal angle only. One costal spot white *without ocellation*. Antimarginal spots blotched, and also unocellated. Two or three bright orange-yellow spots on hindmarginal triangular white blotches. Broad white fringes all wings.

M. Oberthur, in his 'Études,'—which are unfortunately inaccessible to most collectors, there being no copy at present in the library of the Entomological Society,—differentiates *L. pyrenaica*, ♀, as follows:—"*Pyrenaica*, ♀, est toujours en dessus d'un gris blanchâtre uni et satiné avec un serie submarginale d'éclaircies intranervarales, et un liséré noir marginal très fin, tandisqu' Orbitulus a le fond des ailes entièrement noirâtre avec le disc saupoudré d'un semis serrés d'atomes bleu argenté. De plus dans les deux sexes la série transversale de points noir intranervaraux aux ailes superieurs est toujours moins droite dans *pyrenaica* que dans *orbitulus*."

A BUTTERFLY HUNT IN THE PYRENEES.

By H. Rowland-Brown, M.A., F.E.S.

The Pyrenees have received from collectors of Palæarctic Rhopalocera but scant attention of late years as compared with the Alps of Central Europe. The fact is the more remarkable, because the range is quite as accessible as the remoter regions of Switzerland and the Tyrol, while many years' experience of the latter as a touring entomologist leaves no doubt in my mind that for convenience and accommodation the advantage is all with the Pyrenees. A month in July and the early days of August, commencing at Le Vernet in the east and terminating at Biarritz in the west, has left a wholly satisfactory impression of comfortable hotels, clean and well found beyond anything that can be procured at the price in the Alps, though there is of course this disadvantage, that they are situated for the most part on the lower levels; not dotted about among the higher elevations within easy reach of alpine fauna. With the exception of the town of Andorra, which is not French and indescribably primitive and dirty, I can recall no single halting place where the kitchen and *ménage* generally were not sufficient and for the most part admirable. Then, again, it is a pleasure, after collecting in less favoured mountain places in the Cévennes and parts of Southern Austria, to come upon localities where species are represented not "in single spies, but in battalions." The uplands, in fact, as well as the fertile valleys, simply teem with insect-life in summer, and I found this the case wherever I went during the little expedition which I propose to describe.

Unlike the greater part of France, the departments included in the Pyrenean region have been well worked by French entomologists. M. Ch. Oberthur, in his 'Études,' has figured and described numerous local forms of butterflies and moths found by him during many years' systematic and local collecting; while M. Rondou—"instituteur-naturaliste" and schoolmaster of Gédre in the central area—has collected and reprinted from his series of records, published in the 'Transactions' of the Linnean Society of Bordeaux, a full and accurate catalogue of the Macro-Lepidoptera, which I found invaluable as a guide wherever I went. Then Mr. H. C. Elwes, in the 'Transactions' of the Entomological Society of London, published a comprehensive list of the butterflies in 1887; but I do not find in our magazines any detailed notices of recent date, and hope therefore that my own experiences may prove useful, and induce others to follow in my footsteps.

Arriving on July 9th at the Hotel du Parc, Le Vernet, after a not unpleasant journey *viâ* Toulouse and Perpignan, collecting

commenced the following day. Driving up from Villefranche-le-Confluent, the nearest station, I noticed a specimen of *Satyrus briseis* by the roadside, but did not come across the species again. For I had no opportunity of revisiting the hot enclosed valley in which this and other typically southern or Mediterranean insects are known to occur, such as *Epinephele ida*, *E. pasiphaë*, and *Satyrus fidia*. My rambles, indeed, were generally directed up the valley of the Vernet stream, not only because the ground appeared to promise the best results, but to avoid in the cooler hills the great noontide heat. The opening of the campaign, however, was scarcely propitious, for, having taken the only wrong road possible, I endeavoured to make a short cut across the torrent, and while doing so dropped my net into a boiling whirlpool, and lost it altogether. However, I was well supplied, and, having repaired losses at the hotel, set out under a cloudless sky up the narrow road which leads from Le Vernet to Casteil and the Col du Cheval Mort. *Melanargia lachesis* swarmed everywhere, but very few females appeared to have emerged at this date; nor did I find them at all common at any time during the week, while the form predominant was more heavily marked than specimens I have seen from Pont du Gard, and would, I assume, be the var. *canigulensis* of Oberthur; nor was it unusual to meet with the aberration in which the ground colour of the wings is faint yellow in place of the normal pearly white.

Among the Spanish chestnuts and upon the ash trees, which are quite a feature in the riverside meadows, males of *Læsopis roboris* were disporting themselves in the sunshine, but they were already on the wane; and Mr. A. H. Jones, who preceded me by about a fortnight at Le Vernet, tells me he found them in perfect condition then; so that M. Rondou's note for "June and the beginning of July" is no doubt more accurate than Kane's "May–June–July" inclusive; while it is now established that the food-plant of the larva is ash and not oak, as stated in 'European Butterflies.' Of the Theclids, *T. ilicis* was as usual common upon the sedum flowers, but I did not notice any examples of ab. *cerri*. I also took a couple of females of *T. acaciæ* close to Casteil, but they were more or less *passées*. Near the same place I also netted and released a single female *Thais* var. *medesicaste*, the date—July 10th—being the latest I have ever encountered this charming insect. Among a herd of commoner things also, an occasional *Melitæa deione* was still upon the wing, though *M. dictynna* var. *vernetensis*, Oberth., described as "a constant race differing from the type," and much less obscurely coloured, was evidently over. Upon the trailing clematis *Argynnis daphne* disputed the place of honour with *A. paphia*, and here also *Cyaniris argiolus* was to be seen in numbers, while the dusty mule-path was alive with *Satyrus alcyone*, rather more definitely marked than the alpine form, and with the yellowish stain more pronounced. Every patch

of moisture, too, was crowded with thirsty butterflies, *Papilio podalirius* and the commoner Hesperiids being perhaps the most persistent. However, the Lycænids usual to such places were rather sparsely represented, though I picked up individual fine specimens of *Lampides bœticus*, *Lycæna argiades*, *L. hylas*, and *L. amandus*, among the less common, but all males; flying with them were also *Carcharodus althææ*, *Hesperia alveus*, and *H. sao*. But far and away the commonest butterfly on the wing was *Erebia stygne*, which evidently follows immediately on the heels of *E. evias*, of which I only observed a few worn females; nor did I meet with the var. *pyrenaica*, Rühl., at these levels. But for size and brilliancy of colouring these typical *stygne* exceed any I have ever taken; the females being especially fine, and the ocellations of the upper side of the wings large and numerous.

On July 13th I made the ascent of the Canigou, the imposing isolated rock which surveys the Mediterranean from Barcelona to Montpellier, going by way of the Col du Cheval Mort, by far the easiest and most agreeable route in my opinion, as it abounds in streams and springs, in striking contrast to the road by Fillols and the Col des Cortalets, which is for the greater part shadeless and arid. The day promised for the best when I left Le Vernet at 5 a.m., and continued fine until I was within half an hour of the top six hours later. At that time, however, a gale of wind had sprung up, and, though no rain fell, mist and cloud gathered upon the mountains, and were not dispelled until late in the afternoon. The circumstance was all the more disappointing, as I had hoped for at least three hours' collecting on the rocks where the higher Erebias are recorded. However, I did disturb a few fine specimens of typical *E. lappona*, close to the summit (9135 ft.), and, after fighting against a furious wind for about an hour on the way to the chalet hotel of Les Cortalets, I came to a sheltered stony waste just above the tree-line, where males of *Erebia melas* var. *pyrenæa*, Oberth., were flying singly, and very difficult to catch. The one specimen netted I associate with this variety; it is smaller than the forms of *E. lefebvrei* taken by me elsewhere, and there is no trace of the normal ocellations on the upper side of the hind wings. But Mr. Elwes (Trans. Ent. Soc. 1898), in his "Revision of the Genus *Erebia*," has proved conclusively that *Erebia melas*, Hbst., does not occur in the Pyrenees, and Dr. Chapman has also determined that, organically, *Erebia lefebvrei* is a good species, with which therefore the vars. *pyrenæa*, Oberth., and *intermedia*, Oberth., should be associated, and not, as in M. Rondou's list, with *melas*. The only other typically alpine butterfly I encountered on this occasion was *Argynnis pales*, flying over the alpine rose, now in full bloom, as was the dwarf broom—a combination of colour at once gorgeous and effective. Lower down on the route above Casteil, where I did most of my collecting, *Euchloë euphenoïdes* was not uncommon,

the females in fine condition, and showing some considerable variation from those caught by me on the Mediterranean littoral and at Digne. In my Vernet specimens the flush at the apex of the fore wings only shows obscurely and subordinate to the heavy black markings, whereas in all my lowland females the colour scheme is exactly reversed. Again, the contour of the wings appears to me to be rounder than is the case with specimens from Vésubie, Cannes, and Digne, and to approximate more closely in shape to that of *E. eupheno* from Algeria. Lastly, the suffusion of the lower wings is rather primrose than orange, and the black markings generally, as well as the discoidal spot, are more definite and pronounced.

A visit to the Valley of St. Martin close by concluded my excursions at Le Vernet, but I did not come across *Libythea celtis*, which Struve reports as "not rare," though I am almost certain I put up a specimen of this interesting butterfly on the road to Casteil aforesaid. The valley and its approaches, however, afforded excellent sport, *Parnassius apollo* and *Chrysophanus virgaureæ*, with *Satyrus circe*, *Gonepteryx cleopatra*, and again *Læsopis roboris* being abundant everywhere.

From July 17th to July 22nd I added nothing to my bag, being engaged on an expedition to Andorra, though I should certainly have waited a day or two to explore the mountains about Montlouis (5280 ft.) had distances been less great and the weather more settled. With the last of the road from Villefranche to this place the southern character of the fauna changes, nor did I notice any butterflies other than of the commoner species on the ten hours' march through the tiny Republic, locked in the heart of the mountains, where the pastures were gay with the great purple Spanish iris, which is such a feature of the Pyrenees when once across the Mediterranean watershed. I was, however, already on the look-out for *Lycæna pyrenaica*, but the "blues" I saw on the Col de Puymorens were typical *orbitulus*, and, as far as I could observe from superficial examination on the wing, in nowise different from the *orbitulus* of the Alps. By the 21st—one of the hottest days I can remember, and spent for the most part in a slow stuffy train—I had changed my venue from the eastern to the central Pyrenees, and the next day, after a pleasant drive from Luz, cooled by a sharp and welcome thunderstorm, arrived at Gavarnie, where I remained until the 29th.

The marked difference between the eastern and the central and western slopes of the Pyrenees cannot fail to impress those who make the journey of the chain from end to end. Le Vernet and the lower valleys around Perpignan are more or less Mediterranean and meridional in the matter of flora and fauna. The almond shares with the vine the fruitful red soil; the parched uplands are fragrant as gardens with the scented lavender and odorous herbs common to these regions. Crossing from Roussillon

into the Cerdagne, and descending into Béarn, the whole character of the country is transformed. The fields are thick with corn and maze; the copses composed of beeches, hazel, and other woodland trees familiar to English eyes; while patches of purple heather replace the cistus and the lavender upon the lower hills.

Gavarnie itself stands at quite a respectable altitude (5085 ft.), but the best collecting ground is at least a thousand feet higher on either side of the famous "Cirque," to the eastward in the Vallée d'Estaubé, to the west in the Vallée de Poueyespée. About two hours' walk up steep grassy slopes, on the morning of the 23rd, brought me to the best part of first-named locality, and I made a second expedition thither on the 25th. The day was eventful, for I took for the first time three butterflies not hitherto met with by me anywhere else, and the three which belong exclusively to the Pyrenees—*Erebia lefebvrei* (type), *E. gorgone*, and *Lycæna pyrenaica*. The former I found here, as elsewhere, on the stony "shoots" of loose stones which lie just under the snow patches at an elevation of perhaps 7500 ft., and I found the chase as difficult, as tiring, and as elusive as of that *Erebia glacialis* var. *nicholli* of Campiglio which the males so closely resemble as to have deceived the most experienced entomologists into considering the two identical. Superficially no doubt the resemblance is near enough; but the females—which, unlike *glacialis*, were at least as frequent as the males—exhibit a very marked contrast both to those of var. *nicholli* or of var. *alecto*. My series from this valley and from the Poueyespée —where it was much commoner and came lower down, but was distinctly smaller and brighter—is composed of strongly coloured specimens, with the ocellations well marked on a bright band of reddish chestnut. M. Oberthur has made this form the type, but the richness of pigmentation and the number of eye-spots is extremely variable, and I can by no means determine from the thirty or forty odd specimens captured at Gavarnie where his var. *intermedia* is intended to begin and where to end. Meanwhile, it is perhaps worth noting that whereas *E. lefebvrei* was taken only flying or settling on the stones, where *E. gorge* was also not uncommon, the closely allied *E. gorgone* was wholly confined to the grassy hillocks and slopes, where it occurred in profusion; and above the Lac de Gaube at Cauterets, where I met with it again, it exhibited the same peculiarity. Some of the males certainly bear an extraordinary resemblance to those of *gorge* on the under side, but there is no mistaking the females with the pronounced *white* venation. *Gorge* is here also a much finer insect than the familiar types of the Alps, though M. Rondou avers that farther east it approximates closely to the form taken on the Riffelberg. The ab. *erinnys*, Esp., in which the apical eyes are obsolete, or nearly so, and the var. *triopes*, Spr., however, have not been reported so far. And it is also noteworthy

that while all specimens seen or taken of *E. tyndarus* appertain to var. *dromus*, H.-S., examples of *E. lappona* correspond invariably to Graslin's bandless ab. *sthennyo*, the type apparently not occurring west of the Canigou region. I was not fortunate enough to take more than a half-dozen *L. pyrenaica* at Gavarnie, and they were all males, the brood evidently being hardly yet emerged; but they are enough to illustrate the marked differences of shape and coloration as between it and the closely allied *orbitulus*. *L. pyrenaica*, again, which has a special taste for animal droppings, is by no means confined to the heights, for among the many butterflies collected together on a muddy piece of the way to the Cirque just outside Gavarnie, I could one day have taken several had not an intrusive mule splashed into the middle of the covey! *Carcharodus lavateræ* also swarmed at the same place, and I had no less than half a dozen in my net at the same moment, though I found scarcely one of them to be in cabinet condition, and pill-boxing this species generally ends in the prisoner dashing itself to pieces.

An excursion to the Vallée d'Héas was, entomologically speaking, a failure, redeemed, however, by the spectacle of countless flights of *Parnassius apollo*; nor did the long weary tramp back to Gavarnie over mountain pastures burnt brown afford a compensation. But the Vallée de Poueyespée was productive enough to encourage a second visit, and here I met *Colias phicomone*, *E.* var. *cassiope*, nice well-marked examples which may be referred to var. *pyrenaica*, H.-S., and some more fine females of *E. lefebvrei*, the best, however, being confined to a sort of rocky amphitheatre high up on the right bank of the Gave des Tourettes, where a snow-fed torrent descends from Les Sarradets. Slightly lower down occurred also *M. parthenie* var. *varia*, with occasional *A. pales*, and a very distinctive form of *E. tyndarus* var. *dromus*.

I left Gavarnie and the comfortable Hotel des Voyageurs with regret, but already the sands of holiday time were running out, and I wished for a glimpse at least of Cauterets before turning my homeward footsteps towards Biarritz. The most interesting route from Gavarnie lies across the mountains by the Route du Vignemale; but a multiplicity of baggage, a camera, and my entomological apparatus precluded the dispatch of fragile impedimenta round by Pierrefitte, so I took the road and the electric railway in the ordinary way. A single fine day, however, at the Lac de Gaube was destined to be the finale of my mountain experiences, and I climbed thither with the more eagerness, inasmuch as M. Rondou had informed me of the discovery there a few days previous by M. Oberthur of *L. zephyrus* var. *lycidas*, a Lycænid hitherto not known to inhabit the Pyrenees. But, though I hunted diligently over the ground for three hours, I am unable to confirm this interesting news personally, and I conclude that

I did not go high enough above the torrents which feed the lovely lake, and beside which *lycidas* had been observed and captured. But I turned up some interesting species all the same—*Pieris callidice*, larger and more vividly marked with green on the under side than Stelvio and Swiss specimens in my collection; *L. cros;* and some fine *M. dictynna*, darker and more intensely banded than any yet encountered. Unfortunately the next two days were wet, and on August 1st I was due in Biarritz.

(To be continued.)

A NEW GENUS OF HEMITELINI (ICHNEUMONIDÆ) FROM CAPE COLONY.

By P. Cameron.

I have had for some time under observation an ichneumon whose systematic position was not at all clear to me. The recent examination of some fresh material has enabled me to refer it to a new genus of *Hemitelini*, allied to *Lienella*, Cam. It is readily known from all Ichneumonidæ by there being only three abdominal segments, and by the last being stoutly spined laterally. The form of the abdomen reminds one of the Braconid genus *Spinaria*. The *Hemitelini* without an areolet (as in the present genus and in *Lienella*) appear to be well represented in Cape Colony.

Acanthoprymnus, gen. nov.

Abdomen with three segments of equal size, the apex of the last transverse, the sides ending in a sharp spine; the first segment broad at the base, half the width of the apex; there are two stout keels down the centre. Wings without an areolet; the recurrent nervure is received distinctly beyond the transverse cubital; the transverse median received shortly beyond the transverse basal. Transverse basal nervure in hind wings broken distinctly below the middle. Median segment short, areolated, the areola large, 6-angled, obliquely narrowed towards the base, the apex transverse; there are two large areæ on either side of it; the apex is bordered by a stout keel. The whole segment is stoutly striated; its spiracles are small, oval—its base is deeply depressed. Scutellum keeled at the base. Parapsidal and pleural furrows deep. There is a distinct malar space. Hinder ocelli separated from the eyes by about the same distance as they are from each other. Occiput margined. The clypeus is not separated from the face; there is a distinct fovea on either side of it; its apex transverse. Mandibles with a minute subapical tooth. There is a broad curved transverse furrow on the middle of the second, and a narrower one on the third. Wings uniformly fuscous. Discoidal cellule closed at apex. The antennæ unfortunately are broken off.

Acanthoprymnus violaceipennis, sp. nov.

Black; the pro- and mesothorax red; the apex of the last abdominal segment and the spines white; the four front legs, except at the base, rufo-testaceous; the hinder black, with the basal fifth white. Antennal scape dark rufous, as are also the mandibles; the palpi dark testaceous. ♀. Length, 7 mm.

Face and clypeus closely rugose, intermixed with striæ; the vertex and upper part of front much more coarsely rugosely punctured; the lower part of the depressed front closely, strongly, transversely striated. Temples wide, obliquely narrowed. Mesonotum transversely, irregularly, rugosely striated; the sides punctured. Scutellar depression deep, wide, with four stout keels; the scutellum deeply, but not very closely, punctured. The basal depression of the metanotum stoutly, closely striated; the areola has a long central and a shorter lateral keel; the others are closely, irregularly reticulated-striated. Pro- and mesopleuræ closely, strongly punctured, more or less striated; the metapleuræ closely, rugosely reticulated. The first abdominal segment between the keels is stoutly striated, the striæ clearly separated; the sides are in two parts, separated by an oblique keel; the apical part is the larger, and is more depressed; both are irregularly, obliquely, widely striated; the other segments are closely, strongly, longitudinally striated; the depression on the second segment is more widely striated; the longitudinal striæ are intersected by finer transverse ones, forming reticulations; the white apex, between the spines, is smooth. The alar nervures and stigma are black; the latter is narrowly white at the base. Tegulæ red. The sides and middle of the mesosternum are black.

RHOPALOCERA AT BARCELONA, MONTSERRAT, AND VERNET-LES-BAINS.

By R. S. Standen, F.L.S., F.E.S.

Barcelona.

What made us select Tibidabo as the scene of our operations I really don't quite know. At first I think we were captivated by a sort of quaint ring about the name, and we kept on repeating it to ourselves—at least *I* did—like schoolboys. Then it was the highest ground, with a rough scrubby look about it, within easy reach of the city. There was an electric tram to the very foot of it—about three miles distant—and on the top, as we afterwards discovered, a restaurant of great restorative powers after a two hours' climb in the sweltering heat. We collected for two days (May 30th and 31st) on this hillside on our way to Majorca, and again one day (June 12th) on our return. In these three days we took twenty-seven species of butterflies, which, although comparing unfavourably in point of numbers with three days' collecting in almost any Swiss valley, are interesting in so far that six of them are unknown in Switzerland.

In one respect—*viz.*, in the absence of water and the consequent xerophytic character of the vegetation—this locality had much in common with Majorca, and when we come to compare the species we find that ten out of the thirteen taken in Majorca occurred here also; and doubtless, with a wider search, the three absent species, *G. rhamni*, *G. cleopatra*, and *E. ida*, would also have been observed, which seems to confirm the theory—if any doubt ever existed about it—that the islands were formerly joined to the mainland. The dissolution of the partnership appears to have had a disastrous effect upon the isolated partner as far as Lepidoptera are concerned.

To me it was a great joy to see, for the first time, that lovely little thing *Euchloë euphenoides* on the wing. We were probably late for it, as I only saw two, but those two seemed to lift the parched-up landscape out of the commonplace into (I had almost said) a terrestrial paradise. *Melanargia syllius*, too, was new to me, and new also its method of flight, which generally left me much worsted in the race. But the most interesting capture was *Melitæa aurinia* var. *iberica*, a large and beautiful endemic form. The butterflies captured here were as follows:—*Papilio machaon*, L.; one fine specimen. *Pieris rapæ*, L.; several. *P. daplidice*, L.; several. *Euchloë belia*, gen. æstiv. *ansonia*, Hb.; one only. *E. euphenoides*, Stgr.; two males. *Leptidia sinapis*, L.; several. *Colias edusa*, F.; a few. *Pyrameis cardui*, L.; occasional specimens. *Melitæa aurinia* var. *iberica*, Obth.; abundant—a large and beautiful purely Spanish form, with a deep orange-red ground colour on both sides, many of them rather worn. *M. phœbe*, Knock; several, very fine. *M. athalia*, Rott.; a few. *Melanargia syllius*, Hbst.; common, but getting worn on our second visit. *Pararge ægeria*, L.; common and fine. *P. megæra*, L.; common and fine. *Epinephele jurtina* var. *hispulla*, Hb.; abundant and fine, replacing the type. *E. pasiphaë*, Esp.; very abundant and fine. *Thecla ilicis*, Esp.; a few. *T. ilicis* var. *æsculi*, Hb.; one or two. *Chrysophanus phlæas*, L.; occasionally. *Lampides telicanus*, Lang; one fine female. *Lycæna astrarche*, Bgstr.; very common; marginal row of red spots very bright; finer if anything than the Corsican form. *L. icarus*, Rott.; a few. *L. escheri*, Hb.; fairly common. *L. coridon*, Poda; fairly common. *Cyaniris argiolus*, L.; a few. *Adopæa thaumas*, Hufn.; a few. *Thanaos tages*, L.; a few, very fine.

Montserrat.

There was not much to detain us in Barcelona. Having, on our previous visit, exhausted our stock of adjectives over the wonders of the cathedral, with its magnificent cloisters and sacred ducks, over its fine promenades lined with palms and the oriental sycamore, and its bewildering network of trams, Jones and I decided to do a pilgrimage to the monastery of Montserrat.

Nicholson was still staying on for three or four days in Majorca, to tear a few more mosses off the rocks, to try to run to earth some of the talayots, a kind of dolmen for which the south of the island is famous, and to visit the stalactite caves at Manakor. A journey of two hours brought us to the main line station of Montserrat, whence we embarked on a "funiculaire," and crawled up in serpentine fashion to the monastery, taking just an hour to cover the five miles.

The vast agglomeration of buildings was so ensconced in a towering amphitheatre of conglomerate rocks that we only became alive to their existence on arriving at the little station below the church. A uniformed official was there to escort us to the bureau, where the reverend father who presided at the office-desk allotted to us a fairly spacious cell in the block dedicated to Santa Térésa de Jésus. On the ground floor of this block, in a dark arcade, was a series of little shops, where pilgrims who catered for themselves could purchase all necessary comestibles and cooking apparatus, and this was supplemented every morning by a vegetable and fruit market outside. For those to whom, like ourselves, the culinary department was an unfathomable mystery, there was an excellent restaurant at one end of the courtyard. We lost no time in testing its capacities for the midday meal, and then set out with our nets for a ramble up the western slope, which towered up to 4000 ft.—1000 ft. above the monastery itself. The way was arduous and long, but we were always buoyed up with the hope of a possible *Erebia*—if not new to science, at least with characteristics befitting the isolated situation of the vast pile of limestone on which we stood. It was no doubt a futile hope at this comparatively low elevation, and our toil went unrewarded. In a round of about five miles our captures were limited to a few *Lycæna astrarche*, *L. icarus*, *L. coridon*, *Melitæa aurinia* var. *iberica*, and *Pararge megæra*.

We got back just in time for vespers at the magnificent Basilica attached to the monastery. In the choir were about thirty boys and twenty monks. The entire service, which lasted rather over the hour, was choral, accompanied by a fine organ, and the music was some of the most wooing and soul-enthralling I ever listened to. It is said that nothing finer can be heard out of Madrid, and we attended the same service on the two following days.

There are only two roads out of Montserrat, one east and the other west, and, as we had already explored the latter, with divergences to right and left, and a minimum of success, we now decided to take the eastward road, which brought us in about four miles to the Convent of St. Cecilia. Collecting here was of a very different character, and, if the number of species was not very great, many of them were very abundant. First and foremost among these were *Melitæa aurinia* var. *iberica*, a

very fine form, already mentioned as occurring at Barcelona; then came *Euchloë euphenoides*, very fresh and fine, the males preponderating largely over the females; next, in point of numbers, *Lycæna astrarche*, *L. icarus*, *L. coridon*, *Leptidia sinapis*, *Melitæa athalia*, *Pararge ægeria*, *P. megæra*, *P. mæra*, and *Melanargia syllius*. The road was flanked on our left with huge overhanging pudding-stone rocks, and on the right stretched away a rich warm-coloured panorama of alternating broken ground and cultivated fields, terminating with the limitless horizon of the sea.

So attractive was this route, so soft the air, and so delightful the intervals of shade afforded by the trees which here and there intercepted our view across the plains, that we decided to devote to it our third and last day also. On this occasion we extended our walk for about a couple of miles beyond the convent, and were rewarded with a few solitary examples of *Colias edusa*, *Limenitis camilla*, *Vanessa polychloros*, *Thecla ilicis*, and others.

Near the convent was an excellent little restaurant, where we obtained an omelette, cutlets, bread and cheese, cherries, and delicious peaches brought up that morning from an orchard down below, with a delicious red wine and coffee, for the ridiculous sum of 1s. 6d. apiece. On our way home we were treated to a fine specimen of a mountain thunderstorm, and got fairly drenched, but in a quarter of an hour the sun was out as hot as ever, and we had walked ourselves dry by the time we reached the monastery. The next morning (June 16th) we returned by an early train to Barcelona.

The butterflies taken at Montserrat were as follows:—*Aporia crataegi*, L.; a few. *Pieris rapæ*, L.; fairly common near the monastery. *P. daplidice*, L.; one fine male. *Euchloë euphenoides*, Stgr.; male very abundant, female scarce. *Leptidia sinapis*, L.; common. *Colias edusa*, F.; occasionally. *Gonepteryx cleopatra*, L.; not common. *Limenitis camilla*, Schiff.; two or three specimens. *Pyrameis atalanta*, L.; one specimen. *Vanessa polychloros*, L.; one very fine specimen, just emerged, June 14th. *Melitæa aurinia* var. *iberica*, Obth.; the most abundant butterfly on the wing, and for the most part in much better condition than those taken at Barcelona. *M. cinxia*, L.; two specimens, paler than English examples. *M. athalia*, Rott.; fairly common. *Melanargia syllius*, Hbst.; occasional worn specimens. *Pararge ægeria*, L.; fairly common. *P. megæra*, L.; fairly common. *P. mæra*, L., gen. æstiv., Hb.; one only, a very beautiful form, in which the fulvous area of both wings is much larger; apparently a connecting-link with *megæra*. It occurs also at Vernet and in the Cévennes, and replaces the type in both places. *Cœnonympha arcania*, L.; a few. *Lycæna argus*, L.; three or four specimens. *L. icarus*, Rott.; fairly common—one interesting variety. *L. escheri*, Hb.; occasionally. *L. bellargus*, Rott.;

a few. *L. coridon*, Poda; a few. *Adopæa thaumas*, Hufn.; a few. *Hesperia malvæ*, L.; a few. *Thanaos tages*, L.; occasionally.

(To be continued.)

A NOTE ON SOME SPECIES OF *PREPONA*.

Percy I. Lathy, F.Z.S., F.E.S.

Herr Fruhstorfer, in the 'Iris,' 1905, pp. 304, 305, places *P. garleppiana*, Stgr., as a subspecies of *P. neoterpe*, Honrath, and places two other species, *P. brooksiana*, Godm., and *P. deiphile*, Godt., between that species and *P. enagoras*, Hew.

This is incorrect, as *enagoras*, Hew., should follow *garleppiana*, Stgr.; on the under side there is very little difference between *neoterpe*, Honrath, and *enagoras*, Hew., and *garleppiana*, Stgr., but these three forms may at once be separated from Godman's and Godart's species by the extremely irregular postmedian line of fore wing below. According to Fruhstorfer's own showing, *deiphile*, Godt., cannot come between *garleppiana*, Stgr., and *enagoras*, Hew., as it possesses yellow tufts, while the latter species have dark brown, almost black tufts, and Fruhstorfer divides the genus into two sections by this character, Sect. B. 1 with black, and Sect. B. 2 with yellow tufts. *Garleppiana*, Stgr., is more like *enagoras*, Hew., than *neoterpe*, Honrath; in fact, the only way it differs from the former is that it has metallic blue bands on both wings above, but it possesses the submarginal orange spots and costal streak, both of which are wanting in *neoterpe*, Honrath.

Fruhstorfer may not know the true *garleppiana*, Stgr., as two or three years ago several specimens of *neoterpe*, Honrath, were sent out by a German dealer as Staudinger's species. If this error was not corrected, it would have caused confusion. As I write I have before me Honrath's type and a co-type of Staudinger's, and I have also seen Staudinger's type at Dresden.

I am inclined to think either that Staudinger was right in supposing *garleppiana* to be an aberration of *enagoras*, Hew., or that it is a hybrid between that and *neoterpe*, Honrath.

Fruhstorfer gives Columbia as the only locality of *P. præneste*, Hew. I am able to add New Granada, the original locality; Zamora, Ecuador, one specimen taken in July, 1886, by the Abbé Gaujon; and San Remon, Peru, two specimens taken in July, 1903, by Watkins and Tomlinson, and one by Watkins in 1904.

The specimens from the different localities exhibit slight differences. The Ecuador example has a much narrower red fascia on fore wings above, and both Ecuador and Columbian

specimens want whitish spots beyond middle of hind wings below; while those from Peru have the red fascia as wide as in *buckleyana*, Hew., and the spots on under side of hind wings almost as conspicuous as in that form. The blue on the wings above is brighter in the Peruvian specimens. In one *buckleyana*, Hew., are three small red spots near margin above the fascia. There is little doubt that specimens will eventually be procured linking all the forms.

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8. Manders, N.: "Some Breeding Experiments on *Catopsilia pyranthe* and Notes on the Migration of Butterflies in Ceylon" (*op. cit.* pp. 701–8; pls. xxxiv–v [Lepidoptera]).
9. Green, E. E.: "Notes on Australian Coccidæ," &c., No. 1 (Proc. Linn. Soc. N. S. Wales, xxix. pp. 462–5; pl. xvii. (Dec., 16th, 1904) [Hem.]).
10. Goding, F. W., & Froggatt, W. W.: "Monograph of the Australian Cicadidæ" (*op. cit.* pp. 561–670; pls. xviii–xix (Dec. 16th, 1904) [Hem.]).
11. Girault, A. A.: "*Anasa tristis*, De G.; History of Confined Adults; Another Egg Parasite" (Ent. News, xv. pp. 335–7 (Dec. 1904) [Hem., Dipt., Hymen.]).

12. Muckermann, H.: "*Formica sanguinea* subsp. *rubicunda*, Em., and *Xenodusa cava*, Lec.; or the Discovery of Pseudogynes in a District of *Xenodusa cava*, Lec." (*op. cit.* pp. 339–41; pl. xx [Hymen., Coleopt.]).
13. Handlirsch, Anton: "Zur Systematik der Hexapoden" (Zool. Anzeiger, xxvii. pp. 733–59 (July 12th, 1904)).

Haeckel's "Wonders of Life" (1) is a supplementary volume to "The Riddle of the Universe," dealing more particularly and fully with certain biological problems and phenomena, and is a work that no thoughtful entomologist can afford to lay aside without study. The book is divided into four sections, *viz.* Knowledge of Life, Nature of Life, Functions of Life, and History of Life. Apart from a general consideration of certain phenomena, there are many entomological notices, as, *e. g.*, in the chapter on Reproduction. Prof. Carpenter's report (2), the price of which is nominal, should be in the hands of every British entomologist. Some fourteen insects, belonging to five orders of insects and to the Acarina, are treated of in detail. The plates represent photos of *Gortyna ochracea* (Lep.), *Chionaspis salicis* (Hem.), &c.

Felt (3) furnishes a full and detailed account of the mosquitoes of New York State, considered systematically, biologically, and economically; elucidated by three hundred and thirty-one separate figures. Although treating of American species, the work will be indispensable to British students.

Breddin (5) describes a number of Neo-tropical, Oriental, and Sudanese ant- and termite-nest living Hemiptera, including a number of immature forms. Bueno (6) extends the observations of Martin * on the life-history and habits of the North American *Hydrometra martini*, and finds that the more southern var. *australis* of Say is a good species, figuring the male genital segments of both forms.

Green (9) describes an interesting Coccid, *Antonina australis*, from nut-grass (*Cyperus rotundus*). This nut-grass has recently found its way into Honolulu, where it is a terrible nuisance. Green designates it "n. sp."; at least two previous descriptions have, however, appeared in print, the earliest being in Proc. Linn. Soc. N.S.W. xxviii. p. 686 (April 28th, 1904). Goding and Froggatt (10) have monographed the Cicadidæ of the Australian continent. There are one hundred and nineteen species distributed among twenty-one genera; four genera and forty-seven species are described as new. *Melampsalta*, Kolenati, should be replaced by *Cicadetta* of the same author.

Girault (11) observed *Hadronotus carinatifrons*, Ashmead, ovipositing in the eggs of the American Lygalid *Anasa tristis*;

* See 'Entomologist,' xxxiii. pp. 175–6 (June, 1900).

at another time a tachinid fly issued from the abdomen of a female *Anasa* which had previously copulated.

Arrow (7) gives an interesting account of sound-producing organs in Lamellicorn beetles, a large proportion being novel. There is an appendix of two new genera and seven new species, and a list of stridulating Lamellicorn genera.

Manders (8) briefly discusses the migration of butterflies in Ceylon, illustrated by a map (pl. xxxv.).

Handlirsch (13) devotes considerable attention to the systematics of the Hexapoda, in particular with regard to Boerner's peculiar views. Without going deeply into the paper, which would indeed require almost a full translation to do it justice, a reproduction of the orders, &c., adopted will be of interest:—

Class I. Collembola (*Lubbock*).
Order 1. Arthropleona (*Boerner*).
,, 2. Symphypleona (*Boerner*).

Class II. Campodeoidea, *Handlirsch*.
(= Archinsecta, *Haeckel*.)
Order 1. Dicellura (*Haliday*).
,, 2. Rhabdura (*Silvestri*).

Class III. Thysanura (*Latr.*).
Subclass 1. Orthopteroidea, *Handlirsch*.
Order 1. Orthoptera (*Olivier*).
,, 2. Phasmoidea, *Handlirsch*.
,, 3. Dermaptera (*De Geer*).
,, 4. Diploglossata, *Saussure*.
,, 5. Thysanoptera, *Haliday*.

Subclass 2. Blattæformia, *Handlirsch*.
Order 1. Mantoidea, *Handl*.
,, 2. Blattoidea, *Handl*.
,, 3. Isoptera, *Comst*.
,, 4. Corrodentia (*Burm.*).
,, 5. Mallophaga (*Nitsch*).
,, 6. Siphunculata, *Meinert*.

Subclass 3. Hymenopteroidea, *Handl*.
Order 1. Hymenoptera, *Linn*.

Subclass 4. Coleopteroidea, *Handl*.
Order 1. Coleoptera (*L.*).
,, 2. Strepsiptera, *Kirby*.

Subclass 5. Embioidea, *Handl*.
Order 1. Embiaria, *Handl*.

Subclass 6. Perloidea, *Handl*.
Order 1. Perlaria, *Handl*.

Subclass 7. Libelluloidea, *Handl.*
Order 1. Odonata, *Fabr.*

Subclass 8. Ephemeroidea, *Handl.*
Order 1. Plectoptera, *Pack.*

Subclass 9. Neuropteroidea, *Handl.*
Order 1. Megalopteræ (*Latr.*).
,, 2. Rhaphidioidea, *Handl.*
,, 3. Neuroptera (*Linn.*).

Subclass 10. Panorpoidea, *Handl.*
Order 1. Panorpatæ, *Brauer.*
,, 2. Phryganoidea, *Handl.* [= || Trichoptera.]
,, 3. Lepidoptera, *L.*
,, 4. Diptera, *L.*
,, 5. Suctoria, *De Geer.*

Subclass 11. Hemipteroidea, *Handl.*
Order 1. Hemiptera (*L.*).
,, 2. Homoptera (*Leach*).

NOTES AND OBSERVATIONS.

Pupation of Smerinthus tiliæ.—On August 27th, while taking a short stroll in Walmer, I found a *Cossus*-infected elm, in the bark of which were holes through which the moths had made their exit. On removing the bark from one of these holes I, of course, found the cocoon of *ligniperda*, but in it I found a perfect and apparently newly-turned pupa of *tiliæ*. The pupa was very lively, and certainly a fresh one. Surely this is a singular method of pupation for this insect?—R. A. Jackson; Hollingbourne, September 9th, 1905.

A new Pest of the Orange.—Last May, Professor V. A. Clark sent me a larva which was eating the leaves of orange trees at Phœnix, Arizona, doing some damage. Only the young trees were affected, the old ones going unharmed. I bred the moth in due course, and it proves to be *Chloridea obsoleta* (Fabr.) var. *umbrosa* (Grote)—more generally known as *Heliothis armigera umbrosa*. The insect is common, but I had not before known it to attack the orange.—T. D. A. Cockerell.

CAPTURES AND FIELD REPORTS.

Notes on the Season 1905.—Although I have not taken any special notice of the Rhopalocera during this season, except, perhaps, of the Hesperids, I think more butterflies have come under my notice this year in England than for many years past. Almost every plant of *Rhamnus* noted in Surrey or Sussex was tenanted by *Gonepteryx*

rhamni, either in the egg or larval stage. Perhaps the spring brood of *Cyaniris argiolus* was not quite so common in Chiswick as it was a year or two ago, but some specimens were seen of the July brood, which is here usually very scarce. *Pieris rapæ* has been as abundant as usual, but *P. napi* and *P. brassicæ* have not perhaps occurred in their usual quantity in this neighbourhood. *Cœnonympha pamphilus* was very abundant in Richmond Park, and *Aphantopus* (*Epinephele*) *hyperanthus* in plenty at Chalfont Road. But perhaps the most unusually abundant species is *Aglais* (*Vanessa*) *urticæ*. The first seen was at Clandon, July 15th, and several have been seen, even at Chiswick, since. There were eight fine specimens, probing the blossoms of *Sedum telephium*, in the garden on September 13th. Though common enough elsewhere, such a congregation is rare within six miles of Charing Cross. *Pyrameis atalanta*, too, is certainly more numerous than it has lately been in this district. *Pamphilus sylvanus* was really numerous on Putney Heath towards the end of July. I noticed a specimen, on August 5th, resting quite exposed on a bramble-leaf, with the wings closed over the back while the rain was falling fast; but though the leaf was wet, the butterfly was perfectly dry. I should have expected it would have crept under the leaf. Among the Heterocera the larvæ of *Phalera bucephala* have been an exceptional plague in the gardens here, on rose, lime, and birch. Their habit of stripping certain branches on one side of the trees causes the shrubs to become very unsightly. The larva of *Mamestra trifolii* (*chenopodii*) has been quite common on its food-plant, but I have only seen one larva of *Peluga comitata*. On the walls and fences in the neighbourhood a few *Catocala nupta* appear every year, but this year the number has been quite doubled. The larvæ of *Acronycta aceris* have also been rather commoner than usual. This species, both here and on the Continent, appears to be quite suburban. After having been almost scarce for the last two or three years, the larva of *Spilosoma menthastri* is again becoming common.—Alfred Sich; Corney House, Chiswick, September 15th, 1905.

Note on Second Emergences.—It would be interesting to know the experiences of other entomologists as to second emergences this season. I have had the following:—On August 20th, *Stauropus fagi*, and a few days later a second example; *Pterostoma palpina* in August, date not noted; on September 11th, *Hypena proboscidalis*; and on August 26th I found a larva of *Porthesia similis* (*auriflua*) half grown, which spun its cocoon on September 2nd and is now a pupa, and the imago will doubtless emerge shortly.—Francis C. Woodbridge; Northcroft, Uxbridge.

Partial Second Brood of Pseudoterpna bajularia.—On July 5th last, at 10 p.m., I took a female of the above, and obtained ova. These hatched on the 12th of that month, and were fed in a glass cylinder indoors on oak (the room faced north-east). Some of the larvæ fed up much quicker than others—in fact, to-day, September 11th, to my great surprise, a beautiful male specimen (full-sized) emerged, and yet some of the larvæ are still very small, and have every appearance

of hybernating as larvæ. Is not this very unusual? — Arthur Bordu; 39, Elm Grove Road, Barnes, S.W., September 11th, 1905.

Sphinx convolvuli at Bournemouth.—I had a male specimen of *S. convolvuli* sent me on August 25th, which had been found resting on the front door of Linden Hall, Bournemouth, by the hall porter, on opening it in the morning. It was in good condition when found, but was sent to me in a small box, alive, and on its arrival it was much damaged.—C. B. Holland; 12, Lawson Road, Sheffield, August 29th.

Acherontia atropos in London.—This morning I have had a fine specimen of *A. atropos* brought to me. It was taken on the stone-work of Westminster Bridge.—J. Miller; 44, Longfield Street, Wandsworth, S.W., September 1st, 1905.

Plusia moneta in Lewisham. — On the evening of August 29th last Mrs. Chittenden was passing under the electric lights in High Street, Lewisham, when she saw a moth flying just above the pavement. Clasping hands together, she caught the insect, and brought it home. I at once saw that it was a specimen of *P. moneta*, and, although it was damaged, the fringes were in good condition. — D. Chittenden; 98, Court Hill Road, Lewisham, S.E.

Second Broods of Lepidoptera. — Has it been noticed elsewhere that there were an unusual number of, apparently, second broods of Lepidoptera this year? Such occurrences have been quite a feature in this district.—G. Brooks; Ivyside, North Finchley.

[Perhaps our correspondent will kindly supply further details, as the subject is of considerable interest.—Ed.]

Notes from Essex. — I went over to Foulness on Sept. 22nd last, more for the purpose of having a look round than for specimen hunting. I noticed many webs of *Porthesia chrysorrhœa* on the whitethorns; a case of *Epichnopteryx pulla* on one of the sea-wall grasses; a larva of *Pseudoterpna smaragdaria*; two or three cases of *Coleophora artemisiella*, and evidence of the presence of *Catoptria candidulana* among the flowers of sea-wormwood; a larva of *Cucullia asteris* on flowers of sea-aster; and, on the church wall, a defunct pupa of *Vanessa urticæ*. Although Foulness is rather difficult of access, I hope next season to see a good deal more of it. The fine show of *Aster tripolium* was, in my opinion, well worth the visit, apart from the novelty of half an hour's drive across the sands from Wakering Stairs.—F. G. Whittle; 7, Marine Avenue, Southend, Sept. 24th, 1905.

SOCIETIES.

South London Entomological and Natural History Society.—*July 13th*, 1905.—Mr. Hugh Main, B.Sc., President, in the chair.—Mr. Joy exhibited larvæ of *Thecla rubi* feeding on the berries of buck-thorn. He had also found them feeding on the buds of bramble and

dogwood. They made holes to extract the contents.—Mr. Stonell, an *Abraxas sylvata* (*ulmata*) taken recently in the Clapham Road.—Mr. Sich, the ova of *Coleophora gryphipennella* on a rose-leaf. It was an upright egg and abundantly supplied with gum.—Mr. Main, living larvæ of *Papilio machaon* at different ages; and also an old stem of an umbellifer, containing cells of a species of carpenter-bee.—Mr. Step distributed copies of the photograph of the members who attended the field-meeting at Seal Chart on May 27th.

July 27th.—The President in the chair.—Mr. Carr exhibited the larvæ of *Epione advenaria*, from Seal.—Mr. Stonell, a putty-coloured larva of *Odontopera bidentata*, from Yorkshire; and reported that he had taken a fair number of *Cænobia rufa* at Worcester Park.—Mr. Main, a photograph of a colony of the larvæ of *Eugonia* (*Vanessa*) *polychloros* in the New Forest, from which larvæ he had already bred more than sixty imagines.—Mr. Noad Clark, photographs of (1) the ova *Coleophora gryphipennella* on leaves of rose; (2) a much-magnified photograph of the micropyle of the same; and (3) the ova of *Ægeria* (*Sesia*) *chrysidiformis*.—Mr. Sich said that the larva of *C. gryphipennella* was at first a true miner, boring direct from the base of the ovum into the leaf.

August 10th.—The President in the chair.—Mr. Main exhibited the larvæ of *Hadena contigua*, from ova laid by a female specimen obtained in the New Forest. The colour-variation was most extreme.—Mr. Sich, living larvæ of (1) *Nisoniades tages* and (2) *Syrichthus malvæ*, both feeding well on garden strawberry. They fed at night and retired in the daytime into "tents" of leaves loosely spun together. The former hybernated as a larva, the latter as a pupa.—Mr. West (Greenwich), two very local species of Hemiptera, taken at Yarmouth in July; *Gnathoconus picipes*, at roots of violets; and *Chorosoma schillingii*, on marram grass. Mr. Turner, (1) a species of *Œdipoda* which was very common at Gavarnie in the Hautes Pyrénées, and (2) a living specimen of *Locusta viridissima* taken by him at the same place. A discussion took place as to the latter species, and it was considered to be carnivorous rather than vegetarian in its diet.—Mr. R. Adkin read a short note from Mr. Kirkaldy on "The Entomology of the Lowlands of Oahu (Hawaiian Islands)."—Hy. J. Turner, *Hon. Rep. Secretary.*

City of London Entomological and Natural History Society.—*Sept. 5th*, 1905.—The President in the chair.—The Rev. G. H. Raynor and Mr. Charles Capper were nominated for membership of the Society.—Rev. C. R. N. Burrows exhibited living pupæ of *Ochria ochracea* taken in thistle-stems at Mucking, Essex; he remarked on the fact that in this district the species does not seem to feed on burdock (*Arctium lappa*) or mugwort (*Artemisia vulgaris*).—Mr. J. A. Clark, *Lycæna icarus* from Folkestone, including abs. *obsoleta* and *striata*.—Mr. A. W. Mera, *Acidalia rusticata* bred from larvæ reared on dandelion; the specimens were generally considered to be larger than the average of captured imagines. Mr. Mera also exhibited *Agrotera nemoralis* from Brentwood, a capture he considered somewhat remarkable for this locality.—Mr. V. E. Shaw (on behalf of Mr. Newman, of Bexley), two hybrid imagines, the offspring of *Notodonta dromedarius*, female, and *N. ziczac*, male; the exhibitor stated that part of the brood emerged in the autumn of

1904, and proved to be all females; while the balance hybernated as pupæ, and emerged during May, June, and July, all being males.—Rev. G. H. Raynor reported that the second brood of *Cyaniris argiolus* had been abundant at Maldon; he found that the larvæ fed up readily on unopened buds of ivy. — Mr. C. P. Pickett, during a recent visit to Torquay, had observed large numbers of *Pyrameis cardui* and *Vanessa urticæ* visiting the valerian that grows on the rocks in this district.

Sept. 19th.—The President in the chair.—Rev. G. H. Raynor and Mr. Chas. Capper were unanimously elected members of the Society.—Rev. C. R. N. Burrows exhibited a very dark aberration of *Notodonta ziczac*, and a very pale form of *Hadena sordida*; also living larvæ of *Cerura furcula*, *N. ziczac*, *Pterostoma palpina*, *Lophopteryx camelina*, and *Gastropacha quercifolia* (all from Mucking, Essex).—Mr. J. A. Clark, a very pale ab. of *N. ziczac* and a dark specimen of *Calymnia trapezina*.—Mr. A. W. Mera, female specimen of *Porthesia similis* with a black spot at the base of fore wings. — Mr. W. J. Kaye, a bred series of *Thecla pruni* from larvæ taken at Monkswood, Herts; four examples of *Macaria liturata*, ab. *nigrofulvata*, from Delamere, Cheshire; and a long and variable bred series of *Zonosoma pendularia* from Oxshott. Mr. Kaye mentioned that the emergence of the *T. pruni* extended over three weeks from June 15th onwards, and pointed out that three of the *Z. pendularia* were part of a second brood, the remainder of which was still in pupa. — Mr. C. P. Pickett, an abnormally large specimen of *P. cardui*, some unicolorous chocolate-coloured abs. of *Ematurga atomaria*, and several abs. of *Lycæna corydon*, one of which had the dark marginal band on the right fore wing about twice as deep as that on the left wing.—Mr. V. E. Shaw, living imagines of *Oenophila v-flava* taken in a city wine-vault, the larvæ of this species feeding on corks in wine-bottles; also *Spilote* (*Abraxas*) *grossulariata* var. *varleyata*.—Rev. C. R. N. Burrows reported that sugaring in the Mucking haunt of *Cirrhædia xerampelina* had proved a complete failure.—Mr. J. A. Clark recorded the capture of *Peronea cristana* in Epping Forest. — The Honorary Secretary drew attention to the fact that sugaring in the New Forest was now prohibited by order of the Deputy Commissioner of Woods and Forests in that district, the rangers having been instructed to daub clay on the sugar patches in the event of their warning to any individual lepidopterist being ignored. Mr. P. H. Tautz confirmed this by stating that he had been interrupted recently while sugaring in the Forest.—S. J. Bell, *Hon. Sec.*

RECENT LITERATURE.

A Catalogue of the Erycinidæ. By Levi W. Mengel. Pp. 161. Reading, Pa., U.S.A. 1905.

The author of this valuable catalogue is to be congratulated on the completion of his laborious undertaking; he has earned the thanks of all students of the Erycinidæ (=Lemoniidæ, Kirby, = Riodinidæ, Grote). Although he holds the opinion that there are too many genera, and that the number of species should be much reduced, he leaves everything pretty much as he found it.

A Catalogue of the Lepidoptera of Northumberland, Durham, and Newcastle-upon-Tyne. By John E. Robson. Vol ii.—Micro-Lepidoptera. Part i.—Pyralidina and Tortricina. Pp. 106. [Natural History Transactions of Northumberland, Durham, and Newcastle-upon-Tyne. Vol. xv., part i.] Williams & Norgate, London. 1905.

Again we have to compliment the author on the very satisfactory manner in which he has brought his work to its present stage. "Micro" Lepidoptera are not favourites with the collector generally, and the consequence of this is that the distribution in Britain of the Pyralidina, Tortricina, and Tineina is only imperfectly known. This unfortunate state of things has created a difficulty with which Mr. Robson had to contend in the compilation of the instalment of this list under notice. He has managed, however, to get information as to the occurrence of nearly two hundred species of Tortricina in the area discussed. Under Pyralidina seventy-six species are treated, but of these some had been referred to in previous sections, and one or two belong to the Noctuina. We shall be glad to see the remainder of this important catalogue.

The Insects of Jethou, pp. 1–3; *The Insects of Herm*, pp. 1–14; and *the Fauna and Flora of the Sarnian Islands*, pp. 1–6.

The above are three reprints from the 'Transactions' of the Guernsey Society of Natural Science for 1904. The first two are by W. A. Luff, but the third is without compiler's name.

Transactions of the Hertfordshire Natural History Society and Field Club. Edited by John Hopkinson, F.L.S., F.G.S., &c. Vol xii., part iv, pp. 137–168. London: Dulau & Co. 1905.

Among the contents are several papers on entomological subjects; two of these deal with the Coleoptera found in the county, one by Mr. A. E. Gibbs and the other by Mr. E. George Elliman. The former author also gives some very interesting notes on Lepidoptera observed in Hertfordshire in the year 1904, a *résumé* of which was published in this Journal last year (xxxvii. 139). There is also "Notes on Variation in *Melitæa aurinia*," by Mr. V. P. Kitchin, which is accompanied by a plate.

Transactions of the City of London Entomological and Natural History Society for the year 1904. Pp. 1–56. The Society: London Institution, Finsbury Circus, E.C.

In addition to a large amount of exceedingly useful matter comprised in the "Reports of Meetings," the present volume contains the following papers:—"Are the attacks of Lepidopterous Larvæ beneficial to the plants they attack?" by Dr. Chapman; "*Tenusia cambrica* and its Alles," and "Supplementary Notes on *Cidaria*," both by Mr. L. B. Prout; and "Aid to the Study of Lepidopterous Leaf-miners," by Mr. Alfred Sich. All these are of much importance to the student, and will be of considerable interest generally.

OBITUARY.

We deeply regret to announce the death of Mr. Ambrose Quail at Tamworth, New South Wales, on the 11th of February, 1905, at the early age of thirty-three.

He had to leave England some nine years ago owing to the breakdown of his health, and resided for some years at Palmerston North, New Zealand. Unfortunately a series of bad seasons caused a return of his complaint, and after a brief visit to England in the autumn of 1903 he returned to the colonies, obtaining some benefit from a short residence in Queensland, but dying six months after taking up work at Tamworth.

Mr. Quail was a rising and brilliant student belonging to the newer school of lepidopterists, following the methods of Drs. Dyar and Chapman in larval and pupal description; and there is no doubt that had he lived he would have occupied a place in the foremost ranks of entomologists. Added to great keenness of observation and wonderful patience in his researches, he was also possessed of remarkable skill as a draughtsman, as the profuse and beautiful plates illustrating his papers testify. His published contributions include several papers in the 'Transactions' of the Entomological Society of London, others appearing in the pages of this Journal, 'Natural Science,' and the 'Entomologists' Record.' He also contributed to the 'Proceedings' of the Royal Society of Queensland, and the 'Transactions' of the New Zealand Institute. The latest and probably best known of his work was that dealing with the Hepialidæ and Cossidæ, groups that had always been especial favourites, and which his residence in Australia and New Zealand afforded him special opportunities to study. His loss is keenly felt by all who were personally known to him, and it will be a matter of regret to the wider circle of his readers that so energetic and capable a personality was not longer spared to enrich the world's knowledge in his special line of research.

John William Douglas passed away, at the ripe age of ninety years, on August 28th last. Although perhaps chiefly interested in Coleoptera, Hemiptera, and Lepidoptera, almost all orders of the Insecta received some share of his attention. He contributed important monographs and other valuable writings to the 'Transactions' of the Entomological Society of London, the 'Entomological Magazine,' the 'Zoologist,' and the 'Entomologist's Monthly Magazine.' He was part author of the 'Natural History of the Tineina' (13 vols., 1855–1873), and, in conjunction with Scott, produced 'British Hemiptera-Heteroptera' (1 vol., 1865). In 1856 he published 'The World of Insects,' a small but excellent entomological manual. He was co-editor of the 'Entomologist's Monthly Magazine,' and in this position he had been associated with the Journal from the year 1874, when Dr. Knaggs terminated his connection with it. He had been President, and also Honorary Secretary, of the Entomological Society of London, to which he was elected in 1845. Few men have done so much to foster or awaken appreciative interest in the world of insects.

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ABERRATION OF *EUCHELIA (HIPOCRITA) JACOBÆÆ.*

MR. FORSYTHE, of Lancaster, has sent for inspection a most interesting series of *E. jacobææ* that he had obtained in the early part of June last. In all the specimens the ground colour is much greyer than usual, some being especially pale in coloration. In these paler examples the hind wings are pale pink, the subcostal streak and the two outer marginal spots being still paler pink.

He also sent the specimen referred to *ante*, p. 185, and this, as will be seen by the excellent figure drawn by Mr. H. Knight, is a remarkable aberration of this usually constant species. The crimson subcostal streak is continued to subapical spot, and the immediate area below it is thickly powdered with crimson scales, as also are the outer and inner marginal areas.

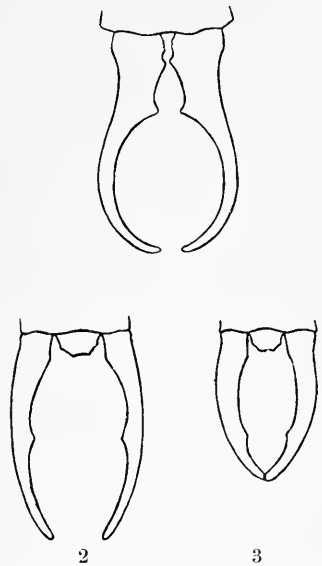
The late Mr. W. Fowler once sent us a somewhat similar specimen of *E. jacobææ*, but it was without the crimson powdering on the marginal areas.

RICHARD SOUTH.

ORTHOPTERA IN 1904.

By W. J. Lucas, B.A., F.E.S.

Though no addition was made during 1904 to the list of British Orthoptera, yet one event of more than ordinary interest occurred in the rediscovery of the earwig *Apterygida media* (= *albipennis*) in Kent. About 1840, in June, the late Prof. Westwood took a few specimens near Ashford; but the insect was not again met with, and it was feared that we could no longer claim it as British. About 1889, however, Mr. J. Edwards took a pair near Norwich; but again no more were taken, until Mr. A. J. Chitty found them plentifully in the autumn of last year in the same district in which Westwood obtained them more than half a century before. Mr. Chitty tells me that they occur throughout the district in suitable localities, which appear to be in the valleys where the soil is light and chalky, and where there is plenty of vegetation. They are generally on the sunny side of the valley, or at any rate sun seems necessary for them. A few were found in an old stump; but they are generally obtainable by sweeping herbage, especially where plants like marjoram are growing. The largest haul was from some hop-bines after the hops had been picked; but they had previously been swept from the sunny bank below the hedge of this hop-garden. The female is more abundant than the male. They occur with the common earwig, *Forficula auricularia*.



A. media is smaller and brighter in colour than *F. auricularia*, and the male forceps are very different from those of the latter. The figure, however, will shew the difference better than a description. The male forceps of *Chelidura arachidis* resemble somewhat those of *A. media*, but *arachidis* is much smaller, and, being an alien from a warmer clime, does not venture out of doors in the two or three localities in which it is found. In ordinary circumstances *A. media* keeps its forceps spread open, not more or less closed at the tip, as is the custom with the common earwig.

At Queenborough Commander Walker found *Anisolabis annulipes* and *Chelidura arachidis* still holding their own, while the

same strenuous entomologist added Oxfordshire to the list of counties in which *Forficula lesnei* was known to occur, by taking it at Beckley on September 10th.

Twice during August the locality near Christchurch was visited for the shore earwig, *Labidura riparia*, and specimens were found without much difficulty. Often their presence might be guessed by small holes in the sand leading under the stones beneath which they pass the day. When two are found together in one lair, they seem to be male and female. On being exposed to the light the hind part of the abdomen, with the forceps, is often thrown back, giving the insect a very strange appearance—this being, no doubt, a "terrifying attitude." Several immature examples were found, one being very tiny. One such, obtained on August 12th, was very white, the point of the face and the tips of the forceps, however, being slightly darker, and the eyes quite dark. Some kept in captivity ate meat, rice-pudding, and banana, but would not touch grass. On one occasion, after fasting for twenty-four hours, a female seized a cinnabar moth (*Euchelia jacobææ*) larva of fair size and commenced eating it at the head. It held the caterpillar with the forceps, and seemed to be purposely stretching it. Sometimes it appeared to experience a difficulty in getting its forceps free. Another female came up, when a fight with the forceps commenced between them. They went more or less backwards to the attack, the head, however, being turned a little on one side, so that they might see what they were doing. After a time two females and an immature specimen were eating at the same larva, but not then holding it with their forceps. Notwithstanding the fact that it was a cinnabar larva—orange and black—they ate of it greedily; but another cinnabar larva put in with a male and a female was not touched, though left with them all night.

As regards the cockroaches, little was noted. An immature *Ectobia panzeri*, which seems to be essentially a coast species, was taken in the south of the New Forest on August 26th. On September 8th Mr. H. Main gave me a prettily marked but wingless and apparently immature cockroach, which arrived in a sugar vessel from Java. It died without maturing on January 5th, 1905. Mr. E. J. B. Sopp received from Liverpool Docks on December 30th five *Blatta americana* (including one large nymph and one female with oötheca protruding) and one *Leucophæa surinamensis*. Apparently they were introduced amongst grain from San Francisco. No doubt numbers of Orthoptera are introduced in this way every year. It is always interesting to note them, but they are seldom likely to affect our fauna. Occasionally, of course, one may come to stay, as did *Blatta orientalis*, *B. americana*, *B. australasiæ*, and *Phyllodromia germanica*, and as possibly *L. surinamensis* may succeed in doing; but climatic conditions are usually quite unsuitable.

It is not till about mid-July as a rule that we begin to find mature grasshoppers. In 1904 I noted them first at Oxshott on July 15th, the species being *Stenobothrus viridulus*, *S. parallelus*, and *Gomphocerus maculatus*. At Merrow Downs, near Clandon, the somewhat rare *S. lineatus* was taken on July 26th (one female). *S. rufipes* was found on August 9th at one spot amongst heather by the side of a fairly open stream in the New Forest. It is perhaps usually found in the rides, or by the margin, of a wood. *Mecostethus grossus* was, as usual, plentiful in August in the New Forest, and was discovered in at least one entirely new locality. On September 11th, at Bookham Common, I for the first time met with *Gomphocerus rufus*. The male is readily known by the heavily clubbed antennæ, the club being dark with a pale tip. In the female the club is much less pronounced, while the wings do not quite reach to the apex of the abdomen. In this latter point the females somewhat resemble the same sex of *Stenobothrus elegans*, but one glance at the pronotum will prevent confusion with females of that species. There were noted from Beachy Head *Stenobothrus parallelus* (R. Adkin), and in addition *S. bicolor* and *S. viridulus* (F. Stevens). Of the long-horned grasshoppers, *Platycleis grisea* was taken amongst the *débris* fallen from the cliffs near Milton in Hants; and Rev. F. C. R. Jourdain reports *Thamnotrizon cinereus* as common at Broadwindsor, in Dorset, between September 15th and 17th. The last grasshoppers noted were *Gomphocerus maculatus*, Esher Common, Surrey, on September 21st, and *Meconema varium*, near Oxshott, on October 1st. *Stenobothrus parallelus*, *S. viridulus*, and *Gomphocerus rufus* fed readily on grass in captivity, holding the blade with the fore legs, and eating downwards along the margin.

Concerning the crickets there is nothing to relate, except that about half-grown specimens of *Nemobius sylvestris* were found in the New Forest in April.

Description of Figures.—1. Forceps of ♂ *Forficula auricularia*. 2. Forceps of ♂ *Apterygida media*. 3. Forceps of ♂ *Chelidura arachidis*.

DESCRIPTION OF A NEW GENUS AND SPECIES OF BRACONIDÆ FROM CAPE COLONY.

By P. Cameron.

Holcalysia, gen. nov.

♂. Antennæ 26-jointed, longer than the body; the joints elongate, the third distinctly shorter than the fourth. Mandibles bidentate; the upper tooth large, gradually narrowed, the lower short, bent inwardly. Occiput not margined. Eyes large, oval; the malar space short. Parapsidal furrows short, narrow; beyond them, and reaching to the scutellum, is a long deep depression or fovea, deepest in the centre and narrowed at the base and apex. Scutellum large, not much

raised. Post-scutellum raised, conical, clearly separated. Lower part of mesopleuræ with a large, long, deep depression or furrow. Radial cellule long, reaching to the apex of the wings; it issues from shortly beyond the middle of the stigma; the first abscissa is minute. Stigma large. There are two transverse cubital nervures; the first cubital cellule is the smaller, the third the largest. Transverse median nervure received shortly beyond the transverse basal; the recurrent nervure is interstitial. Second discoidal cellule open at the apex below; the discoidal nervure is received beyond the recurrent nervure. The cubitus and radius in hind wings do not reach to the apex of the wing. Palpi long, slender; the maxillary 6-jointed. The second abscissa of the radius is longer than the first transverse cubital nervure; the cubital cellules are separated from the discoidal. The second abdominal segment is smooth and shining like the others; it has no transverse furrow. The large radius is gradually narrowed towards the base and apex. In the hind wings there is a closed præbrachial cellule; below it are two cellules, a shorter closed basal and a longer apical one open at the apex below.

Characteristic of this genus is the strongly tuberculate or raised post-scutellum. The only genus with this feature is *Hoplitalysia*, Ashm., but that differs in some essential particulars from the genus here described. In the table of Szepligeti (Gen. Braconidæ, p. 202) my genus would run near to *Phænocarpa* and *Adelura*, but these genera have not a tuberculate post-scutellum. The large deep central furrow on the apical half of the mesonotum is noteworthy.

Holcalysia testaceipes, sp. nov.

Black, shining; the outer orbits, except at the centre of the eyes, the inner more narrowly and more obscurely, the oral region and mandibles, rufo-testaceous; the palpi and legs of a paler, more yellowish testaceous colour; wings hyaline, the nervures and stigma black; the apical and transverse nervures paler; the antennæ are thickly covered with white pubescence. ♂. Length, 4 mm.

Antennæ longer than the body, smooth and shining; the mesonotum at the sides of the scutellum, the median segment and the basal abdominal segment closely, strongly aciculated. The large, wide mesopleural depression is also aciculated; in it, near the middle, are two clearly separated, not very distinct, keels; at the upper side of the apex is a distinct furrow; the upper side of the apex is longer than the lower, it being obliquely sloped. The first abdominal segment is about two and a half times longer than wide; the centre is raised; the depressed sides finely, closely, longitudinally striated.

New Names for Hymenoptera.

Zethoides, Cam. (Trans. Am. Ent. Soc. xxx. 93) *non* Fox = *Plesiozethus*, Cam.

Nomia metallica, Cam. (Proc. Zool. Soc. 1901, 247) *non* Smith = *N. Willeyi*, Cam.

Cerceris himalayensis, Cam. (Ann. Mag. Nat. Hist. Feb. 1905) *non* Bing. = *assamensis*, Cam.

NEW AUSTRALIAN BEES, IN THE COLLECTION OF THE BRITISH MUSEUM.

By T. D. A. Cockerell.

Paracolletes roscoviridis, n. sp.

♂. Length about 8 mm.; in all respects very close to *P. carinatulus*, Ckll. (from Queensland), but differing thus: more robust, with a broader abdomen; head, thorax, and abdomen yellowish green instead of blue-green, the abdomen with the hind margins of the first two segments, and all the segments beyond, suffused with a rosy tint, which covers the fourth and fifth segments with a rich glow, and shows a little purple; stigma more brightly coloured; second submarginal cell less narrowed above; second recurrent nervure joining third submarginal cell a little distance from its end (at its end in *carinatulus*); area of metathorax not only transversely carinate, but also with conspicuous transverse grooves or deep striæ, especially just below the keel; hind tibiæ and anterior tibiæ in front, ferruginous, but the middle tibiæ, and anterior tibiæ behind, dark; hind femora ferruginous, with the basal half strongly suffused with black. Other characters are: hair of face and thorax above light fulvous or orange-tinted, but that of vertex long and grey-black; flagellum brownish beneath, the last joint a little rufescent; b. n. meeting t. m.; first r. n. joining second s. m. at its middle; wings clear; tarsi ferruginous; lateral pieces of genitalia shaped rather like the end of a finger seen in outline, fuscous basally and subhyaline apically; median piece with its rounded apical part dark reddish centrally, and hyaline at the margins; nearly the lower half of clypeus black, but the rest green.

Hab. W. Australia, 68. 6. The numbers cited are the accession numbers of the Museum.

Halictus dampieri, n. sp.

♀. Length about 6 mm.; head and thorax dark olive-green, the front and mesothorax dullish, with a satiny lustre; apical part of mandibles reddish; antennæ entirely dark; clypeus shining black, with a few punctures, except its upper margin, which is broadly green; tegulæ rufous, blackened basally; area of metathorax large but not well defined, coarsely granular, with an inconspicuous and minute subreticulate sculpture; wings quite clear, brilliantly iridescent, stigma and nervures dark fuscous; b. n. falling some distance short of t. m.; first r. n. meeting second t. c.; third t. c. and second r. n. very weak; legs black, with white hair, yellowish on under side of tarsi; claw-joints ferruginous; hind spur with short stout spines; abdomen dark green, practically hairless, except at the apex, though there is a fringe of hair along the lateral margins, at the dorso-ventral suture. With the compound microscope, the front and mesothorax are seen to be very minutely tessellate all over, with very few scattered shallow punctures; the area of metathorax is evidently reticulate in the middle, the reticulations weakening and giving way to spots and dotted striæ laterally; the surface of the abdomen is impunctate, and covered

all over with very minute cross-striæ, which are here and there joined by short lines, like the elongate cells in the stem of a plant.

Hab. Queensland (Gilbert Turner; Ridg. 5. 91, 706). Allied to *H. floralis*, Sm., but readily known by the dark colour of the thorax. From *H. flindersi* and *H. murrayi* it is readily known by the granular (not coarsely wrinkled) appearance of the area of metathorax. It will be observed that this and the following species of *Halictus* are named after Australian explorers.

The genus *Halictus* is so large, and many of the species are so much alike, that the ordinary methods of description are often unsatisfactory. I find that the use of the compound microscope reveals details of sculpture which are of great assistance in defining the species, and it seems that this method of examination should be generally employed.

The small group of Australian species having metallic (blue or green) colours on the thorax exhibits the following microscopical characters :—

(1.) *Sculpture of front.*—The front in *H. dampieri* is minutely tessellate, with very few shallow punctures; in *H. flindersi* and *H. murrayi* it is coarsely striate, but with this important difference, that in *flindersi* the striæ are transverse just below the central ocellus, and just below this is a delta-shaped space without regular striæ; whereas in *murrayi* the striæ run right down from the central ocellus, covering the surface.

(2.) *Sculpture of mesothorax.*—In *H. dampieri* minutely tessellate, with very few scattered punctures; in *H. flindersi* ♀ minutely tessellate, with short transverse plicæ at the places of insertion of the hairs, becoming more distinct in the ♂, which has quite long and very distinct plicæ, more or less oblique. In *H. murrayi* and *H. urbanus baudinensis* the mesothorax is coarsely microscopically tessellate, with numerous distinct punctures superimposed. For the most part these punctures are about as far apart as the breadth of one, or perhaps a little more distant.

(3.) *Sculpture of second abdominal segment.*—In *H. dampieri* and *H. flindersi* transversely striatulate, with oblique cross-lines, rather more numerous in the latter. *H. flindersi* also has some very faint punctures about the middle.

Halictus flindersi, n. sp.

♀. Length 6 mm. or a little more; head, thorax, and abdomen shining purple-blue, the upper part of the clypeus and the anterior part of the mesothorax peacock-green, and the face in general more or less green; pubescence white, long, and abundant, the hairs with curled ends, on the under side of the abdomen, but elsewhere only moderately abundant; apical half of mandibles dark reddish; antennæ dark, the flagellum dull reddish apically beneath; mesothorax shining, with the median impressed line distinct; metathorax truncate, the truncation with a sharp edge, the area strongly longitudinally (antero-posteriorly)

ridged; legs black, with quite abundant greyish-white hair, that on tarsi beneath yellowish, the basal joint of hind tarsi with a conspicuous little orange brush at its apex; hind spur with three strong teeth; tegulæ shining piceous, more rufous behind; wings clear; stigma and nervures fuscous; stigma very large; basal nervure very strongly bent, falling a rather long distance short of t. m.; first r. n. meeting second t. c.; second r. n. and third t. c. subobsolete; abdomen shining, almost free from hair above except apical segment, which is very hairy; no hair-bands or patches.

♂. Length scarcely over 5 mm., more slender; abdomen darker, little metallic; thorax greener, but vertex dark blue; clypeus without yellow or white; antennæ coloured as in female.

♀, var. a. Mesothorax and scutellum entirely Prussian-green.

Hab. Queensland (Gilbert Turner, Seaf. 1. 90; 440 and 439). Both sexes, and the two forms of the female, were evidently taken at the same time and place.

Halictus murrayi, n. sp.

♀. Length about 5 mm.; head and thorax dark blue, granular, and little shining; clypeus largely purplish; anterior part of mesothorax rather shiny, with blue-green tints; legs and abdomen piceous or brown-black; pubescence white, short and not dense, not forming bands or patches on the abdomen; apical part of mandibles reddish; antennæ black as far as third joint (the rest broken off); head broad; area of metathorax with strong ridges, the intervals wrinkled; tegulæ small, reddish; wings clear, faintly dusky apically, nervures and stigma very dark brown; stigma very large; b. n. falling a long way short of t. m.; first r. n. meeting second t. c., but a little on the outer side; second r. n. and third t. c. very weak; abdomen with much white hair beneath.

Hab. Adelaide River (J. J. Walker, 5138). Structurally allied to *H. urbanus baudinensis*, but that has the tegulæ, tibiæ, and tarsi clear red, which is not at all the case in *murrayi*. There is also some resemblance to *H. inclinans*, Sm., and *H. limatus*, Sm.

The following series of species has the thorax black, not metallic*:—

All the tibiæ and tarsi clear ferruginous; hind margins of abdominal segments more or less pallid or reddish . . . . . 1.

Not so; legs dark, and abdomen without colour-bands 2.

1. Larger, abdomen with broad reddish bands (Melbourne) *bicingulatus*, Sm., ♀.

Smaller, abdomen with obscure bands (Adelaide) . *oxleyi*, Ckll.

* While on black *Halictus*, I will take the opportunity of stating that *Lucasius*, Dours, the name of a subgenus of these bees found in Europe, is a homonym, and may be altered to *Lucasiellus*. The first use of the name *Lucasius* was in Crustacea (1859).

2. Abdomen with distinct hair-bands, or lateral patches at the bases of the segments . . . . . 3.
   Abdomen without hair-bands or patches. Spp. to be treated later.
3. Size very small . . . . . *humei*, Ckll.
   Size medium . . . . . 4.
4. Male; more hairy; area of metathorax rugoso-reticulate . . . . . *lanuginosus*, Sm.
   Females; less hairy; area of metathorax striate . 5.
5. Thorax very coarsely sculptured (Victoria) . . *gilesi*, Ckll.
   Thorax finely sculptured (Hobart, Tasmania) . *repræsentans*, Sm.

(To be continued.)

A BUTTERFLY HUNT IN THE PYRENEES.

By H. Rowland-Brown, M.A., F.E.S.

(Concluded from p. 249.)

The collecting ground here is not easy to discover at once, so much have the market and villa gardens encroached upon the heaths of late years. A morning at Anglet was wasted in the attempt to find a suitable country, and it was more by accident than intention that I struck a really good locality to the south of the town on the road to St. Jean de Luz, and hard by the Bois de Boulogne. I spent an afternoon and morning on the boggy slopes which extend from the pine woods to the bamboo swamps, now more or less composed of oozing mud. Among the heather *Satyrus dryas* was flapping heavily, while *S. arethusa* was enjoying a sun-bath wherever there was an interval of dry sand. But *Cœnonympha œdippus*, which haunts the damp and shady hollows, was nowhere to be seen. One worn female, however, which I kicked up from the grass, revealed the fact that I was too late for the species, and the same may be said of *Heteropterus morpheus*, for, though I took a dozen or so of these odd butterflies, they were nearly all worn to rags, and therefore liberated. *Lampides bœticus*, again, presented the same lamentable appearance, but among a host of *Cyaniris argiolus* I took a splendid fresh male *Lycæna alcon*, for which Biarritz is not given as a locality by M. Rondou, though Mr. Elwes mentions it among his captures there in July, 1886. The next day the weather broke up, and, as there seemed no chance of an immediate improvement, I turned northwards on the 5th, well satisfied with the results of my wanderings, both entomological and otherwise. Not counting varieties and local forms, M. Rondou includes 158 species in his catalogue of the Rhopalocera of the Pyrenees. I took or observed 109 in what was little more than a fortnight's collecting, made up as follows :—

Papilionidæ.—*Papilio podalirius, P. machaon, Thais rumina* var. *medesicaste** (Vernet), *Parnassius apollo.*

Pieridæ.—*Aporia cratægi, Pieris brassicæ, P. napi, P. rapæ, P. callidice, P. daplidice* (Villefranche), *Euchloë cardamines** (Cauterets), *E. euphenoides* (Vernet), *Leptidia sinapis* var. *diniensis* (Vernet), *Colias phicomone* (Canigou and Gavarnie), *C. hyale* (Andorra), *C. edusa, Gonepteryx rhamni, G. cleopatra.*

Nymphalidæ.—*Limenitis camilla** (Vernet), *Pyrameis atalanta, P. cardui, Vanessa io, V. urticæ, V. polychloros, V. antiopa, Polygonia c-album, Melitæa phœbe, M. didyma, M. deione, M. athalia, M. parthenie* and var. *varia, M. dictynna, Argynnis selene* (Canigou and Biarritz), *A. euphrosyne, A. pales, A. dia, A. ino* (Vernet), *A. daphne, A. lathonia, A. aglaia, A. niobe* and ab. *eris, A. adippe, A. paphia, Melanargia lachesis* and var. *canigulensis, M. galatea, Erebia epiphron* var. *pyrenaica* † and var. *cassiope, E. stygne, E. evias* (Vernet), *E. lefebvrei* † and var. *pyrenæa,*† and (?) var. *intermedia,*† *E. gorgone,*† *E. gorge, E. euryale** (Vernet), *E. lappona,* and (Gavarnie) var. *sthennyo, E. tyndarus* var. *dromus; Satyrus circe* (Vernet), *S. hermione, S. alcyone, S. briseis,** *S. semele, S. arethusa, S. dryas* (Biarritz), *Pararge egeria, P. megæra, P. mæra* and var. *adrasta, Aphantopus hyperanthus, Epinephele jurtina* and (Vernet) var. *hispulla, E. lycaon* (Cauterets), *E. tithonus* (omitted from M. Rondou's catalogue, doubtless by an oversight, as it is common everywhere), *Cœnonympha œdippus, C. arcania, C. pamphilus* and var. *lyllus.*

Lycænidæ.—*Læsopis roboris* (Vernet), *Thecla ilicis* and var. *æsculi* (Vernet), *T. acaciæ* (Vernet), *Chrysophanus virgaureæ, C. hippothoë, C. alciphron* var. *gordius* (Vernet), *C. phlæas* and var. *eleus, C. dorilis, C. subalpina* (Cauterets), *Lampides bœticus, Lycæna argiades, L. argyrognomon* (*argus* auctorum), *L. baton* (Gavarnie), *L. orbitulus* (Col de Puymorens), and var. *oberthuri,* Stgr.,† *L. pyrenaica* † (Gavarnie), *L. astrarche, L. eros* (Cauterets), *L. amandus, L. hylas, L. escheri, L. bellargus, L. corydon, L. minimus, L. semiargus, L. alcon** (Biarritz), *L. arion, Cyaniris argiolus.*

Hesperiidæ.—*Heteropterus morpheus* (Biarritz), *Adopœa lineola, A. thaumas, Augiades comma, A. sylvanus, Carcharodus lavateræ, C. alcææ, C. althææ, Hesperia carthami, H. sao, H. alveus* and var. *fritillum, Thanaos tages* (Biarritz).

The following forty-nine complete the species included in M. Rondou's catalogue :— *Papilio alexanor,** reported from Bayonne—probably an imported or escaped bred specimen, as it has not been observed south-west of the Rhone Valley so far as I can discover; *Parnassius mnemosyne; Euchloë belia,* with vars. *ausonia* and *simplonia; E. tagis* var. *bellezina,* very

* Single specimens only.
† Not reported from the Alps of Central Europe.

doubtful; *Colias palæno*, even more so; *Apatura iris*; *A. ilia*, with ab. *clytie* and ab. *metis*; *Limenitis sibylla*; *Melitæa aurinia*, with vars. *provincialis* and *merope*; *M. cinxia*; *Argynnis hecate*; *A. pandora*; *Melanargia syllius*; *Erebia manto* and var. *cæcilia*, Hb.; *E. oeme*, with vars. *cæcilia*, Esp., and *spodia*; *E. glacialis* var. *alecto*, Hb.; *E. pronoë*; *E. neoridas* and ab. *margarita*, Oberth.* (ranked as a species); *E. æthiops*; *Satyrus statilinus* and var. *allionia*; *S. fidia* ab. *monticola*, Th. Mieg.; *S. actæa* and var. *podarce*; *S. cordula* (ranked as a var. of *actæa*); *Pararge hiera*; *P. achine*; *Epinephele ida*; *E. pasiphaë*; *Cœnonympha iphis*; *C. dorus*; *Libythea celtis*; *Nemeobius lucina*; *Thecla spini*; *T. w-album*; *T. pruni*; *Callophrys rubi*; *Zephyrus quercus*; *Z. betulæ*; *Lampides telicanus*; *Lycæna argus*; *L. orion*; *L. eumedon*; *L. damon*; *L. cyllarus*; *L. melanops*; *Pamphila palæmon*; *Adopæa actæon*; *Hesperia proto*; *H. serratulæ*; *H. cacaliæ*; and *H. malvæ*; to which must now be added *Lycæna zephyrus* var. *lycidas*.

PHALONIA (*ARGYROLEPIA*) *BADIANA*, Hb.

By Eustace R. Bankes, M.A., F.E.S.

Dr. T. A. Chapman's note (*ante*, p. 213) under the above heading, in which he says that he has recently bred this species from seed-heads of burdock (*Arctium lappa*), revives one's scepticism as to the accuracy of the statement published in Wilkinson's 'British Tortrices,' p. 292 (1859), copied into Stainton's 'Manual,' ii. p. 270 (1859), and recopied into Meyrick's 'Handbook,' p. 548 (1898), that the larva feeds in the "stems and roots" of *Arctium lappa* (burdock). The late Mr. W. P. Weston's statement in Entom. xiii. p. 295 (1880), that the larva feeds "in the roots" of *A. lappa*, is, I imagine, derived from the same source, in which case Wilkinson must be held primarily responsible for the widespread belief in the reputed larval habit in question, which has, so far as we are aware, received no confirmation during the last forty-six years. Snellen, in 'De Vlinders van Nederland,' Micro-Lepidoptera, p. 246 (1882), merely says of the larva, "According to Stainton it lives in the stems and roots of *Arctium lappa*," and remarks that it is "still undescribed"; but four years later Sorhagen supplied the omission by publishing a detailed description of the larva in 'Die Kleinschmetterlinge der Mark Brandenburg,' p. 86 (1886).

In opposition to Wilkinson's account of the larval habits we have, in addition to Dr. Chapman's recent experience, the following facts, recorded by some of our most careful and reliable observers. In Entom. xix. p. 295 (1886), Mr. Alfred Thurnall,

* Single specimens only.

in his 'Notes on Micro-Lepidoptera,' says: "*A. badiana*, larvæ in seed-heads of burdock beginning of October, with *lappella*. I fancy the books are wrong in saying that this larva feeds in the *stems* and *roots* of burdock. I can only find them in the *seed-heads*; perhaps they gnaw into the roots or stems for the purpose of pupating." Mr. W. G. Sheldon also, in Entom. xx. p. 33 (1887), remarks: "*Argyrolepia badiana*: what I presume to be the larva of this species was very common in the seed-heads of burdock (*Arctium lappa*) during September. In common with many another entomologist, I have searched long and diligently in the roots and stem for this larva (following the advice of the standard works on the subject), with, of course, no success"; to which the late Mr. W. Machin replied, on pp. 110–1: "I beg to say there are two species of larvæ, viz., *A. badiana* and *Parasia lappella*, feeding in September in the seed-heads of burdock (*Arctium lappa*), both of which I have bred in some numbers for many years past. The larvæ of *A. badiana*, when full fed, leave the heads and spin their cocoons amongst the rubbish at the roots of the plant. . . ." Again, Sorhagen (*loc. cit.*) says of this species: "The larva on *Arctium Lappa*, in the stems and roots (Stainton), or seed-heads (Maling*). I found it in September not infrequently in a meadow near a wood, in the seed-heads of *Cirsium oleraceum*, on the seeds of which Rössler had already guessed that it lived. The frass remains in the domicile. It is full fed before winter, and pupates in spring in its domicile." In Tutt's 'Practical Hints,' part i. pp. 83–4 (1901), we read, "The seed-heads of burdock (*Arctium lappa*) should be collected in September for the larvæ of *Argyrolepia badiana*, which pupate among rubbish at the roots of the plant"; this hint being doubtless based on Mr. Machin's note, which is quoted above. Lastly, in 'Nat. Hist. Trans. Northumberland, Durham, and Newcastle-upon-Tyne,' xv. pt. i. p. 101 (1905), Mr. John E. Robson remarks of *A. badiana*, ". . . among burdock, on which the larva feeds. Meyrick says in the stems and roots; Mr. Gardner says in the seeds. I believe it really feeds on the seeds, but pupates near the roots."

A careful review and comparison of all the above evidence, which proves conclusively that the normal habit of the larva of *A. badiana* is to feed in the *seed-heads* of *Arctium lappa* (in Britain), or of *Cirsium oleraceum* (in Germany), and to pupate either amongst the rubbish at the roots of the food-plant (Machin), or else in its domicile in the seed-heads (Sorhagen), seem strongly to warrant the assumption that the old idea of its feeding in the "stems and roots" is a fallacy, which probably originated in its habit, observed by Machin, of spinning up near the roots;

* Having failed to find or to trace through friends in the North of England, where Maling lived, the note by him to which Sorhagen alludes, I should be grateful if any one could give me the reference to it.—E. R. B.

for it seems impossible to believe that, in the case of this single-brooded species, the larva, which is indisputably addicted to the former method of feeding, would also adopt the latter.

Isle of Wight: September 25th, 1905.

RHOPALOCERA AT BARCELONA, MONTSERRAT, AND VERNET-LES-BAINS.

By R. S. Standen, F.L.S., F.E.S.

(Continued from p. 254.)

Vernet-les-Bains, Pyrénées Orientales.

On June 17th we left Barcelona for Vernet, a tedious journey of twelve hours' duration, including a wait of three hours at the fine old fortified town of Perpignan, the capital of the famous Roussilon country. And here we had another sample of the kind of thunderstorm that is manufactured in the south. The thunder and lightning were accompanied by such torrents of rain that in five minutes the streets were rushing rivers, and the natives, caught unawares, like drowning rats. Happily this storm and the one at Montserrat were the only rains we had during the five weeks we were away.

It was dark when we reached Vernet, and we had seen nothing to prepare us for the enchanting prospect which greeted us the next morning. In front of us lay the public gardens—or park, as it is here called—with spreading lawns of the freshest of untrimmed grass, dotted about with large round beds of roses, and intersected with meandering gravel paths. On one side a mountain torrent tore along in a deeply channelled bed, a small kiosk crowning a huge pyramid of rocks piled up in the centre of it. Throughout the park, and all down one side of it, were grouped tall forest trees, through the openings of which could be seen two glistening sheets of water. Here and there were pretty decorative villas embowered in foliage, and all round the outskirts were some half-dozen large hotels—the Hôtel du Parc, in which we were located, being one of them—a casino, and the grand Etablissement des Bains. Looking across the torrent the grim old town rose up, tier upon tier, dominated by the very ancient Eglise de St. Saturnin, and a still more ancient Roman keep; whilst immediately behind us towered Mont Canigou, 9000 ft.—the highest point of the Eastern Pyrenees.

The Rhopalocera of Vernet and Mont Canigou have been so well described and catalogued by Rondou, Oberthür, Elwes, De Graslin, and others, that there seems nothing left to say

about them. It may be interesting, however, to any who may select the latter half of June for their visit to know exactly what species they may expect to find at that period, and the kind of localities in which they occur.

We thought it best to work the lower elevations first, so we spent two long mornings in the scrubby plantations and low-lying meadows on either side of the road to the Villefranche station.

Our joy over results was not precisely delirious here; we were perhaps rather late for the successful working of these dry stony levels, and the only insect at all common was *Cœnonympha arcania*, in the little grassy and shrubby copses on the right-hand side of the road; but neither of the vars. *darwiniana* or *satyrion* occurred. There were a few *Aporia cratægi*, *Melitæa athalia*, one or two commoner blues, a *Melanargia lachesis*, and a single very fine female *Læosopis roboris*.

The next morning we pursued a winding path through the shrubberies leading from the eastern corner of the hotel, which brought us in five minutes to an open sandy tract sparsely covered with *Cistus*, *Lavandula stoccas*, and several coarse grasses. A conduit, which brought water down to the hotels, had in places overflowed, and made damp patches on the sand. Here the lovely *Papilio* var. *feisthamelii* came to take her morning dip. Anything more dainty, more fascinating, than the evolutions in the air of this graceful creature before settling down on the wet sand it is difficult to imagine; and so shy that, if the first swoop of the net failed, she never came again, and I am not sure that I have not more than once rejoiced at her escape. How different was the bold, dashing *P. machaon!* Jones declares that he might have put his net over half a dozen at one time. Here, too, were *Melitæa phœbe* and *athalia*, *Pararge ægeria*, *Epinephele jurtina* var. *hispulla*, and several blues.

A little farther on, by a shady path under trees, we came to a pretty little flower and vegetable garden in a semicircular *cul-de-sac*, hemmed in by a steep and lofty bank held together by great boulders interspersed with young ash-trees, brambles, and other shrubs, and the dainty little pitcher-plant (*Aristolochia pistalochia*). This latter suggested *Thais rumina* var. *medesicaste*, and, although we were too late for the imago, two or three larvæ were found nearly full-fed.

The morning sun sent his hottest rays down into this little corner, and it required some courage to face it; yet, so keen was my companion, that he would stand by the hour against a burning rock high up the bank, in the full glare of the sun, swooping up *Læosopis roboris*, which seemed to spring at frequent intervals from under his feet, whilst I stood below in the shade, picking up the crumbs, so to speak, that fell from his generous table.

Another notable capture was the Canigou form of *Melanargia lachesis*, which occurred in some numbers before we left.

In the garden was a row of beds that had just been sown with seed, and, after the gardener had given them their morning deluge, it was a pretty sight to see swarms of blues and skippers settle there and revel in the moisture.

By the middle of the day the sun had left this hot corner, and after *déjeuner* we generally crossed the river, and wandered along the road to Castell, where butterflies seemed more plentiful than elsewhere. In this respect it reminded me of that wonderful valley of the Ormonts in Switzerland, between Aigle and Le Sefrey, only that the species were almost entirely different.

About a mile from Vernet was another hot corner—a hollow bend of the road, sheltered from any slight breeze that might be stirring, and this seemed to be the rendezvous of all the butterflies in the neighbourhood. Commonest of all was *Aporia cratægi*, and after that *Euchloë euphenoides* and *Melitæa athalia*; then came *Leptidia sinapis*, *Colias edusa*, *Gonepteryx rhamni*, *Limenitis camilla*, *Polygonia c-album*, *Melitæa didyma*, *Argynnis lathonia*, *Pararge ægeria* and *megera*, *Aphantopus hyperanthus*, *Epinephele jurtina* var. *hispulla*, *Cœnonympha arcania* and *pamphilus*, *Lycæna argus*, *astrarche*, *icarus*, *escheri*, and *bellargus*, *Argiades sylvanus*, *Hesperia carthami*, and a crowd of others. A little nearer Vernet, on the same road, I took two perfect specimens of the beautiful *Pararge mæra* var. *adusta*. The type is not found in the Eastern Pyrenees.

But, seductive as this locality was, we felt the need of going farther afield, if we were to do any sort of justice to the district. And so, when the demeanour of the amiable Treasurer of the E.S.L. indicated that he was absorbed in the solution of a problem, I knew instinctively that Mont Canigou was the subject of it. A few suggestions on my part added fuel to the flame; a companion was found in a young Englishman staying at the hotel, and on the following morning they were off, taking with them the necessary sleeping-gear for spending the night at a comfortable châlet not far from the peak. After a wholesome night's rest they made an early start for the summit, and, when they had sufficiently recovered from the labour of discharging superlatives at the incomparable panorama that lay before them, Jones unfurled his "engin de chasse," and they commenced the descent. At first there was an immense and rugged moraine intersected by broad streaks of snow—no trees and no shrubs—only a few herbs and lichens clinging to the rocks; also some small ponds. When the trees did appear they were knotted and twisted into the most extraordinary shapes, testifying to the terrible struggles they must have had to sustain against the tempests. Jones was rather surprised to take *Euchloë cardamines* at 7000 ft., and *Argynnis euphrosyne* at 6000 ft.;

then two female *Parnassius mnemosyne* at 4000 ft., and *Erebia stygne* var. *pyrenaica* in great numbers at the same height—a striking form, larger than the type, and with the red band very pronounced. *Erebia melas*—the chief rarity of Mont Canigou—had not yet put in an appearance.

(To be concluded.)

NOTES AND OBSERVATIONS.

On Late Broods of Lepidoptera.—Nine larvæ of *Notodonta ziczac* pupated on July 1st and 2nd. I allowed them all to spin up in a large chip box. On opening this, on August 1st, I found that an imago had emerged from each of the pupæ and the moths were dead, seeming to indicate that they could not have spent much more than three weeks in pupa. Mr. Grellet, of this town, tells me that he took a specimen of *Plusia moneta* at a gas lamp, on or about Sept. 29th; surely a second emergence. I have now eleven lively and healthy pupæ of *Vanessa urticæ*, the result of pupation on Sept. 12th and 13th of larvæ taken about Sept. 3rd. These pupæ are quite lively, and at the present date (Oct. 21st) show no signs of emergence.—A. H. Foster; Hitchin.

[*N. ziczac* is normally double-brooded, and *P. moneta* is more or less partially so. During the last week in August of this year I noted a colony of the larvæ of *V. urticæ* on nettle at Harpenden, Hertfordshire. They were then about half grown, and about fifty were taken, and these were subsequently reared on hop (*Humulus*). The majority duly pupated, and the butterflies, all but one, emerged between Sept. 17th and 25th. The belated one left the chrysalis on October 23rd.—R. S.]

Campodea staphylinus.—In September I found, in a garden in Warwick, a specimen of this simple insect, belonging to the *Thysanura*. It may, or may not, be the nearest representative of the primitive insect, but at any rate records of its distribution are none too numerous, and should be made when possible.—W. J. Lucas.

Preponderance of Females in Autumnal Broods.—On August 18th last I found at Stoke Dry, in Rutland, a nest of young *Vanessa urticæ* larvæ, evidently only just hatched. They began to pupate on September 10th, and emerged from the 1st to the 4th of October. They are twenty in number, and every one is a female. Last autumn (1904) a somewhat similar thing happened with regard to one of the broods of *Abraxas grossulariata* I was rearing. Of forty-two specimens which emerged in October, forty were females. The rest of the larvæ hybernated and produced twelve males and eight females in May and June, 1905.—(Rev.) Gilbert H. Raynor; Hazeleigh Rectory, Maldon, October 5th, 1905.

Notodonta dromedarius (Second Brood) at Reading.—On July 15th I found a larva of the above; it spun up among the leaves of birch on the 20th, and emerged a perfect male specimen on August 4th.—W. E. Butler; Reading.

Plusia moneta (Second Brood) at Reading.—On June 8th I found in my garden one larva of the above; it spun up on the 13th and emerged July 6th, and I netted a worn specimen on the 16th. On August 13th I found one larva and five cocoons, from which I reared five perfect specimens. They emerged—August 27th, two; 28th, one; 30th, one; and September 2nd, one. The larva I found on the same day, August 13th, spun on the side of a glass, and as I was going away for my holidays I very carefully removed it, so that I could take it with me. In the operation, however, I, no doubt, injured it, for that was the only one that did not attain the perfect state.—W. E. Butler; Hayling House, Reading, October 16th, 1905.

Second Broods of Lepidoptera.—I may mention that on August 18th last I netted three perfectly fresh *Ancylis* (*Phoxopteryx*) *derasana*. I am aware that this pretty species is occasionally double-brooded, but I had only met with it on one previous occasion. On Sept. 19th last I took two perfect specimens of *Gypsonoma* (*Hedya*) *aceriana* on a fence in South Croydon; it is possible that these may have been a partial second brood, but I have never known it to occur with this species or its near allies. I first noticed the imago on July 1st last, and, as usual, it kept coming out all through that month into early August; but then it disappeared, to crop up again on the above-mentioned exceptionally late date!—A. Thurnall; Thornton Heath, Oct. 4th.

[Since the above was written I, yesterday (Oct. 9th), boxed a perfectly fresh *G. aceriana*, and saw two others (unfortunately out of reach) apparently equally fine.]

Epiblema (Phlæodes) immundana F. R.—I wish to record a fact to which I can find no allusion in any work on the Tortrices. Collectors of these insects will remember that on the dorsal margin of the above-named species there is always to be traced a more or less conspicuous blotch of a brownish colour in the first brood, but often (in, say, forty per cent.) of the second brood this blotch is nearly or quite pure white. I have never observed this in any specimens of the first brood. What can be the reason for this difference? I first met with this white-patched form as far back as September, 1890, and wondered at the time what it could be. This year I saw dozens of the ordinary form in April and May, and in August a large number of their descendants with the white blotch, although others could not be told from the normally marked first brood.—A. Thurnall; Thornton Heath, October 4th, 1905.

Early Hybernation of Vanessa urticæ.—On August 23rd I noticed a specimen of *V. urticæ* on the ceiling of a cellar stairway in my house. To-day (October 16th) I see it is still there, and seemingly has not moved since I first noticed it.—T. Baxter; St. Anne's-on-Sea.

A Raid by Nabis limbatus.—On September 13th, while we were resting in some fields near Theydon Bois, Essex, we were much interested in watching a struggle taking place in a hedge between a hemipterous insect and a crane-fly. The bug had seized the fly by its left wing, and was striving, in a determined manner, to drag its prey away. The fly offered a stout but bootless resistance, in the course of

which it got badly damaged by clinging to the blades of grass, &c., over which it was being slowly drawn. We brought away both captor and prisoner, and subsequent investigation determined the bug to be *Nabis limbatus* and the crane-fly to be *Tipula paludosa*.—F. W. & H. Campion; 33, Maude Terrace, Walthamstow.

Rhopalocera palæarctica.—We have received a prospectus, with specimen plate and page of text, of an important work which is in course of publication, and of which Mr. Roger Verity is the author. It is proposed to bring together information from all sources concerning each species. The "intention is not only to render the work useful to the amateur for the classification of his specimens, but to give it a really scientific value by an exhaustive study of all the geographical, seasonal, and accidental forms of each species." The plate, which is well produced, is of large size, showing thirteen full-sized figures of *Papilio machaon* and its forms. This appears to be a work that is much needed.

CAPTURES AND FIELD REPORTS.

Noctua at Hartlepool.— On Oct. 3rd I took a perfect specimen of *Dasypolia templi* (male) at rest on an electric light standard in West Hartlepool. This, I believe, is the first record of this insect in the town, and, as far as I can ascertain, only the larva has been found in the neighbourhood. The installation of the electric light is drawing new visitors into the town, and in addition to the above I have taken *Nonagria lutosa* and *Tapinostola elymi* in the main thoroughfare of Hartlepool.—(Rev.) B. Harvey-Jellie; Hartlepool.

Insects at Hurst Castle. -- Hurst Castle is a small peninsula of shingle at the extremity of a single bank of some mile in length. Insects--at any rate conspicuous ones--were, as might be expected, not common there; but on two short visits during August there were seen--the grasshopper, *Stenobothrus bicolor*, male and female; *Vanessa cardui*; *Satyrus semele*; *Pieris rapæ*; *Cœnonympha pamphilus*; some blues, no doubt *Lycæna icarus*; a moth, *Eubolia bipunctaria*; a few humble-bees; and a nest of the ant, *Lasius niger*.--W. J. Lucas.

Wasp with Butterfly.--On Aug. 13th, in the New Forest, I found a worker wasp of the species *Vespa vulgaris* struggling on the ground with a butterfly, *Pararge egeria*, of which it appeared to be trying to get a good hold. I secured the two. In the glass-bottomed box the wasp snipped off the wings of the butterfly, and then tried to fly away with the body. A few days previously I had noticed a wasp similarly in possession of a moth.--W. J. Lucas.

Limenitis sibylla. — Mr. E. Marsh tells me that he found this butterfly in numbers between Redford and Petersfield in mid-July.— W. J. Lucas.

Pararge megæra. — In and near the New Forest during August this butterfly was rather common. It does not seem usually to be a plentiful butterfly in the district.—W. J. Lucas.

Locusta viridissima. — Mr. G. B. Oliver sends for identification a specimen of this large grasshopper, taken by a labourer in a field at Ramsey, in Huntingdonshire, on Oct. 3rd. As Mr. Oliver had not previously seen one, it is apparently not common there.—W. J. Lucas.

Mutilla europæa. — On Aug. 15th I took in the New Forest a specimen of this interesting and brightly coloured solitary ant. It is either uncommon there or it keeps well out of sight, for I have never previously captured a specimen.—W. J. Lucas.

Acherontia atropos on the Lancashire Coast. — A fine male specimen of *A. atropos* was found here on Sept. 10th. Another was taken by a fisherman some time during the same week, but he afterwards lost it.—T. Baxter; St. Anne's-on-Sea.

Vanessa antiopa in Suffolk. — An example of this species was captured here on Sept. 29th by Mr. R. Rix in his garden, where it had settled on top of a beehive. The specimen, which he has generously given to me, is unfortunately somewhat damaged. About thirty years ago my brother put his hat over one, not far from the present scene of capture, but failed to secure it.— (Rev.) A. P. Waller; Waldringfield Rectory, Woodbridge.

Vanessa antiopa in Middlesex. — A specimen of *V. antiopa* was captured at Harrow on July 27th last, and recorded in the 'Field' of Aug. 5th by Mr. A. Vassall, M.A.—F. W. F.

Vanessa antiopa in Norfolk. — Mr. Gerard Gurney records in the 'Field' capturing a good specimen of *V. antiopa* on Aug. 26th at Norwich; it was resting with expanded wings on a small oak tree, one of a row which had been "sugared" the previous night. He also states the larvæ of *antiopa* were plentiful last July in the Rhone Valley on various species of sallow, in some cases completely denuding the bushes of their leaves.—F. W. F.

Catocala fraxini in Suffolk. — An example of this fine moth was taken and another seen in September last at Flixton, Suffolk, by Mr. Cecil S. Joy.—F. W. F.

Sirex juvencus in Edinburgh. — I received for identification on Oct. 3rd a female specimen of this fine *Sirex*, which was captured in Edinburgh.—F. W. F.

Colias edusa at Fleet, Hants. — Whilst playing on the North Hants Golf Links at Fleet, on July 28th last, I noticed two examples of *Colias edusa*, evidently not long out. I have been in other counties since then—Sussex, Wiltshire, Cornwall—but I have not seen another specimen of this butterfly. — Harold Hodge; 9, Highbury Place, London, N.

Æschna cyanea. — I bred a very fine *Æschna cyanea* in July this year from a nymph sent to me from Oxfordshire in May (or June) of 1904. This is not the first time I have bred from a nymph kept during the whole winter; but I find the great majority, even though quite small when first obtained, emerge the first summer. — Harold Hodge.

SOCIETIES.

Entomological Society of London.—*October 5th*, 1905.—Mr. F. Merrifield in the chair.—Mr. J. R. Davidson, of Drumsheugh Gardens, Edinburgh, was elected a Fellow of the Society.—The decease was announced of Mr. John William Douglas, the oldest Fellow of the Society, who was elected in 1845; Mr. George Bowdler Buckton, and Mr. Ambrose Quail.—The President announced that since the last meeting the University of Oxford had conferred upon Commander J. J. Walker, R.N., one of the Secretaries, the degree of M.A. *honoris causa* for services to entomological science.—Mr. Edward Harris showed living larvæ of *Cordylomera suturalis*, taken from a log of mahogany imported from the Sekondi district of the Gold Coast, together with the perfect insect, which was dead at the time the discovery was made.—Mr. A. T. Rose exhibited a remarkable melanic specimen of *Catocala nupta*, taken by Mr. Lewis in his garden at Hornsey, N., in September. The coloration of the lower wings was of a dull brown, and all the markings of the upper wings strongly intensified.—Mr. Norman H. Joy brought for exhibition Coleoptera taken during a three days' trip to Lundy Island in August, including *Melanopthalma distinguenda*, Cox, a species new to Britain; *Stenus ossium* var. *insularis*, a variety new to science; and a series of *Psylliodes luridipennis*, Kuts., and *Ceuthorrhynchus contractus* var. *paltipes*, Crotch, a form peculiar to the island. Mr. Alfred Sich showed examples of *Argyresthia illuminatella*, Z., two of the four specimens taken near Hailsham, Sussex, on June 15th this year. They were beaten off *Pinus*, and until examined with a lens were supposed to be *Ocnerostoma piniariella*, of which species two were also exhibited for comparison.—Mr. W. J. Lucas exhibited the larva, cocoon, and the subsequent imago of an "ant-lion," *Myrmeleo formicarius*, from two Spanish larvæ given him by Dr. T. A. Chapman last autumn. The difference in size between the small larva and the large perfect insect was remarkable. He also showed a living female of the rather scarce grasshopper *Stenobothrus rufipes*, taken in the New Forest at the end of August, and kept alive feeding on grass.—Mr. G. C. Champion exhibited several examples of *Lymexylon navale*, L., from the New Forest.—Mr. A. H. Jones showed series of *Lycæna argus* var. *hypochiona* (*ægon*, Schiff.), taken on the North Downs this year, approaching the form of *L. argyrognomon*, taken not uncommonly in the Rhone Valley. Together with these he had arranged for comparison typical British *L. argus*, L., *L.* var. *corsica*, from Tattone, Corsica, and a series of *L. argyrognomon*, Brgstr. (*argus*, auctorum) from Chippis, near Sierre.—Colonel J. W. Yerbury exhibited specimens of *Hammerschmidtia ferruginea*, Fln., the first authentic British specimens, from Nethy Bridge; *Micrododon latifrons*, Lw., wrongly identified at a previous meeting as *M. derius*, and under this name so recorded in Verrall's 'British Flies'; *Chamæsyophus scævoides*, Fln., a single specimen swept on June 15th, 1905, in the Abernethy Forest, near Forest Lodge; and *Cynorrhina fallax*, L., which insect occurred in some numbers at Nethy Bridge during the same month.—Mr. H. J. Turner exhibited series of four species of the genus *Coleophora*, *C. alcyonipennella*, *C. lixella*, *C. albitarsella*, and *C. badiipennella*, together with

the larval cases mounted *in situ* on the ruined leaves of their respective food-plants. He also exhibited living larvæ and their cases, of *Goniodoma limoniella* on *Statice limonium*, *Coleophora obtusella* on *Juncus maritimus*, and *C. glaucicolella* (?) on *Juncus glaucus*, which three species he had received from Mr. Eustace R. Bankes, who obtained them in the Isle of Wight.—Commander J. J. Walker read a paper by Mr. A. M. Lea, entitled "The Blind Coleoptera of Australia and Tasmania," and exhibited specimens of *Illaphanus stephensi*, Macl., from Watson's Bay, Sydney, N.S.W., and *Phycoctus graniceps*, Brown, and *P. sulcipennis*, Lea, from Hobart, Tasmania.—H. Rowland-Brown, M.A., *Hon. Sec.*

South London Entomological and Natural History Society.—*Thursday, August 24th*, 1905.—Mr. Hugh Main, B.Sc., F.E.S., President, in the chair.—Mr. Carr exhibited *Triæna* (*Acronycta*) *tridens*, female, from Clandon, with larvæ and bred specimens of *T. psi*.—Mr. Harris, a short series of *Phorodesma smaragdaria*, bred from Essex larvæ.—Mr. Main, a large exotic longicorn beetle, taken alive at Silvertown.—Mr. West (Greenwich), ordinary undeveloped forms and developed forms of the hemipteron *Nabis brevipennis*, from Darenth.

Thursday, September 14th.—The President in the chair.—The President referred in suitable terms to the death of Mr. N. D. Warne, for years an active member of the Society.—Mr. South exhibited (1) a long series of *Acidalia virgularia* (*incanaria*), and remarked that the specimens, which were bred in April, were all very large, and much darker than usual. From ova deposited by some of the females another generation was reared in July, but the individuals of this brood were small and of the usual colour; in size they agreed with the autumn female parent of the April specimens; (2) *Rhacodia emargana*, with var. *caudana*, var. *effractana*, and var. *excavana*; and (3) a bred series of large and strongly marked *Coremia unidentaria*.—Mr. Goulton, excellent photographs of lepidopterous larvæ.—Mr. Smallman, a beautiful xanthic variety of *Cœnonympha pamphilus*, taken on Wimbledon Common in August.—Mr. Kaye, for Mr. Richards (1), series of *Acidalia dilutaria*, one of normal forms, the other of darker and yellower specimens; (2) *Macaria liturata* var. *nigrofulvata*; and (3) pupæ of *Anarta myrtilli*.—Mr. West (Greenwich), a large collection of butterflies from West Africa.—Mr. Main, a photograph of a larva of *Phorodesma smaragdaria*.—Mr. Sich, larvæ and cases of *Coleophora laripennella* on *Chenopodium*.—Mr. South, larva and case of *C. limosipennella* from birch at Oxshott.—Mr. Penn Gaskell, ova clusters of *Ocneria dispar* from San Sebastian, where they were abundant in early September.—Dr. Chapman, examples of *Erebia scipio* from the Basses-Alpes, and the white glistening cocoons of the coccid *Eriopeltis festuca*, and contributed notes.

September 28th.—Mr. Hugh Main, B.Sc., President, in the chair.—Mr. F. M. B. Carr exhibited a variety of *Aglais urticæ* taken at Chalfont Road, in which the blue marginal spots are absent, and the black basal area is more extended than usual.—Mr. Moore, the insects taken by him during the Society's field-meeting at Clandon, on July 15th.—Messrs. Harrison and Main, (1) *Apatura iris*, bred from a New Forest larva hybernated on sallow in a sleeve; (2) *Cœnonympha typhon* (*davus*)

from Cheshire and the Isle of Lewis, the former showing the ocelli much more pronounced; and (3) *Erebia æthiops* (*blandina*), two specimens bred from ova laid by a Yorkshire female.—Mr. Coithrup, a very fine variety of *Polyommatus corydon*, in which the marginal markings of the hind wings were developed and coalesced into radiating streaks. —Mr. J. W. Kaye, a fine bred series of *Thecla pruni*, from Monkswood larvæ. He pointed out the variable and unstable character of the orange markings of the female.—Mr. Joy, a bred series of *Cyaniris argiolus*, being about half of a brood of which the remainder were going over the winter as pupæ, and gave notes on his method of breeding.—Mr. Turner read a paper entitled "Notes on the Genus *Coleophora*," and illustrated each species mentioned by a life-history showing imago, cases at different stages, position in life, and the leaves showing larval depredations.

October 12*th*.—The President in the chair.—Mr. Edward Hill, of Dorville Road, Lee, was elected a member.—Mr. Stonell exhibited a number of varieties of British Lepidoptera, including pale *Orthosia suspecta*, pale and dark *Noctua sobrina*, *Tæniocampa gracilis* var. *pallida*, &c.—Mr. Cowham, a fine, richly banded *Dicycla oo*, from Woodford.—Messrs. Harrison & Main, (1) *Nemeophila russula*, a series bred from Delamere Forest ova; and (2) *Callimorpha dominula*, bred, from Deal. —Mr. Sich, the two specimens of *Argyresthia illuminatella* from Hailsham, Sussex, which had been determined by Mr. Meyrick as new to the British fauna.—Mr. Kaye, (1) a pair of black *Boarmia gemmaria* (*rhomboidaria*); and (2) a much-suffused *Cleora glabraria* from the New Forest.—Mr. Ashdown, specimens of the local hemipteron *Eysarcoris melanocephalus* taken in Surrey, and the rare *E. æneus* from the New Forest.—Mr. West, the Coleoptera *Sibinia potentillæ*, on *Spergula arvensis*; *S. primita*, on grass; and *Rhinoncus bruchoides*, on *Polygonum*, by sweeping in Darenth Wood in August.—Mr. Joy, a fine variety of *Cupido minima*, having the usual submarginal row of dots on the hind wings elongated into streaks of considerable but varying length.—Mr. West (Ashtead), a photograph showing a cluster of *Mania maura* in a corner of a room, where for years they had been accustomed to assemble.—Mr. F. Noad-Clark, a microscope, fitted with all the ordinary modern appliances, in illustration of his paper.—Mr. R. Adkin, specimens of *Emmelesia unifasciata* that had emerged in August of this year from pupæ of 1900. Some individuals had emerged in 1901, 1902, 1903, and 1904, and a few pupæ still remained over.—Mr. F. Noad-Clark read a paper, "Practical Hints in Microscopical Manipulation."—Hy. J. Turner, *Hon. Rep. Secretary.*

Lancashire and Cheshire Entomological Society. — The first meeting of the autumn session was held in the Royal Institution, Liverpool, on Monday, October 16th, the President, Mr. Samuel J. Capper, F.E.S., in the chair, and was probably the largest and most successful in the history of the Society. In opening, the Chairman extended a cordial welcome to the visitors, who included a number of ladies.—After the passing of the minutes, a vote of condolence was passed with the relatives of the late Mr. William Johnson, one of the original members of the Society.—Eight candidates were proposed for membership, and several donations to the Library and Micro-slide

Cabinet were announced.—The exhibits were extremely numerous, of the highest merit and interest, and covered almost every branch of entomology. The following were particularly noteworthy :—Mr. W. A. Tyerman showed a lovely bred series of *Pyrameis cardui* from Waterville, Ireland; Mr. F. N. Pierce, series of *Abraxas grossulariata*, with many vars., from Wallasey larvæ; Dr. W. Bell, two cases of beautifully preserved larvæ on their food-plants; Mr. W. Mansbridge, bred series of *Peronea permutana*, *P. aspersana*, and *P. hastiana* from Wallasey, *Catoptria expallidana* (Wallasey), *Pædisca corticana*, part of a long and variable series (Delamere), and *Ephippiphora populana* (Crosby); Mr. C. E. Stott, a light var. of *Dicranura vinula* bred from a batch of Blackpool ova; Mr. Richard Wilding, a series of *Polia chi* from Montgomeryshire; Mr. C. F. Johnson, some very dark vars. of *Macaria liturata* (Delamere), one black and one asymmetrical var. of *A. grossulariata* from Stockport larvæ, bred series of *Acronycta leporina*, including very dark suffused specimens (Rixton Moss), and of *Boarmia repandata* and *Acidalia contiguaria* (N. Wales); Mr. G. L. Cox, captures in Hunts, including *Toxocampa pastinum*, *Acidalia rubiginata*, *Dicycla oo*, with var. *renago*, *Hadena atriplicis*, *Cymatophora octogesima*, and *C. or*; Dr. P. F. Tinne, melanic forms of *Aplecta nebulosa*, *A. grossulariata*, *Xylophasia polyodon*, red vars. of *Smerinthus populi*, and specimens of the tarantula spider (British Guiana), and of a *Mygale* which preys on humming-birds; Mr. J. E. Robson, *Synia musculosa*, *Micra parva*, *Leucania extranea*, and *L. vitellina*, all ex coll. Mason, *L. favicolor* (Lieut. Mathew, R.N.), *L. albipuncta* (Bournemouth), *Xylomiges conspicillaris* (Taunton), *Pachetra leucophæa* (G. T. Porritt), and *Anerastia bankesiella* (E. R. Bankes); Dr. Cotton, *Zygæna pilosellæ* and *Cucullia chamomillæ* from Abersoch, *Xanthia cerago* and *X. silago* (Eccleston, Lancs.), *Odontopera bidentata* ab. *nigra*, and a very handsomely banded *Noctua festiva* with dark margins; Mr. F. C. Thompson, long series of *Tapinostola fulva*, *Eupithecia venosata* bred from *Lychnis*, and *Miana arcuosa*, all from Eccleston; Dr. P. Edwards, series of *Calligenia miniata*, *Cleora lichenaria*, *Larentia cæsiata*, and *Acidalia imitaria*, all from South Devon; Mr. R. Tait, jun., bred series of *Angerona prunaria*, *Pericallia syringaria*, and *Eriogaster lanestris* (Monkswood), *Acidalia contiguaria*, and *Agrotis ashworthii* (N. Wales), *Melanippe rivata*, and *M. procellata* (Sidmouth), and a bred var. of *O. potatoria* from Wallasey; Mr. B. H. Crabtree, bred series of *Agrotis ashworthii* and *A. agathina* (N. Wales), *O. bidentata* ab. *nigra*, *A. grossulariata*, and *Dianthœcia cucubali* (Manchester), *Hydrelia unca* (Ulverston), and *Argynnis selene* (Windermere). In Coleoptera, Mr. J. F. Dutton showed a collection made by Mr. Geo. Ellison at Stromness, including a melanic form of *Anchomenus parumpunctatus*, *Donacia discolor*, *Chrysomela sanguinolenta*, *Otiorrhynchus blandus*, *O. maurus*, and *Ptinus tectus*; Dr. H. H. Corbett, *Quedius longicornis*, *Monohammus sutor*, *Orsodacna cerasi*, *Hyperaspis reppensis*, and *Acanthocinus ædilis*, all from Doncaster, and sub-fossil remains of *Hydrophilus piceus* from the peat of Hatfield Moor; a case of Coleoptera collected in the North of France by Messrs. W. G. Dukinfield and C. B. Williams; Mr. H. St. J. K. Donisthorpe, *Dibolia cynoglossi*, *Adrastus pusillus*, and *Dinarda hagensi*; Mr. J. R. le B. Tomlin, *Psylliodes luridipennis* and *Ceutho. contractus* var. *pallipes* from Lundy Island, and *Anophthalmus gentilei*, a blind species from caves in

North Italy.—On behalf of the Liverpool School of Tropical Medicine, Mr. R. Newstead exhibited the life-cycle of the tse-tse fly (*Glossina palpalis*, Rob. Desv.), also living pupæ of this species and of *G. fusca*, all from Kasongo (Upper Congo), taken by Drs. Dutton and Todd.—Mr. W. J. Lucas sent a pair of the rare dragon-fly *Ischnura pumileo* from the New Forest. — Mr. Oscar Whittaker, three excellent photographs of cockroaches and a scarce hemipteron, *Aradus depressus*, taken at Pettypool by Dr. C. R. Billups.—Dr. R. J. Cassal sent specimens of a very rare trichopteron, *Limnophilus elegans*, from the Isle of Man.—Mr. E. J. B. Sopp exhibited *Forficula lesnei*, taken on the yellow-horned poppy at Swanage (Tomlin), *F. pubescens*, *Ectobia panzeri*, with egg-capsules, from St. Alban's Head (Tomlin), and a series of life-history cards of British beetles. — J. R. le B. Tomlin and E. J. B. Sopp, *Hon. Secretaries.*

RECENT LITERATURE.

Report of Work of the Experiment Station of the Hawaiian Sugar Planters' Association. Bulletin No. 1. Parts i.–iv. Leaf-Hoppers and their Natural Enemies. By R. C. L. Perkins. Honolulu, 1905.

Part i. of this important Bulletin comprises pp 1–69, and deals with species of the Dryinidæ, which are parasitic upon particular groups of Homopterous Rhynchota. Part ii. (pp. 70–85) treats of the Epipyropidæ, a family of Lepidoptera which the author considers most nearly related to *Fumea* and *Taleporia* of the Tineidæ and to the Psychidæ of the Psychina. The larvæ of species referred to this family are parasitic on Homoptera. In part iii. (pp. 86–111, plates i.–iv.) the Stylopidæ (Coleoptera) and in part iv. (pp. 112–157, plates v.–vii.) the Pipunculidæ (Diptera) are considered.

OBITUARY.

With great regret we have to announce that Mr. Norman Dalziel Warne died on August 25th last, after a short illness. He was born in 1868, and was educated at Charterhouse. Subsequently he went into the well-known publishing business at Chandos House, Bedford Street, of which his father, Mr. Frederick Warne, was the head. On the retirement of the latter in 1895, Mr. N. D. Warne, together with two elder brothers, became partners in the firm. As a student of natural history he was perhaps more especially attached to the Lepidoptera, and most of his somewhat limited leisure was devoted to active work in the field. He was elected a member of the South London Entomological and Natural History Society in 1888, and although he was not able to attend the meetings, during the past two years or so, as frequently as he wished, he always took a keen interest in the welfare of the Society, and was a generous contributor to its library. He was also a member of the Quekett Microscopical Club.

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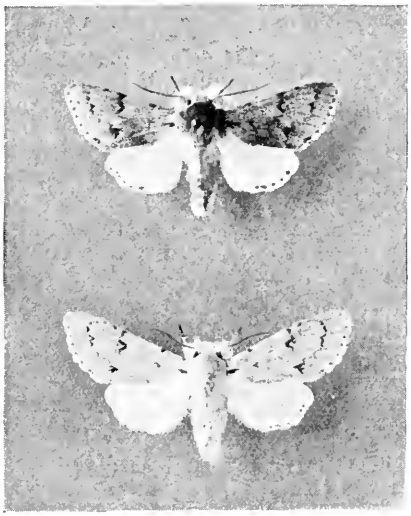
AN INTERESTING MELANIC FORM OF *ACRONYCTA LEPORINA*.

BY WILLIAM MANSBRIDGE, F.E.S.



IN the Liverpool district occasional specimens of a melanic form of *A. leporina* have been captured by various lepidopterists nearly every season for some years past. Attention was first drawn to the variety by my friend Dr. J. Cotton in a paper read before the Lancashire and Cheshire Entomological Society, and at his request I now give these particulars of this interesting form, and propose the varietal name *melanocephala*.

The typical insect occurs everywhere in North Cheshire and

South Lancashire where birch is found, but does not seem to be abundant in any of its localities, among which may be mentioned Delamere Forest, the woods near Hale Bank on the Lancashire side of the Mersey, Knowsley Park, and the Mosses between Prescot and Ormskirk; indeed, in some years not more than an odd specimen or two are taken.

What one may regard as the local type is scarcely darker or more irrorated with black than specimens from other parts of England, although now and again one finds an insect with a little more black scaling, yet not enough to form a distinct intermediate between the var. *melanocephala* and the usual form occurring in the district. It is curious that any darkening which may be found is first apparent in the hairs of the thorax, which in the variety are quite black. It is very difficult to estimate the proportion of the variety to the type, which at present is very low, although the ratio seems to be on the increase. Several attempts have been made to obtain ova from this dark form, but without success, so far as I have been able to learn—certainly my own endeavours have failed; and, as the experiment results in the absolute ruin of the moth as a cabinet specimen, one is naturally reluctant to repeat the sacrifice with the one or two insects obtained at the cost of a great deal of hard work.

Acronycta leporina, L., var. *melanocephala*, var. nov.—Differs from the type as follows:—Fore wings in both sexes strikingly suffused with fuscous, and with all the normal markings intensified. Thorax black; abdomen blackish, not so dark as the thorax; hind wings as in the type. Types (male and female) in coll. W. M.

The photograph, here reproduced, is by Mr. Hugh Main, F.E.S. The right side of the upper figure represents the melanic form; the left fore wing should be exactly as dark as the right fore wing, but the camera has failed to show this. The lower figure of a specimen of the usual form is shown for comparison.

ENTOMOLOGY AT BARMOUTH.

By J. Arkle.

The railway ride from Chester to Barmouth, in Merionethshire, lies among some of the finest scenery in North Wales. Through the celebrated Vale of Llangollen, and along the side of Bala Lake, the Great Western keeps to the Valley of the Dee. Through the trees, which fringe both river and railway above Llangollen, an occasional glimpse can be had, on the river-reaches, of the Ancient British wicker-made coracle. Still onwards and upwards, and leaving Bala behind, we find the geography books of our youth were wrong in ascribing the source

of that river to Bala Lake. For still there is the Dee, although now reduced to a mere brook splashing and tumbling among the rocks. A sharp look-out must be kept through the carriage-window, or we miss the top of the watershed, and find we are speeding along the banks of another stream which flows in an opposite direction. This is the river Mawddach, and, by the time we reach Dolgelly, it is a respectable stream. The train rushes on to Barmouth Junction, where we change to the Cambrian Railway, and so cross the Mawddach Estuary to Barmouth along the viaduct.

During the last two summers I have had the pleasure of spending a week in July with my friend, Mr. W. J. Kerr, of Tan-y-Bwlch, and now of Cromer, who takes a house at Barmouth for the summer months. Before entering upon an account of the insects observed, it may be well to give some idea of the country which formed our hunting-ground, and which possesses such an attractive insect fauna. (1.) A coast-line of sand-hills (bare) or shingle. (2.) Flat ground, frequently marshy, sometimes cultivated, often meadows. (3.) Belt of rising ground, very rocky, heathery, and woody up to 1500 ft. or so. (4.) Slate or granite mountains with grassy patches frequently 2000 to 3000 ft.; highest point, Cader Idris (the chair of the giant Idris).

A stranger to Barmouth can hardly fail to notice the greetings of numerous jackdaws, the music of the sweet church chimes, and the magnificent flora of the gardens. Here, in a favoured climate, the valerian (so attractive to insects) abounds; veronicas, white and blue, and hydrangeas of chameleon tints, blossom as thickly as hawthorns: they live out of doors all through the winter, and from their size convert the gardens into veritable shrubberies. Tree mallows, eight or nine feet high, and covered with pink blossoms, give an impression as of a foreign land.

Each of my visits was timed for July 15th, and a glance at the floral wealth referred to showed the season of 1905 to be quite a week later than that of the preceding year. And as with flowers, so with insects, as the sequel showed.

I found my friend had been entomologically busy. Among other things on his setting-boards, taken between the 18th of June and July 8th, were a fine series of *Chærocampa porcellus*, netted at valerian flowers; a series of *Apamea unanimis*, also taken at valerian flowers (both species common); three *Cucullia asteris* (only three seen, and all at valerian); a fine series of *Hadena contigua*, taken at sugar; *Mamestra persicariæ*, common at sugar; a darkly marked *Noctua festiva*, all wings suffused with smoky, upper wings with central black spots, also black markings; one *Agrotis suffusa*, one *M. furva*, one *Xylophasia scolopacina*, one *N. ditrapezium*, two *Aplecta nebulosa*, one *Mania maura*—all taken at sugar; *A. ripæ*, *Plusia festucæ* (one), *Acronycta ligustri*, *Ino*

statices, *Acidalia imitaria*, and several *Thyatira derasa*, captured either at sugar or flowers. This list, omitting other species common and generally distributed, represents entomologically Mr. Kerr's garden. Its application to Barmouth can be increased by adding *Macroglossa stellatarum*, *Bombyx quercus*, *Macrothylacia rubi*, *Malacosoma neustria* (the larvæ feed here on sloe), *Odonestis potatoria* (very common), *Lasiocampa quercifolia* (two larvæ found on sloe, June, 1904; one reared to an imago), *Saturnia pavonia* = *carpini*, *Liparis auriflua* (rather scarce), and *A. tincta* and *A. herbida*, June, 1905.

Two of the above species deserve special mention, *A. nebulosa* and *M. maura*. The type-form of *A. nebulosa* at Barmouth is as pale as *Polia chi*; that is, although only some sixty odd miles south-west from Chester, and practically on the same coast, the moth exhibits no trace of melanism, as in the Delamere varieties *robsoni* and *thompsoni*, but, in fact, inclines towards albinism! Mr. Kerr very kindly gave me one of his specimens. The upper wings are white, the usual markings smoky-grey, with a short black bar near the lower angle; the lower wings are smoky-grey and gradually paler towards the base.

Dusking was much obstructed by the over-abundance of *Hypena proboscidalis*, *Scopula lutealis*, *Botys ruralis* = *verticalis*, *Camptogramma bilineata*, and *Crambus culmellus*. Other captures were *S. prunalis*, *S. olivalis*, *Herminia derivalis*, *Rivula sericealis*, *Ebulea sambucalis*, *Nudaria mundana*, *Aphomia sociella*, *C. pinellus*, *Liparis auriflua*, *Miana furuncula* var. *vinctuncula* (Hüb.), *Leucania comma*, *Noctua baja*, *Mamestra brassicæ*, *Habrostola triplasia*, *Plusia gamma*, *P. chrysitis*, *Gnophos obscuraria*, *Uroptery.x sambucaria*, *Metrocampa margaritaria*, *Crocallis elinguaria*, *Pseudoterpna cytisaria*, *Hemithea strigata* = *thymiaria*, *Boarmia repandata*, *B. rhomboidaria*, *Emmelesia decolorata*, *E. affinitata*, *Acidalia scutulata*, *A. bisetata*, *A. imitaria* (very common), *A. aversata*, *Halia wavaria*, *Cidaria dotata*, *C. ribesiaria*, *Eupithecia castigata*, *E. pumilata* (worn), *Abraxas grossulariata*, *A. sylvata* = *ulmata*, *Hysipetes elutata*, *Cabera pusaria*, *Coremia ferrugata*, *Melanthia bicolorata* = *rubiginata*, *M. ocellata*, *M. albicillata*, *Melanippe sociata*, *Larentia viridaria* = *pectinitaria*, *Pterophorus monodactylus*, and *Aciptilia pentadactyla*.

Beating by day gave us *Lithosia lurideola* = *complanula*, *Lomaspilis marginata*, *Eubolia mensuraria*, *C. populata*, *C. truncata* = *russata*, *H. elutata* (very ordinary forms), *E. affinitata*; while *Tanagra atrata* = *chœrophyllata*, *Pyraustra purpuralis*, *P. ostrinalis*, and *Ennychia octomaculata* were occasionally netted on the hillsides.

Among other small things taken in the district were *C. hortuellus*, *C. pratellus*, *T. fosterana*, *T. viburnana*, *T. læflingiana* var. *ectypana*, *Cnephasia subjectana*, *Scoparia cembræ* var. *scotica* in 1904; and *T. læflingiana*, *Scoparia frequentella* var. *port-*

landica, *Cnephasia osseana*, *Cacoecia rosana*, and *Salebria betulæ* in 1905.

Sugaring became unprofitable with the middle of July, and more so in 1904 than in 1905. The following is the list for 1904: *Acronycta rumicis* (common), *Cerigo cytherea*, *Hadena contigua* (one), *Triphæna ianthina*, and *Leucania conigera* (common). In 1905 this list was increased by *T. fimbria*, *T. orbona*, *M. persicariæ* (abundant), *A. rumicis*, *Axylia putris*, *Xylophasia polyodon* (finely marked forms on a pale ground), *H. derivalis*, *Hydræcia nictitans*, *H. oleracea*, *Phlogophora meticulosa*, several *H. contigua* (mostly worn), *Apamea oculea* (fine mahogany-coloured forms), *Caradrina cubicularis*, *Noctua plecta*, *Amphipyra tragopogonis*, pale *X. lithoxylea*, *M. maura*, and very many *L. conigera*. Towards the end of August sugar again became productive, and among the autumn moths *Asphalia diluta* and almost black *N. xanthographa* should be noted. In the charming grounds of Mr. Davis (Plas Mawddach)—remembered for more than one enjoyable evening with the net in July—several *Sphinx convolvuli* were taken at flowers of *Nicotiana affinis* in September.

In our dusking and sugaring operations we were aided by a powerful lamp, which was carried, even well up the hillsides. Fears were entertained lest it might be mistaken for the religious lights reported in the neighbourhood, but which, not being among the faithful, we had failed to see. However, our brilliant lamp excited, apparently, neither enthusiasm nor comment.

No one who has climbed the Panorama Walk from Barmouth and up to Panorama View can forget the splendid mountain scenery. On the lower slopes *Zygæna filipendulæ* swarmed, and resting on the rocks higher up *A. promutata* could be had. The ground marked No. 1 (sand-hills or shingle) was so barren and unproductive that it received only a single visit. Nothing animate appeared to exist save the restless surf, with its everlasting groan and roar. The ground marked No. 2, however, was alive with insect life. On two spots (one about two miles north of Barmouth, and close to the railway; the other, Arthog Marsh, on the other side of the estuary and opposite the town) are colonies of *Z. trifolii*. This is an interesting insect, because it has been declared, with hardly any reservation, to be the *Anthrocera palustris* of Mr. Tutt (see 'Practical Hints for the Field Lepidopterist,' pp. 68 and 90). Remembering the situations affected by *Z. trifolii*, and the dates quoted, say, by Wilson, for its occurrence (second week in May to second week in June), it certainly seems more than curious if this marsh insect, mostly fresh in the middle of July, should be the same species. Certainly there is nothing in the climate of Barmouth to retard the appearance of *trifolii*. My specimens of this marsh insect are, on the whole, larger than in my series of *trifolii* (Yorks), and the spots, on the whole, are larger. Sometimes the second pairs of

spots are confluent. In 1904 a few *filipendulæ* (there were numbers two or three hundred yards off) were found flying with them, but not in 1905; and the moths were fresher in 1905 than in the more forward July of 1904. The second week in July, however, in any season would, I believe, see the moths at their best. I brought a few live females home with me. They seemed very happy on thistle-flowers in a glass-jar with net over the top, and they laid numbers of yellow eggs underneath the flower-heads, from which I have now hybernating larvæ. Other insects on this Arthog Marsh were *Epinephele hyperanthus* (plentiful), *Argynnis aglaia*, *C. perlellus* (abundant in 1904, none seen in 1905), with its melanic form *warringtonellus* and intermediates, *C. pascuellus* (most plentiful in 1905), *Perinephele lancealis* (one only in 1904), *Endotricha flammealis*, *Stenopteryx hybridalis*, *P. pruniata* = *cytisaria* (worn), *E. plumbaria* = *palumbaria*, *A. immutata* (common), *R. sericealis*, *C. culmellus*, &c. In the reed-beds were larvæ and pupæ of *Nonagria arundinis* = *typhæ*, and earlier in the month *X. scolopacina* had been, in 1904, common at sugar. Typical specimens of *Bryophila perla* were found resting on the walls in the neighbourhood, particularly on the Barmouth side. A nice local strain of this species was discovered away to the north, near Minfford, varying from very pale to darkly-marked forms.

It is a butterfly country. Near the village of Arthog, among the wooded slopes (ground No. 3), *Thecla w-album* was a plentiful insect, but very local, and more abundant and in better condition in 1905 than in 1904. In a favoured open spot, not a dozen yards across—a regular butterfly corner, and full of flowering bramble, scabious, meadow-sweet, knapweed, and St. John's wort—we stood, in the full blaze of a hot sun, and netted the little Theclas at our leisure. It was impossible to take too many of them, for they have a wonderful way of dodging the net, particularly on bramble. In 1904 Mr. Kerr headed the score, Mr. T. White (also of Cromer) came second, and I made a bad third. In 1905, however, I did much better; but, as is too often the case with the Theclas when netted, most of our captures were either chipped or rubbed. Here, in this butterfly corner, were also *A. paphia* and *A. aglaia*, *Pararge egeria*, *T. quercus*, *Lycæna icarus* = *alexis* (worn), *E. hyperanthus* (abundant), and, not far from it, *E. ianira*, *E. tithonus*, with an occasional *Pieris brassicæ* and *P. napi*; the last-mentioned paler than Chester specimens, but often with very primrose-yellow under sides. On the lower grounds throughout the district *P. rapæ* and *Vanessa urticæ* were common enough, two or three *V. atalanta* (probably hybernated specimens) were seen, and *Satyrus semele* was plentiful on the sunny embankments of the Cambrian Railway. *Thecla quercus* occurs freely in, apparently, all the oak woods, especially on ground No. 3. In one locality on the Barmouth side of the

estuary Mr. Kerr was our guide to a spot where the butterfly literally swarmed. The best way to capture it is to get on the hillside, as much as possible on a level with the tops of the scrub oaks. After mid-day the butterfly goes to rest, and hardly one is to be seen. Mr. Kerr foretold they would reappear about five o'clock, and there was never truer prophecy. At the appointed time they were on the wing again, more abundant than at mid-day. But, although fresh out, in 1905, like *T. w-album*, few of our captures were perfect. In this locality one or two *Pararge megæra* were observed.

And no one who has been there can ever forget the lovely mountain forest scenery of the Artro Valley, eight miles north of Barmouth. On the marshes by the railway on our journey to the valley, *Melitæa aurinia* = *artemis* occurs in the season. The valley practically begins at the village of Llanbedr, and nets were soon in requisition. On the way up a spot was pointed out where *Euchloë cardamines* (generally distributed throughout the neighbourhood), *Nemeobius lucina*, *Nisoniades tages*, and *Macroglossa bombyliformis* can be taken. Higher up the valley, on the marshy patches among bog-myrtle, *A. selene* and *A. euphrosyne* are abundant in their season. I saw and nearly captured a worn specimen of the latter. Both in 1904 and 1905 *A. paphia*, *A. aglaia*, *A. adippe*, *Cœnonympha pamphilus*, *Pararge egeria*, and *Hesperia sylvanus* were captured. The fritillaries were so abundant that on one occasion in 1904 I took two *A. aglaia* and one *A. adippe* with one sweep of the net. We saw only one or two *egeria* in 1904, but they appeared to be fine and fresh. In 1905 a good many were seen and netted; but they were all worn, and evidently remnants of the first brood. On a low-lying flat in this valley we again came upon the marsh *trifolii*, and flying with *filipendulæ* in 1904; but, curiously enough, we did not see them together in 1905. Higher up is the fine Nancol Fall. At rest upon a rock near the fall was a rather worn *Hepialus hectus*. The Nancol is a tributary of the river Artro, and the fall struck me as being an almost exact duplicate of the Fairy Glen, Bettws-y-Coed, but with a greater volume of water, and altogether more dangerous.

July is a between-time for larvæ, generally speaking; that is, it is a month between the imagos of most species and the caterpillars. The following larvæ, however, were observed: *Dianthœcia capsincola*, in capsules of *Silene inflata*; *Phalera bucephala*, on oak; *Euchelia jacobææ*, on ragwort flowers; and I counted nine broods of *V. urticæ* one day on roadside nettles close to Barmouth.

The district is evidently a rich one for Diptera. We met a collector who showed us a choice collection taken chiefly on the marshes. On Arthog Marsh the great ox gadfly, *Tabanus bovinus*, was more numerous than welcome. This dipteron can pierce

through the thickest ribbed stocking, and raise pyramidal blisters the size of a crown piece. Another dipteron infests the hind-quarters of cattle, with apparently the instinct to keep well out of reach of the animals' tails.

Dragonflies were numerous. *Sympetrum striolatum* = *Libellula vulgata* was frequently met with in the lower woods; *Orthetrum cærulescens* was generally distributed, abundant flying over a ditch on Arthog Marsh; *Cordulegaster annulatus* often sported, especially over this ditch, in half a dozen at a time, until, when one was caught, the rest made off, and we saw them no more. Here were also numbers of *Libellula depressa*, and more than once late specimens of *Pyrrhosoma nymphula* = *Agrion minium* and *Ischnura elegans* were captured. *Calopteryx virgo* was taken, and *Æschna juncea*. The last-named is known as "the snake servant" by the country folk. Whenever you see one, they say, you are sure to see a snake as well. Curiously enough this was more than once verified. But the snake was only a harmless grass snake, and, after the manner of all British serpents, very glad to get away as fast as possible.

Ground No. 4 (the mountain tops) we simply admired over and over again for its indescribable grandeur, so I have no idea what insects, if any, exist thereon.

Chester: Nov. 1st, 1905.

NEUROPTERA COLLECTED BY DR. T. A. CHAPMAN IN FRANCE AND SPAIN, 1904.

By W. J. Lucas, B.A., F.E.S.

In 1904 I received from Dr. T. A. Chapman a small collection of Neuroptera taken by him that year in France and Spain. Most of these were dragonflies; but a few belonged to other and more obscure groups of the order Neuroptera as generally understood.

Dr. Chapman supplies the following note on the localities in which the insects were found: "About a month was spent at Hyères (March 20th to April 17th). I believe all of the few dragonflies taken there were met with at La Plage, on the coast, some two or three miles from Hyères—all I think by the ditches beside the racecourse; where the mosquitoes were sufficiently troublesome to make the sport unattractive. The next ten days were spent at Ste. Maxime, some way eastward along the coast. There is no limestone here, and the botany and entomology are in several respects decidedly different from those of Hyères. A few days (May 3rd to 8th) were then spent at Draguignan (some way inland), in a valley basin between quite low hills. It

seemed a promising locality, more like Hyères in its Lepidoptera, with some Basses-Alpes flavour (*L. dupunchelii*, &c., being present). All these localities are, however, very well known. In Spain, in July and August, we visited two very different localities, taking on the way a day or two at Guethary (July 5th, 6th), a pleasant little watering-place not far from Biarritz, and with an Atlantic fauna and flora. In Spain our first resting-place (July 8th to 22nd) was at Puerto de Pajares, a pass across the main ridge of the Cantabrian ranges, at 4500 ft. elevation, about two hundred miles west of St. Sebastian and some thirty-five from the Atlantic coast, with a climate and general aspect of country reminiscent of many parts of Scotland,—a humid climate, with bog and moorland, grassy and stony mountains, but passing rapidly on the southern side into a drier and more typically Spanish district. We then went to La Granja (July 24th to August 2nd), and for a day (August 5th) to Navalperal, both in the Guadarrama range, at about 5000 ft. elevation, some thirty or forty miles from Madrid, quite in central Spain, in a region where the lower ground at least is very dry and hot in summer, and the fauna and flora are quite Mediterranean in their aspect, with even a little of the African character that the more southern and eastern portions of Spain possess. The Guadarrama is, however, well watered in its upper levels, and it results that La Granja is one of the richest and most prolific stations in Spain that the entomological collector could desire — quite rivalled, however, by other places in the same range, as, for example, the Escurial. Both La Granja and the Escurial are now becoming familiar to English entomologists. The larvæ of *Myrmeleon* were very abundant in the pine-woods at La Granja, under the trees where the earth was very light and dusty, occasionally six or eight, of very various sizes, being present in about a square foot of ground."

For the sake of comparison, species that do not belong to the British fauna are marked with an asterisk.

France: Hyères. — Dragonflies: *Brachytron pratense*, one female; *Pyrrhosoma nymphula*, one female; **Sympycna fusca*, a considerable number; *Ischnura elegans*, several.—Ste. Maxime. Other Neuroptera: *Hemerobius lutescens*, one; *Chrysopa aspersa*, one; *Mystacides azurea*, two; **Sericostoma galleatum*, a very interesting form of the genus, two.—Draguignan. Dragonflies: *Libellula depressa*, two females, immature male; **Gomphus simillimus*, one male; *Cordulegaster annulatus*, one rather immature female. Other Neuroptera: **Ascalaphus coccajus*, one male; **Panorpa meridionalis*, one female, the identification of which is just a little doubtful; *Odontocerum albicorne*, two; **Rhyacophila vulgaris*, one.—Pont du Gard. Dragonflies: *Brachytron pratense*, one male, one female.—Guethary (Basses-Pyrénées). Dragonflies: *Orthetrum cærulescens*, one male, one female;

Cordulegaster annulatus, one female; *Calopteryx virgo*, one male, one immature female; **C. hæmeroidalis*, several, both sexes; *Platycnemis pennipes*, one female; **P. latipes*, one male, one female.

Spain: Puerto de Pajares.—Dragonflies: *Sympetrum striolatum*, one male; *Pyrrhosoma nymphula*, two males, two females. Other Neuroptera: *Sialis fuliginosa*, one; **Panorpa meridionalis*, three males, three females; *Megalomus hirtus*, one, provisionally so named by Mr. Morton, but it does not entirely agree with the northern *hirtus*, nor the big southern form *tortricoides*, Rambur; *Limnophilus centralis*, four; **Sericostoma pyrenaicum*, two (perhaps = *S. selysi*).—La Granja. Dragonflies: *Sympetrum striolatum*, two males; **S. meridionalis*, one male; *S. flaveolum*, one male, one female; *Orthetrum cærulescens*, three males, three females; **O. brunneum*, one male; *Cordulegaster annulatus*, one female: *Anax imperator*, one male; *Calopteryx virgo*, one male, two females; *Lestes sponsa*, one female; **Sympycna fusca*, one male, one female. Other Neuroptera: **Myrmeleon formicarius*, one; **Ascalaphus longicornis*, five females; **Dilar meridionalis*, six; *Hemerobius inconspicuus*, one; **Leptocerus braueri*, one.—Navalperal. Dragonfly: **Lestes barbara*, one defective male.

Two living larvæ of the ant-lion (*Myrmeleon formicarius*) from La Granja were given me by Dr. Chapman on September 22nd. After passing several months without food, one produced an imago of good size about the following midsummer.

For great assistance in identification I have to thank Mr. K. J. Morton, of Edinburgh, especially in connection with the specimens belonging to the less known and more difficult groups, which, though few in number in this collection, were none the less interesting.

ON THE DARK FORM OF *ISCHNURA ELEGANS* (FEMALE).

By F. W. and H. Campion.

In October, 1904, we drew attention in these pages (vol. xxxvii. p. 252) to the occasional occurrence in Epping Forest of a dark form of *Ischnura elegans*, female. We have again met with this form during the present year, specimens having been taken on June 25th, August 13th, and September 3rd, one on each occasion. The second specimen was at the time of capture attached *per collum* to a normal male; this was evidently an old individual, as it had a worn and dusty look, and had the left fore wing torn. The association of this dusty appearance with ragged wings was also noticed on July 22nd in the case of two females of *Agrion puella*. The state of the example of August 13th and a re-

consideration of the arguments in favour of maturity set out in our previous communication have confirmed our impression that we are dealing with a mature form. The species has been unusually abundant with us this year, and we have paid special attention to the immature coloration, with the result that we are satisfied that at no stage of its colour-development does the typical form correspond with the dark form. The fact that the latter has occurred in three successive years encourages the belief that it is also permanent, and to this form we now propose to give the varietal name of *infuscans*.

During the present season, also, the orange variety of the female (*rufescens*, Steph.) has made its appearance in Epping Forest, for the first time in our experience. We have therefore been placed in a position to compare fresh specimens of *rufescens* with our own dark females, and we think that the chief points of difference between the typical female and its two varieties may be stated in the following terms:—

Spots behind eyes small and rounded; meso- and meta-thorax blue, with a broad black mid-dorsal band, and two narrower black lateral bands; segments 1 and 2 blue, with thistle-shaped black marking on 2; 8 blue. *elegans*.

Spots behind eyes large and pear-shaped or rounded; meso- and meta-thorax orange, with a broad black mid-dorsal band; lateral bands obsolete; segments 1 and 2 orange, with flask-shaped black marking on 2; 8 blue . . . . . var. *rufescens*.

Spots behind eyes small and rounded; meso- and meta-thorax dark olive-green, with a broad black mid-dorsal band; two narrower black lateral bands usually present, but not constant; segments 1 and 2 dark olive-green, with thistle-shaped black marking on 2; 8 dark orange-brown, becoming almost black in time. var. *infuscans*.

RHOPALOCERA AT BARCELONA, MONTSERRAT, AND VERNET-LES-BAINS.

By R. S. Standen, F.L.S., F.E.S.

(Concluded from p. 280.)

The climb appears to have been a tolerably fatiguing one, and Jones got badly blistered by the sun while crossing the snow near the summit. I was chagrined nevertheless that my years kept me ignominiously at the bottom.

Our last and most memorable walk was to the ruins of the abbey Church of St. Martin du Canigou, about three and a half miles from Vernet, at a height of 3000 ft. After passing the village of Castell there is a zigzag of nearly two miles over a

wild and rocky pass before reaching the ruins, which burst upon you quite suddenly.

It is an imposing group of eleventh century Roman work in pale grey granite, the tower alone standing erect and uninjured, as though it would brave eternally the tempest and the storm. It stands on a high isolated plateau, from which, on one side, is a splendid view over the smiling Valley of Vernet, and on the other a dark and frightful abyss, the bottom of which is covered with verdure—a singular contrast.

At the further end of the Abbey is an extension of the narrow plateau, well covered with grass and shrubs, alternating with huge blocks of granite, and here the form of *E. stygne*, before mentioned, was excessively abundant. I took rather a singular example of it, in which the band was grey instead of red, and four-eyed spots on the fore wing instead of the customary three; but it can only, I think, be considered a curious colour aberration. *Parnassius apollo* seemed to be coming out quite fast, and it was a pretty sight to see them, together with *feisthamelii* and *machaon*, fluttering about that grandest of Cistuses—the *laurifolius*—many large bushes of which adorned the banks a little lower down. I took here also a fine specimen of *Chrysophanus alciphron* var. *gordius*, and Jones a *Pararge mæra* var. *adrasta*.

Thus ended our brief visit of ten days to one of the most lovely and productive places in the Pyrenees. There is no doubt that from the middle of June to the middle of July would be the most favourable period of the year for working this district, and I believe that a few days spent at the comfortable hostelry on the arête of Mont Canigou during the second week of July, working downwards, would result in a complete mastery of the Erebias of the district.

I append a list of the Rhopalocera taken and observed:—

Papilio podalirius var. *feisthamelii*, Dup. Common, frequenting damp ground and resting on mud. The type also occurs rather earlier in the year.—*P. machaon*, L. Common locally.

Thais rumina var. *medisicaste*, Ill. One worn specimen seen, and larvæ nearly full grown on *Aristolochia pistalochia*.

Parnassius apollo, L. Common about St. Martin du Canigou.—*P. mnemosyne*, L. Two females; 5000 ft., Mont Canigou.

Aporia cratægi, L. One of the most abundant butterflies of the district.

Pieris brassicæ, L., and *P. rapæ*, L. Scarce.—*P. napi*, L., and *P. daplidice*, L. Occasionally.

Euchloë cardamines, L. One on Mont Canigou at 7000 ft.—*E. euphenoides*, Stgr. Common and fairly fresh.

Leptidia sinapis, L. Occasionally.

Colias hyale, L. Two males in good condition on the Castell road. Rondou gives August only for this species, but there must be a spring brood also, I imagine.—*C. edusa*, F. Occasionally, quite fresh.

Gonepteryx rhamni, L. Several, worn.

Limenitis camilla, Schiff. Rather common.

Pyrameis atalanta, L. One seen.—*P. cardui*, L. A few.

Vanessa io, L. Two just out. — *V. polychloros*, L. A few seen.—*V. antiopa*, L. One seen.

Polygonia c-album, L. Common.

Melitæa cinxia, L., *M. phœbe*, Knoch, and *M. didyma*, O. A few.—*M. didyma* var. *alpina*, Stgr. One only.—*M. athalia*, Rott. Numerous and very variable. It is possible that one or two may prove to be *deione*, and others the var. *vernetensis*.—*M. dictynna*, Esp. A few.

Argynnis euphrosyne, L. One on Mont Canigou at 6000 ft. — *A. lathonia*, L. Several.—*A. adippe*, L. Seen only.

Melanargia lachesis, Hb. A few. — *M. lachesis* var. *canigoulensis*. Fairly common; rather near *galatea* on under side, but ground colour a more chalky white.

Erebia evias, God. One or two, worn. — *E. stygne* var. *pyrenaica*, Rühl. Very abundant on Mont Canigou at 4000 ft., and again at St. Martin du Canigou.

Satyrus alcyone, Schiff., and *S. semele*, L. Occasionally, just coming out.

Pararge ægeria, L., and *P. meyera*, L. A few.—*P. mæra* gen. æstid. *adrasta*, Hb. A few; described in Montserrat list. The type does not occur in the Eastern Pyrenees.

Aphantopus hyperantus, L. Common.

Epinephele jurtina var. *hispulla*, Hb. A few; did not see the type, although Rondou and Elwes both give it as abundant.

Cœnonympha arcania, L. Very common on Station Road. — *C. pamphilus*, L. A few.

Lacosopis roboris, Esp. Locally among young ash-trees; fairly common, and in beautiful condition.

Thecla ilicis, Esp. A few. — *T. ilicis* ab. *cerri*, Hb., and *T. ilicis* var. *esculi*, Hb. Two or three.

Callophrys rubi, L. One worn specimen, Station Road.

Chrysophanus alciphron var. *gordius*, Sutz. One or two at St. Martin du Canigou.—*C. phlæas*, L. A few.

Lycæna argiades ab. *coretas*, O. One or two females only.—*L. argus*, L. A few. Staudinger (whose nomenclature I have followed) does not recognize *ægon* as distinct. — *L. orion*, Pall. One specimen only. — *L. astrarche*, Bgstr. Common and fine. — *L. icarus*, Rott., *L. amandus*, Schn., *L. escheri*, Hb., *L. bellargus*, Rott., and *L. coridon*, Poda. A few.—*L. cyllarus*, Rott. One only.

Cyaniris argiolus, L. Occasionally.

Adopæa thaumas, Hufn. Two or three.

Argiades sylvanus, Esp. Common.

Carcharodus alceæ, Esp. One only.

Hesperia carthami, Hb. Just coming out, several specimens.—*H. sao*, Hb., *H. alveus*, Hb., and *H. malvæ*, L. Occasionally.

Referring to the last paragraph of my paper (*ante*, p. 280), Mr. Rowland-Brown reminds me that it has been conclusively established by Dr. Chapman that *Erebia melas* is not a Pyrenean species at all, but that *lefevrei* is the proper specific name for the Pyrenean form.

NEW AUSTRALIAN BEES, IN THE COLLECTION OF THE BRITISH MUSEUM.

By T. D. A. Cockerell.

(Concluded from p. 273.)

The microscopical characters of these species are as follows:

(1.) Front.

H. bicingulatus.—Densely rugoso-punctate.

H. oxleyi.—Densely rugoso-punctate, the punctures large.

H. humei.—Closely rather weakly punctured, with a few short striæ in front of middle ocellus.

H. lanuginosus.—Exceedingly densely punctured, the punctures large; this is like the mesothorax of *oxleyi*.

H. gilesi.—Very densely punctured, the punctures strong but not extremely large.

H. repræsentans.—Very densely punctured.

It will be noted that the front is entirely different from that of the metallic species, described earlier. *H. humei*, which shows signs of striæ, is in other respects most like the metallic species.

(2.) Mesothorax.

H. bicingulatus. — Densely rugoso-punctate, the punctures dull, the areas between them more shining, and minutely ridged or lineolate—the remnants of a tessellate sculpture.

H. oxleyi.—Densely rugoso-punctate, the punctures large, the ridges between them reduced, and not sculptured; the punctures themselves are shiny.

H. humei.—Coarsely microscopically tessellate, with numerous punctures, in the manner of *H. murrayi*.

H. lanuginosus.—With dense large punctures, much as in *oxleyi*, but there are more distinct intervals between them, which, however, are smooth and shining.

H. gilesi.—Densely punctured, the punctures large, the intervals showing coarse tessellate sculpture, in the style of *bicingulatus*.

H. repræsentans.—With dense large punctures, the surface between not sculptured, except anterior middle, which is irregularly transversely lineolate, with only short pliciform hair-punctures.

(3.) Second abdominal segment.

H. bicingulatus. — Shining, but very closely and strongly punctured, the punctures extending over the whole surface.

H. oxleyi.—Extremely finely and densely punctured all over, the punctures very minute and regular, looking like very fine honeycomb.

H. humei. — Basal half closely and distinctly punctured; apical half feebly transversely lineolate, with scattered hair-punctures. (First segment well punctate, though not densely, on apical half; third segment not even well punctate at base.)

H. lanuginosus.— Basal part very densely punctured, not unlike front, but apical part with the punctures well separated though very strong, showing the surface, which is coarsely tessellate, with a tendency for the stronger lines to run transversely.

H. gilesi.—Strongly punctured; very densely basally: about the middle the punctures are well separated, showing the shining ground, which is transversely lineolate, the lineolæ often joining, so that the sculpture becomes subtessellate; the depressed apical part has the punctures smaller, narrowed, each emitting a hair.

H. repræsentans.—Very strongly punctured, the punctures extremely dense on basal third, but otherwise well separated, and more or less transversely elongated, but the surface between is shining and smooth.

The microscopic characters are not repeated in the specific descriptions.

Halictus bicingulatus, Sm.

Melbourne; Ent. Club, 44. 12.

Halictus oxleyi, n. sp.

♂. Length about 7 mm., or rather less; black, with the pubescence yellowish, especially on face, where it is abundant; mandibles rufous, lighter and almost yellow in the middle; scape dark, but the rest of the antennæ light ferruginous, above and below, the flagellum paler and yellower beneath; metathorax truncate, but the margins not sharply angled; enclosure shining and smooth, roughened only at extreme base, abruptly ridged transversely by the upper border of the truncation, but the edge is not sharp; tegulæ large for the genus, very pale testaceous; wings hyaline, nervures and stigma amber-colour; b. n. falling far short of t. m.; femora piceous, with the apex pale ferruginous; tibiæ and tarsi pale ferruginous; abdomen broad, with a sericeous lustre, piceous, with the hind margins of the segments pallid, but no hair-bands or patches,

Hab. Adelaide, 59. 52. Allied to *H. orbatus*, Sm., and *globosus*, Sm.

Halictus humei, n. sp.

♀. Length about 5½ mm.; black, with greyish-white pubescence, quite dull and greyish dorsally, whiter and abundant on the ventral surface of thorax and abdomen; antennæ dark, the flagellum brownish beneath; area of metathorax granular, not invading the truncation, tegulæ rufo-piceous, with a lighter spot; wings hyaline, slightly dusky, very iridescent, stigma and nervures reddish brown; b. n. falling only a little short of t. m.; first r. n. joining second s. m. near its apex; third t. c. and second r. n. very weak; legs piceous, very hairy, the

hair on hind tibiæ above glistening silvery; abdomen broad, shining but quite pubescent, the hind margins of the segments obscurely rufescent; the lateral bases of segments 2 to 4 broadly covered with whitish tomentum.

Hab. "Australia," 67. 42 (type). Another is marked "Australia, 58. 168." This may be compared with *H. globosus*, Sm., and *H. familiaris* (Erichs.). It nearly agrees with the brief description of *H. familiaris*, but does not seem to be quite the same, and it is questionable whether *familiaris* can ever be certainly recognized. The hind spur of the hind tibia in *H. humei* is very peculiar, being simple except for a stout divergent truncate spine or tooth just before its middle. The anterior spur of the same tibia is microscopically ciliate.

Halictus lanuginosus, Sm.

"Australia" (Koebele). In U.S. National Museum.

Halictus gilesi, n. sp.

♀. Length about 8 mm.; black, looking just like *H. repræsentans*, except for the following characters: clypeus with irregular longitudinal furrows as well as punctures; tegulæ redder; mesothorax much more coarsely sculptured; stigma lighter and redder; first r. n. entering apical corner of second s. m.; otherwise scarcely at all different, but clearly a valid species. The microscopic characters, given above, are decisive.

Hab. Victoria, 89. 108.

Halictus repræsentans, Sm.

Hobart, Tasmania (J. J. Walker, 3221, 3222).

Boulder, Colorado: Sept. 23rd, 1905.

BIBLIOGRAPHICAL NOTES ON THE HEMIPTERA. No. 5.*

By G. W. Kirkaldy.

(A) The Type of Cimex, Linné.

I hope the readers of the 'Entomologist' are not already bored with this question; the supposed "law," however, that Mr. Blanford considers so conclusive is not an old well-established proposition, or rather—more correctly—an old, effete suggestion originating at the dawn of modern nomenclature, but immediately laid aside because of its impracticability.

Mr. Blanford's note (p. 110) is eminently unsatisfactory. He

* This article was written by Mr. Kirkaldy prior to the death of the late Mr. Blanford, whose note on the subject was published, *ante*, p. 110.—Ed.

has evaded the real points at issue, and merely refers to the former note in 'Nature,' to which I had raised what were, to me at least, valid objections.

As I had not at the time of my receipt of the 'Entomologist' for April a copy of the 12th edition of the 'Systema' (I possess only the 10th and 13th), it was necessary to delay my reply. It now appears, as will be seen later, that the 12th edition does not aid in the solution at all. As this supposed "law" vitally concerns a large number of Linnean genera in all orders, and as it has not been even mentioned in a considerable number of monographs and revisions of insects including Linnean genera,* I trust the Editor will allow it to be thrashed out thoroughly.

The points raised by Mr. Blanford are:—

(1) That Linné specially indicated (in the 'Philosophia Botanica' (1751)) that officinal species were to be considered as the types of plant genera.

(2) This is to be applied to Zoology from 1758.

(3) This principle overrides all others, for type fixation.

(4) The reason for *lectularius* being fixed as type of *Cimex* is explained in the 12th edition of the 'Systema.'

(5) That *Clinocoris*, Fallén, is a synonym of "*Acanthia*."

In reply, I would again say that:—

(1 & 2) Linné mentions nothing of all this in the 10th edition of the 'Systema,' the starting point of zoological nomenclature. He himself has not carried out this rule,† and it was disregarded by his immediate pupils.

(3) There is another fundamental principle, to which I believe a greater consequence should obviously be paid, *viz.* that the type-species must agree with the original generic description. It is surely ridiculous to cite an apterous species as the type of a genus, part of whose diagnosis mentions without modification the presence of four wings.

(4) Mr. Blanford declares that the 12th edition of the 'Systema' ought to silence my doubts. The following is what is therein stated (tom. i. pars. 2, p. 715):—"Declaratur hæc species nunquam elytris s. alis, sed semper apterum, Larvæ aut Pupæ forma persistit, quod singulare; at in Carniolia volatilis etiam occurrat? confer Scopoli."

Now what has this to do with making *lectularius* the type of *Cimex*? It does not make it any the more conformable to the generic diagnosis, and in any case the 12th edition can have no

* I have not seen *any* entomological works entertaining this principle published within the last twenty-five years, but, as I do not pretend to have examined more than a restricted area of entomological literature, I have made the statement in a restricted manner.

† It will be sufficient to cite *Empis*, *Conops*, *Nepa*, *Tipula* [rectius *Tippula*], *Ichneumon*, &c., as examples of classical names misapplied, or probably misapplied, by Linné.

"say" in the matter; either *lectularius* was or was not available as type in 1758; if it was not (in 1758), nothing effected in 1766 could make it so.

(5) I quite agree with Mr. Blanford that *Clinocoris* is a mere synonym of "*Acanthia*," but he does not say which "*Acanthia*"! There are two, viz. *Acanthia*, Fabr., Latr. (otherwise known as *Salda*), a valid genus; and *Acanthia*, Fabr., Fall., type *lectularius*, which is not valid; *Clinocoris* is a synonym of the latter, and therefore is, I think, available as a substitution for this invalid *Acanthia*, Fallén.

(B) Miscellaneous Notes.

(*a*) In the fourth part of these notes (p. 79), I asked for information anent "*Naucorinus*." This has been kindly furnished to me by Mr. Prout, and my MS. notes are confirmed.

I think Mr. Sherborn is wrong in including *Naucorinus*, Meuschen, as a valid generic term, as there is no diagnosis, no species, no singular form, and it is almost certainly a *lapsus calami* for *Naucoris*, Geoffroy, described sixteen years previously.

The citation is "*Notonectæ, Nepæ, Naucorini, Cimices*," and the species-names mentioned are *glauca, linearis, cinerea, grandis, cimicoides*, &c., of which the first belonged, at that date, to *Notonecta*, the next two to *Nepa*, and the fourth to *Naucoris*. I do not think "*Naucorinus*" can even be cited as a synonym of *Naucoris*.

(*b*) In the fourth part of these papers (p. 7), for "19th Band" of Herrich-Schaeffer, read "9th Band."

(*c*) In the 'Entomologist' (1902, p. 316), I discussed the date of publication of the text of the "Hemiptera" in Duperrey's 'Voyage of the Coquille.'* At that time I had not seen Sherborn's paper on this matter in the Annals & Mag. Nat. Hist. (7), vii. pp. 388–92 (1901). Sherborn cites the date, sec. Bibl. Franç., as 1831, but this notice must surely have been taken from proof-sheets.

For the 1838 date we have (1) Guérin himself, who complains *inter alia* that Boisduval has anticipated him (in 1835) by publishing on the same subject, although knowing of Guérin's proposed work; (2) the fact that only the plates, never the text, are quoted by Laporte (1832) or Burmeister (1834–5), two of the principal hemipterists of that date; and (3) Boisduval, in the 'Voyage of the Astrolabe . . . Faune Entomologique, 1ère partie Lépidoptères' (1832), writes in an "Avis" inserted between the title-page and page 1 of the "Avertissement": that, while this first half-volume was being printed, several livraisons of plates of the entomological part of the 'Coquille' have been published.

* The tenth item under Boisduval, in Hagen's 'Bibliotheca,' p. 64, should be erased, as it is entirely erroneous.

He regrets very much that Guérin has not yet (1832) published the text, so that he could have established certain synonymy more satisfactorily than is possible from figures, which, although very carefully made, leave something to be desired for such a purpose. I cannot see my way, therefore, to quoting an earlier date than 1838 for the Hemiptera of the 'Coquille.'

(7) In my "Nomenclature of the Genera" ('Entomologist,' 1903, p. 214), I included the new genera in Burmeister's work cited here, under date of 1838, that being the date on the title-page, the date given by Hagen, and the date usually accepted by homopterists.

Unfortunately this is another case of incorrect title-page, and I now set forth all I can trace in the matter, in the hope that further information may come to light.

(*a*) The work was issued at irregular intervals, in parts, unpaged, undated, and with the genera unnumbered. I do not know if covers were issued, and, if so, whether these were dated.

(*b*) The original title was "Genera Insectorum. Iconibus illustravit et descripsit Hermannus Burmeister . . . . volumen I, Rhynchota: Berolini . . . Burmeister et Stange, 1838," the preface being dated October, 1837.

(*c*) In 1846, after ten parts were issued, the title was altered to "Genera quædam Insectorum. . . . . ." "Berolini, sumtibus A. Burmeister, 1838–1846."

(*d*) As mentioned in (*a*), the parts are neither dated nor paged, nor are the genera numbered. There is, however, an "Index generum descriptorum," dated from Halle, July, 1846, in which the genera are numbered and arranged according to their supposed affinities, not according to date of publication.

(*e*) The contents of each part are as follows (principally according to the 'Bericht der Entomologie') :—

Heft 1, 1837 : (?) *Lystra* (no. 20). [Ed. 2, 1840–6.]
,, 2, 1838 : *Selenocephalus* (no. 12), *Cœlidia* (no. 15), *Eupelix* (no. 6), *Jassus* (no. 14).
,, 3, 1838 : *Ulopa* (no. 3), *Dorydium* (no. 5), *Cephalelus* (no. 4), *Ledra* (no. 9).
,, 4, 1838 : *Gypona* (no. 16), *Xerophlœa* (no. 8). [Also *Phthirius* and *Pediculus*.]
,, 5, 1840 : *Paropia* (no. 7).
,, 6 or 7, 1841 : *Typhlocyba* (no. 13).
,, 8, 1845 : *Fulgora* (no. 18). [With subgenus *Pyrops*, no. 19 in Index.]

(*f*) The *Lystra* notes are referred to in Spinola's Monograph of the Fulgoridæ (1839), so that they are probably included in the first part. The 'Bericht der Entomologie' commences in Wiegmann's Archiv for 1838, and it is there mentioned that

pts. 2–4 have been issued, so that presumably pt. 1 appeared between October and December 31st, 1837. I have not seen Wiegmann's Archiv for 1837, and do not know if there are any entomological references there. In my copy of the "Genera" there is, besides the original, a second edition of the "*Lystra*" notes, in which Burmeister refers to Spinola's monograph, and remodels his own notes and descriptions; these (including *Phenax*, which is in both) extending to $4\frac{1}{2}$ sides in the first edition, four in the second, owing to smaller print. There is no clue to the date of this, but it must be between 1840 and 1846.

(*g*) The notes on *Eurymela* (no. 17) are referred to in Amyot and Serville's 'Hémiptères' (1843). They may therefore form part of the first part (1837 ?), but more probably 6th or 7th.

(*h*) *Typhlocyba* is recorded in the 'Bericht' for 1841; it is in either the 6th or 7th part, the remainder of these parts being devoted to beetles.

(*i*) *Bythoscopus* (no. 10) and *Acocephalus* (no. 11) are a puzzle. The notes on the former are referred to in Westwood's 'Introduction' (1839), so that these must apparently be referred to first part, but *Acocephalus* is referred to in *Bythoscopus*, and *vice versâ*, in the "Genera"; and also in *Acocephalus*, the *Jassus* notes (14) (1838) are mentioned! So that either (1) Westwood was acquainted with Burmeister's MS. notes, (2) Burmeister referred to his own manuscripts, or (3) the 'Bericht' had imperfect copies to record from. I think the second is very likely to be the case. As I have an uncut copy, it may be useful to mention that the pages measure 140 by about 230 mill., the plates 164 by 243 mill.

(8) With regard further to Guérin's 'Iconographie du Règne Animal, Insectes,' dated on the title-page 1829–38, but mentioning 1843 in the text as early as p. 352, Guérin himself, on p. 15 (where the date 1838 is to be inferred as mentioned), states that many species have been published from his plates only, and that he considers a figure valid publication, an expression of opinion which few entomologists will share.

With regard to these plates, 55, 58, and 59 are undated; 56 is 1834; 57, 1835; with regard to the text it must be after 1843. Erichson, in 1848 ('Bericht' for 1846), states that it was scarcely published before 1845, and was not at Berlin before 1846; 1844 or 1845 may fairly safely be taken as the date, and, as the firm of Baillière is still in existence, it may be possible to trace original covers. The copy now before me contains an additional title-page, not present in the other copies I have seen. On the reverse side it states that the complete 'Iconographie' was published in forty-five livraisons, each with ten plates. There were three editions—1. 8vo, with black figures. 2. 8vo, with coloured figures. 3. 4to, with coloured figures. The text (8vo) was sold separately.

NOTES AND OBSERVATIONS.

Butterflies of France.—I shall be much obliged if any entomologists who have collected in the following departments of France, or can refer me to local collectors, or published local lists, will communicate with me:—Oise, Aisne, Ardennes, Meuse, Meurthe-et-Moselle (later than Cantener), Yonne, Nièvre, Dordogne, Lot, Aveyron, Hérault, and the Vosges districts generally. — H. Rowland-Brown; Harrow Weald.

The Rose Scale.—Mr. Theobald, in his very valuable 'Report on Economic Zoology,' just published, states (p. 98) that he has not been able to detect this scale (*Aulacaspis rosæ*) in the open in Kent, Surrey, or Sussex. I may as well record, therefore, that last year I found it out-of-doors on a rose-bush in my brother's garden at Ewell, Surrey. On p. 64, Mr. Theobald gives an account of an interesting new aphid, *Siphonophora fragariella*, Theob., attacking strawberries. The generic name *Siphonophora* is a homonym, and apparently the proper name for the genus is *Macrosiphum*, Passerini, 1860. The strawberry aphid will therefore be *Macrosiphum fragariellum*.—T. D. A. Cockerell.

Hornet and Butterfly.—Mr. Lucas's note (Entom. xxxviii. p. 282) reminds me of an incident. One morning in September, I think it was in 1893, while watching several specimens of *Pyrameis atalanta* enjoying fallen fruit in the orchard, I was surprised to see a hornet suddenly pounce on one of the butterflies as the latter was sailing round, about four feet above the ground. In a few seconds the hornet had bitten off the beautiful wings of the butterfly, and was bearing away its helpless victim between its legs. *Sic transit gloria mundi!*—Alfred Sich; Corney House, Chiswick, Middlesex, Nov. 8th, 1905.

Phalonia badiana, Hb. — I have just been reading with much interest the remarks on the larval habits of this species by Mr. Bankes (*ante*, p. 275). That the larva leaves the seed-heads of *Arctium lappa* to pupate elsewhere is undoubtedly correct. I have bred a large number, and have always found that upon leaving the seed-heads they spin their cocoons amongst the rubbish in the pot. I do not *now* think that they even enter the stems or roots at any time, as I have carefully examined large numbers of stems in the winter where the larva occurred commonly in September, but always without any result. I am afraid that entomologists are often "like sheep" in following statements without trying to verify them, by so doing they have in this instance most decidedly "gone astray." When I first began to collect the Tortrices, I used to search in vain for this larva in the stems of its food-plant until I mentioned the matter to Machin, and he remarked: "You will never find them *there*, as they always spin up amongst the rubbish upon leaving the seed-heads, in which I have always found them." The next season I was able to confirm his statement. With regard to Mr. Bankes's inability to find Mr. Maling's note, quoted by Sorhagen, I think that I can throw a glimmer of light on the matter. In the 'Entomologist,' vi. 283, Machin (in a list of insects reared in 1872) gives "*A. badiana*, bred from seed-heads of

Arctium lappa"; and on the same page there is a short list of captures by Maling, although he does not mention *badiana*, yet, curiously enough, he records the very closely allied *cnicana*! Is it not possible that Sorhagen may have got a little mixed with the two very similar names—Machin and Maling?—A. Thurnall; Thornton Heath, November 2nd, 1905.

Method of Oviposition by Cordulegaster annulatus.—During a visit to Cornwall in August of this year, I had the opportunity of observing very closely the mode of procedure of *Cordulegaster annulatus*, Latr., during oviposition. The account given in Lucas's 'British Dragonflies' reads thus: "The female does this apparently by dipping the tip of her abdomen in the water at random." This is completely borne out by what I saw; but as I was able to watch the insect at very close quarters for some ten minutes, it seemed that a short account might be of interest. The locality was a spot on the cliffs going from St. Ives to Zennor, shortly after the basalt gives place to the granite. A small stream running across the moorland towards the sea was connected with some small pools of comparatively still water. Whilst hunting for marsh plants by the side of one of these pools a large female *Cordulegaster annulatus* came to rest upon the wing within a couple of feet of me where I knelt, and after remaining poised upon the wing for a few seconds, suddenly bent the posterior portion of her abdomen at right angles to the anterior portion, and commenced rising and falling on the wing. The end of the abdomen was thus repeatedly thrust into the soft mud at the edge of the pool, the insect rising between each thrust to a height of some six inches. About seventy to seventy-five thrusts were made per minute, and this was continued for nearly ten minutes in the same spot. The female was not accompanied by the male. In depositing its eggs while hovering on the wing, *Cordulegaster annulatus*, Latr., agrees with *Sympetrum striolatum*, Charp., *S. flaveolum*, Linn., *S. scoticum*, Don., *Libellula depressa*, Linn., *L. quadrimaculata*, Linn., and *Æschna juncea*, Linn.; but of these, the first three are accompanied by the male insect. In apparently laying its eggs in the mud it agrees with *Agrion mercuriale*, Charp.—Eric Drabble, D.Sc., F.L.S.; Hartley Laboratories, The University, Liverpool.

Prolonged Pupal Stage in Emmelesia unifasciata (Perizoma bifasciata).—Some fifty larvæ of *Emmelesia unifasciata*, collected in the autumn of 1900, pupated during the latter part of October and the first few days of November of that year. In August, 1901, ten moths emerged; in 1902, eleven; in 1903, two only: in 1904, five; and in 1905, two: these last having thus passed five winters, and in point of time four years and nine months in pupa. No attempt was made to artificially retard emergence, the pupæ having been kept under as nearly natural conditions as may be practicable in confinement, the earthen pan containing them remaining out of doors during the whole period, exposed to the weather but sheltered from direct rain, and in a position where it would receive a fair amount of sunshine. It is, I believe, a well-known habit of this species to lie over as a pupa for more than one winter, but it appears to be pretty generally believed that the second or, perhaps, the third year is

the limit of its endurance. The above, however, shows that, under favourable conditions, *i.e.*, protection from predatory enemies, &c., its vitality will enable it to withstand a much longer period and still produce perfect imagines.—Robert Adkin; Lewisham, November, 1905.

Early Hybernation of Vanessa urticæ.—Seeing the record on the above subject (page 281) has induced the following note. Every autumn the ceiling of a certain staircase in this house is the resort of one, or more, hybernating *V. urticæ*, but this season, at the *beginning of July*, I noticed a specimen, in fine condition, had taken up its quarters upon a slanting part of the ceiling, wings erect, head downwards, legs spread out, and antennæ neatly folded back as usual. I see it is there to-day in exactly the same position, and is the only one taking advantage of the retreat. The question naturally arises—what is the cause of hybernation? It cannot be a feeling of the approach of winter or lack of food in this case, as the temperature was far more summer-like after the insect had settled than it was before, and the situation is comparatively well lighted, so that the insect could not have mistaken dusky surrounding for the shortening days of autumn. I shall watch its motionless repose with interest, unless the broom dislodges it, for doubtless it has been noticed that this very necessary and useful instrument and hybernating insects are somewhat at variance.—G. B. Corbin; Ringwood, November 14th, 1905.

Partial Second Brood of Spilosoma menthastri. — A female specimen of *S. menthastri*, captured in Kensington in May last, deposited just over one hundred eggs. The larvæ fed up rapidly, and, excepting a few that died when full grown, pupated. Twenty-one imagines emerged during the latter part of August and beginning of September, and there are now (November 20th) thirty apparently healthy pupæ still remaining. The majority of the specimens reared favour the female parent in the amount and style of the black maculation, as well as in the ground colour, which is of the normal white. Some, however, have the ground colour creamy; others have few black spots; and one example has only one spot about the centre of the fore wings, and two or three towards the outer margin.—E. G. Gentry & W. E. Phillips.

Epiblema (Phlœodes) immundana, F. R. — With reference to Mr. A. Thurnall's note (*antea*, p. 281) on this species, I cannot explain the apparent absence of the white-blotched form from among the first-brood specimens in his district; but my own experience by no means accords with his. For whereas, among large numbers of examples of the earlier brood, he has not seen any with the dorsal blotch "nearly or quite pure white," I find that, out of the twenty-one bred and captured representatives of this same brood from the Isle of Purbeck, that have remained with me, nine are of this form which his experience leads him to believe only occurs in the later generation. It is quite likely that everywhere a larger proportion of the second, than of the first, brood would have the dorsal blotch white, as the result of the well-known tendency (acting on an inherent tendency towards this style of marking) shown by species to produce paler imagines if their metamorphoses are

completed rapidly than if these are retarded. If, as seems probable, the eggs laid by the second-brood moths hatch about September (Sorhagen, Kleinschmet. d. M. Brandenburg, 112, definitely states that they do so in the "autumn"), this period will be fully double as long in the case of the first, as in that of the second, generation. The form with the dorsal blotch white is the true *immundana*, F. R., while that in which it is dark is var. *estreyeriana*, Gn. Although Mr. Meyrick, in H B. Brit. Lep. 493 (1895), enters *E. immundana* as only single-brooded, as also did Heinemann in Kleinschmet. Deutsch. u. d. Schweiz, B. i, H. i, p. 158 (1863), the existence of a second brood in England, as well as on the Continent, has been long known, and is recorded in Wilkinson's Brit. Tort. 82 (1859); Stainton's Manual, ii. 208 (1859); Morris's Brit. Moths, 175 (1868); Entom. xiii. 111 (1880); Snellen's Vlind. v. Nederland, Microlep. 335 (1882); Young Nat. v. 206 (1884); Sorhagen's Kleinschmet. d. M. Brandenburg, 112 (1886); Tutt's Prac. Hints, ii. 42 (1902), etc. In this last work it is said to be only partially double-brooded, but it seems likely that, at any rate in many districts, it is completely and regularly so. Again, Meyrick gives the larvæ of the April–May imagines as feeding in July and August, whereas in this and various other localities, both English and Continental, the larvæ that produce the April–May moths hatch out in the autumn (*teste* Sorhagen, *l. c.*), live inside the birch and alder catkins, and can be collected, about full-fed, in plenty therein during the end of February and March. The larvæ that produce the later brood feed on the leaves of these trees in June and July, and the moths emerge about August. — Eustace R. Bankes; Norden, Corfe Castle, Nov. 10th, 1905.

New Work on British Butterflies.—We have received Part i. of 'A Natural History of the British Butterflies,' by J. W. Tutt, F.E.S. Pages 1-4 are occupied by general observations on butterflies and part of a chapter dealing with egg-laying. These items appear to be an instalment of the Introduction. The familiar Hesperiidæ are in future to be known as Urbicolides, and the author's reasons for this change will be found in the following passage, extracted from his remarks on the superfamily:—". . . . . in 1758, Linné separated (Syst. Nat., x., 482) the smaller butterflies—hairstreaks, blues, coppers and skippers—under the title *Plebeii*, and further subdivided (*op. cit.*, pp. 482, 484) them into the *Rurales* and *Urbicolæ*, the latter being, even at this time, absolutely restricted to the 'skippers.' Pallas, in 1771, Fabricius, in 1775, 1781, and 1787, and Esper in 1776, maintained the Linnean name. In 1780 Goeze called them the *Urbicolæ*, and in 1781 Barbut, using *Urbicola* in a truly modern generic sense, fixed the type of the genus as *comma*, Linn., No. 256, whilst in 1788 Borkhausen subdivided the Linnean *Rurales* into the *Subcaudati* (hairstreaks), *Rutili* (coppers), and *Polyophthalmi* (blues), keeping, however, the Linnean name *Urbicolæ* for the skippers; whilst, more important than all, Fabricius himself, in renaming the group (Ent. Syst., iii., 258) in 1793, *Hesperia*, retained the Linnean sub-divisions calling the blues, &c., the *Hesperia-Rurales*, and the skippers the *Hesperia-Urbicolæ*. So far, therefore, as Linné's group names—*Papilio*, *Nymphalis*, *Plebeius*, *Ruralis*, *Urbicola*, &c.—have any classificatory and nomenclatorial value, it is

clear that the 'skippers' must be called the Urbicolides, and its typical genus, of which Barbut named *comma*, Linn., No. 256, the type, *Urbicola*." Possibly this action on the part of the author may be perfectly legitimate, but we fear that its acceptance as a new starting-point will still further delay the establishment of anything durable in the way of classification, or, at all events, the nomenclature thereof. As such matters are, however, still open to discussion, we will dismiss them from the present notice and turn to the less debatable contents of the initial part of this new text-book. Acquaintance with the author's other volumes on British Lepidoptera had prepared us for masterly and exhaustive treatment of the Butterflies, and we certainly are not disappointed. First of all, the superfamily is dealt with as a whole, and including remarks on the general biological structure of the Urbicolids (pp. 81–90). Then follows a consideration of the sub-family Thymelicinæ, tribe Thymelicidi (pp. 91, 92), with an account of *Adopæa lineola* (pp. 93, 104). It is presumed that the pages 5 to 80 yet to come will be occupied by further introductory matter, but there is no mention of this. The book will be found exceedingly useful to everyone interested in our butterflies, but to the student in the higher branches of entomology it will be indispensable. There is a well-executed plate of Urbicolid ova, reproduced from photographs taken direct from the eggs.

CAPTURES AND FIELD REPORTS.

Late Flight of Dragonflies.—Mr. C. W. Dale forwards the following records: *Æschna mixta*, October 17th, 1807; *Æ. cyanea*, November 3rd, 1834; *Sympetrum scoticum*, October 22nd, 1816; *S. striolatum*, October 3rd, 1863. On November 12th last I saw a dragonfly on the wing at the Black Pond, near Oxshott, which must have been *S. striolatum*, and I have seen the species as late as November 14th. At the same time I saw *S. scoticum* on November 2nd, in 1902.—W. J. Lucas.

Campodea staphylinus.—This insect was taken at Weymouth and Portland in May, 1893, by Mr. G. Worth.—C. W. Dale; Glanvilles Wootton.

Deilephila livornica bred from the Egg.—On June 6th of last year my good friend Dr. Crallan, of Bournemouth, sent me four ova of *D. livornica*, from a batch laid by a moth captured in that town. One of these unfortunately hatched out during transmission. The next day the three remaining ova hatched. I fed the larvæ on vine-leaves, till in due time they pupated. I am sorry now that I did not force them, as two dried up. However, I was rewarded with one fine insect, which emerged in the first week of September.—Joseph Anderson; Chichester.

Lucanus cervus at Chichester. — The stag-beetle (*L. cervus*) was by no means uncommon here during the past summer. — Joseph Anderson.

Sirex gigas at Chichester. — This handsome "giant" saw-fly made its appearance here during the past season. Single specimens may be met with nearly every summer, but many years have passed since *Sirex juvencus* has been seen.—Joseph Anderson.

Xylina semibrunnea in Reigate.—While working ivy-bloom in Reigate, on November 14th, I took a fine specimen of *X. semibrunnea* on an exposed head from which all the bloom had fallen, leaving only the hard seed-heads. I am told by a Lewes collector that he finds the ivy-bloom most attractive when it is falling. Is this the experience of other collectors?—A. J. Wightman; 28, Station Road, Redhill.

Lepidoptera at Light in Reigate in 1905.—I have this year taken the following insects at light here, which I did not take in 1904:—*Drepana binaria*, *Ptilophora plumigera*, *Demas coryli*, *Luperina cespitis*, *Miana fasciuncula*; while several insects, abundant in 1904, did not turn up at all, viz., *Cirrhædia xerampelina*, *Plusia chrysitis*, *Hydræcia micacea*, *Pachnobia rubricosa*.—A. J. Wightman; 28, Station Road, Redhill.

Sphinx convolvuli in South-west London. — I beg to report the capture of a specimen of *S. convolvuli* at light, on Wimbledon Common, on October 15th, 1905.—Claud E. L. Ellis; 17, Telegraph Street, London, E.C.

Odonata in Herts, 1905.—A gravel-pit and several ponds were searched near the village of Shenley. On June 13th, *Agrion puella*, *Enallagma cyathigerum*, and *Ischnura elegans* were on the wing in great abundance, and three *Pyrrhosoma nymphula* (all males) were captured. On June 14th some specimens of *Libellula depressa* were captured, and also one *P. nymphula* female, flying along a hedge. On June 14th two *Erythromma naias* (males) were taken, at one of the ponds where *E. cyathigerum* and *I. elegans* were abundant. On June 15th an *E. naias* female was captured, and another female on June 16th. On July 15th two more *E. naias* (males) were captured, and two females were seen. In August and September *Sympetrum striolatum*, *Æschna grandis*, and *Æ. cyanea* were abundant. On August 22nd a species of *Lestes* turned up in the gravel-pit. It seemed to be *L. dryas*, but the specimen has not been satisfactorily identified so far. — E. R. Speyer; Shenley, Herts.

A New Forest Holiday. — As I alighted at Lyndhurst Road Station one afternoon towards the end of last June, I could not help contrasting the weather with that which I had experienced on my arrival at the same spot on a day in late July, 1903. Then, great clouds of fine rain were sweeping continually across the country, and the forest was a mass of bog and swamp; now, the temperature was nearly eighty degrees in the shade, and the forest was indeed the Mecca of the entomological wanderer. On my former visit, the rainfall almost created a record for July and August; this time, day followed day of brilliant sunshine, making the collecting of insects, if at times a somewhat warm occupation, yet always a most delightful one. Very soon after my arrival I was, on Lyndhurst Common, to be greeted at once by a conspicuous *Nemeophila russula*. The males were about in some numbers, though I saw but a single female. As dusk

fell, *Agrotis porphyrea* was common and *Hepialus hectus* abundant. On my first morning, June 28th, I walked through the woods towards Stubby Copse to see what butterflies were about. *Argynnis selene* was numerous in places, and I caught sight of the first specimen of those future swarms of *A. paphia* which were soon to enliven the ridings. *Limenitis sibylla*, most graceful of insects, was just appearing in the freshness which it so quickly loses, and on the heaths were early arrivals of *Lycæna ægon*. In the pine-woods one could not walk far without disturbing *Macaria liturata*, and more seldom *Thera variata* and *Ellopia prosapiaria* (*fasciaria*), while *Bupalus piniaria* fluttered from every pine-tree. Elsewhere in the forest, on the first day's excursion, we took specimens of *Gnophria rubricollis*, *Epione advenaria*, *Phorodesma bajularia*, and a number of *Calligenia miniata*. Returning by the heath, *Aspilates strigillaria* and *Panagra petraria* were knocked out. Later on, the heaths yielded several good insects. Notably *Gnophos obscurata*, which was first beaten out—or, perhaps, considering its subterranean hiding-place, it would be more exact to say, "scraped out"—on July 4th. In a few days the moth was very common here and there about the heath, and in half an hour's scraping in a favourite spot, I more than once counted from fifty to sixty specimens flying up. The males were ten times as numerous as the females. Paler forms were infrequent, but on the whole they varied from black to a fairly light grey. Another geometer, of which I took a few on the heath during the second week of July, was *Pachycnemia hippocastanaria*; and several chases of that most agile of day-flying Noctuæ, *Heliothis dipsacea*, resulted in the capture of a single specimen. Other geometers, met with at odd times in excursions through the forest, included *Angerona prunaria*, *Iodis lactearia*, *Hyria auroraria*, *Macaria notata*, *Cleora glabraria*, *C. lichenaria*, *Eurymene dolobraria*, and *Acidalia imitaria*. Denny Bog is generally a productive hunting-ground. It is not, however, the pleasantest of spots for dusking. Even in the dryest summer there is a somewhat odorous dampness rising at sunset. In 1903 it was utterly impenetrable, but this year I took, amongst others, at dusk, *Ephyra orbicularia*, *Eucosmia undulata* (common), *Cleora glabraria*, and *Lithosia mesomella*. Most of the evenings were too still and dewy to make sugar very productive. However, *Aplecta nebulosa* was always abundant, and I was in time to secure a short series of *Moma orion*, as well as *Thyatira batis*, *T. derasa*, *Acronycta ligustri*, *Cymatophora or*, *C. duplaris*, and *Agrotis herbida*. An unusual visitor to sugar was a female *Psilura monacha*, and I was surprised one evening by *Cossus ligniperda* fluttering at the bottom of a sugar-patch.

On July 14th we made an excursion to Swanage, to renew acquaintance with *Hesperia actæon*. It was in fine condition, and abundant in places, though I found the species in a spot more inland than when I visited the locality last. They are accompanied by *Hesperia linea*, from which they are easily distinguished on the wing after a little practice. *Melanargia galatea* was also about, and a fritillary, probably *Argynnis aglaia*. This inland migration, if such it be, is to be regretted, for so, the skipper will run a much greater risk of extermination than when its breeding-ground is the difficult slope of the cliff. What hosts of common butterflies were enjoying that

wonderful weather! Amongst innumerable *Epinephele ianira*, I had the good fortune to see, and capture, in Denny Wood, a very fine male with a large symmetrical cream-coloured area in both upper and lower wings. On my visit in 1903 I took a quite white specimen of *Cœnonympha pamphilus*, similar to one I caught in Norfolk some twelve years ago. It seems possible, however, that these white varieties of *C. pamphilus* are merely faded. *Valesina* was first seen on July 8th. In all I counted eleven between then and the 20th, and many of them were unaccountably damaged. *Vanessa polychloros* appeared on July 17th, and *Lycæna argiolus* on the same date. *Thecla quercus* seemed quite rare, and I did not see more than a dozen all the time. *Limenitis sibylla* was abundant in many parts of the forest. I was anxious to net *Apatura iris*. Its larvæ may be obtained here for a few pence, or they may be beaten from sallow; but these are unworthy methods of securing such a noble insect. It was not, however, till my last day's collecting, on July 20th, that I got within reach of *iris*. Then, in a riding of Wood Fidley, I stalked one as it sat upon a frond of bracken, and with a lucky stroke bagged my first emperor, or, to be more correct, empress. I think the satisfaction of netting *A. iris* must rather exceed that of the man who purchases the larva, even at a reduced price for taking a quantity. It was warm work, those July days in the forest ridings, when the London thermometers stood in the eighties, and few things can equal the pleasure with which, having shaken off the swarm of pursuing flies, one attacks one's tea (those New Forest teas!) after such a day spent in tramping the heaths and woods, and sprinting after elusive Lepidoptera. — S. L. Orford Young, M.B.

SOCIETIES.

Entomological Society of London.—*October 18th*, 1905.—Dr. T. A. Chapman, M.D., F.Z.S., Vice-President, in the chair. — Mr. Charles William Bracken, B.A. (Lond.), of 18, Whiteford Road, Mannamead, Plymouth; and Mr. William Hubert St. Quentin, of Scampton Hall, Rillington, York, were elected Fellows of the Society.—Mr. H. Rowland-Brown exhibited series of Erebias taken this year in the Pyrenees, including *Erebia lefebvrei*, with the vars. *pyrenæa*, Obth., from Mont Canigou, E. Pyrenees, and var. *intermedia*, Obth., from Gavarnie. He also showed, for comparison, *E. glacialis* var. *nicholli* from Campiglio, which at one time was supposed to be identical with *lefebvrei*, then considered to be the Pyrenean form of *E. melas*. With them were arranged specimens of *E. gorgone* and *E. gorge* from the Lac de Gaube, Cauterets, and from Gavarnie; and a short series of *Lycæna orbitulus* from the Central Alps, *L. orbitulus* var. *oberthuri*, Stgr., *L. pyrenaica*, and *L. pheretes* from the Brenner and Cortina districts. It was remarked that there seemed to be a greater superficial affinity between *pyrenaica* and *pheretes* (not reported from the Pryenees) than between *pyrenaica* and *orbitulus*.—Mr. E. C. Bedwell, eight specimens of *Apion lævigatum*, Kirby, one of the rarest indigenous Apions, found on August 31st, sheltering under plants of *Echium*

vulgare in the Lowestoft district. — Mr. S. Shelford showed a Ligæid bug the fore-limbs of which were remarkably well adapted for fossorial habits, and comparable with those of the mole-cricket; a Brenthid beetle with a deep channel running along the dorsal part of the prothorax and occupied by acari; and an Anthribid beetle with a crescentic sulcus for the reception of acari on the prothorax. All the specimens were from British North Borneo.—Mr. C. J. Gahan, on behalf of Mr. C. O. Waterhouse, exhibited a living example of *Phaneroptera quadripunctata*, which species had been found in some numbers in a vinery near Chester.—Mr. W. J. Kaye brought for exhibition a long variable series of *Heliconius numata*, from the Potara River, British Guiana, clearly proving that these very variable forms were only aberrations, and were not subspecies, at least in this locality. A pair of *Heliconius silvana* were also shown with two rare aberrations, showing the black area of the hind wing divided; and examples of *Heliconius vetustus*, it being remarkable that although similar to *numata* it was nevertheless a distinct species.—Mr. A. H. Jones exhibited a collection of Lepidoptera made by him in Majorca during the first half of last June, and remarked upon the great scarcity of lepidopterous species in the island. Only thirteen kinds of butterflies were observed, and these without any indication of variation, with about six species of moths (all occurring in Britain), including *Agrotis saucia*, *Acidalia ochrata*, and *A. degeneraria*, the latter, interesting in point of colour, being much redder. He also exhibited *Melanargia lachesis* var. *canigulensis*, from Le Vernet, showing on the under side in the males a strong resemblance to *M. galatea*; also *Melitæa aurinia* var. *iberica*, Obth. (*desfontainii*, Rbr.), from Montserrat, near Barcelona; and a melanic specimen of *Erebia stygne*, taken by Mr. R. S. Standen at St. Martin du Canigou, Le Vernet.—Mr. Frank P. Dodd communicated a paper "On a Parasitic Lepidopteron from Queensland, Australia."—Commander J. J. Walker read a paper by Mr. E. G. R. Meade-Waldo, "On a Collection of Butterflies and Moths made in Morocco, 1901–2." The species enumerated included a *Cœnonympha* new to science. But for so luxuriant a country as that visited it was remarkable how few butterflies and moths were observed.

November 1*st*.—Mr. F. Merrifield, President, in the chair.—Mr. J. W. H. Harrison, B.Sc. (Lond.), of The Avenue, Birtley, was elected a Fellow of the Society. — The Rev. F. D. Morice exhibited (1) *Panurgus moricei*, Friese, a species of bee new to science, taken by him near Gibraltar, of which it was remarkable that whereas species of this genus are entirely black, in this species the male face entirely, and the female partly, was bright yellow, the legs partly yellow, and the abdomen spotted down each side, very much as in *Anthidium*; and (2) the unique type-specimen of *Heriades fasciatus*, Friese, a male of the *Chelostoma* group, taken by him at Jericho in 1899, in which, again, while all its congeners are practically unicolorous, the abdomen is brightly banded, not unlike that of a wasp. A discussion followed as to the reason of the peculiar coloration in the species under review, the exhibitor pointing out that the colour mimicry in this species could not be due to parasitism, both *Panurgus* and *Heriades* being industrious genera.—Mr. W. J. Lucas showed a male specimen of the earwig

Forficula auricularia, taken at Warwick in September last, with a drawing of the cerci (forceps), which were very abnormal, the broader basal part of the two appearing to be more or less fused together, while the legs of the forceps were jointed to the basal part. The case, he said, was interesting because in cockroaches, &c., the cerci are regularly jointed.—Mr. G. C. Champion exhibited various interesting insects from Guatemala recently received from Señor Rodriguez, including *Heterosternus rodriguezi*, Cand., *Pantodinus klügi*, Burm., *Plusiotis adelaida*, Hope, and a species of Orthoptera greatly resembling a dead withered leaf, possibly a new species of *Mimetica*.—Mr. Norman H. Joy showed two species of Coleoptera new to the British Islands: *Læmophilus monilis*, F., taken in the neighbourhood of Streatley, Berks; and *Dacne fowleri*, n. sp., from Bradfield, with specimens of *D. humeralis* and *D. rufifrons*, for comparison.—Mr. H. St. J. Donisthorpe showed a specimen of a new *Agathidium* discovered last year in Cumberland, and since taken by him in Durham; and a series of *Prionocyphon serricornis*, with a drawing of the larva.—Dr. F. A. Dixey exhibited preparations of the scents of some African butterflies collected by him and Dr. Longstaff during the recent visit of the British Association, also specimens of the species investigated. A discussion on the presence and use of scents in various orders of insects followed, in which the President, Professor Poulton, Col. C. T. Bingham, and other Fellows joined.—Mr. P. I. Lathy, F.Z.S., communicated "A Contribution towards the Knowledge of African Rhopalocera."—Col. C. T. Bingham contributed a paper entitled "A New Species of the Hymenopterous Genus *Megalyra*, Westwood, by J. Chester Bradley, Ithaca, N.Y., U.S.A."—H. Rowland-Brown, M.A., *Hon. Sec.*

South London Entomological and Natural History Society.—*October 26th*, 1905.—Mr. Hugh Main, B.Sc., President, in the chair.—Rev. E. Tarbat exhibited a specimen of *Pseudoterpna pruinata* (*cytisaria*) from Morthoe, in which the usual green colour was replaced by a rich yellowish brown; it was in bred condition.—Mr. Kaye, an extremely light form of *Boarmia abietaria*, bred from a Box Hill larva. It was noted that this species was generally much darker now than years ago in that locality, but none were as light as the specimen shown.—Mr. Step, a larva of the New Zealand "vegetable caterpillar" *Hepialus virescens*, and the fungus *Cordiceps robertsii*, which atttacked it.—Mr. West (Greenwich), the following Hemiptera: *Drymus sylvestris* var. *ryei*, uncommon, under dead leaves; *D. pilicornis*, very local; and *Berytus crassipes*, rare, under stones; all from Box Hill.—The remainder of the meeting was devoted to an exhibition of lantern slides by the members, illustrating animals and plants in nature, protective resemblance in insects, curious abnormal growths, our British heaths, microscopic life, insect metamorphoses, and views taken during the field meetings.

November 9th, 1905.—The President in the chair.—Mr. Stonell exhibited, (1) a selected series of *Heliophobus hispidus* to show the very small variation in British specimens; (2) a long series of *Tæniocampa gothica* and its var. *gothicina*, extremely varied, some of the latter form having the "gothica" mark obsolete; (3) *Callimorpha dominula*, with yellow hind wings: (4) *Ægeria* (*Sesia*) *tabaniformis*, from the Gregson

collection; (5) extremely dark forms of *Agrotis nigricans*; and (6) a melanic *Larentia multistrigaria*.—Mr. Moore, a collection of Orthoptera from South Africa.—Messrs. Harrison and Main, a short series of *Acidalia aversata* bred from a female taken at Bude. Six were reddish and banded like the parent, five were ordinary putty-coloured, four with no band, one with a very dark band.—Mr. R. Adkin, (1) specimens of *Pararge egeria* from Shaldon, September 21st, 1905, one of which was extremely dark, compared with others taken at the same time; (2) a series of *Dryobota* (*Hadena*) *protea*, reared from ova; he read notes on the breeding and habits of the larvæ.—Mr. Main, pupa cases of *Pyrameis atalanta* and *P. cardui*, and also pupæ of *Pieris napi* showing great variation in the number and intensity of the black markings.—Mr. Goulton, a box of insects he was presenting to the Society's collections, including a series of *Geometra vernaria*.—Mr. Rayward, a very fine series of bred *Polyommatus bellargus* from Reigate, and contributed notes.—Mr. Scourfield, F.R.M.S., then gave an address on "Mendel's Law of Heredity," and exhibited specimens and diagrams in illustration of his remarks.—Hy. J. Turner, *Hon. Rep. Secretary.*

City of London Entomological Society.—*October 3rd*, 1905.—The President in the chair.—Rev. C. R. N. Burrows, a series of *C. punctaria* bred from ova laid by Brentwood female.—Mr. J. A. Clark, *G. obscurata* taken at Folkestone during first week in August, of somewhat dark coloration for chalk district.—Mr. Heath, one *L. albipuncta* from Sandown, Isle of Wight, September 7th, 1905; a series of *C. ferrugata* bred from Eynsford female; and a series of *L. deplana* from Box Hill.—Mr. E. Harris, a beetle found under the bark of a log of Gold Coast mahogany, also larvæ found in the same log; both unidentified.—Mr. Harrison, *C. davus* from Cheshire and Isle of Lewis; those from the latter locality were paler generally, and had the white cilia much more accentuated than the Cheshire specimens.—Mr. Pickett, a long series of *C. dominula* bred from Deal larvæ, the brood producing seventy-four females and eighty-six males; also two examples of *S. hyperanthus* var. *arete*, Folkestone, July 15th, 1905; and a male *S. ianira*, in which the usual bright brown area on both the upper and lower wings was replaced by a creamy shade.—Mr. Kaye also exhibited *C. dominula*.—Mr. Prout, a short series of *N. neurica* from the East Kent marshes, including four examples of the black var. *hessii*, which is not known to occur in the Norfolk Broads, where this species is plentiful.—Mr. Riches, *C. porcellus* bred from Eastbourne larvæ, and *A. aceris* from Hornsey, including a very dark specimen.—Mr. Shaw, *C. propugnata*, second brood from Eynsford ova, which emerged on July 29th and 30th, 1905.—Mr. Bacot stated that an escaped larva of *E. cardamines* that had "spun up" on a dark chair-leg in a corner of a room had produced a very dark pupa.

October 17th.—The President in the chair.—New member: Mr. Edelsten proposed, and Mr. Prout seconded, Mr. E. A. Bowles.—Mr. Bell, a series of *H. actæon* taken at Swanage on July 21st, when the insect was abundant.—Mr. Benton, two specimens of *C. pamphilus*, Purley, June, 1905, one with marginal band very deep and dark, and the other with ocellus on under side of one wing almost obsolete; also two

A. filipendulæ, each with one under wing partially bleached, and an example of *S. hyperanthus* with one upper wing in a similar condition. —Rev. C. R. N. Burrows, seven pupæ of *P. machaon* reared from ova; of these, five, having pupated on carrot stems, were pale green, while the remaining two, one of which pupated on glass, and the other on muslin, were dark grey in colour: also three cocoons of *C. furcula* on three different woods, each closely resembling its base. The exhibitor pointed out that in the latter case the protective coloration was obviously produced mechanically.—Mr. Edelsten, a long series of *C. russata* bred from ova laid by a typical female taken in the Norfolk Broads; the specimens ranged from the type through var. *comma-notata* to var. *perfuscata*, with many fine intermediate forms; also *N. plecta*, from South Devon, with the usual pale costal streak suffused with the ground colour; and from Norfolk, with this streak very prominent. — Mr. Kaye, a fine series of *C. elpenor* bred from larvæ taken near Basingstoke Canal; although it is generally stated that this larva will not accept a change of food-plant, Mr. Kaye, having found the larvæ on yellow balsam, had no difficulty in feeding them up on willow-herb.— Mr. Mera, *A. sinuata* from Cambridge. — Mr. Pickett, *P. phlæas* from Dover, August, 1905, with spots on hind wings elongated so that they coalesced with the marginal band; also *B. perla* from Torquay, Folkestone, and Southend, those from the latter locality having the orbicular and reniform very strongly marked.—Mr. Riches, *G. smaragdaria*, bred, from Essex marshes, including a specimen with the two left wings much paler than the right-hand pair; also *M. fluctuata* var. *costovata* from Hornsey.—Mr. Shaw, *A. lucernea* taken at valerian at Torquay on July 18th, and a larva of *Œnophila v-flavum* mounted for the microscope.—Mr. Harris stated that the beetle exhibited by him at the previous meeting was *Cordylomera suturalis*.—Mr. Kaye reported the capture of one *X. semibrunnea* at ivy near Leatherhead.—S. T. Bell, *Hon. Sec.*

Duplicates and Desiderata.—We always desire that those of our readers, who wish to do so, should have full opportunity of making known their requirements through the medium of our "Exchange" pages. Of late years, however, it seems to have become usual to reserve the majority of such notices for the last four months of the year. To find room for the large number of these lists, sometimes received, it has occasionally been necessary to curtail some of the more lengthy of them. May we venture to suggest that it would be a convenience all round if lists for the "Exchange" could, during the period mentioned at least, be condensed into about six lines each? Please note that lists for the "Exchange" should be sent in on or before the 25th of each month, and should *not* at any time be crowded on a postcard.

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WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.
W. LUCAS DISTANT, F.E.S., &c.
EDWARD A. FITCH, F.L.S., F.E.S.
F. W. FROHAWK, F.E.S.
MARTIN JACOBY, F.E.S.
W. F. KIRBY, F.L.S., F.E.S.
G. W. KIRKALDY, F.E.S.
W. J. LUCAS, B.A., F.E.S.
Dr. D. SHARP, F.R.S., F.E.S., &c.
G. H. VERRALL, F.E.S.

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THE ENTOMOLOGIST

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DESCRIPTIONS OF SOME NEW GENERA AND SPECIES OF PHYTOPHAGOUS COLEOPTERA FROM NEW GUINEA.

BY MARTIN JACOBY, F.E.S.

AMONG the specimens obtained by Mr. A. S. Meek in a comparatively unknown region of New Guinea just behind that part claimed by Germany, and received by Mr. O. Janson, some very interesting new forms are contained, the more conspicuous and remarkable of which I give the descriptions here.

Æsernia Meeki, sp. n.

Metallic purplish or greenish, the antennæ and tarsi bluish-black, last abdominal segments flavous; thorax impunctate, deeply foveolately excavated at the sides, cupreous; elytra deeply punctate-striate and longitudinally costate anteriorly, this portion purplish, posterior half finely punctured, smooth, flavous. Length, 20 mill.

Head metallic green, with a deep central groove, a few punctures are placed near the eyes, the rest impunctate; in front of the clypeus is a deep depression or fovea; antennæ bluish-black, extending to about the middle of the elytra, third and the following two joints of equal length, terminal joints more elongate and slender. Thorax scarcely twice as broad as long, the sides straight, the anterior angles pointed and produced, the disc with a deep longitudinal central groove, cupreous, the sides deeply excavated and foveolate, some of the foveæ extending nearly to the middle of the disc, the latter itself impunctate; scutellum rounded, metallic green, with a small fovea at the apex. Elytra with the middle portion strongly but gradually raised, the sides with a deeper transverse depression before the middle and a smaller one at the latter place, strongly longitudinally costate anteriorly, the striæ between the costæ more or less strongly and closely punctured, the costate portion metallic green, the posterior half of the elytra flavous, finely punctured, and flat; below and the legs metallic green, the last three abdominal segments flavous.

Hab. Owgarra, New Guinea (A. S. Meek).

At once distinguished from any of its allies by the partly costate, partly smooth elytra. Each of these has about eleven round costa (counting the short subsutural one); the interstices are deep and narrow, excepting the last, in which two or three much broader, elongate, deep grooves separate the costa from the lateral margins. *A. formosa*, Gestro, has almost similarly sculptured elytra, but these have a flavous transverse band below the middle, and the apex is metallic green, like the rest of the surface.

Æsernia costata, sp. n.

Blackish, the femora and tibiæ flavous; thorax deeply foveolate at the sides, impunctate; elytra with numerous highly-raised, partly-connected longitudinal costæ, black, the apical third portion flavous, finely punctured. Length, 20 mill.

Head impunctate, black, deeply foveolate between the eyes; antennæ black, the fourth joint about one-half longer than the third, following joints not longer. Thorax of the same shape as in *A. Meeki*, but somewhat more elongate, the anterior margin deeply concave, entirely impunctate, the disc without a central groove, the sides deeply longitudinally excavate, the excavation irregularly foveolate, another single fovea is also placed near the base at each side; scutellum ovate, impunctate. Elytra with their greatest convexity rather before the middle, with three transverse depressions at the sides, the first of them the deepest, the anterior two-thirds very strongly longitudinally costate, the costæ sometimes transversely connected and separated at the sides by deep elongate foveæ, the apical third portion flavous, finely punctured, with an arrangement of rows here and there. Below bluish-black, the last two abdominal segments flavous; legs elongate and slender, flavous, the tarsi black.

Hab. Owgarra, New Guinea (A. S. Meek).

Quite distinct from *A. Meeki* in the much more pronounced and longer elytral costæ and their foveolate interstices, in the differently sculptured thorax, and the general coloration.

Palæosastra, gen. nov.

Elongate, subcylindrical, and robust, the head short and broad, antennæ very long and slender, extending to the apex of the elytra, the basal joint elongate, club-shaped, the second small, the third more than twice as long, the others very elongate, slightly curved, the apex of each produced. Thorax short and transverse, twice as broad as long, the sides nearly straight, posterior margin oblique near the angles, the disc with a lateral and basal depression. Scutellum broad. Elytra wider at the base than the thorax, broad and elongate, slightly widened posteriorly, closely punctured, their epipleuræ narrow and gradually disappearing below the middle. Legs long and slender, the tibiæ not sulcate, all armed with a long spine, the metatarsus of the posterior legs longer than the following joints together, claws appendiculate: prosternum invisible between the highly-raised coxæ, the anterior cotyloid cavities open.

This genus has most of the structural characters of the

Luperinæ of Chapuis' arrangement, but is altogether of entirely different aspect and shape, being broad, robust, and elongate, somewhat of the shape of some species of *Oides*. The extremely long antennæ, very slender and elongate legs, shape of the thorax, and the peculiar subæneous coloration will at once distinguish the genus from any of the tribe Galerucinæ.

Palæosastra gracilicornis, sp. n.

Obscure æneous, the antennæ, tibiæ, and tarsi and the abdomen black, lower portion of the femora fulvous; thorax closely punctured; elytra fuscous-æneous, extremely closely and finely punctured. Length, 16 mill.

Head impunctate, the vertex rather convex, frontal elevations elongate, trigonate, clypeus broad, rugosely punctured, eyes large, oblong, antennæ black, extremely long and slender; the third joint more strongly curved at the apex than the following ones. Thorax with the angles produced, subtuberculiform, the space in front of the posterior angles thickened, the surface distinctly and closely punctured, the sides with a round fovea, the base with a broader, more shallow depression. Scutellum punctured. Elytra much wider at the base than the thorax, the shoulders rounded, the entire surface very closely punctured, the punctures scarcely finer than those of the thorax, except towards the apex. The breast obscure metallic, like the elytra, abdomen blackish. Legs long, thin and slender, femora fulvous, their apex and the tibiæ and tarsi black.

Hab. Owgarra, New Guinea (A. S. Meek).

Papuania, gen. nov.

Oblong-ovate, strongly convex and widened posteriorly, antennæ long and filiform, the second joint short, the third slightly shorter than the fourth, the following joints equal. Thorax subquadrate, strongly constricted at the base, transversely sulcate. Scutellum slightly longer than broad, convex. Elytra much wider at the base than the thorax, deeply transversely depressed anteriorly, the posterior portion strongly widened and convex, their epipleuræ broad at the base, entirely disappearing below the middle. Legs long and slender, the tibiæ unarmed, the metatarsus as long as the following three joints together, claws bifid; prosternum invisible between the coxæ, the anterior cotyloid cavities closed.

The genus proposed here for the reception of this insect has very much the appearance of the Indian genus Agetocera in regard to the thorax and the elytra, but the very long and slender antennæ, unarmed tibiæ, and the structure of the elytral epipleuræ, as well as that of the anterior cotyloid cavities, differ entirely from the last-named genus, and do not fit in any group of Chapuis' arrangement of genera.

Papuania impressipennis, sp. n.

Fulvous, the antennæ (the basal joints excepted), the breast and legs black; thorax impunctate; elytra metallic greenish-blue, deeply

depressed below the base, strongly convex posteriorly, finely and closely punctured; abdomen rufous. Length, 12 mill.

Head about as long as broad, impunctate, transversely grooved between the eyes, the latter rather small, frontal elevations distinct, trigonate, clypeus strongly convex, triangular, palpi with the penultimate joint thickened; antennæ long and slender, black, the lower three joints fulvous. Thorax slightly wider than long, the basal portion strongly narrowed, its sides straight, but rather strongly and suddenly widened towards the apex, the disc with a transverse sulcus at the middle, which is deeply impressed at the sides but shallow at the centre, the surface entirely impunctate. Scutellum black. Elytra metallic greenish or blue, deeply transversely depressed below the base, the depression bounded at the sides by a longitudinal ridge, the punctures more strongly marked within the cavity and at the sides than at the rest of the disc. Legs black; abdomen reddish-fulvous, the last segment in the male, incised at each side, the median lobe excavated, not broader than long, the corresponding segment in the female entire, obtusely rounded.

Hab. Owgarra, New Guinea (A. S. Meek).

THE INSECTS OF THE NORTH CORNISH COAST.

By A. E. Gibbs, F.L.S.

Those who have read Mr. Baring Gould's novel 'In the Roar of the Sea' will be familiar with the name of Polzeath, the little hamlet on the River Camel, where the heroine of the story lived. From a perusal of this interesting work of fiction can be gained an idea of the wild and rocky nature of the coast-line which guards the land from the fury of the Atlantic breakers. Nestling at the head of a sandy cove called Hayle Bay, at the foot of hills which shield it from the fury of the winter storms, Polzeath in summer is a delightful spot at which to spend a holiday. To the north-west, at the mouth of the river, rises the mighty headland of Pentire, while on the other side of the water the steep cliffs of the Stepper are seen, and beyond them is the fine promontory of Trevose, crowned with a lighthouse. A building estate is being laid out on the cliffs at Pentireglaze, where half a dozen convenient houses have been erected. Polzeath is a veritable naturalist's paradise, miles away from the nearest station, and here, during the summer of 1905, I settled for a few weeks' insect hunting. The South-Western express from Waterloo landed us at Wadebridge about five o'clock in the afternoon of July 1st, and it was nearly two hours later when, after a drive which despite the rain proved very interesting, we reached our destination. The large box containing our entomological apparatus, tins of syrup for treacling (for it was necessary to remember that we were six or seven miles from the nearest shop), and

other necessary impedimenta, had arrived safely by the carrier's 'bus which travels to and fro from Wadebridge three times a week; so, relieved of anxiety on that score, we set out to view the land. But the rain continued to fall, and darkness set in early, and we had to abandon the idea of spreading the alluring sweets. The weather had improved by the next morning, but everything was still very wet, and no Lepidoptera were to be met with. The wild parsley which grows abundantly on many of the stone walls was, however, being visited by Diptera, *Leptogaster cylindrica*, *Chrysotoxum elegans*, and *C. festiva* being specially noticeable. Close by our house a pretty little bay called Pentire Haven ran inland, and from its head a cart-track had been constructed along the hill-side. A tiny stream trickled down the valley, and by its side a small enclosure had been planted with oats. A convenient row of posts was discovered between the field and the road, and these afforded a most welcome spread for our treacle patches. The large heads of various umbelliferous flowers, and, later on, the abundant clumps of ragwort, also proved very useful for sugaring purposes. It was with some anxiety we spread the treacle, wondering what these bare, treeless, wind-swept rocks would yield; but all doubts were quickly set at rest. As soon as the light of the lantern was thrown on the first post we were delighted to see that it was covered with moths struggling for places, and crowding round every runnel and splash of treacle. *Agrotis exclamationis* was there in its thousands, with a fair sprinkling of *Axilia putris*, *Agrotis corticea*, *Noctua plecta*, and *Acronycta rumicis*, and, above all, *Agrotis lunigera*. Never having taken this last-named insect before, the presence of beautifully fresh specimens of both sexes afforded us much pleasure. It is generally stated that *A. lunigera* is only to be taken on steep and dangerous cliffs, in places where sugaring is by no means a safe occupation; but its abundance at Polzeath showed that this is not invariably the case. Here it was found on posts and flower-heads in the valley at some distance from the seashore, and so abundantly did it occur, that one evening's work yielded upwards of fifty specimens. A long and very varied series was the result of the month's collecting, enabling us not only to enrich our own cabinet, but to supply correspondents as well. At dusk *A. lunigera* is to be taken on the wing on the steep hill-sides, flying over woodsage (*Teucrium scorodonia*), which grows luxuriantly hereabouts, and whose blossoms are very attractive to insects. On July 6th *A. lucernea* was taken in the net, only one other specimen of this insect being seen during our visit, and that one came to light in the house. We worked hard at bloom of *Silene maritima* for *Dianthœcia barrettii*, which surely ought to occur at Polzeath, but our efforts were not successful. Most of the sugaring was done in the little valley, visits to more distant spots proving less remunerative.

At the end of Hayle Bay, beyond the village of Polzeath, a small wood clothed the steep side of the valley, and, as there were practically no other trees in the neighbourhood, we concluded that here we should do our best work; so on July 5th, which was a very promising evening, in company with Mr. P. J. Barraud, of Bushey Heath, who was staying with me, I visited the spot, and sugared with great hopes of success; but the only insect which rewarded our exertions was a very light coloured specimen of *Aplecta nebulosa*. A second visit to this locality at the end of the month proved equally unremunerative. About the end of the first week of July *Lithosia complana* began to appear, and a short series was secured, but it was soon over, its place being taken by *L. lurideola*. *L. complana* was taken at sugar, principally in the heads of ragwort, and also while dusking on the hillside; but this latter method of work proved very trying on account of the steep and broken nature of the ground, which resulted in not a few tumbles and much practical acquaintance with the business ends of the spines of *Ulex europæus*.

As the month advanced *Triphæna interjecta* and *Caradrina taraxaci* became two of the commonest insects, frequenting chiefly the sugared heads of ragwort, and, in the case of the latter species, the flowers of woodsage. An occasional specimen of *Bryophila muralis* was taken on the posts, but diligent search in the daytime on rocks and walls failed to reveal its presence, the only specimens seen being at sugar. As July wore on *Agrotis exclamationis*, of which one or two nice varieties had been captured, gave way in point of numbers to *Apamea didyma* in great variety; but during the second half of the month sugaring was much less effective than was the case at first, the wonderful abundance of Noctuæ on those early nights being a thing to be long remembered.

Not very much was accomplished among the Lepidoptera in the daytime. *Pararge egeria* was to be seen during the first week in worn condition, but when, at the beginning of September, I returned to Polzeath for a few days, the second brood was flying, and in fine condition; but unfortunately I then had no net, and so could not secure a series. Other abundant day-flyers were *Vanessa io*, *V. atalanta*, and *Pararge megæra*. A worn pair of *Sesia musciformis* were secured on July 4th, and a third specimen was taken by Mr. Barraud on the 7th. The sea-thrift (*Armeria vulgaris*), which it frequents, is very common, and doubtless the insect might be taken abundantly in June.

Some little work was done in other orders. Odonata were represented by *Sympetrum striolatum* (abundant), *Ischnura elegans*, *Libellula depressa*, *Cordulegaster annulatus*, and *Calopteryx virgo*. Among the Aculeates may be mentioned *Odynerus parietinum*, *O. trifasciatus*, *Cœloxys acuminata*, *Cerceris arenaria*, *Ammophila sabulosa*, *Crabro vagus*, *C. cibrarius* (plentiful at

bramble-flowers on the sand-hills at St. Enodoc), and *Panurgus ursinus*. The sawflies included *Allanthus scrophulariæ, Selandria serva*, and *Abia sericea*. The great green grasshopper (*Phasgonura viridissima*) was frequently seen, coming to sugar in its immature stage during the first half of our visit, and again later on as a perfect insect.

Diptera were most plentiful round the little wood already referred to, and in the boggy meadows immediately below it. Here *Asilus crabroniformis, Dysmachus trigonus, Anthrax paniscus, Volucella bombylans, Eristalis intricarius*, and *Mesembrina meridiana* were taken, while *Chrysops cæcutiens* and *Hematopota pluvialis* made work anything but pleasant, especially for my companion, who was much troubled by their unwelcome attentions. Of the last named species one male was secured by sweeping, which may be worth recording, for common as the females are, the males are not so often met with. I took a male in the same way last year in Lincolnshire.

The following is the list of the Lepidoptera taken at Polzeath :—

Rhopalocera.—*Pieris brassicæ, P. rapæ, P. napi, Argynnis paphia, Vanessa io, V. atalanta, Pararge egeria, P. megæra, Epinephele ianira, E. tithonus, Aphantopus hyperanthus, Cœnonympha pamphilus, Polyommatus phlæas, Lycæna icarus, Hesperia thaumas, H. sylvanus.*

Heterocera.—*Sesia musciformis, Zygæna filipendulæ, Lithosia lurideola, L. complana, Euchelia jacobææ, Lasiocampa quercus, Thyatira derasa, T. batis, Bryophila muralis, Acronycta (?) psi, A. rumicis, Leucania conigera, L. lithargyria, L. comma, L. impura, L. pallens, Axylia putris, Xylophasia lithoxylea, X. monoglypha, Neuria reticulata, Mamestra brassicæ, Apamea didyma, Miana strigilis, M. fasciuncula, M. literosa, M. bicoloria, Caradrina morpheus, C. alsines, C. taraxaci, C. quadripunctata, Agrotis puta, A. suffusa, A. segetum, A. lunigera, A. exclamationis, A. corticea, A. nigricans, A. tritici, A. lucernea, Noctua plecta, N. c-nigrum, N. festiva, N. rubi, Triphæna interjecta, T. orbona, T. pronuba, Amphipyra tragopogonis, Euplexia lucipara, Phlogophora meticulosa, Aplecta nebulosa, Hadena adusta, H. dentina, H. oleracea, H. pisi, Cucullia umbratica, Gonoptera libatrix, Plusia chrysitis, P. gamma, Chariclea umbra, Hypena proboscidalis, Uropteryx sambucaria, Epione apiciaria, Crocallis elinguaria, Gnophos obscuraria, Pseudoterpna pruinata, Hemithea strigata, Acidalia dimidiata, A. dilutaria, A. marginepunctata, A. remutaria, A. imitaria, A. aversata, Abraxas grossulariata, Emmelesia alchemillata, E. decolorata, Eupithecia oblongata, E. absinthiata, E. pumilata, Melanthia ocellata, Melanippe rivata, Anticlea rubidata, Coremia ferrugata, C. unidentaria, Camptogramma bilineata, Eubolia limitata, Cledeobia angustalis, Aglossa pinguinalis, Scoparia dubitalis, S. mercurella, Nemeophila noctuella, Pyrausta purpuralis, Herbula cespitalis, Ebulea crocealis, Stenia punctalis, Œdematophorus lithodactylus, Homœosoma binævella, Phycis subornatella, Apomia sociella, Aspis udmanniana, Trycheris aurana, Xanthosetia hamana, Argyrolepia badiana, Blabophanes rusticella, Depressaria costana, D. arenella, D. alstrœmeriana, D. yeatiana, D. applana, D. badiella, Œcophora lambdella.*

PREOCCUPIED GENERIC NAMES IN THE HOMOPTEROUS FAMILY FULGORIDÆ.

By W. L. Distant.

In working out the Indian Fulgoridæ for my third volume on the Rhynchota of British India, I have been compelled to propose new names for some genera which bear names previously used in zoology. As these are not yet published, it is perhaps better to detail them at once, lest other substitutions should be made, and further synonymy be created:—

Vekunta, n. nom.
Temesa, Melich., Hom. Faun. Ceylon, p. 40 (1903).—Moll.

Kinnara, n. nom.
Pleroma, Melich., Hom. Faun. Ceylon, p. 41 (1903).—Spong. and Ins.

Vinata, n. nom.
Erana, Walk., J. Linn. Soc. Zool. i. p. 151 (1857).—Aves.

EPIBLEMA IMMUNDANA, F. R.

By Eustace R. Bankes, M.A., F.E.S.

Referring to my remarks on *Epiblema immundana* (Entom. xxxviii. 311–12), I have just come across an interesting note by Mr. A. Balding in Ent. Mo. Mag. xxi. 276 (1885), in which he says that he bred this species in April from larvæ collected—evidently in the Wisbech district—in catkins (of alder; see Ent. Mo. Mag. xxi. 206) in the previous November, some of the larvæ having pupated during November, and others in the end of January. This proves that the eggs laid by the second-brood moths hatch out in the autumn, as stated by Sorhagen (Kleinschmet. d. M. Brandenburg, 112), but I imagine that such early pupation is abnormal, for even in this mild climate larvæ are obtainable in plenty, in catkins of alder, in the end of February and beginning of March.

Mr. Balding (Ent. Mo. Mag. xxi. 276) incidentally mentions that two out of his last five first-brood moths were "devoid of the white blotch" (the omission of any such note about the first two makes it probable that they *had* the white blotch), thus showing that the typical white-blotched form, for which Mr. Thurnall has looked in vain in the first generation, outnumbered the dark-blotched var. *estreyeriana*, Gn. In my own experience of the early brood (see Entom. xxxviii. p. 311) the latter slightly outnumbered the former.

Norden, Corfe Castle: Dec. 12th, 1905.

LEPIDOPTERA IN EAST SUFFOLK, 1905.

By Rev. A. P. Waller, B.A.

I have headed my notes "Lepidoptera in East Suffolk," but in reality my observations, with few exceptions, have been confined to a small district situated near Woodbridge, and in close proximity to the tidal waters of the River Deben. The past season in this restricted locality, which I have now worked regularly for six years, and on and off for a much longer period, has been marked by the entire absence of many species I usually expect to see, and by the occurrence of several insects which are quite new to me. Additions to my local list were *Hepialus sylvanus*, *Euchelia jacobææ* (imagines and larvæ), *Biston hirtaria*, *Noctua baia*, *Tethea subtusa*, *Cleora lichenaria*, *Chesias rufata* (1), *Herminia cribralis*, *Schœnobius mucronellus*, &c. The absentees included *Vanessa polychloros* (always uncertain as to numbers, but generally occurring), *Thecla rubi* (sometimes abundant), *Mamestra anceps*, *Apamea basilinea*, *A. gemina*, *Grammesia trigrammica*, *Agrotis saucia*, *Noctua festiva*, *Aplecta advena* (often plentiful), *Mania typica*, &c. I have seen neither *Colias edusa* nor *Sphinx convolvuli*, and I do not remember noticing *Vanessa cardui*, whilst only one pupa of *Acherontia atropos* has been brought to me from the potato fields.

Referring to my diary, I see the first note I have is the appearance, on March 1st, of *Hybernia rupicapraria* and *H. marginaria* at light. Later in the month the common Tæniocampids came freely to sugar. I had no sallows within a mile or more of my house and so, one evening, having procured a bundle of sallow-bloom, I placed it about my garden. Moths came to this in some plenty, whilst the sugar, which the previous night had been well tenanted, was entirely deserted. Atmospheric conditions may have had something to do with it, as the night was colder, and the sugar-patches more exposed to the wind; but the preference for the sallow was certainly very interesting to notice.

Nothing of much note occurred in April. A few larvæ of *Ellopia fasciaria* and *Thera firmata*, with numerous *T. variata*, were beaten from Scotch fir, and a score or more *Cirrhœdia xerampelina* from ash. On April 12th I boxed a fine specimen of *Nola cristulalis* from a tree-trunk, a much earlier date than I have taken it before. During May I did very little collecting, but at the latter end of the month I noticed *Eupœcilia vectisana* flying freely amongst armeria on the saltings; and I secured a single example of *Epichnopteryx reticella*, which species I first recorded for this county in 1903. This insect seems to be extending its range northward, for I hear that it has been taken this year near Southwold. June in the early days was not very eventful, with the exception of seeing *Euchelia jacobææ*, *Adela degeerella*,

and *Heliaca tenebrata*, the two former both new to me here, and the latter only observed once before. On the 16th I made a journey beyond my usual district, to the sea-coast a little to the north of Felixstowe, Mr. G. P. Hope having informed me that the larvæ of *Malacosoma* (*Bombyx*) *castrensis* were to be found in large numbers, as also the imagines of *Setinia irrorella* just emerging and in fine condition. This latter I failed to discover in the short time at my disposal, but the larvæ of *M. castrensis* were in immense quantities, feeding on *Plantago maritima*. One might have taken many hundreds of nearly full-grown caterpillars, not to mention webs of those in the earlier stages of growth. Out of about a hundred which I brought home some suffered from the journey, but a good proportion fed up well on apple-leaves sprinkled, as Newman suggests, with salt and water. They also fed on chrysanthemums, but seemed to prefer apple. The result was a nice and variable series of some forty moths, two-thirds of which were males. Both *M. castrensis* and *Setinia irrorella* are very interesting insects for this county, as I believe there has been only about one record of their occurrence during many years past. The end of June brought various geometers, of which I may mention *Acidalia trigeminata* (this species is much commoner and of more regular occurrence than *A. bisetata*, which I did not observe at all), *Coremia quadrifasciaria* (a few, usually scarce, but occurred last year in some plenty), *Melanippe unangulata* (I have not seen this for some years), *Phibalapteryx tersata*, *P. vitalbata* (rare here), *Cidaria picata*, &c. *Scoparia basistrigalis* was common both at light, in my trap, and at rest on tree-trunks, and *Agdistis bennettii* and *Schœnobius mucronellus* were taken in the light-trap. In seed-pods of the common yellow flag (*Iris*) I found a few larvæ of *Tortrix costana*, and also two small strawberry-coloured larvæ which I have been unable to identify, and which unfortunately escaped. Dusking by the reed-beds and near the river, *Acidalia emutaria* and *Herminia cribralis* (five) were netted, and two beautiful specimens of *Senta maritima* var. *wismariensis*. Subsequent work in July produced a fine series of *S. maritima*, including varieties—*nigro-striata* and *bipunctata*. Dusking by the reeds in July also rewarded me with long series of *Leucania straminea*, *Calamia phragmitidis*, *Nudaria senex*, and *Chilo phragmitellus*. *L. straminea* was on the wing until quite the latter end of the month, and the later specimens were in much better condition than those which I captured earlier. This species flies most freely on a windy evening, which of course makes netting it a matter of some difficulty. On July 4th, as I have already recorded in the August number of the 'Entomologist,' *Leucania favicolor* flew into my room, attracted by the light. This specimen is the typical buff form. On July 20th a second came to sugar, the golden yellowish form var. *lutea*, Tutt. On the 27th and 28th I

secured two more at sugar, both these being the red form var. *rufa*, Tutt. Unfortunately these last, which I took on sugared flowers of dock, are not in very good condition. I remember it was on sugared dock that I captured two or three of the red form in 1901, though at the time I supposed them to be a variety of *L. pallens*. Here, I may say, I have to thank Mr. Gervase Mathew, R.N., for most kindly allowing me to see his unique series of this interesting insect, and also for confirming the identity of my own.

Towards the end of July sugar began to attract moths in large numbers, but, with a few bright exceptions, the better noctuids were wanting. A thing that always strikes me is that each season one or two species seem especially to assert themselves. Last year, for instance, the three Plusiids *chrysites*, *iota*, and *gamma* appeared in unusual quantities. I shall not easily forget how the last-named swarmed one evening in early June at the flowers of sweet rocket. The wind suddenly veered round from east to west, and as suddenly my garden seemed alive with *P. gamma*, where, half an hour before, not one was to be seen. This year I have been interested in the abundance of *Hydræcia nictitans* and *Agrotis tritici*, neither of them, as a rule, common insects here. Both came in profusion to light and sugar. I had no idea before that *H. nictitans* was such a variable insect; a long series included var. *paludis* and many other nice forms. During the early part of August I was away from home, and when I returned, though sugar still proved attractive, nothing of any special note turned up. There was a very large second brood of *Leucania pallens* out, so I worked hard, hoping for some more *L. favicolor*, but with no success. In September I had little or no leisure, as I was busy changing my residence. On the 29th a specimen of *Vanessa antiopa* was brought to me, this I have already recorded. The cold winds of October were not very enticing, so that autumn collecting was more or less of a failure.

I do not know what verdict other entomologists will pronounce upon the season 1905, good or bad. I am content to call it a very interesting one.

Waldringfield Rectory, Woodbridge.

PHALONIA BADIANA, Hb.

By Eustace R. Bankes, M.A., F.E.S.

I have no doubt that Mr. Thurnall's suggestion (Entom. xxxviii. 309–10), that Sorhagen (Kleinschmet. d. M. Brandenburg, 86) erroneously attributed Machin's statement about *P. badiana* (Entom. vi. 283) to "Maling," owing to notes by both writers having appeared on the same page, is correct. The

mistake may have arisen, as he thinks likely, from confusion between the two somewhat similar names, but it seems to me still more probable that Sorhagen entirely overlooked Machin's name, which is given without address or date and in a singularly inconspicuous position, and, at a cursory glance, took the whole page as a contribution from Maling, whose name and address are printed at the foot of it. It occurred to me some time ago that Sorhagen must have written "Maling" for "Machin," and a footnote to my paper was penned to this effect, but having only in mind Machin's later note (Entom. xx. 110–11), which proved to have been published the year *after* Sorhagen's work, I had no explanation to offer of how such a mistake could have arisen, and substituted the footnote, published in Entom. xxxviii. 276, for the original one.

Norden, Corfe Castle: Dec. 11th, 1905.

DESCRIPTION OF A NEW FIJIAN SPECIES OF CICADIDÆ.

By W. L. Distant.

Subfam. Cicadinæ.

Div. Dundubiaria.

Little is known of the Cicadidæ found on these islands, but from what little is known, the species are large and distinct. More than twenty years ago I described two species from the Fijis, and have not seen another specimen from the islands save the two which prompt this note.

Sawda ? vitiensis, sp. n.

♀. Head and pronotum ochraceous; front of head with a central line more broadly bifurcating anteriorly, pale castaneous; area of the ocelli piceous-black; pronotum with the anterior margin and the fissures pale castaneous, and with a central fascia only denoted by its darker margins, which are more defined posteriorly; mesonotum piceous-brown, the lateral margins and two discal fasciate lines ochraceous, four obconical spots only denoted by their darker margins, of which the two central are shortest; abdomen above piceous-brown, its base and lateral areas transversely palely pilose; body beneath and legs ochraceous; base and apex of face, and bases and apices of femora and tibiæ, brownish or piceous; tegmina and wings hyaline, the venation ochraceous, becoming piceous towards apical areas, tegmina with the costal membrane brownish ochraceous, basal venation of the upper ulnar area pale ochraceous, transverse veins at bases of second, third, fourth, fifth, and seventh apical areas infuscated, and a series of small

fuscous spots at apices of longitudinal veins to apical areas; head as long as breadth between eyes, and including eyes much narrower than base of mesonotum, anterior margins of vertex of head almost at right angles to front; greatest breadth of tegmina about one-third of length. Long. excl. tegm., ♀, 37 millim.; exp. tegm., 125 millim.

Hab. Fiji Islands (Crowley Bequest, Brit. Mus.).

This description is based on two female specimens. The species conforms to all the characters of the genus *Sawda*, with the exception of the more elongate tegmina. For absolute generic identification a male example is of course necessary.

DESCRIPTION OF A NEW SPECIES OF *ODYNERUS* (*ANCISTROCERUS*) FROM THE CAPE DE VERDE ISLANDS.

By P. Cameron.

Odynerus (*Ancistrocerus*) *atlanticus*, sp. nov.

Black; almost the apical half of the clypeus, its sides above obscurely, the under side of the antennal scape, of the apex of the flagellum more obscurely, the upper basal half of the pronotum, tegulæ, the basal segment of the abdomen except a semicircular mark on the basal slope, the apical fourth of the second segment, its sides broadly at the apex, the line becoming gradually narrowed towards the base, and the legs, except the coxæ and trochanters, red. Wings hyaline, tinged with violaceous, the nervures black. ♀. Length to end of second abdominal segment, 9 mm.

St. Vincent, Cape de Verde Islands (J. J. Walker).

Basal segment of abdomen cup-shaped; its suture indistinct; the greater part of the basal two ventral segments are red. The punctuation on the first segment is fine, close, distinct; the second is finely punctured on the sides and apex; the others are more distinctly but not deeply punctured. Head closely, rugosely punctured, and thickly covered with white pubescence; the punctuation on the clypeus is wider, more scattered; it is stronger on the upper than on the lower half; the apical incision is shallow; the sides forming stout blunt teeth. The punctuation on the front runs into striations. Thorax strongly, closely punctured, and thickly covered with white pubescence; the base of pronotum transverse, the sides angled but not projecting. There are two longitudinal furrows on the apical third of the mesonotum. The upper half of the sides of the metanotum roundly project, almost forming longish rounded tubercles. The sides of the clypeus are not keeled. The first abdominal segment is larger than usual; the second is longer than its width at the apex; it is narrowed at the base, being thus clearly separated from the first. The second cubital cellule in front is as wide as the space bounded by the recurrent and

the transverse cubital nervures; both the former are received about the same distance from the latter.

Belongs to Saussure's Section iii^{e} (Vespides, i. 148), which contains three species from Madeira and the Canaries. The present species cannot well be confounded with any of them, unless it be that a large series of specimens might show that all are forms of one species, of which the present would form a well-marked race.

AN HISTORICAL NOTE ON THE PARASITISM OF CERTAIN HOMOPTERA.

By G. W. Kirkaldy.

The parasitism of certain Homoptera of the families Fulgoridæ and Tetigoniidæ (or "Jassidæ"), by Dryinids, the internal parasites being protected by a conspicuous external seed-like covering lodged beneath the lobes which develop into the tegmina, was first clearly made known by J. Mik, the Austrian dipterist,* although the first notice was as early as 1857, by E. Perris.†

In 1878, however, C. W. Dale, in his 'History of Glanvilles Wootton,' (p. 304), proposed new generic and specific names, i. e. *Homopterophagus dorsettensis*, for "a very curious black parasite about the size of a mustard-seed, adhering to the side of various species of the Homoptera where the elytra join the thorax"; this looks like a little black bag, and Dale considers that it must belong to the Acari! I have not seen recently Dale's effusion, but have extracted the above particulars from the "Arachnida" for 1878, in the 'Zoological Record' for 1879 (publ. 1881), p. 23. It refers, however, without doubt, to the larval covering of *Gonatopus*, or allied genus, though of course Dale's names have no value.

By the way, I think that British students of parasitic Hymenoptera and Diptera would be astonished at the results of captures and careful examination of nymphs and egg-cases of Fulgorids and Tetigoniids. *Try it!*

Honolulu.

* 'Zur Biologie von *Gonatopus pilosus*, Thoms. Ein hymenopterologisches Beitrag" (Wiener Ent. Zeit. i. pp. 215–21 (Sept., 1882), plate iii., in which the hymenopteron is noted as parasitic on *Deltocephalus xanthoneurus* (= *assimilis*, Fallén.)).

† "Nouvelles excursions dans les grandes Landes" (Ann. Soc. Linn. Lyon (2), iv. pp. 172–3), where *Athysanus maritimus* [= *Thamnotettix*] i stated to be parasitised by *Gonatopus pedestris*.

FOUR INTERESTING AUSTRALIAN BEES, IN THE COLLECTION OF THE BRITISH MUSEUM.

By T. D. A. Cockerell.

Gastropsis victoriæ, n. sp.

♂. Length about 15½ mm.; black, shining, and punctured; face very narrow, covered with long light yellow hair; eyes very large, converging above; ocelli very large, placed somewhat nearer to antennæ than to top of head; occipital region very little developed; antennæ ferruginous beneath, mainly black above; scape short but not very stout; first joint of flagellum slender and greatly elongated, quite as long as the next five united; last joint truncate with rounded edges, and shining beneath, the apical joints not especially swollen; anterior margin of clypeus with two shining dentiform processes, the rather wide interval between them concave; maxillary palpi six-jointed, the last three joints slender, the last linear and longer than the one before; blade of maxilla short, not as long as the palpus, with a fringe of rather long hairs at the end; labial palpi four-jointed, joints one and four of the same length, two and three equal and shorter than one, or two perhaps the shortest; paraglossæ short, broad, and rounded, subpyriform in outline; tongue short, broad, obtuse, bristly, the upper surface in the dry specimen occupied by a deep pit; malar space practically obsolete; mandibles entirely black, bidentate; mesothorax convex, with dense punctures, except on the posterior middle, where they are sparse on a shining ground; scutellum closely punctured but shining; post-scutellum large and convex; area of metathorax finely granular, triangular, with all the angles greatly produced and acute; hair of thorax yellowish white, except on hind part of mesothorax and scutellum, where it is black or fuscous; tegulæ large, rufo-piceous; wings somewhat dusky and stained with yellowish; nervures piceous, stigma obsolete; marginal cell long and narrow, slightly pointed at the end; basal nervure falling far short of transverse-medial; second submarginal cell very broad, only moderately contracted above, receiving the first r. n. before its middle; third s. m. a trifle larger than second, but not nearly so large as first, receiving the second r. n. about its middle; legs black, hairy; the anterior tibiæ, and a spot at apex of their femora, red, their tarsi also mainly ferruginous, while the outer margin of the tibiæ is blackened; middle tarsi dark red, with fuscous hair; inner face of hind tibiæ covered with a fine greyish-white tomentum; inner face of hind tarsi with reddish hair; spurs ordinary, hind margin of hind spur minutely ciliate; claws deeply bidentate; abdomen broad and convex, not at all tapering or conical, shining and punctured, hairy but not banded, nor are the hind margins of the segments pallid; the hair on first segment and basal half of second is dull white, on the others black or fuscous, except on the two last, where it is light yellow; apical plate of abdomen truncate, not bidentate.

Hab. South Australia, "70. 19." (type); Victoria, "85. 108." Both specimens have been in some liquid, so allowances must be

made for the description of the pubescence. The specimen from Victoria was collected by Mr. F. du Boulay. I have described this curious bee at some length, because I think it may form a new genus; but, in the absence of a more complete knowledge than we as yet possess of the mouth-parts of *Gastropsis pubescens*, it seems best to defer the proposal of a generic name. I have elsewhere (Canad. Entom. 1904, p. 304) stated that *Gastropsis* appears to be allied to *Meliturga*. *G. victoriæ* has many characters that remind one of *Meliturga*, but the elongated tongue and labial palpi of the latter are very different. However, it is known that among the Andrenids and Halictids allied forms may differ much in the length of the tongue and palpi, and I am not inclined to believe that the resemblances just mentioned are illusory. It is much to be desired that we should learn something about the habits of *Gastropsis*.

Anthoglossa aureotincta, n. sp.

♀. Length about 13 mm.; black, with the hind margins of the first four abdominal segments pale orange-golden, the first rather narrowly, the others broadly, and with overlapping white hairs, forming thin marginal bands. Head broad; facial quadrangle a little broader than long; antennæ entirely black, except that the flagellum may be called brown-black beneath; clypeus with very large punctures; anterior margin of clypeus and the convex labrum dark ferruginous; mandibles slender, not elbowed, bidentate, bright red in the middle; hair of sides of face, and cheeks, long and white; of region around antennæ, and occiput, tawny; mesothorax dull, minutely granular, its rather short hair fuscous-tipped, its plumosity so fine as to be visible only with the compound microscope; hair below tegulæ tawny, but lower down it is white; tegulæ dark brown, microscopically tessellate; area of metathorax with a dull subsericeous surface, which under the compound microscope is seen to be entirely covered with an exceedingly minute raised network; wings nearly clear, with light purple iridescence; stigma obsolete; nervures piceous; second s. m. broad, not greatly narrowed above, receiving the first r. n. about its middle; third s. m. very long, much longer than second, but not so long as first, and receiving the second r. n. near its end; marginal cell long, narrowly truncate; basal nervure falling a little short of t. m.; legs black, with copious hair, which has more or less of a golden tint, that on hind femora long and loose, conspicuously plumose; there is no knee-plate at base of hind tibia, but there is a more or less defined area, on which the hair is short and dark coppery fuscous; basal joints of middle and hind tarsi much broadened and flattened, the second joint also larger than usual, and heart-shaped; abdomen broad, with a sericeous surface; apical fimbria copious and pale chocolate-colour.

Hab. Perth, W. Australia (H. W. J. Turner). Closely allied to *A. sericea*, Smith, but differing in the colour of the flagellum, tegulæ, tibiæ, and tarsi, as well as the apical fimbria. These species are not very close to *A. plumata*, and they will

probably be removed from *Anthoglossa* at some later date. *Lamprocolletes venustus*, Sm., has golden abdominal bands like *A. aureotincta*, and is, I believe, congeneric with it; it may be separated by its smaller size and ferruginous scape, as also the colour of the legs. *Paracolletes marginatus*, Sm., seems also to be closely allied; it has the tibiæ and tarsi a lively red.

PROSOPISTERON, n. genus.

Small bees, similar in most respects to *Prosopis*, but with an enormous stigma, much larger than the areas of the submarginal cells combined, pointed at both ends, its apex on costal margin; body black marked with yellow (but no yellow on face), practically without hair, but margin of tubercles fringed with fine plumose pubescence, clearly visible under the compound microscope; second submarginal cell scarcely half length of first, and receiving both recurrent nervures, near its base and apex respectively; basal nervure curved, and falling a little short of transverso-medial; surface of wing with many very short black bristles; mesothorax microscopically reticulate, and with large punctures; scutellum similarly sculptured; base of metathorax microscopically reticulate, appearing dull and granular under a lens, the enclosure not distinctly defined; face fairly broad, microscopically strigulose or aciculate; anterior edge of clypeus concave; ocelli rather large, amber-colour; labrum with a truncate process; mandibles stout, simple; malar space short but distinct; antennæ quite ordinary; abdomen with a sericeous surface, the fine microscopical striæ transverse; legs quite ordinary, all the claws strongly bidentate or bifid.

Prosopisteron serotinellum, n. sp.

♀. Length about 6½ mm.; black, with the upper border of the prothorax broadly, and the tubercles, orange-yellow; abdomen slightly purplish, with a sericeous surface; antennæ long, black, the flagellum dark brownish beneath; stigma dark sepia-brown, nervures piceous or black; a dark fuscous cloud occupying nearly all of second submarginal cell and much of apical part of first; tegulæ black, shining; spurs pallid.

Hab. Queensland; "Ridg. 11. 93., 715" (Gilbert Turner). A very remarkable bee, easily known by the gigantic stigma.

Euryglossa ichneumonoides, n. sp.

♂. Length about 7 mm.; head and thorax black, legs and abdomen yellowish ferruginous; hair of head and thorax long, delicately plumose, white, except on the upper part of head and thorax, where there are some long black hairs, especially noticeable on hind part of scutellum; maxillary palpi very long and slender; antennæ very long, black, flagellum faintly brownish beneath; clypeus very shiny, with large well-separated punctures; front and mesothorax dull; tegulæ shining rufo-testaceous; wings hyaline, beautifully iridescent, the large stigma and the nervures ferruginous, the latter rather dark; second submarginal cell very large, a little longer than the first below, receiving the first r. n. a considerable distance from its base, and the

second near its apex; marginal cell pointed; basal nervure not reaching transverso-medial; femora somewhat dusky basally; abdomen with a purple lustre, and somewhat infuscated at base and apex; apical plate projecting, rounded.

Hab. W. Australia; "47. 109." At first sight one would take this for a small ichneumonid, but it is a true bee. The very large second submarginal cell is peculiar, and the species is one of several which for different reasons will be eventually removed from *Euryglossa*.

Erratum.—'Entomologist,' February, 1905, p. 37, line 16, for "it has gigantic ocelli, such as are not seen," read "it has *not* gigantic ocelli, such as *are* seen."

DESCRIPTION OF A NEW SPECIES OF ICHNEUMONIDÆ FROM CAPE COLONY.

By P. Cameron.

Asphragis ? flavo-orbitalis, sp. nov.

Rufo-testaceous; the eye orbits broadly, face, clypeus, mandibles except at the apex, where they are black, the pleuræ and the apices of the abdominal segments narrowly, yellow; the flagellum of the antennæ black; wings hyaline, the stigma testaceous, the costa and nervures black. Female. Length of body and ovipositor 5 mm.

Head smooth, the face weakly punctured, almost bare. Malar space as long as the antennal scape. Thorax closely punctured, almost bare. The mesonotum and scutellum are yellow; the former has a broad brown line down the centre of the basal half and one on the sides, commencing behind the middle and extending to the apex. Metanotum transversely punctured; there is a smooth line down the centre; the apex is smooth; behind it is bordered by a keel. First abdominal segment smooth, its apex finely closely striated; the second more strongly striated; the striæ are close and extend near to the apex; the third is minutely closely punctured; the other segments are smooth. Cerci and sheaths of ovipositor black. The recurrent nervure is received at a greater distance than the length of the transverse cubital nervure from the latter; the transverse median distinctly beyond the transverse basal; the recurrent nervure is largely bullated in front. The apical nervures in the hind wings are obsolete; the transverse median is unbroken.

This agrees fairly well, generically, with the species I have described (Trans. South African Phil. Soc. xv. p. 201) as *Asphragis ? rufipes*; but in the present species I cannot detect any pectinations on the claws. If not an *Asphragis*, there is no described genus to which it can be referred.

NOTES AND OBSERVATIONS.

Butterflies of the Pyrenees: a Correction.—In my summary of the butterflies taken last year in the Pyrenees, I mentioned that M. C. Oberthur had reported *Lycæna* var. *lycidas*, from the Lac de Gaube. My informant, M. P. Rondou, of Gèdre, has since written to tell me that the species turns out to be a new form of *L. escheri*, and not the variety of *L. zephyrus* which collectors have turned up near Berisal and in some of the lateral valleys of the Rhone, but not hitherto westward of the Central Alps.—H. Rowland-Brown; Harrow Weald, Dec. 19th, 1905.

British Butterfly Post Cards.—We have received from Mr. Walter Dannatt a series of half-a-dozen post cards upon which are printed, in colour, one or more excellent figures of British butterflies. These pictures from nature are very fine examples of what can now be done by the three-colour printing process.

Acronycta leporina var. melanocephala.—In my note in Entom. xxxviii. 289, I should have pointed out that the form of *A. leporina* met with in Lancashire and Cheshire is referable to var. *bradyporina*, Tr. In calling this the "local type" I quite overlooked the above fact. We do not get the typical *leporina*, in which the ground colour is pure white with scarcely any black dusting. The variety *melanocephala* is quite distinct, and not to be confounded with *bradyporina*; the most striking difference between them being the black thorax and darker coloration of the former.—William Mansbridge; Liverpool.

Epiblema (Phlocodes) immundana.—Referring to Mr. Bankes's note (Entom. xxxviii., p. 311), re *Epiblema immundana*, I have examined my series of the insect taken here, and find that the majority of the first brood have the dorsal blotch white or whitish. I find I have only one specimen of the August brood taken here, which I suppose indicates that it is scarce. That specimen has the blotch white.—E. F. Studd; Oxton, Exeter, Dec. 8th, 1905.

CAPTURES AND FIELD REPORTS.

Crambus fascelinellus in South Devon.—I beg to record the capture of three specimens of *Crambus fascelinellus* in South Devon. The above were identified by Mr. Bankes, and he informs me that the capture of this species in South Devon is of great interest, as it has been previously taken only on the east coast. Barrett in his Lep. Britt. Islands, vol. x., p. 108, gives its British distribution as limited to the Norfolk, Suffolk, and Essex coast. The date they were taken was August 21st, 1901. Mr. Bankes also says this is rather late for this insect.—H. M. Edelsten, F.E.S.; Forty Hill, Enfield.

SOCIETIES.

Entomological Society of London.—*November 15th*, 1905.—Mr. F. Merrifield, President, in the chair.—The decease was announced of Captain Frederick Wollaston Hutton, F.R.S., Director of the Canterbury Museum, Christchurch, New Zealand.—Mr. W. R. Dewar, Government Entomologist, Orange River Colony; Mr. William George Sheldon, of Youlgreave, South Croydon; and Mr. Francis C. Woodbridge, of Northcroft, Cornwall Road, Uxbridge, were elected Fellows of the Society.—Mr. Arrow exhibited a flower-frequenting beetle from the Transvaal, illustrating a remarkable device for the cross-fertilization of flowers, one of the front feet being tightly clasped by the curiously formed pollinia of an *Asclepias*. He remarked that he had seen no similar instance amongst Coleoptera.—Mr. W. J. Kaye showed a remarkable specimen of *Agrotis tritici*, bearing a close resemblance to *A. agathina*. It had been taken this year at Oxshott, flying over heather in company with *agathina*, and was a good example of syncryptic resemblance brought about by the common habit of resting on heather.—Mr. W. J. Lucas exhibited a specimen of *Forficula auricularia*, taken by Mr. R. A. R. Priske at Deal in September, 1905, having the left cercus normal, while the right was that of var. *forcipata*.—Dr. F. A. Dixey showed forms of South African Pierine butterflies, taken by him in Natal and Rhodesia during the dry period of the present year, together with specimens of the same species for comparison, taken in the same localities during the rains. He remarked that the exhibit illustrated the fact, now widely recognized, that these forms varied in general correspondence with the meteorological conditions prevailing at the different seasons.—Mr. Edward Harris exhibited a long series of *Hemerophila abruptaria*, bred through two seasons by him, showing the proportion of resultant melanic and light forms from combinations of the several parents, light and dark.—Mr. Selwyn Image exhibited a male specimen of *Tortrix pronubana*, taken by Mr. Harold Cooper at Eastbourne this autumn, and sent to him on October 12th. The insect, which is about the size of *T. bergmanniana*, is new to the British list, but an additional capture from the Worthing district has been reported this year.—Commander J. J. Walker communicated a paper, entitled, "Hymenoptera-Aculeata, collected in Algeria by the Rev. A. E. Eaton, M.A., and the Rev. F. D. Morice, M.A.; Part ii., Diploptera," by Edward Saunders, F.R.S., F.L.S.

December 6th.—The President in the Chair.—Dr. O. M. Reuter, of Helsingfors, Grand Duchy of Finland, was elected an Honorary Fellow of the Society.—Mr. Charles William Mally, M.Sc., Associate of the Society of Economic Entomology of Washington, U.S.A., Government Entomologist for the Eastern Province of the Cape Colony; and Mr. Harold Powell, of Rue Mireille, Hyères, France, were elected Fellows of the Society.—Dr. K. Jordan exhibited a series of varieties of the Mediterranean *Carabus morbillosus*, showing all intergradations from the ordinary *morbillosus* with broad prothorax and costate and catenulate elytra to the Moroccan *aumonti*, which has a narrow thorax and smooth elytra. It is one of the most striking cases of geographical variability.—Mr. H. St. J. Donisthorpe showed specimens of *Ptinus*

pusillus, Sturm., recently discovered in a corn factor's shop at Edmonton. The species, which is common in France and Germany, has not been recorded hitherto in Britain.—Mr. A. J. Chitty exhibited an hermaphrodite of the Proctotrupidæ, probably one of the Spilomicrinæ, Aspm.; a sand-wasp, without wings, taken by Mr. Poole, running on a beech-trunk, named by Mr. Saunders as *Didineis lunicornis;* and the male *Apion semivittatum*, Gyll. (*germari*, Walt.), taken many years ago by Mr. Walton, near the Tivoli Gardens, Margate, together with a female specimen of the same species, discovered while sweeping long grass near the Chequers Inn, Deal, on September 26th, 1904.—Mr. F. B. Jennings exhibited a male and female example of the Dipteron *Helophilus transfugus*, L., taken from thistle-heads in the marshes at Edmonton last July, and a specimen of *Stenopteryx hirundinis*, a parasite on swallows and martins, found on Box Hill, Surrey, in August.—Mr. G. T. Porritt brought for exhibition specimens of *Odontopera bidentata* ab. *nigra*, and stated that the melanic form was rapidly increasing in the Wakefield district of South Yorkshire.—Dr. F. A. Dixey showed specimens of South African Pierine butterflies, taken by him in the dry season this year, further illustrating their forms; and with them, for comparison, specimens taken by other collectors during the rains.—Mr. O. E. Janson exhibited a male and female specimen of *Ornithoptera chimæra*, Rothschild, and some remarkable species of *Delias*, collected recently by Mr. A. S. Meek in the mountain region of British New Guinea.—Commander J. J. Walker, on behalf of Mr. A. M. Lea, Government Entomologist of Tasmania, showed a specimen of a Buprestid beetle, *Cyria imperialis*, Don., having, in addition to the normal fore-leg on the left side, two supplementary fore-legs originating from separate coxæ.—Mr. G. C. Champion exhibited male and female examples of *Tetropium crawshayi*, Sharp, bred by the Rev. G. A. Crawshay from eggs deposited in July last in the bark of larches at Leighton Buzzard.—Mr. E. R. Bankes showed the unique specimen of *Depressaria emeritella*, Stn., from an unknown locality, on which the species was added to the British List many years ago; a specimen of *Cerostoma asperella*, L., discovered by Mrs. Hutchinson near Leominster, on September 21st, 1881, and only taken, as regards Britain, in Dorset (formerly), and Herefordshire very rarely; and various specimens recently acquired from the collection of the late Dr. P. B. Mason and labelled by Haworth himself, showing the method of explaining his identification of the species, described by him in his 'Lepidoptera Britannica,' published 1803–1828.—Mr. A. Bacot, who exhibited long series of *Tryphæna cornis*, bred through three generations, and brought together to test the relative proportions of melanic to non-melanic forms and the possible range of variations to be obtained from a single pair of parents, announced that the results of the second and third generations seemed to be capable of "Mendelian" explanation.—Mr. R. Shelford exhibited larvæ of *Collyris emarginatus*, Dej., from Borneo, and said that it was certainly unusual to find a predaceous larva with mouth-parts qualified to excavate burrows in wood. He also showed larvæ and pupæ of *Mormolyce*, together with a specimen of a fungus (*Polyporus*) split open to show the lenticular chamber excavated by the larva, to which access was obtained by so small an orifice that it was surprising that the

emerged beetle could squeeze through.—Professor E. B. Poulton communicated further notes by Mr. A. H. Hamm, which tended to confirm the opinion that *Pieris rapæ* chooses for prolonged rest a surface on which it will be concealed.—Mr. William John Lucas exhibited diagrams of the instars, and also of the mouth parts of the imago, to illustrate a paper read by him, "On the Emergence of *Myrmelion formicarius*"—Mr. Martin Jacoby communicated a paper entitled "Descriptions of New Species of African *Halticinæ* and *Galerucinæ*."—Mr. Claude Morley communicated a paper "On the Ichneumonidous group, *Tryphonides schizodonti*, Holmgr., with Descriptions of New Species."—H. Rowland-Brown, M.A., *Hon. Secs.*

South London Entomological and Natural History Society.—*November* 23*rd*, 1905.—Mr. Hugh Main, B.Sc., F.E.S., President, in the chair.—Mr. F. G. Bellamy, of Eltham, was elected a member.—This meeting was devoted to a special exhibition of varieties and notable captures.—Mr. J. P. Barrett exhibited series of *Aporia cratægi* taken in 1871, in the New Forest; and in 1901–05 in East Kent; together with a variety of *Argynnis adippe* from Three Bridges, with the markings of the hind wings run into streaks and considerably suffused with black; a form of *Melanargia galatea* having the black marking almost wholly confined to the marginal and submarginal areas of all four wings; and a specimen of *Polia xanthomista* taken in 1904 in East Kent.—Mr. Tonge, photo-micrographs of the ova of all the British species of the genera *Ennomos*, *Oporabia*, *Cheimatobia*, *Anisopteryx*, *and Hybernia*, all the species of a genus being mounted on one card.—Mr. R. Adkin, a series of *Anthrocera* (*Zygæna*) *filipendulæ*, to illustrate the gradual change in the colour from the typical rich crimson through shades of terra-cotta and pinkish yellow, to a pale clear yellow; also an example in which the four basal spots were united into an irregular elongated patch. He also showed a *Pararge megæra*, in which the apical ocellated spot was absent from the right fore wing, there being only a minute black dot. It was also without the ocellus on the under side.—Mr. Hy. J. Turner, a collection of butterflies from South America, chiefly belonging to the *Ithomiinæ*.—Mr. A. Harrison and Mr. H. Main, (1) series of *Aplecta nebulosa* bred from larvæ taken in Delamere Forest. Eleven per cent were of the very dark and black forms, and a considerable number of intermediate forms were obtained. The gradation between the extremes was remarkably regular; (2) series of *Hypsipetes sordidata* from Windermere, Delamere and Seal bred, and Barmouth captured; only the first series showed any considerable variation; (3) a black variety of *Agrotis exclamationis* from Lancashire; (4) a melanic series of *Cymatophora duplaris* from Simonswood Moss, where only dark forms seem to occur now; (5) a *Melanippe fluctuata* with only the costal portion of the central band remaining, and with brownish ground colour; and (6) a specimen of *Acronycta leporina* from Delamere Forest with black thorax and abdomen, and with fore wings much suffused with black.—Mr. Stanley Edwards, a collection showing the various groups of the Heliconinæ.—Mr. West, of Greenwich, his collection of British Hemiptera, some 431 species, many of which were particularly interesting as having been taken in the near neighbourhood of

London.—Mr. F. B. Carr, a bred specimen of *Lasiocampa quercus*, in which the scales were extremely ill-developed.—Mr. Harrison, on behalf of Mr. E. Harris, of Chingford, bred series and generations of *Hemerophila abruptaria*, from ova laid in May, 1904, from the pairing of a dark female with a light male and from ova obtained by pairings of this first generation.—Dr. Chapman, bred specimens of *Arctia villica*, var. *konewkai* from Sicily, in which the spots of the fore wings run together to form fascia, together with larvæ of the same, which had black heads instead of the red of the type.—Mr. Hare, a very dark variety of *Boarmia repandata* from Basingstoke.—Mr. G. B. Browne, (1) a dark form of *Ellopia fasciaria*; (2) bred specimens of *Cabera pusaria* v. *rotundaria*; (3) an extremely dark form of *Aeronycta ligustri* from Lee; (4) dark forms of *Trachea piniperda*, and (5) a varied series of *Lithostege griseata*.—Mr. Chittenden, dark forms of *Triphæna comes*, bred from Forres larvæ, and a yellow form of *Tiliacea aurago* from Ashford, Kent.—Mr. Rayward, several *Anthocera filipendulæ* with the sixth spot almost suppressed, and a most brilliant form of *Polyommatus bellargus* from Reigate.—Mr. Dobson, the species of dragonflies which he had taken last summer on the Norfolk Broads, viz. *Libellula fulva*, *L. quadrimaculata*, *Orthetrum cancellatum*, *Æschna isosceles*, *Brachytron pratense*, and *Cordulia ænea*.—Mr. Joy, a specimen of *Cupido minima*, in which the submarginal spots on the under side of the hind wings were elongated into partial rays.—Mr. South, varieties of (1) *Amphidasys betularia*, with unusually well defined transverse lines; (2) *Cleora glabraria*, a much suffused form; (3) *Boarmia cinctaria*, with the two medial lines approaching below the middle; (4) *Tephrosia punctularia*, of a pale ochreous colour; and (5) *Ematurga atomaria* aberrations from Oxshott. He also showed a series of unusually small examples of *Vanessa* (*Aglais*) *urticæ*, reared from larvæ fed on hop.—Mr. Barnett, some large Buprestid Coleoptera, with examples of the extremely large ova of the same.—Mr. Bacot, very extensive series and generations of *Triphæna comes*, originating from parents bred from larvæ collected in Aberdeenshire, and bred by Messrs. Bacot, Prout, Gardiner, Newman, Raynor, Harrison, and Hamlyn. The results were: 1st generation, ♂ melanic × ♀ red = 21 melanic, 32 red; 2nd generation, ♂ × ♀ both melanic = 212 melanic, 71 red; ♂ × ♀ both red = 285 red; 3rd generation, ♂ × ♀ both melanic = 68 melanic, 5 red; ♂ melanic × ♀ red = 17 melanic; ♂ × ♀ both red = 26 red.—Hy. J. Turner, *Hon. Rep. Sec.*

City of London Entomological Society.—*November 7th*, 1905.—Mr. E. A. Bowles, of Mydellton House, Waltham Cross, was elected a member of the Society.—Mr. A. Bacot exhibited an extensive series of *Triphæna comes*, representing three generations, the subject of an experiment in heredity. The original parents were selected from imagines bred from larvæ from Cluny, Aberdeen: in the first generation a cross between a bright red female and a melanic male produced sixty per cent. red and forty per cent. melanic specimens. In the second generation a pairing between two red imagines produced one hundred per cent. red imagines, while pairs of melanic forms produced seventy per cent. to eighty per cent. melanic, the remaining imagines being red; in the third generation broods from melanic and non-

melanic parents respectively each bred absolutely true.—Mr. C. P. Pickett, a bred series of *Angerona prunaria*, including two females bred from Monmouth, one female from Raindein, Essex, male with the usual chocolate bands a dull smoky brown and the yellow ground colour also very dull.—Mr. G. H. Heath, a male specimen of *Epunda nigra*, with the white scent glands on underside of abdomen well displayed.—Mr. H. M. Edelsten, a specimen of *Cidaria testata*, destitute of hind wings, which came to "light" in Norfolk Broads.—Mr. W. Beattie, two specimens (male and female) of *Lycæna acis* and one *H. paniscus*, which he stated were captured, either by himself or his daughter, in the neighbourhood of Mickleham, Surrey, during 1904 or 1905 : unfortunately the exhibitor could give no precise data.—Mr. E. A. Cockayne, *O. dilutata* var. *christyi*, bred from larvæ beaten from elm at Rannoch.

November 21*st*.—Mr. F. Capel Hanbury and Dr. G. G. C. Hodgson were elected to membership of the Society.—Mr. E. Harris exhibited a long series of *Hemerophila abruptaria*, representing four generations. The original parents were a melanic female and a typical male, taken in North London district in May, 1905. The resulting imagines emerged in August, except two that went over to April, and yielded fifty per cent. melanic and fifty per cent. non-melanic forms. Two dark specimens paired in August, and the imagines emerged from March 24th to May 26th, 1905, about seventy per cent. being melanic and thirty per cent. non-melanic. From this brood four pairings were obtained, viz. (*a*) dark male and dark female; (*b*) light male and light female; (*c*) dark male and light female; (*d*) light male and dark female. These yielded (*a*) all melanic specimens; (*b*) all light specimens; (*c*) eighty per cent. dark, twenty per cent. light; (*d*) sixty-eight per cent. dark, thirty-two per cent. light.—Mr. C. P. Pickett an extraordinary asymmetrical male *A. prunaria*, bred in July, 1905, from Essex and Raindein Wood parents, the right wing being ab. *sordidata* and the left ab. *pickettaria*.—Rev. C. R. N. Burrows, a series of the form of *Acronycta rumicis* named by Curtis *salicis*, from Barnsley.—Mr. V. E. Shaw, a series of *E. subciliata* from Torquay, July 27th, 1905.—Rev. G. H. Raynor, ova of *Thecla pruni*.—Mr. J. Riches, several abs. of *A. grossulariata*, including a specimen with a large black blotch on right fore wing, while the left was normal.—Rev. G. H. Raynor read a short paper, entitled 'A New Index Entomologicus,' in which he pointed out the inconvenience, for reference purposes, of the annual diary kept by most entomologists, and detailed his own system of using one large volume, in which a page was reserved for each species; on this page entries of captures could be made year after year, together with notes on life-history, &c., and references to records, &c., in various entomological publications.—S. T. Bell, *Hon. Sec.*

Entomological Club.—A meeting was held on December 15th, 1905, at 27, Hereford Square, S.W., the residence of Mr. Arthur J. Chitty, the host and chairman of the evening. The other members present were Prof. Poulton, and Messrs. Adkin, Donisthorpe, and Hall. There were ten visitors. Before supper an hour or two was given to the inspection of the host's entomological collections, and especially the fine one of British Coleoptera.

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DESCRIPTION OF ANOTHER NEW SPECIES OF ÆSERNIA (COLEOPT. CHRYSOMELINÆ) FROM NEW GUINEA.

BY MARTIN JACOBY.

SINCE the publication of the descriptions of several new species of *Æsernia* (*ante*, p. 1), I have received several specimens of another handsome species, of which I here give the description.

Æsernia gestroi, sp. n.

Obscure blackish-green; the sides of the thorax strongly rugose, with a single fovea near the base; elytra foveolate punctate-striate anteriorly, the interstices longitudinally costate, with a broad fulvous transverse band below the middle, the apex closely and finely punctured. Length, 17–20 mm.

Head impunctate, deeply depressed between eyes, antennæ bluish-black, slender; thorax twice as broad as long, the sides nearly straight, very slightly narrowed at the base, the anterior margin concave, the angles pointed, the disc with a narrow central longitudinal groove, the sides irregularly and deeply foveolate-rugose, with a single larger fovea in front of the other rugosities; elytra with the greatest elevation near the base, each with about ten highly raised costæ, these are followed by a broad dark fulvous transverse band; the interstices between the costæ impressed with deep irregular punctures, often confluent and forming elongate foveæ, the fulvous band is narrowed to a slight degree near the suture and impressed with a few punctures, but the apical portion is closely and more strongly punctured. Body beneath and legs bluish-black.

Hab. Babooni, British New Guinea.

More nearly allied to *Æ. formosa*, Gestro, than any other species, but of a more dull greenish colour, the elytral interstices much more deeply and confluently foveolate-punctate. Dr. Gestro says nothing of any elytral costæ, so prominently marked in the present species, and describes his insect as having simply, strongly, striate-punctate elytra. I cannot therefore

identify *Æ. gestroi* with *Æ. formosa*. In *Æ. corallipes*, Gestro, the last segment of the abdomen is described as testaceous. In the insect here described the entire abdomen is bluish-black, and the fulvous elytral band is much wider than in *Æ. formosa*; the legs also are greenish-black.

DESCRIPTIONS OF TWO NEW SPECIES OF BRACONIDÆ FROM AUSTRALIA.

By P. Cameron.

Bracon turneri, sp. nov.

Black, the pro- and mesothorax, except the former at the base below, red; the mandibles, except their teeth and the sides of the first abdominal segment, pale yellow; apical joints of palpi fuscous; wings fuscous, the nervures and stigma black. ♂. Length, 5 mm.

Central part of first abdominal segment coarsely, irregularly punctured; a narrow, fine, shining keel down its centre; the second segment is deeply, irregularly, rugosely punctured, except at the apex in the middle, where there is a raised, smooth, shining area to which the middle keel extends; the latter is smooth and shining, the dilated base is longer by about one-half than its width at the base; suturiform articulation deep, crenulated; it does not extend to the sides and there is no apical lateral branch; the third and following segments are smooth and shining, sparsely covered with longish white pubescence; the hind tibiæ and tarsi are thickly covered with long, soft, white pubescence; the second abscissa of the radius is as long as the third; head and thorax smooth, thickly covered with long, soft, white hair.

Agathis latibalteata, sp. nov.

Black, shining; the sides of the first and third abdominal segments, the apex of the first broadly, and the whole of the second, and the greater part of the ventral surface, pale yellow; the apical two-thirds of the fore femora and their tibiæ and tarsi, pale testaceous; wings fuscous, highly iridescent, the nervures and stigma black. ♂. Length, 6 mm.

Head, pro- and mesothorax smooth, shining; the face, pleuræ and breast sparsely covered with white pubescence; mandibles of a paler rufous colour than the head; the palpi pale testaceous; scutellar depression with a stout central and two lateral narrower keels, the outer obliquely sloped; mesopleural furrow weakly crenulated; metanotum rugosely punctured, the sides more weakly than the centre; there is no area, but the centre is raised, the raised part narrowed above; the sides and pleuræ are densely covered with long white pubescence; abdomen smooth, shining; the first segment is fully more than twice longer than the width at the apex; areolet small, oblique, triangular; the nervures united above, where they are much thickened; radial cellule short, narrow; front deeply excavated laterally; the metapleuræ are more thickly pubescent than usual, as in some species of *Euagathis*.

NOTES ON AFRICAN COTTON INSECTS.

By Fred. V. Theobald, M.A.

In these days of development of cotton cultivation in Africa much interest has been centred on the work of cotton insects. It has been justly thought that, with the importation of seed from one part of Africa to another, and from America and the West Indies, &c., to Africa, we should be introducing numbers of strange cotton insects.

Undoubtedly the worst cotton pests in America and the West Indies are the cotton boll weevil (*Anthonomus grandis*, Boh.), the cotton boll worm (*Heliothis obsoleta*, Fabricius), and the cotton worm (*Aletia argillacea*, Hübner).†

In recently going over the cotton pests of the world, I have come to the conclusion that very few insects are likely to be imported in seed to Africa; the most important are the cotton boll weevil, and a small Tineid moth (*Ereunetis minuscula*, Walsingham), the larvæ of which have been noticed boring into cotton-seed in the West Indies. A sharp look-out should undoubtedly be kept for both pests amongst the seed, especially for the weevil, for it may sometimes be found hybernating amongst the seed in numbers.

Before very long we are sure to hear of the cotton boll worm of America (*Heliothis obsoleta*) attacking cotton in West and Central Africa. The conclusion might possibly be formed that it had been imported.

This widely distributed moth is known in Africa already as a true native species. It has been found in the Sudan, in Abyssinia, in British East Africa, in North Gamiland; it occurs all over Cape Colony, the Orange River Colony, the Transvaal, in Natal and Basutoland. It attacks mealies and other native corns. I rather fancy from the description sent me that it has already started attacking cotton in Mozambique.

At present all the cotton pests known in Africa are confined as cotton pests to that continent, except the omnivorous cutworm (*Agrotis ypsilon*, Rott.), known in America as the greasy cutworm.

The best known are those found in Egypt, namely, the cotton boll worm (*Earias insulana*, Boisduval), which also occurs in Sokotra at 3500 feet.

The Egyptian cotton worm (*Prodenia littoralis*, Boisduval), which attacks the leaves, and concerning which the Khedivial Government has recently issued instructions to be enforced for its eradication.

The small cotton worm (*Caradrina exigua*) recently worked

* Read before the Association of Economic Biologists, at Liverpool Dec. 29th, 1905.

† The cotton boll worm of America has always been known as *Heliothis armiger*, Hübner (1796), but it is now known to be the *Bombyx obsoleta* of Fabricius (Ent. Syst. 3, i. p. 456, 1793).

out by Mr. Willcocks, also attacks cotton-plants; an insect well known in America, Europe, and our own country.

The caterpillar of *Agrotis ypsilon*, has likewise been found destructive to cotton by Mr. Willcocks in Egypt. It is also harmful in America. This practically completes the previously known lepidopterous pests.

The only others worthy of note are, first, the Egyptian cotton-stainer (*Oxycarenus hyalinipennis*, Costa), found on many other plants, particularly around the Mediterranean. This "stainer" does not always seem to do much harm, but they may get in the ripe bolls, and they suck the sap from blossoms and the base of the young bolls, and so stop development. They also pollute the cotton, making it dirty, and give it a disagreeable smell.

So far I have only received one species of cotton aphis from Africa. This seems to be *A. malvæ*, Koch, which is very annoying in Egypt, and more so in the Sudan; it also occurs on melons.

A report on these Egyptian pests is being prepared by Mr. Willcocks at Cairo, so that no further reference is needed here.

New Pests.

The Cotton Gold-tail (Porthesia virguncula, *Walker*). — The only new moth is one of the gold-tails, the *Porthesia virguncula* of Walker. These moths and their pupæ were sent me by the Director of Agriculture of the British East Africa and Uganda Protectorate, and were briefly recorded in my Report on Economic Zoology for 1904–1905, p. 117.

This moth is very widely distributed, and is very common in India. I do not think it has, however, been previously recorded from Africa. It is of a pure satiny white, with a small golden tail-tuft. The specimens received from East Africa measured from three-fourths to a little less than an inch across the expanded wings. They are evidently subject to great variation in size, for in the large series in the British Museum, from India, some measure nearly an inch and a half across. The larvæ very much resemble those of our brown-tail (*Porthesia chrysorrhœa*). They spin a delicate cocoon of dull white, rather loose silk and hairs. From the note sent me they apparently live freely on the leaves as our *P. auriflua* does, and not gregariously, as does the brown-tail (*P. chrysorrhœa*). The pupa is bright chestnut-brown. The larvæ feed ravenously on the leaves, leaving only the midrib, and were found severely damaging the foliage in the Uganda Protectorate, at Malindi, in October. They could easily be kept in check by spraying with Paris-green, or, better still, arsenate of lead wash. It is extremely unlikely that it has been introduced, and will probably be found elsewhere in Africa on the cotton and other plants.

A Flea-beetle Enemy.—From the Sudan Dr. Balfour has recently sent me some small brown Halticid beetles, which are

found to do considerable harm to the cotton there. They are small and very obscure beetles, which Jacoby has identified as his *Nisotra uniformis* described from Sierra Leone.

New Cotton-stainers.—Three cotton-stainers that have not previously been found on cotton have come from Uganda, one being a new species recently described by Mr. Distant. These insects, especially those of the genus *Oxycarenus*, are often to be found abundantly in cotton bales. Opinions differ as to the amount of damage they do. All agree that they spoil cotton by being squashed in the gin and thus staining the fibre. They also puncture the bolls and cause them to become hard so they cannot open, and thus the cotton becomes matted and spoiled, and in addition they stain the cotton with excreta when sucking the seed.

Oxycarenus albidipennis, Stal.—This bug is closely related to the Egyptian cotton-stainer. It lives in the cotton boll after opening, and attacks the cotton-seed. The larval stage is flesh- or pink-coloured, with dusky head. The specimens were found at Malindi, in Uganda, in February, and were sent me by the Director of Agriculture, who reports that it causes discoloration of the cotton.

Oxycarenus exitiosus, Distant.—This small Lygæid was sent me by Mr. Linton, who found them in numbers in cotton bales at Nairobi. It proved to be a new species, and was described by Mr. Distant ('Entomologist,' July, 1900, p. 169, vol. xxxviii. No. 506). It is a black species, with posterior lobe of the pronotum and corium testaceous, a dark spot at the posterior angle of the latter; the membrane pale hyaline grey; the lateral margins of the corium often distinctly lutescent; abdomen sanguineous beneath except the apex, and a central longitudinal line. Coxæ, a central ring to the intermediate tibiæ, and the posterior tibia, except base and apex, yellowish. Length 3 to 4 millim.

This insect has also been found in Cape Colony. Mr. Distant was informed it was there injurious to peaches. The habitat added by Distant is Cape Town, Seapoint, South Africa (Mansell Weale). It probably works in the same way as the related Egyptian species.

Dysdercus nigrofasciatus, Stal.—This bug is present in large numbers in all cotton-fields in Uganda, and has occurred in bales of cotton also. It is one of the largest bugs found on the cotton in Africa so far. It probably occurs on a number of other plants, and may be found in many parts of Africa. It is about 12 mm. long. Head chocolate-brown; antennæ dark brown. The narrow anterior lobe of the pronotum rather pale grey, mid lobe bright brown, the large posterior lobe pale yellowish brown, almost ochreous. Corium pale ochreous, with a broad black transverse bar on the posterior half; membrane black; under wings dusky brown; legs deep reddish brown. Abdomen reddish above; the first, second, and third segments

below pale creamy yellow with median basal dark areas, fourth and fifth dark brown, sixth pale creamy, apex dark brown. It also occurs in Europe. It gives the fibre a dull yellowish discoloration.

There will probably be found a host of native insects attacking cotton as its area of cultivation increases. These will come from wild plants near by. It is thus very important in the cultivation of cotton to keep the land and borders of the plantations as free as possible from all weeds and native growth.

DESCRIPTION OF A NEW SPECIES OF *GABUNIA* (ICHNEUMONIDÆ) FROM NATAL.

By P. Cameron.

The genus *Gabunia* was described by Kriechbaumer in Sitzber. Naturf. Ges. Leipzig, 1895, p. 130, three new species—namely, *ruficoxis*, *cærulea*, and *flavitarsis*—being referred to it. In the Mém. Soc. Ent. Belg. v. 1896, Tosquinet described a new genus, *Nadia*, with three new species, namely, *fasciipennis*, *cyanea*, and *formosa* (pp. 337–344), all (like the species of *Gabunia*) from West Tropical Africa. In his "Classification of the Ichneumon Flies," Bull. U.S. Nat. Mus. xxiii., Ashmead places *Nadia* in the *Lissonotini*, and *Gabunia* in the *Xoridini*, in which tribe *Nadia* is placed, quite correctly, by Tosquinet. In the Zeit. f. Hymen. ü. Dipter. 1904, p. 172, Prof. R. Krieger, from an examination of Kriechbaumer's types, concludes that *Nadia* is a synonym of *Gabunia*, the three species of the two authors being stated to be very closely allied, and might be even identical. I am now in a position to add a new species from the East Coast (Natal), most nearly allied to *G. cyanea*, Tosq., and *G. cærulea*, Kriech., if these two be really distinct.

Gabunia ruficeps, sp. nov.

Dark blue; the head red, except for a dark blue stripe behind the ocelli, touching the eyes and the apical two-thirds of the mandibles. Antennal scape red; joints eight to twelve white. The tibiæ and the tarsi almost want the blue tint, which is conspicuous on the coxæ, trochanters, and femora; the apex of the first joint of the hind tarsi and the second, third, and fourth are yellowish white. Wings purple, highly iridescent; on the anterior a wide clear hyaline cloud commences at the base of the stigma, and extends clearly beyond the areolet; there is a smaller cloud at the apex of the hind wings, the edge itself being clouded; the nervures and stigma are black. ♀. Length, 22 mm.; terebra, 8 mm.

Centre of face irregularly striated, the striæ converging towards the centre; the sides transversely reticulated, more strongly above

VARIATION IN MELITÆA AURINIA.

than below. Vertex smooth, sparsely punctured; the front below the ocelli is raised, the raised part gradually narrowed below, and stoutly, transversely striated. Temples smooth and shining; the malar space bears a narrow furrow near the middle. Clypeus above clearly separated, but not by a distinct furrow; its upper part stoutly, irregularly punctured; the obliquely depressed apex is almost smooth; its apex is black, transverse, and has a tubercle in the centre. Palpi black. Mesonotum strongly, closely punctured; the depressed apex in the middle strongly, closely striated, the striæ oblique and converging from the sides towards the middle. Apical half of scutellum more strongly and closely punctured than the basal. Post-scutellum strongly but not closely punctured. Metanotum strongly, closely, transversely striated; the striæ on the sides oblique, in the middle more or less roundly curved. Pleuræ closely, strongly, obliquely striated, the striæ more or less curved; the centre of the propleuræ smooth, shining. Abdomen smooth and shining. Areolet four-angled, narrowed in front; the recurrent nervure uniting in the middle; the transverse median nervure is received very shortly behind the transverse basal. Transverse median nervure in hind wings broken in the middle. Hind tarsi stout, closely spinose below; the spines longer at the apices of the joints; they are stouter on the fourth joint.

Noteworthy of this species is its great resemblance to *Cryptaulax ruficeps*, Cam., and *Oneilella formosa*, Bé., all three having the same general coloration of body and wings.

VARIATION IN *MELITÆA AURINIA*.

By V. P. Kitchin, F.E.S.

(Plate I.)

These notes and the figures illustrating them refer to specimens of *M. aurinia* taken and bred by the writer in Co. Galway, Ireland.

The typical Irish form of the insect known, I believe, as var. *hibernica*, has clear yellow markings, free from that brownish suffusion which detracts from the brilliancy of our English specimens. For the typical Irish form see fig. 12.

Variations of the upper wing.—Figure 1 shows ab. *virgata*, in which the black band dividing the yellow patch near the middle of the costa is lacking. The opposite extreme is reached in fig. 2, a heavily black-banded form. In fig. 3 is seen a variety closely approaching that named *merope*, which is found in the Alps. In this the black band crossing the yellow patch on the inner margin is missing, all but a mere spot. Figure 4 is that of a dwarfish variety with narrow fore-wings. In fig. 5 is shown a variety in which the structure of the wings is abnormal. Two nervures (5 and 6) on upper wing, and one on lower wing, are

entirely lacking, and are not even marked by the usual black lines. Half of nervure six is missing in fig. 10.

Variations of the lower wing.—The central spot and lower spot in the yellow band are absent in fig. 6. The same specimen shows also the row of crescents round the hind margin greatly reduced in size, and brownish yellow instead of clear whitish yellow. Figure 7 shows a variation often present in ab. *virgata*. The central yellow fascia is continued almost to the base of the wing by an irregular oblong patch. A similar extension of the corresponding band on the under side is not infrequently found on the same specimens. It occurs also when the upper side does not correspond (see fig. 9).

Variations of the under side.—Black bands are sometimes found near the inner margin and costa, corresponding to those on the upper side. The pale yellow fascia on the under wing is often powdered with black scales. In fig. 8 it lacks the outer black line. This variety illustrates a tendency common to many continental members of this genus, in which the black markings are restricted to the basal portion of the under wing.

Variation of the antennæ.—I have a specimen (not figured) in which the antennæ are noticeably shorter than usual.

Pathological aberrations.—In fig. 2 the costa is straight on one side and curved on the other. Figure 10 is that of a specimen which I watched emerging from the pupa. The wings lack scales over most of their area, but the fringes are all perfect.

ENTOMOLOGICAL NOTES FROM SWITZERLAND.

By Gerard H. Gurney.

The following short notes on my captures in Switzerland last summer were roughly jotted down in my note-book every day, and may, perhaps, be of interest to others who were also able to spend a few weeks in that wonderful country. During an all too short six weeks, spent mostly in, and near, the Rhone Valley, I identified one hundred and twelve species of butterflies, irrespective of the moths, which, out of a possible one hundred and eighty-eight, is a large percentage.

I arrived at Aigle, at the entrance, or beginning rather, of the Rhone Valley, on Saturday, June 24th, and stayed at the Grand Hotel, about a mile from the town, at the side of the valley of the "Grand Eau," which proved to be a capital collecting ground.

The weather for a week previous to our arrival had been fine and hot, but the *very* day I got there it clouded over, and the next two days were wet and dull—rather a damper to one's enthusiasm on first getting out. However, Tuesday the 27th broke fine and

cloudless, and for the remainder of the time the weather was, as a rule, glorious—in fact, the occasional dull days we had came almost as a relief, and enabled me to get set some of the many butterflies in my boxes, the result of two or three days' collecting, perhaps.

In the hayfields and meadows surrounding the hotel at Aigle the following species were in abundance :—

Aporia crataegi, *Colias hyale* (a good deal worn), *Nomiades semiargus*, *Argynnis adippe*, *Melitæa athalia*, *M. parthenie*, *M. dictynna*, and *Aphantopus hyperanthus*.

A little less plentiful, though still very common, were *Argynnis aglaia*, *A. niobe*, almost all of the var. *eris*—*Limenitis camilla*, *Pararage mæra*, and *P. achine*—the last in splendidly fresh condition. A walk up the mountain at the back of the hotel in the direction of Ollon produced *Papilio podalirius*, and *P. machaon*, and four or five *Lycæna arion*, *Dryas paphia*, *Melitæa phœbe*, *Satyrus alcyone*, and a single specimen of *Carcharodus lavateræ*, besides hosts of commoner things.

Another day took me down to the Rhone Valley, where the hay was being cut. None the less I turned up several things of interest: by the side of the river, *Brenthis dia* was fairly common and a few worn *B. euphrosyne*, some fine large specimens of *Cupido minima*, and a couple of male *Rusticus argyrognomon* Brgstr. The same day I came upon a row of four small sallow bushes which had been almost completely denuded of their leaves by a vast colony of the larvæ of *Euvanessa antiopa*; they looked very conspicuous on the bare boughs as they were quite full grown, and those I took proceeded to pupate the very same evening, emerging satisfactorily three weeks later. I also found a "nest" of the larvæ of *Eugonia polychloros* on willow, about a mile further on. Along the road between Aigle and Sepey on June 29th *Parnassius apollo* was appearing, evidently quite freshly emerged; in the same place *Melitæa didyma*, all males, and very highly-coloured, was common, with *S. alcyone*, *Thecla ilicis*, var. *cerri*, and a bit further on, and about three miles from Sepey in the hayfields, I got a few fresh *Chrysophanus hippothoë*, and some *Cœnonympha iphis*, besides a good many commoner "blues" and "skippers."

Four days later, on the same ground, three very fresh *Apatura iris* were taken, *P. apollo* was plentiful, and a single very large male *Satyrus cordula*.

On July 4th I moved my quarters to Villars, a small village above Bex, about 4200 ft. up and in full view of the wonderful Argentine and Diablerets mountains. Besides being a good locality itself, Villars has the advantage of being on a funicular railway, so that one could very easily make excursions down or in the other direction. In the fields round the village I took nice series of *C. hippothoë*, *Polyommatus eumedon*, and *C. iphis*; a

little higher up, *Brenthis amathusia*, *Erebia melampus*, and *E. ligea* were very abundant, while at about 5000 ft. I found plenty of *E. stygne* and *E. œme*. Three fresh specimens of that gaudy little "copper" *Chrysophanus amphidamas*, all males, were also taken near a small wood not far from Villars. Further down, in the direction of Gryon, on the wooded sloping hillside, all the butterflies of the neighbourhood seem to be collected together; four or five different species of "blues," the commonest being *P. damon*, great numbers of *M. didyma*, the males extremely richly coloured, *L. camilla* and *sibylla*. *S. cordula*, males and females, both in fine condition, besides many others of commoner sorts. A long expedition to Solalex, at the foot of the Argentines, on July 14th, resulted in *Colias phicomone*, eight beautiful fresh specimens of *Lycæna alcon*, several *Erebia manto*, a solitary specimen of *Brenthis pales*, besides *Polyommatus hylas*, *Erebia æthiops*, and *E. stygne*. Before leaving Villars two more *C. amphidamas* were taken very close to the place where the previous pair had been captured, and no doubt they were all of the same brood; I also took two or three fresh *C. dorilis*, and *Brenthis ino* was beginning to come out in the fields behind the hotel the last two days of my stay, and probably would soon have become plentiful there.

On the 17th I went to the Riffel Alp, above Zermatt, a glorious spot, not merely from an entomological point of view. For, with one of the grandest views in Switzerland always before one, the wonderful Matterhorn peak for ever rising higher, the top either lost in clouds or outlined against the blueness of the atmosphere, he must indeed be a prosaic man who could be unconscious of his surroundings for a minute; and the butterflies were as captivating as the place. I seemed to have arrived at the Riffel at exactly the right time, as, although one or two of the higher alpine species were distinctly *passé*, most of the insects were in very good condition. To mention all the butterflies I got during the fortnight I was there is impossible. I can only casually note the most interesting of them.

A nice series of *Anthocharis simplonia* was taken about a mile above the Riffel Alp, where they were very local, flying swiftly up and down a rocky moraine. A female, which was kept alive for ova, unfortunately was exposed one morning to the hot sun and was dried up. A little below the hotel, in the direction of Zermatt, *Polyommatus orbitulus* was fairly plentiful, and a little lower still was a small colony of *P. donzelii*, with two or three specimens of *P. baton* flying with them.

P. eros, all males, were taken flying over puddles on the path. *Melitæa parthenie* var. *varia* was plentiful but over, but *B. amathusia* was very fresh and finely coloured; I was surprised to find it as high up as this. *Cœnonympha satyrion* was common, and the two "coppers"—*Chrysophanus virgaureæ* and *C. hippothoë* var. *eurybia*

—were both abundant in the luxuriant meadows below the hotel; two or three *Chrysophanus alciphron* var. *gordius* were netted nearer to the village of Zermatt, one being a very small, dwarfed specimen. Amongst the "Erebias" *Erebia mnestra*, *E. euryale*, *E. goante*, and *E. ligea* were all fairly common at rather a lower elevation than the Riffel Alp itself; whilst further on, as soon as one left the flowery meadows and got higher on the moraine, *Polyommatus optilete*, *Pieris napi* var. *bryoniæ*, *Colias palæno*, *Melitæa aurinia* var. *merope*, *Erebia lappona*, and *E. tyndarus* all occurred. becoming commoner the higher one got, and at the Gorner Grat, over 10,000 ft. high, *Pontia callidice*, *Erebia alecto* var. *glacialis*, and *E. gorge* were all fairly plentiful, though very local, One day, about a week before I left the Riffel Alp, I made a long expedition below Zermatt, down the Visp Valley, in the direction of Stalden, getting out at the little station of Kalpetran, some seven or eight miles from Zermatt; and the rough, sloping ground here on either side of the road proved to be a capital collecting ground. It was an exceedingly hot day, and there were great quantities of insects everywhere, the air being filled with the "summer hum" of countless bees, grasshoppers, and crickets. *P. apollo* was all over the place, a female flew down and laid an egg on a plant of saxifrage at my very feet; I kept her alive hoping she would lay some more, but although she lived a week and became quite tame, nothing came of it. However, another female from the same locality laid a quantity of fertile eggs which successfully hatched in due course. *M. phœbe*, and *M. didyma*, both in beautiful condition, were very abundant, and a few very fresh *A. lathonia* were noticed; a little further on *S. cordula*, males and females, were in great numbers and flying in the same place; a good many *Epinephele lycaon* and some fine large *Hipparchia semele*, though all typical, none of the variety *aristæus*. Here also I found a nice colony of that beautiful "Burnet" *Syntomis phegea*, which I had not taken before. Amongst a crowd of common "blues" were two fresh *L. alcon*, and off a tall thistle by the side of the path a splendid male specimen of *Rusticus* var. *lycidas* in grand condition.

Two or three *C. alciphron* var. *gordius* were netted, rather worn however, and a couple of *Pyrgus sao*, besides *C. lavaterœ*, and several commoner Hesperiids. *C. phlœas* var. *eleus* was flying near some moist patches in company with *C. virgaureœ* and one immense *P. podalirius* near Stalden; a few *Polygonia c-album*, some very brightly coloured *T. ilicis* var. *cerri*, and some fresh *A. niobe*—in fact, it was a memorable day for insects all round.

In the above notes I have simply mentioned a few of the most interesting butterflies taken, and have not touched on the moths, of which a number of good things were captured almost entirely at light. My two great "coups" were a fine specimen

of *Hoplitis milhauseri*, caught at one of the acetylene lamps outside the hotel at Aigle, and a beautiful fresh *Plusia v-argenteum* which flew into my bedroom at the Riffel Alp attracted by the electric light. Of larvæ found the most interesting was a nearly full-fed larva of *Parnassius mnemosyne*, which was walking across the road close to Bex Station; it fed up slowly on a species of monkshood, and is now a seemingly healthy pupa.

THE DRAGONFLIES OF EPPING FOREST IN 1905.

By F. W. and H. Campion.

On May 7th we started up from the rushes a single immature Agrionid, which unfortunately escaped us. Cloud and rain subsequently coinciding with our opportunities for collecting prevented the resumption of work until May 28th, when we found that *Agrion puella* and *Ischnura elegans* had already appeared, as well as *Pyrrhosoma nymphula*, which with us always precedes in point of time the two mentioned species.

The only addition made during the season to our local list of Odonata was the orange variety of *Ischnura elegans*, which we shall have occasion to mention again.

The various species taken were as follows:—

(1) *Pyrrhosoma nymphula*, which was very abundant and flying in pairs on May 28th, was not taken later than July 2nd.

(2) *Agrion puella* was scarce on May 28th, but common and *in cop.* on June 4th; thereafter it was collected regularly until July 30th.

(3) *Ischnura elegans*.—Although the species was represented on May 28th by var. *rufescens*, we did not take the typical form before June 4th, when it was common. On August 13th, after several weeks during which none but mature individuals were obtained, we suddenly found a considerable number of immature specimens. The last examples of the species were taken on September 3rd.

Var. *rufescens*.—As already stated, this variety was met with for the first time in Epping Forest. This fact is somewhat remarkable, as one at least of the ponds at which it has now occurred has been regularly examined for Odonata during several years past, without a trace of it having been found. One specimen was taken on May 28th, one on June 13th, and two on July 16th; one of those taken on July 16th escaped from the net.

Var. *infuscans* has again occurred, and some further observations upon the variety have been published (Entom. xxxviii. 298).

(4) *Anax imperator* was seen on a few occasions, but only one specimen was obtained. That was a male, which we found on

June 4th in a much damaged and nearly dead state on the banks of a pond which the species usually frequents. The left hind wing was in a shrivelled condition, and the insect's presumably imperfect powers of flight may have led to its destruction.

(5) *Libellula depressa* was first seen and taken on June 18th, and afterwards became pretty plentiful; it was not noticed later than July 22nd.

(6) *Enallagma cyathigerum*.—It is curious to note how far from water this species, and especially the females, will sometimes travel. We have already recorded (Entom. xxxvi. 49) the occurrence in 1902 of a female in our garden at Walthamstow, which is fully half-a-mile distant from any sheet of water. The first capture of the past season was a solitary female found in the Forest on June 25th quite a long way from water, and another female was taken at rest in our garden at about 5.30 p.m. on July 2nd. A male was taken at rest in one of the rooms in our house on July 23rd, but no specimens were taken anywhere after September 3rd.

(7) *Sympetrum striolatum*.—A single immature specimen was seen and netted on July 16th; it had just emerged from the water, and we found its empty nymph-case clasping a neighbouring rush. Two weeks later the species was still immature. The last specimens occurred on September 18th.

(8) *Æschna grandis*.—The earliest specimen seen was a male taken on July 16th. On the 22nd of that month we took a female which was ovipositing in a pond, and found that more than half the length of its abdomen—that is, part of segment five and the whole of segments six to ten—had been thrust below the surface of the water. The species was collected pretty frequently until September 3rd.

(9) *Æschna cyanea*.—The first representative of this species was seen on July 30th. It appeared to be flying in a perfectly normal manner, but, upon being taken, it proved to be a teratological male. Both the wings on the right side looked as though the tips had been scorched by fire, and the hind wing was considerably shorter and broader than the corresponding wing on the other side. Pterostigmata were absent from both wings. The right hind leg was also malformed, the tarsus being represented apparently by a single short joint divided at the extremity. Another male, taken on September 18th (the latest date for this species), had the left hind leg in a still more rudimentary state, the tibia being abnormal as well as the tarsus.

Not a trace of *Æschna mixta* was met with, notwithstanding the strictest search made at the proper season and in its favourite haunts. Another and more remarkable omission from the year's dragonfly list for this locality was the total absence from the ponds which we habitually visit of the usually common little insect, *Lestes sponsa*.

LEPIDOPTERA AT RANNOCH IN 1905.

By E. A. Cockayne, F.E.S.

On May 17th we arrived at Rannoch, a party of three. The weather being beautifully fine, we decided to go at once in search of *Anarta cordigera* and *Fidonia carbonaria*.

After a rather warm climb through the birch-woods and the heathery moor above, we reached the bare and rocky top of the hill, where the bearberry grows hanging over the rocks in long trailing masses.

We soon saw a single *A. cordigera*, flying very fast, and though we saw many more during the day, only captured three. *F. carbonaria* we scarcely saw till nearly twelve o'clock, when they began to appear on all sides, flying fairly actively, and, if frightened, they were impossible to catch on the slippery and uneven ground. The larva of this insect is said to feed on birch and sallow, but I noticed that it was only met with where bearberry was growing in abundance, and the females frequently settled on this plant. There is plenty of birch and sallow on this hill, but none on the part where the insect occurs. Probably, like *A. cordigera*, it is exclusively a bearberry-feeder. *F. carbonaria* was easily distinguished from *F. atomaria* by its greater powers of flight, its smaller size, and bluer appearance. The latter, too, was much commoner at a slightly lower level. The next few days the weather continued fine, and *A. cordigera* was seen in considerable numbers in those isolated places where the bearberry was sufficiently common. They appeared to spend most of the day feeding on the flowers of this plant, or resting on the ground. On one occasion, early in the afternoon, we saw fifteen hovering together at the side of a large stone, as if assembling. Several were caught, but no female could be found, and I do not think there was one. They do not pair till dusk, when they settle down for the night on the patches of bare peat or on the rocks, always in a place sheltered from the wind, and never many yards from a bearberry plant. Perhaps it was more or less parallel to the instance, mentioned by Barrett in his 'British Lepidoptera,' of an assemblage of *Anarta myrtilli* which was undoubtedly attracted by a dead and dried-up moth, too bleached to be identified. *F. carbonaria* flies chiefly from twelve noon onwards, and is very susceptible to cold. One bright and sunny, but very cold day, we did not see any fly naturally, and could only put up two or three.

We were surprised to find several *Thecla rubi* on the blossoms of the bearberry, and later saw them in abundance in the Black Wood, settling on the clumps of whortleberry (*Vaccinium vitis-idæa*). At the time I wondered what the larvæ had fed on, but find, on looking up the subject, that both these plants have been recorded as food-plants of this butterfly.

Anarta melanopa, chiefly males, began to appear on May 18th, the bearberry, however, which furnishes food for both larva and imago, did not come into flower at this elevation till May 28th, and was then eagerly visited by both sexes. Bearberry (*Arctostaphylos uva-ursi*) in the Rannoch district grows at two levels, luxuriantly at 800 to 900 feet, and, separated by a zone where it is absent, again at 2000 feet as a stunted closely-growing plant. At the lower level *F. carbonaria* and *A. cordigera* occur and, at the upper, *A. melanopa*. They rarely encroach on one another's ground. I should have said never, but we did take a couple of *A. cordigera* on the *melanopa* ground.

During the whole of May we found odd specimens of *Hadena glauca* on the rocks, and one occasion saw one flying in the sunshine. On June 1st, however, we were astonished to see a good many eagerly feeding at the bearberry with *A. melanopa*, in the hot midday sun.

In spite of careful searching, we never saw *melanopa* settled on a rock, though these matched its colour perfectly. On the crisp grey lichen, which carpets the whole summit of the mountain, I found two at rest, and from it many more were disturbed.

We saw one of these active little moths captured by a small brown crab-spider (*Thomisus ? cristatus*). As I was standing, net in hand, waiting for the moths to visit the flowers, one came and, before I could move, the spider sprung and seized it just behind the head, and, though many times smaller than its prey, held it until it was dead. It did not even let go when I placed both on my hand. We also noticed a good many large grey hunting-spiders running over the lichen, probably in search of a similar meal.

Lower down the hills we came across a few *Acronycta myricæ* on the rocks. From the number of freshly emptied pupa-cases, and the few moths found, I think they must choose other resting-places. Probably they sit on the bare peat, as we found *A. menyanthidis* and *Scodiona belgiaria* later. *Glauca* and *menyanthidis* were also noticed three or four times, high up the trunks of birches and aspens. Two or three *Arctia fuliginosa* var. *borealis* were seen flying, and looked very bright as the sun struck their ruby wings.

On the 25th of May we deserted the open moor and beat the branches of the alders which grow along some of the mountain burns. *Hypsipetes impluviata* was beginning to emerge, and a week later there were hundreds. They were wonderfully varied, from the pale English form to almost black specimens, and one asymmetrical dark form was obtained. Amongst these trees we also took one *Cidaria miata*, several *Coremia ferrugata*, and two *Selenia illunaria*. *Cidaria suffumata* was widely distributed, though not common, and rather past its best. Amongst the eighteen we took were one or two typical specimens, several

intermediates and one var. *piceata*. Another, a male, was suffused with a reddish brown instead of the black-brown of *piceata*, but unfortunately was a good deal worn.

On the 29th we took a specimen of *Hypsipetes ruberata*, and saw a second. They were in a birch wood, with a few sallows at the edge. Later, two more were taken, one on an aspen.

On May 30th *Lobophora hexapterata* appeared on the aspen-trunks in considerable numbers, showing a good range of colour and markings, including many buff-banded forms, only three of which were males. This variety is almost restricted to the females, as far as my experience goes. Amongst these birches and aspens were several worn females of *L. lobulata*, one with the transverse lines very black, and a second with these partially fused, forming a single central band.

Lobulata lingered on till June 4th, surely a very late date! I have taken them in the same wood on April 10th, in considerable numbers. These aspens proved rich in Macro-Lepidoptera. *Cymatophora or* was first found on June 2nd, and lasted until June 22nd. A few recently emerged specimens were found on the lower part of the trunks; the rest were shaken from the higher branches, often falling into the burn, and affording some excitement before they could be fished out.

On June 2nd we took five *Cidaria corylata*, one being of the var. *albocrenata*. This insect became very abundant later, but only included a small number of the variety. On the aspens we also found one *Notodonta dictæa*, with very white ground colour; one *Lophopteryx camelina* uniformly dark brown with smoky grey fringes and hind wings; several *Smerinthus populi*, also very dark.

(To be concluded.)

NOTES AND OBSERVATIONS.

Scoparia frequentella ab. portlandica not at Barmouth.—In Entom. xxxviii. 292–3 (1905), the capture of "*Scoparia frequentella* var. *portlandica*" in the Barmouth district, last season, was chronicled by Mr. J. Arkle, whereupon, thinking that so startling a statement required investigation, I wrote to him, and he has kindly obliged me with the loan of the specimen upon which his record was based. It shows no resemblance to ab. *portlandica*, and is not even referable to *S. frequentella*, for it proves to be, most certainly, an ordinary light specimen of *S. cratægella*, Hb. *S. frequentella* ab. *portlandica*, which is clearly figured, though under the erroneous name *phœoleuca*, in Ent. Mo. Mag. v. pl. i. fig. 10 (1869), and in Leech's Brit. Pyr. pl. 15, fig. 5 (1886), is so remarkably localized that, in spite of its having been recorded (as "*phœoleuca*") from Brandon by Leech (*op. cit.*, p. 19), as well as from Ranworth by Winter (Ent. Wk. Int. ix. p. 3 (1860)), my belief that it has not been met with beyond the limits of the Isle of

Portland remains unshaken, though I should welcome the sight of an example from Brandon or elsewhere. Can anyone inform me where the specimens that gave rise to the Brandon or Ranworth records are to be found? In justice to Mr. Arkle, it must be added, that he was misled in the matter by an experienced lepidopterist, who definitely pronounced the Barmouth individual, when it was submitted to him for identification, to be *Scoparia frequentella* var. *portlandica*.—EUSTACE R. BANKES; Norden, Corfe Castle, December 21st, 1905.

THE VARIATION OF THE LARVA AND PUPA OF VANESSA HIPPOMENE, Hüb.—Through the great kindness of Monsieur Georges Autelme, I received three full-grown larvæ of this rare insect—rare at any rate in this island, and now almost extinct. I hope at some future time to give full details regarding its life history and distribution, but for the moment I wish to direct attention more particularly to the very remarkable variation which the larvæ and pupæ undergo when exposed to or partially deprived of sunlight. The larvæ were found when full-grown on the food-plant, which was growing under the shelter of some trees, and only received the direct rays of the sun for a portion of the day only. They differed appreciably, but their colour generally was pale grey with black lines, more particularly on the segments and along the line of the spiracles, and with conspicuous yellow spots, from which arose the branched yellow spines with black tips. The general coloration reminded one forcibly of the larva of the figure-of-eight moth (*Diloba cæruleocephala*). They were placed in an ordinary breeding-cage, in a shady but by no means dark verandah, and pupated the following day, close together at the top of the cage. Though I had never seen the pupæ before, still they all struck me as being remarkably dark, being of deep umber-brown with a few spots of deep gold. By a lucky chance I found an egg of the insect on one of the leaves sent with the larvæ, and this I reared in the same cage and in the same position as the former. This larva was in all its stages a dark grey black, darker than the larva of *V. urticæ* and almost as dark as *V. io*; the usual yellow spots could just be distinguished as deep ochreous or almost chocolate-coloured dots; the spines were much reduced in size, and instead of being pale yellow were obscure salmon-pink. The larva when full-fed was a third less in length than the others, though abundantly supplied with food, and I was, consequently, considerably surprised one morning to find it suspended. I brought the cage into bright sunlight, and surrounded the larva with white foolscap paper, and, as I anticipated, the resulting pupa was pale brown, with numerous spots and splashes of pale gold and silver. The butterfly differed in no way from the others. Professor Poulton, unless I am greatly mistaken, has demonstrated the susceptibility of the larva and pupa of *V. urticæ* to altered conditions; but I am not aware of any Vanessid varying to such an extent as *V. hippomene*, either under natural or artificial conditions. As far as I can recollect, the larva of *V. urticæ* varies but slightly. Possibly all tropical Vanessids vary to the same extent as *V. hippomene*, but I do know that such variations, if they exist, have been recorded. I may add, that the larva which hatched October 8th pupated November 5th, and emerged November 16th, a rate of growth which must cause envy

among the breeders of English Vanessids!—N. Manders, Lt. Colonel, R.A.M.C.; Curepipe, Mauritius.

Sugar at Witherslack.—At the beginning of July I spent a few days at Witherslack, in company with my friend Rev. J. E. Tarbat, and our experience with sugar was so remarkable as to be worthy of record. It was the kind of experience one hardly expects to have more than once in a lifetime. We sugared for seven nights, and each night, irrespective of varying weather conditions and of nights which did not seem likely to be favourable—clear, cool, or windy—the moths swarmed. On the majority of the evenings we worked a round of trees, partly in an open field, through a little orchard and spinney on the side of a hill, and up to a big tree crowning a knoll. Every tree had numbers of moths upon it, and on coming to this final tree—an ash—in a somewhat exposed situation, my friend remarked, "We shan't have much here, ash is not good for sugar." As he spoke, our lamp shone upon the patch, which was a living mass of insects, coming on while we watched, knocking one another off, tumbling to the foot, and at once climbing up again, On our second round, when we had picked off what we wanted, and had disturbed others, and it being midnight, the moths were getting satiated and some had flown, we counted those that remained on this tree and found there were upwards of seventy on the one patch of sugar. We noted twenty-five species that evening on that one tree. Altogether, on the seven evenings, June 30th to July 7th, we noticed the following species of Noctuæ feeding:—*Thyatira batis* and *T. derasa*, *Cymatophora duplaris*, *Acronycta psi*, *A. rumicis* (including a dark form), and *A. menyanthidis*, *Leucania conigera*, *L. lithargyria*, *L. comma*, and *L. pallens*, *Axylia putris*, *Xylophasia rurea* (and var.), *X. lithoxylea*, *X. sublustris*, *X. monoglypha* (with many very dark forms), *X. hepatica*, *Mamestra sordida*, *M. furva*, *M. brassicæ*, *M. persicariæ*, *Apamea basilinea*, *A. gemina* (and var.), *A. unanimis*, *A. didyma*, *Miana strigilis*, *M. arcuosa*, *Grammesia trigrammica*, *Caradrina alsines*, *Rusina tenebrosa*, *Agrotis segetum*, *A. exclamationis*, *A. corticea*, *A. strigula*, *Noctua augur*, *N. plecta*, *N. c-nigrum*, *N. triangulum*, *N. brunnea*, *N. festiva*, *N. rubi*, *N. baia*, *Triphæna comes*, *T. pronuba*, *Mania typica*, *M. maura*, *Euplexia lucipara*, *Aplecta prasina*, *A. nebulosa*, *A. tincta*, *Hadena dentina*, *H. dissimilis*, *H. oleracea*, *H. pisi*, *H. thalassina*, and *H. contigua*—in all fifty-five species.—(Rev.) W. G. Whittingham; Knighton Vicarage, Leicester.

Oviposition of Æschna juncea and Agrion mercuriale.—In Dr. Drabble's note (*ante*, vol. xxxviii. p. 310) he incidentally states that *Æ. juncea* deposits its eggs while hovering on the wing. This scarcely agrees with my experiences of the species in Surrey. There, by its actions, it gives one the impression that it deposits them in the tissues of plants. I have supposed that *A. mercuriale* does the same thing, but have never seen the process. Has Dr. Drabble had personal experience of the proceedings of *A. mercuriale* when ovipositing? I am afraid we know very little for certain about the early history of dragonflies at present.—W. J. Lucas.

Melitæa desfontainii and M. aurinia var. iberica in Central Aragon.—I found these two species flying together last June in a gorge

near a place called El Puerto, about sixteen kilometres south-east of Teruel. *M. desfontainii* was much the more abundant of the two, but most of the males were getting decidedly the worse for wear, when I first visited the locality on June 12th; and even the females, of which however there was no scarcity, had to be somewhat carefully selected. Though occurring in the gorge, too, this butterfly, especially the females, was much more plentiful on the undulating plateaux in the forests above; whereas *M.* var. *iberica* I never took except in the gorge itself. Moreover the latter was, I imagine, only just beginning to come out on June 12th, and was very much scarcer than *M. desfontainii*. I believe, however, that had I remained on at Teruel during a couple of intensely hot, cloudless days (June 20th and 21st), and spent them at El Puerto, instead of packing up on one, and riding my bicycle to Albarracin on the other, I might have secured a good series of *iberica*, which, as it was, I failed to do. But an entomological career, like most others, is full of successful episodes that "might have been."—Margaret E. Fountaine; Bath, January 23rd, 1906.

A General Exhibition.—The South London Entomological and Natural History Society proposes to hold a General Exhibition of Natural History Objects at their rooms in Hibernia Chambers, London Bridge, on Saturday, March 10th. It will be on the same lines as those that were so successful some years ago. Exhibits from those who are not members will be gladly welcomed. Full particulars may be obtained from Mr. Stanley Edwards, 15, St. Germans Place, Blackheath, S.E.; or Mr. Hy. J. Turner, 98, Drakefell Road, New Cross, S.E.

CAPTURES AND FIELD REPORTS.

Eupithecia debiliata, &c., in Leicestershire.—I was fortunate in taking, last summer, in this county, *Eupithecia debiliata*, *Eucosmia undulata*, *Bomolocha fontis*, *Venilia macularia*, *Xylophasia scolopacina*, and *Orthosia suspecta*. The first three species were discovered a year or two ago, by Mr. Bouskell and Mr. Dixon, but I think were not recorded in the 'Entomologist.' *V. macularia* I found some years ago, in an open heathy park, and re-discovered in the same place this year, it feeding apparently on *Teucrium scorodonia*. The two last-named species have not, as far as I am aware, been noticed in the county hitherto. *Bomolocha fontis* evidently feeds, not on *Erica*, as mentioned in Stainton, St. John, and Merrick, but on *Vaccinium*. There was no *Erica* in the neighbourhood, at all events in sufficient quantity, and I verified my conclusion later by finding the larvæ on *Vaccinium*. (Rev.) W. G. Whittingham; Knighton Vicarage, Leicester.

Crambus fascelinellus in South Devon.—With reference to Mr. Edelsten's note (Entom. xxix. 19) I may mention that I took a specimen of above on the coast near here, on August 9th, 1899, and my friend Mr. B. A. Bower, of Chislehurst, took another in the same locality, when in my company, on the 15th of the same month.—E. F. Studd; Oxton, Exeter, January 4th, 1906.

SOCIETIES.

Entomological Society of London.—The Annual General Meeting was held on Wednesday, January 17th, at the rooms of this Society, 11, Chandos Street, Cavendish Square.—Mr. F. Merrifield, the President, read an Address on the General Operation of Temperature on the Growing Organism of Lepidopterous Insects, based on a series of experiments, especially with reference to the remarkable limitations imposed by climatic and artificial conditions.—The Report of the Society showed that for the first time in its history the number of ordinary Fellows had reached five hundred. The officers and council were elected for the Session 1906-7 as follows:—President: Mr. F. Merrifield. Hon. Treasurer: Mr. A. H. Jones. Hon. Secretaries: Mr. H. Rowland-Brown, M.A., and Commander J. J. Walker, M.A., R.N., F.L.S. Librarian: Mr. G. C. Champion, F.Z.S. Other members of the Council: Mr. G. J. Arrow, Mr. A. J. Chitty, M.A., Mr. J. E. Collin, Dr. F. A. Dixey, M.A., M.D., Mr. H. Goss, F.L.S., Mr. W. J. Kaye, Mr. H. J. Lucas, B.A., Professor E. B. Poulton, M.A., D.Sc., F.R.S., Mr. L. B. Prout, Mr. E. Saunders, F.R.S., F.L.S., Mr. R. S. Standen, F.L.S., and Mr. C. O. Waterhouse.—H. Rowland-Brown, M.A., *Hon. Secretary.*

The South London Entomological and Natural History Society. —*Thursday, December 13th*, 1905.—Mr. Hugh Main, B.Sc., F.E.S., President, in the chair.—Messrs. Harrison and Main exhibited a series of *Cleoceris viminalis*, bred from Windermere larvæ, showing variation from pale grey to very dark, with captured pale specimens from Barmouth. They also showed *Plusia moneta* from Chertsey and Reigate larvæ.—Mr. Stonell, (1) melanic specimens of *Phigalia pedaria* from Delamere Forest, *Odontopera bidentata* from Skelminthorpe, and *Camptogramma bilineata* from Shetland; (2) *Polyommatus icarus*, females, with male coloration; (3) *Lycæna arion* from N. Cornwall; (4) *Nonagria cannæ* from Norfolk; and (5) *Eupithecia pernotata* taken at Loughton in 1876.—Dr. Chapman, larvæ sent to him by Mr. Murray from Carnforth; they were so densely hairy as to appear almost solid. They appeared to him to be larvæ of *Nemeophila plantaginis*, although he had never known them to hybernate at such an advanced stage in this country. Mr. Murray did not think they were this species. A continental record was mentioned of the species hybernating full fed, when it was densely haired.—Mr. Adkin, series of melanic *O. bidentata* from Durham larvæ, some of which showed whitish lines or markings. —Mr. Goulton, photographs of larvæ *in situ* on their food plant.—Mr. H. Moore, nest of the Durban White Ant (*Termes bellicosus*) and a large species of Wood-louse (*Glomeris*).—Mr. Barnett, dark forms of *Mellinia circellaris*, *Boarmia gemmaria* var. *perfumaria*, and a varied series of *Hybernia defoliaria*, some being brilliantly banded, all from W. Kent. —Mr. Fremlin, *Sirex juvencus* from Maidstone.—The reports of the Field Meetings held at Reigate and at Oxshott were read.

January 11th, 1906.—The President in the chair.—Mr. J. W. Schoon, of Bayswater, and Mr. A. A. Dobson, of New Malden, were elected members.—Mr. West, of Ashtead, exhibited a booklet, recently published, containing some sixty admirable photographic reproductions of life-histories and protective resemblances in the Lepidoptera.—Mr.

Hy. J. Turner, male examples of *Morpho cypris* from South America.—Mr. Tonge, a capital photograph of the life-history of *Sesia* (*Macroglossa*) *stellatarum*, ova, larva, pupa, and imago.—Mr. Main, a long and variable series of *Noctua festiva*, bred from Lancashire larvæ, and a photograph of the egg-capsule of *Periplaneta americana*.—Mr. Kaye, a remarkable specimen of *Agrotis tritici*, bearing a close resemblance to *A. agathina*. It was taken with the latter species flying over heather at Oxshott, and was a good example of syncryptic resemblance brought about by the common habit of resting on heather.—Mr. R. Adkin read the Report of the Field Meeting held at Seal on May 27th, and added to it a summary of the characteristics of the area covered by the Society's Field Meetings in W. Kent during the past few years.—Mr. Carr communicated the Report of the Field Meeting held at Chiselhurst and St. Paul's Cray on September 16th.—Hy. J. Turner, *Hon. Rep. Sec.*

Lancashire and Cheshire Entomological Society.—The Annual Meeting was held in the Royal Institution, Liverpool, on Monday, December 18th, 1905.—In the unavoidable absence of the President, Mr. S. J. Capper, F.E.S., Mr. Richard Wilding, Vice-President, occupied the chair.—The minutes of the preceding meeting having been confirmed, the following were elected members of the Society:—The Right Honble. Lord Avebury, P.C., D.C.L., LL.D. (Farnborough, Kent); George Arnold (University of Liverpool); Eustace R. Bankes, M.A., F.E.S. (Corfe Castle); Geo. C. Champion, F.Z.S., F.E.S. (Woking); Thos. A. Chapman, M.D., F.Z.S. (Reigate); Chas. W. Dale, F.E.S. (Glanvilles Wootton); Rev. H. S. Gorham, F.Z.S., F.E.S. (Great Malvern); Herbert Goss, F.L.S., F.E.S. (Surbiton); Martin Jacoby, F.E.S. (West Hampstead); Gervase F. Mathew, F.L.S., F.E.S., Paymaster-in-Chief, R.N. (Dovercourt, Essex); Professor Raphael Meldola, F.R.S., F.C.S., F.E.S. (London); Frederic Merrifield, F.E.S., President of the Entomological Society of London (Brighton); Claude Morley, F.E.S. (Monk's Soham); David Sharpe, M.A., M.B., F.R.S. (Cambridge); H. R. Sweeting (Wallington); Colonel Charles Swinhoe, M.A., F.L.S., F.E.S. (London); Gerald M. Taylor, M.A. (Rossall); Rev. A. Thornley, M.A., F.E.S. (Nottingham); Commander Jas. J. Walker, M.A., R.N., F.L.S. (Oxford); and Lieut.-Colonel John W. Yerbury, R.A., F.Z.S., F.E.S. (London).—Donations to the library were received from the President of the Board of Agriculture and Dr. Jas. Fletcher, LL.D., F.R.S.C. (Ottawa).—The Secretary announced that the following invitations had been accepted on behalf of the Society:—(1.) From the President and Council of the Association of Economic Biologists, to take part in its third Annual Meeting to be held in the School of Tropical Medicine, University of Liverpool, on December 28th and 29th, 1905, when papers will be read by Mr. Fred V. Theobald, M.A. (Presidential Address), Professors Rubert Boyce, M.B., F.R.S., and Major Ronald Ross, C.B., D.Sc., F.R.S., and Messrs. W. E. Collinge, M.Sc. (two), W. G. Freeman, R. B. Greig, Robert Newstead, A.L.S., F.E.S. (two), M. Steains, and F. V. Theobald. (2.) From the Council of the Liverpool Science Students' Association, to co-operate at an Exhibitional Meeting to be held in the Royal Institution on January 12th, 1906.—The Secretary then read the Report of the Council, showing that the session had been an eminently successful one. The Treasurer (Dr. J. Cotton) then presented his

Balance-sheet, which showed a substantial and increased balance at the bank. On the motion of Mr. Webster, it was resolved to print and circulate the Reports in the Proceedings of the Society.—On the motion of Mr. Tait, seconded by Dr. Edwards, and supported by Messrs. Webster, Stott, Cotton, and the Chairman, a vote of thanks was accorded the retiring Secretary, Mr. Sopp, for his services to the Society during the four years he had held office. It was further resolved that the motion be specially recorded in the Transactions of the Society. — The Annual Address, by Mr. Horace St. J. K. Donisthorpe, F.Z.S., F.E.S., Vice-President, was then communicated. In opening, the lecturer first dealt with the eighteen species of beetles that had been added to the British list during 1905, and afterwards summarized the more noteworthy papers that had appeared in current entomological literature during the year. Later, in discussing the science of entomology, he exhorted members to undertake original research, and to collect with some special object in view. There were the theories of mimicry and protective resemblance; the courtship of insects; the uses of the scents they bear, attractive and repellant; and other equally interesting problems for solution. In many cases he deprecated a protracted waiting for further evidence before venturing to theorize, and insisted on the faculty of imagination, rightly used, being as essential to a scientist as to a literary man, as instanced in Darwin, and referred to the mass of material already accumulated in the museums of the country. The lecturer then passed to a consideration of our indigenous myrmecophilous Coleoptera, a subject with which his name is inseparably associated.—On the motion of the Chairman, a very cordial vote of thanks was accorded Mr. Donisthorpe, whose paper it was resolved to print in full in the Proceedings of the Society. — The following officers were elected to serve during 1906:— President: Samuel J. Capper, Esq., F.E.S. Vice-Presidents: Professor T. Hudson Beare, B.Sc., F.E.S., F.R.S.E.; Richard Wilding; J. H. Bailey, M.B., Ch.B.; E. J. B. Sopp, F.R.Met.S., F.E.S.; Professor E. B. Poulton, M.A., D.Sc., F.R.S.; and J. R. Charnley, F.Z.S., F.E.S. Hon. Treasurer: J. Cotton, M.R.C.S., L.R.C.P., L.S.A. Hon. Secretaries: H. R. Sweeting, M.A.; W. Mansbridge, F.E.S.; and W. Delamere Harrison. Hon. Editor: J. R. le B. Tomlin, M.A., F.E.S. Hon. Librarian: F. N. Pierce, F.E.S. Council: H. St. J. K. Donisthorpe, F.Z.S., F.E.S.; A. Tippins; W. A. Tyerman; B. H. Crabtree, F.E.S.; J. Kidson Taylor; J. F. Dutton; W. Webster, M.R.S.A.I.; F. R. Dixon-Nuttall, F.R.M.S.; Rev. T. B. Eddrup, M.A.; C. E. Stott; R. Tait, Jun.; and P. Edwards, M.R.C.S., L.R.C.P., L.S.A. — The following were reappointed recorders:—Coleoptera, J. R. le B. Tomlin; Hymenoptera, Edward Saunders, F.R.S., F.L.S., F.E.S.; Lepidoptera, F. N. Pierce; Diptera, C. R. Billups, M.R.C.S., L.R.C.P., and E. E. Lowe, F.L.S.; Neuroptera, W. J. Lucas, B.A., F.E.S.; Orthoptera, E. J. B. Sopp; and Hemiptera, Oscar Whittaker.—Exhibits were shown as follows:— British Lepidoptera, by Mr. R. Tait, Jun. Three cases of West African Lepidoptera, captured on the Gold Coast during May, 1905, by Mr. W. A. Tyerman. *S. carpini* as a weasel—a case of mimicry—by Dr. P. Tinne; the moth rests on heather, with head downwards, and antennæ loosely folded to suggest whiskers: the resemblance probably

protects it from attack by birds, &c., and was very effectively shown in the exhibit. The stick-insect, *Tirachoides spectabilis*, from New Guinea, by Mr. J. J. Richardson. The scarce grasshopper, *Megostethus grossus*, L., from the New Forest (presented to the Society), by Mr. W. J. Lucas. *Creophilus maxillosus*, L., with a red thorax, from Ashton-on-Mersey, in November (R. Tait, Jun.); a perfect specimen of the green cockroach, *Panchlora virescens*, Thunb., captured amongst bananas in Manchester (H. Garnett); and the Central American earwig, *Apterygida linearis*, Esch., from the Liverpool Docks, by Mr. Sopp; the latter insect kindly identified by Mr. Malcolm Burr, B.A. Mr. Sopp also showed a photograph, kindly presented to him by Mr. Robert Morley, R.B.A., of the artist's picture "Cornered," now on view in the Liverpool Autumn Exhibition of Pictures. This was greatly admired, the subject being keenly appreciated by all, it being evident that Mr. Morley was a naturalist as well as an artist.

A meeting was held at the Royal Institution on Friday, January 12th, 1906, in conjunction with the Liverpool Science Students' Association and the Liverpool Microscopical Society.—Chas. Stacey Colman, Esq., M.A., The College, Bishop's Stortford, was elected a member of the Society.—The following members contributed exhibits:—Mr. R. Wilding, a drawer of British Aphodii. Mr. E. J. B. Sopp, a series of life-history cards of various British beetles, showing their ravages in certain products of commercial importance, the most interesting being *Triplax ænea* (under holly bark), *Pentarthrum huttoni* (in old ash-wood), *Bruchus rufimanus* (in beans), *B. pisi* (in peas), *Anobium paniceum* (in liquorice and coriander seed), *Lasioderma serricorne* (in cigars), *Dryocœtes autographus* (in bark); the two last being of very rare occurrence. Dr. J. Cotton, cocoons of *Dicranura vinula* and *D. bifida*. Mr. F. N. Pierce, an educational case of Lepidoptera—butterflies and moths—rare books, and a beautiful series of insect appendages, which were shown under the microscope. Mr. Wm. Mansbridge, a drawer of North American butterflies. Mr. J. J. Richardson, a drawer of exotic hawk moths.—H. R. Sweeting and Wm. Mansbridge, *Hon. Secs.*

Birmingham Entomological Society.—*October* 16*th*, 1905.—Mr. G. T. Bethune-Baker, President, in the chair.—Reference was made to the loss of Mr. J. W. Douglas, who was one of the honorary members of the Society, and had been so since its commencement.—Mr. W. Harrison showed *Pheosia tremula*, Cl. (*dictæa*, Esp.), from Selly Oak, which he thought was a new locality for it; also a series of *Nonagria typhæ*, Thnb., from Sandwell Mill Pond; and other local insects.—Mr. G. H. Kenrick exhibited a small collection of butterflies made in Mexico during a recent hurried visit to that country; he had but a few hours on two occasions to give to collecting, so that there were not many specimens. He remarked that the first three butterflies he saw on leaving the city of Mexico to collect were *Pyrameis atalanta*, L., *P. cardui*, L., and *Vanessa antiopa*, L.—Mr. R. S. Searle showed Lepidoptera from Norfolk; *Cirrhœdia xerampelina*, Hb., from Feltwell Fen; *Arsilonche venosa*, Bkh., from same place; and *Leucania obsoleta*, Hb., from Denner.—Mr. J. T. Fountain showed some larvæ which he believed to be *Hadena unanimis*, Tr.; they are found in abundance on the Stratford Canal, near Yardley, living in tubes turned up out of the leaves of a sedge-like grass.

November 28th, 1905.—Mr. G. T. Bethune-Baker, President, in the chair.—The Rev. F. D. Morice exhibited the whole of his collection of Chrysids; one boxful of British ones comprising a nearly complete set of those known to occur in this country, and including such rarities as *Hedychridium coriaceum*, Dhlb., of which five specimens were shown, which are probably all that have been taken in this country. Also six boxes containing the Palæarctic collection, which was wonderfully rich and complete.—Mr. G. T. Bethune-Baker, a very fine collection of Lepidoptera received from New Guinea.—Colbran J. Wainwright, *Hon. Sec.*

City of London Entomological and Natural History Society.—*December 5th.*—Annual Meeting.—Exhibits:—Mr. Cockayne, *H. leucophæaria*, thinly scaled, Oxford, February, 1903; also *A. leporina* ab. *melanocephala*, from Warrington. Mr. Edelsten, *N. sparganii*, male, with upper wings powdered with black scales and an extra black spot above the reniform. Mr. Hamling, *R. luteolata* ab., bred May, 1905, the ground colour being pale, with usual markings on costa very indistinct, and the apical blotch absent. Mr. A. Harrison, *A. leporina*, from Delamere Forest, with black thorax and abdomen and fore wings suffused with smoky black; a melanic series of *C. duplaris* from Simonswood Moss, Lancashire; *A. ashworthii*, second brood bred in October, from ova laid by imagines reared from larvæ taken in North Wales in the spring. Mr. Pickett, a long series of hybrid *S. populi* × *ocellatus*; also specimens of hybrid *C. curtula* × *reclusa*, *S. illunaria* × *illustraria*, and *N. dromedarius* × *ziczac*, the latter resembling the first species in size and colouring, but having the "pebble" markings of *ziczac*. Mr. J. Riches, *O. gonostigma*, second brood, bred, from Brentwood. Mr. Shaw, a long series of *B. muralis*, Torquay, July, 1905, varying from very pale to dark green and olive forms.—The treasurer's and secretaries' reports having been read, and the officers and council for 1906 elected, Mr. A. W. Mera read his presidential address.—S. J. Bell, *Hon. Sec.*

OBITUARY.

We regret to hear that Mrs. Hutchinson, of Leominster, died on December 10th. Throughout a long life she seems to have been devotedly attached to the study of Natural History, but with a special leaning to the insects, and those more especially that were to be observed in her own district. Her unique opportunities for investigating the life-history of *Grapta c-album*, and also that of *Eupithecia consignata*, were turned to good account, and it is probable that many cabinets owe their series of each of these insects to her generosity. Mrs. Hutchinson contributed many interesting notes, and longer articles, to the entomological journals from time to time. In the 'Entomologist' for 1881 there is an article from her pen, in which she disproves a suggestion that had been made that *G. c-album* was becoming extinct in England. The careful manner in which she reared those species of Lepidoptera in which she was specially interested is shown in the case of *E. consignata*, of which species she presented twelve specimens to the National Collection in 1903. Ten of these were bred in April, 1903, and were the direct descendants of a female captured in April, 1874.

NEW BUTTERFLIES FROM B. GUIANA AND JAMAICA.

(Two-thirds natural size.)

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NEW SPECIES OF GUIANA AND JAMAICAN BUTTERFLIES.

BY WILLIAM JAMES KAYE, F.E.S.

(PLATE II.)

THE species of butterflies here described are all from the Guiana region, except the small *Chlosyne*, which is from Jamaica. The latter is of great interest, as indeed are all the species peculiar to this island, as showing how local the insect must be. It is now some years since the specimen was taken, and, owing doubtless to the exact locality (Manchester Mountains) not having since been visited, no further specimens have been taken. The Guiana species include a *Eucides*, which is apparently quite new. This insect has occurred in some numbers, but, strangely, only three males have been taken to some twenty females. The *Papilio* now described may be the female of some known male; but, on the other hand, if it should belong to the *latinus* group, the sexes would be similar, and the now described form would be entirely new. I lean to the latter view, on account of the yellow spots on the sides of the abdomen and the sides of the thorax. The row of red spots coming close up to the subterminal row of yellow spots is also suggestive of the *latinus* group. The Heliconius of the *cybele* group has remained undescribed for years. It is evidently a rare species. Mr. H. J. Adams has the insect also without a name. Unfortunately the *Protogonius* is not here figured. The species or race can, however, now be recognized readily from its special characteristics given below.

Protogonius hippona, Fab., verus.

The identity of this species has so commonly been lost sight of that a description seems badly wanted. There are in existence two specimens of *P. hippona* in the Banksian collection, and these were doubtless identified from Fabricius's type. The

species in some of its forms exhibits yellow instead of white spots to outer margin of hind wing. The large black area of hind wing is the special characteristic of the species.

Fore wing black and tawny, with a heavy yellow band which is very variable in its lower half from beyond cell to outer margin. Apical area black, containing two or three yellow blotches, the uppermost one of which is much the largest. A broad black edging on inner side of transverse band and a heavy black inner marginal band from base to tornus. Inner area of wing fulvous, more yellowish towards its outer confines. Hind wing with the costal half fulvous, a black dash running in towards base from outer margin along vein 7; above this, midway, is a large conspicuous fulvous blotch, well defined by black margins. Lower half of wing heavily black, but variable in extent towards and beyond the cell. Sometimes black irroration extends right across the wing, but more frequently the black area stops abruptly on reaching the lower corner of the cell. A row of large and conspicuous white marginal spots, those beyond the black area becoming obliterated, or only showing indistinctly as yellowish marks. Expanse 106 mm.

Hab. The Guianas (English, Dutch, and French). Lower Amazon.

The species varies considerably. From the very few individuals available for examination, it appears that the form in French Guiana (Cayenne) has a darker hind wing than those from British Guiana (Berbice), and these in turn are darker than those from Paraguay (?), if the latter should prove to be the same species, as is possible. In fact it may be that the vast majority of the described species of *Protogonius* are all one species, with different geographical forms, but all overlapping somewhere or other. Starting with the extremest black hind-winged form from Cayenne, one works through to a lighter form in British Guiana. In Venezuela there is a less black form still, and the band of the fore wing has become broken. Going northward, this reduction of the yellow area becomes more and more marked, until in *T. cecrops* some specimens have a very slender band. In Trinidad, where insularity has worked to bring about greater change, and where there is no fusion of any other race, the form has assumed quite a distinct facies in *T. ochraceus*. Northwestwards, in Columbia, in *T. tithoreides* there is an admixture of the Northern and Southern races: Northern, in retaining the large distinct marginal spots to fore wing; Southern, in showing a reduction in the size of the marginal spots to the hind wing. In Columbia there is a subform of *tithoreides* called *albinotatus*, in which all the spots and band of the fore wing have become white. Going from Guiana westward, one finds a similar form to the British Guiana race in the Lower Amazon. Higher up the same system, on the Rio Madeira, there is a chestnut-coloured form which shows an influence of northern form, but of

this race we know very little, especially as to how the intermediate forms fit in. In Peru the form called *diffusus* shows the yellow band partly obliterated by the ground colour in the lower half, and frequently the apical spots are entirely suppressed. From this form there is a gradation in aberration where the yellow is entirely suppressed, where the colours have become black and fulvous only, but where the hind wing has retained the usual coloration. This form is probably unnamed, but is probably only an aberration of *diffusus*. Lastly, as an extreme in one direction, there is the form *semifulvus*, in which the hind wing is greatly blackened as far as vein 6. Specimens of this are found, showing a transition of the orange band to the yellow band, as found in *diffusus*. Going southwards, no great change is found from the less extreme Guiana forms till one comes to Southern Brazil, where the chief distinction lies in the presence of a longer white apical patch instead of two or three yellow patches. The shape of the yellow band remains much the same as in the Guiana form, in fact almost identical with that of the Berbice specimen. The colouring of the hind wing varies greatly, from fulvous to a shade of lemon-colour, to yellow with a shade of fulvous. It may possibly be due to varying altitudes in some localities where two forms have been received from the same country, as they have been from Colombia and Ecuador. Accurate data are much needed to decide, but there is scarcely a doubt that continuity of forms prevails to a very large extent.

Papilio caburi, n. sp. (Pl. II. fig. 1).

Fore wing deep lustrous ivy-green, the basal half much darker and less lustrous. Hind wing lighter green than fore wing, and with a greater sheen on the costa; reaching to nervure 7 is an oblong patch of cream-coloured scales, and between nervures 6, 7 is just an indication of another patch; before the margin is a row of larger black blotches around the nervures extending to vein 6, where the blotches have become much reduced. Outer margin deeply crenulate, with sharp triangular tooth-like black marks running up between the nervures. Abdomen of the same colour above as hind wing; the sides with three rows of orange patches. On the under side of fore wing ground colour dull blackish; basal half much darker, with a small elongated patch of cream-coloured scales within the cell, lying near lower discocellular. Under side of hind wing blackish, with a marginal row of cream-coloured spots between the nervures, preceded by a row of brick-red heart-shaped blotches. On under side of abdomen is a double row of cream-coloured white dots. Expanse 150 mm.

Hab. Forest between Essequibo and Mazaruni Rivers, near Bartica (W. J. Kaye, April 16th, 1901).

Eueides nigrofulva, sp. n. (Pl. II. fig. 4, ♀ ; 5, ♂).

♂. Fore wing wholly orange and black. The costa black for entire length; the apex very broadly black; outer margin sinuated black; inner margin orange, except just at base, where a longitudinal black streak takes its rise, following the line of nervure 1 *b*, becoming much narrower before outer margin is reached. Discoidal blotch very large, black, hardly joined with the black of costa, and only connected with another large blotch situated between nervures 3, 4 by a small and narrow extension of the blotch; an ill-defined blotch between nervures 2, 3. Hind wing with a very broad marginal band, containing indications of lighter spots, and throwing up short tooth-like marks between all the nervures except between 6, 7. Between the band and the discoidal cell are series of black elongated patches, variable in size and intensity. Thorax with a pair of orange marks and first abdominal segment with another pair. On the under side of fore wing is a row of white marginal spots, largest at apex and smallest at tornus; within the black apex is a band of straw-colour, and again, just within the discoidal blotch, the tint is straw-colour. Under side of hind wing with a lightish area round upper disco-cellular; the black marks within the band very clear and distinct. A marginal row of very distinct large white spots.

♀. With the wings more ample, with the band inside apical black patch straw-coloured, and with the area immediately within the discoidal blotch also straw-coloured. Expanse: male, 82 mm.; female, 90 mm.

Hab. Essequibo River, Potaro tributary (C. B. Roberts, June, November, December, September).

Chlosyne pantoni, n. sp. (Pl. II. fig. 6).

Fore wing above dark black-brown, with deep ochreous markings. Near the base is a narrow obscured ochreous mark; a large irregular ochreous patch, chiefly lying within the cell, but extending towards the inner margin, and a patch of similar colour lying well beyond the cell between veins 4 and 7, extending indistinctly through to the costa. A series of large ochreous subterminal spots lying well in from the margin. On the under side the inner margin and outer margin broadly brownish black; within the latter is a series of spots, which are yellowish towards costa and ochreous towards tornus. The remainder of the wing as on upper side, except that there is a wedge-shaped ochreous mark extending to base, and not a small linear mark. Hind wing above, with the costa, broadly greyish black, the outer and inner margins dark brownish black; the central area of the wings ochreous. Central lunule indistinctly blackish. A large mark from inner margin to just beyond the lower corner of cell dark brownish black. On the under side the ground colour wholly blackish, with a slight ashy tone. In basal half are a number of cream-coloured large blotches. A double subterminal line of festooned whitish marks, preceded by a row of large dark-red spots, which become more and more suffused towards costa. Expanse 56 mm.

Hab. Jamaica (Manchester Mountains).

The species is named after Mr. E. S. Panton, its discoverer.

Heliconius tumatumari, n. sp. (Pl. II. fig. 2).

Fore wing black, the base crimson. A large yellow blotch within the cell, divided from the red area by a roundish black blotch. Discoidal blotch irregular black, joining another black mark just beyond the cell between veins 3 and 4. Beyond the cell are elongated patches of sulphur-yellow radiating round to the costa. Between veins 2, 3 there is a break with the ground colour, and just above vein 2 there is another yellow mark, sometimes elongated, and joining the yellow area with the cell. At the extreme angle of the tornus is an elongated yellow spot, and immediately before apex are three yellow spots, the centre one of which is usually most distinct. Abdomen not marked above, and with a white line running down the centre beneath, bordered on either side with a very fine more or less indistinct white line. Expanse 97 mm.

Hab. British Guiana.

The species is related to *H. cybele*, and from the very few specimens seen is tolerably constant.

Heliconius silvana var. *divisus*, nov. (Pl. II. fig. 3).

Fore wing as in typical *silvana*. Hind wing with the transverse black area divided by a band of the brownish ochreous ground colour as far as vein 5, where there is placed the usual lower yellow spot close to the margin. Both the upper and lower of these spots well defined, but the indications of the remaining marginal spots very ill defined, and hardly distinguishable beyond vein 3. The upper portion of the black area, above the band of ground colour, more arched than in typical *silvana*.

This form is probably a rare aberration only, and not confined to any one locality. Similar specimens occur on the Lower Amazon, as well as in British Guiana, from whence the form is now described.

LEPIDOPTERA AT RANNOCH IN 1905.

By E. A. Cockayne, F.E.S.

(Concluded from p. 40.)

In the birch woods, *Drepana lacertinaria* and *D. falcataria* were met with; the former, much the commoner of the two, was rather darker than the usual English form. *Falcataria* in this district is a most lovely insect. It has an almost white ground colour, crossed by an intensely dark-brown stripe curving round to the hooked wing-tip. *Cymatophora duplaris* was abundant on the smaller branches of the birches. All were more or less melanic, some nearly black.

Coremia salicata and *Emmelesia blandiata* were common locally, the former commoner near the tops of the hills.

On June 23rd *Psodos trepidaria* was flying in profusion on a

bare plateau about 2500 ft. above sea-level. Bearberry has been suggested as its larval food-plant, but I do not think this can be true. They are most abundant on parts of the hill-top where no bearberry grows. The only two plants sufficiently common are crowberry (*Empetrum nigrum*) and lichen. The former seems to me, on the whole, more probable, and we noticed that a great many, females especially, could be disturbed from the tufts of this plant. In a former year I tried the young larvæ on lichen; but, though they lingered alive for a few days, they did not appear to touch it. I hope some day to try with crowberry, perhaps with more success.

Sugaring was an almost complete failure, producing on May 26th two *H. glauca* and two *Pachnobia rubricosa*; June 9th, six *Hadena rectilinea*, one *H. dentina*, eight *Eurois adusta*; June 15th, four *Hadena rectilinea*, one *H. pisi*, one *C. or*; June 22nd, one *Acronycta leporina*, one *A. myricæ*, one *H. rectilinea*, four *H. dentina*, one *E. adusta*, one *C. duplaris*, one *Agrotis porphyrea*, one *Euplexia lucipara*, and one *Eupithecia satyrata*. These were the most successful evenings, and the above include every individual seen at the sugar.

The last three evenings were devoted to catching the males of *Hepialus humuli*, in the hope of finding some approach to the variety *hethlandica*. Though all those taken both near the village and in some meadows four miles along the north shore of the loch were quite typical, the time was not wasted. We were surprised to see that, as soon as the ghost moths began to hover over the long grass, small parties of black-headed gulls arrived, and began crossing and recrossing the fields. Flying very low, they frequently dropped to the level of the top of the long grass, apparently to catch something. By standing under a large elm at the edge of one of the fields we were rewarded by seeing a gull capture a male *humuli*. The birds used to arrive in little parties of two to five, and worked the fields from about 9.30 to 10.30. They then flew off to their home on the island at the head of the loch, about nine miles away. The black-headed gull seems to be the most adaptable of birds, always ready to meet new conditions. However, I must not wander off to talk of birds.

The following is a further list of insects noticed:—*Pieris napi*, *Argynnis euphrosyne*, *A. selene*, *Lycæna icarus*, *L. agestis* var. *artaxerxes*, *Macroglossa fuciformis*, *Euthemonia russula*, *Lasiocampa quercus* var. *callunæ*, *Saturnia carpini*, *Notodonta dromedarius* var. *perfusca*, *Xylophasia rurea* var. *combusta* (one blacker than any I have seen before), *Apamea basilinea*, *Tæniocampa stabilis*, *Phytometra ænea*, *Rumia cratægata* (one aberration with red much reduced), *Cabera pusaria*, *Bupalus piniaria*, *Odontopera bidentata*, *Ephyra pendularia*, *Acidalia fumata*, *Melanippe tristata*, *Melanthia ocellata*, *Coremia montanata*, *C. fluctuata* (dark forms), *C. propugnata*, *C. pectinitaria*, *Emmelesia alchemillata*, *Eubolia palumbaria*, *Eupithecia nanata*, and *Tanagra chærophyllata*.

A few pupæ of *Sesia scoliiformis*, and larvæ of the following insects were also taken: *Pœcilocampa populi* (a lovely variegated form on aspen, and a dull uniform brown one on alder and elm), *Lithomia solidaginis*, *Xanthia ferruginea*, *Plusia interrogationis*, *Tæniocampa populeti* (aspen), *Leucania impura*, *Cleoceris viminalis* (all the black and some green larvæ stung, the remainder producing well-marked imagines running into the var. *obscura*), *Cidaria truncata*, *Larentia cæsiata*, &c. The most interesting results were got from the larvæ of the Oporabias.

On May 29th we beat a few alders, and, finding the larvæ very small, did not try again till June 6th. On that day we beat forty-four from alder, and twenty-nine (for the most part much larger ones) from hawthorn growing on the same hill-side, and one from a birch. From a row of large elms on the other side of the valley we only got fourteen, which were, with one exception, very large. All the larvæ were pure green, except one from the elm, which had a few faint red marks above the spiracles. A day or two later we beat none from elm, and only a few from hawthorn; but there were still many quite small on the alders. By June 10th twenty larvæ from hawthorn and ten from elm had spun their cocoons, while only four out of more than sixty on alder were full-fed. This suggested that those on alder were *O. autumnata*, and the rest *O. dilutata*, as we had expected from the account published by Mr. Allen in the 'Entomologist,' xxxiv. p. 43. As late as June 21st there were still some *Oporabia* larvæ on the alders, and I have a record of finding one on the same food-plant on July 6th, 1901. A few very dark-green *Oporabia* larvæ with dark cheek stripes were found on ling, and three pale larvæ, one with pronounced red markings, were taken at night on sweet-gale. These last failed to emerge, but those from ling produced four *O. filigrammaria* between August 20th and September 8th. Of the other pupæ many produced solitary ichneumons, nearly all identified by Mr. Morley as two species of the genus *Limneria*. Nearly half my pupæ were destroyed in this way. All the larvæ on alder and hawthorn proved to be *O. autumnata*; the imagines emerged from September 13th–October 10th, and varied from very pale to glossy dark-brown forms—one of the former and three of the latter having an almost complete central band. The larva from birch produced a male of *O. dilutata*. From the larvæ on elm three *O. dilutata* (all pale, one with an annular mark replacing the central spot) emerged on September 27th, October 3rd and 7th; one *O. autumnata* on October 4th; and on October 6th two large pale females of *O. dilutata* ab. *christyi*, which seems likely to prove a true species. These results appear to prove that *O. autumnata* in Rannoch is a more general feeder than in the Enniskillen district, where it is never found on hawthorn, even if these trees are growing at the edge of the *autumnata* ground.

NEW AUSTRALIAN BEES IN THE COLLECTION OF THE BRITISH MUSEUM.—II.

By T. D. A. Cockerell.

Halictus.

The following species are black, the abdomen without hair-bands or patches. They are named after well-known Australian explorers:—

	Mesothorax shining, with widely scattered punctures	1.
	Mesothorax dull, very closely or at least (*forresti*) rather closely punctured	2.
1.	Very small; area of metathorax very finely and regularly longitudinally striate	*burkei*, Ckll., ♀.
	Larger; area of metathorax irregularly longitudinally wrinkled	*sturti*, Ckll., ♀.
2.	Area of metathorax with very coarse vermiform ridges	*forresti*, Ckll., ♂.
	Area of metathorax not so	3.
3.	Most of clypeus yellow; size largest, length about 10 mm., male	*warburtoni*, Ckll.
	Clypeus all black; size smaller, females . .	4.
4.	Area of metathorax delicately irregularly reticulate	*mitchelli*, Ckll.
	Area of metathorax finely striate with raised lines	5.
5.	Second submarginal cell large, approximately square, except that the second t. c. slants inwards above	*leichardti*, Ckll.
	Second submarginal cell narrower, much higher than broad	*willsi*, Ckll.

The microscopic characters of these species are as follows:—

(1.) Front.

H. warburtoni.—At sides cribrately punctured, with very large shining punctures, covering the surface; but in middle, below the ocelli, dull, with a very feeble mallear sculpture.

H. mitchelli. — Contiguously punctate all over, the lateral areas not so strongly as in *warburtoni*, and the median area distinctly and regularly, though the punctures are small.

H. burkei.—Dullish, with small but distinct punctures, which are moderately dense; the ground between them is roughened by little lines.

H. willsi.—Not unlike *burkei*, but punctures closer.

H. sturti.—General type of *willsi* and *burkei*, but punctures laterally becoming sparse and weak, and nowhere are they strong.

H. leichardti.—With close small punctures all over.

H. forresti.—With small and quite close, but by no means

contiguous, punctures; hair in middle line and around antennæ very beautifully plumose; hair at upper part of sides simple.

(2.) Mesothorax.

H. warburtoni. — With shallow but large and almost contiguous punctures all over; they are somewhat shiny, and the intervals are smooth. (The scutellum is also extremely densely and strongly punctured.)

H. mitchelli. — Strongly and closely, but not contiguously, punctate on a smooth ground; a few minute punctures interspersed. The interval between the punctures perhaps averages from half to three-quarters the width of a puncture, though in places it is more. (Scutellum has very small punctures, with a few larger ones interspersed; the punctures are mostly scattered, not dense.)

H. burkei. — Rather shining, minutely but very distinctly tessellate, with very distinct but very widely separated punctures.

H. willsi.—Rough, and contiguously punctured all over.

H. sturti. — With widely separated weak punctures, on a rather obscurely tessellate surface.

H. leichardti.—Obscurely tessellate, with rather close strong punctures all over, except that anteriorly the punctures become weaker and sparser.

H. forresti.—Minutely tessellate, with rather shallow fairly close punctures.

(3.) Second abdominal segment.

H. warburtoni. — Basal half well-punctured, on a microscopically tessellate surface; apically the punctures get smaller and much more distant, and the tessellation gives way to a transverse lineolation.

H. mitchelli.—With small regular punctures all over, averaging about as far apart as twice the diameter of one. Ground obscurely transversely lineolate. Hind edge of segment (as also of first) very narrowly light yellow (so narrowly that it is not readily noticed with a lens).

H. burkei.—Dullish, not punctate; the basal part minutely transversely lineolate.

H. willsi.—Minutely and densely, though not contiguously, punctured. The broad depressed apical part transversely lineolate, with minute widely-separated punctures.

H. sturti.—Obscurely lineolate, with only minute scattered hair-punctures. The subapical region has a row of depressed dark bristles.

H. leichardti. — Closely punctate, the punctures small but strong.

H. forresti. — Dullish, with very minute and quite sparse

punctures. Apical part minutely transversely lineolate, with very few punctures.

Halictus warburtoni, n. sp.

♂. Length about 10 mm.; black, the pubescence dull white, with some black or dark fuscous on vertex and dorsum of abdomen; inner orbital margins shallowly submarginate, converging below; clypeus with rather more than the anterior half light lemon-yellow, the yellow also sending a broad process upwards in the median line; antennæ long, black, the middle flagellar joints bulging beneath; area of metathorax short, shining, with irregular plicæ, bounded by a distinct rim; sides of metathorax covered with white tomentum; legs black, including tarsi; hair on inner side of tarsi slightly yellow; tegulæ large, punctate, dark rufous; stigma large, rather dark reddish, nervures fuscous; b. n. falling just short of t. m., with no interval between them; second s. m. approximately square; first r. n. meeting second t. c.; abdomen rather broad, convex, the hind margins of the segments very dark reddish. The scutellum is bigibbous, with a median depression.

Hab. Hobart, Tasmania (J. J. Walker, 3215). Not unlike *H. lanuginosus*, Sm., but, while the pubescence is of the same general type, it is much less abundant; the head, seen from in front, is broader and more triangular (in *lanuginosus* it is nearly round); the stigma is much larger; the area of metathorax is quite different, &c.

Halictus mitchelli, n. sp.

♀. Length not quite 9 mm.; black, so similar to *H. warburtoni* that at first I thought it might be its mate; but the microscopical characters dispose of this possibility, and the wings are also quite different, the stigma being smaller and yellower (a sort of dull amber), the nervures are lighter, and the first r. n. enters the second s. m. about the beginning of its last fourth. The scutellum is flattened, not bigibbose, and the area of metathorax has an irregular subreticulate pattern of raised lines.

Hab. Hobart, Tasmania (J. J. Walker, 3220). Easily known from *H. repræsentans*, Sm., by the sculpture of metathorax, light stigma, &c.

Halictus burkei, n. sp.

♀. Length about 5 mm.; black, with the abdomen rufo-piceous; the head is dullish, but the mesothorax is very shiny, and when held near the window for examination reflects the blue sky so that one could easily be deceived into thinking it tinted; flagellum dull reddish beneath; area of metathorax dull, covered with very fine striæ; legs rufo-piceous or almost black, the knees redder; tegulæ pale testaceous, with a dark mark in front; wings iridescent; stigma very large, dull reddish brown; nervures light brown, the second r. n. and third t. c. barely discernible; b. n. falling some distance short of t. m.; second s. m. about twice as broad below as above, receiving the first r. n. at about the beginning of its last fourth; abdomen shining above, beneath with much white hair, in which pollen is collected.

Hab. Hobart, Tasmania (J. J. Walker, 3251).

Halictus willsi, n. sp.

♀. Length almost 6 mm.; black, with dull white pubescence; head broad; front and mesothorax appearing granular, hardly shining; flagellum dull brownish beneath; legs black, hairy; hind spur having a broad, strongly divergent, blunt tooth about the end of its first third, and beyond that only a single broad low rounded lamella; tegulæ shining dark rufous, not punctate; b. n. very strongly bent, and falling just short of t. m.; second s. m. higher than broad; first r. n. meeting second t. c.; second r. n. and third t. c. barely visible; stigma and nervures rufous; area of metathorax very finely striate; abdomen broad, dullish; venter with long erect white hair.

Hab. "New Holland," 44 . 4.

Halictus sturti, n. sp.

♀. Length a little over 6 mm.; black, broad, and robust, with scanty white pubescence; clypeus very shiny, with a few large punctures; front dullish; flagellum only very faintly brownish beneath; mesothorax shining, overlapping prothorax in front; post-scutellum with white tomentum; area of metathorax shining and irregularly wrinkled; legs dark rufo-piceous, hairy; hind spur with three little sharp teeth close together about the middle, but otherwise simple; the first of these teeth is shorter and more divergent than the other two; tegulæ large, piceous; wings iridescent, stigma and nervures dark rufo-piceous; b. n. falling a short distance short of t. m.; second s. m. narrowing above; first r. n. meeting second t. c.; second r. n. and third t. c. a little weakened, but very distinct; abdomen broad, shining, pitch-black, the hind margins of the segments as black as the rest.

Hab. Queensland (Gilbert Turner, 631).

Halictus leichardti, n. sp.

♀. About the same size and general appearance of *H. sturti*, but distinguished at once by the strongly fuscous tint of the wings, the broader face, the strongly and densely punctured mesothorax, and the equally densely though more finely punctured abdomen. Scape long, flagellum ferruginous beneath; front, vertex, and mesothorax with some short dark hair; tubercles covered with dull white tomentum; area of metathorax finely but rather irregularly striate, the striæ not reaching its posterior edge; tegulæ rather large, piceous, punctured, though not all over; stigma and nervures dark reddish; b. n. falling some distance short of t. m.; second s. m. large, receiving the first r. n. at its apex; outer nervures as in *H. sturti*; legs dark, hairy, much of the hair dark; hind spur with two rows of very fine teeth, the inner edge bearing closely appressed, pale, sharp teeth, about eighteen in number, the hind edge with less numerous, rather larger, blunter, and darker teeth; the anterior spur has also the row of fine pale teeth, quite the same as on the other; abdomen broad.

Hab. Queensland (Gilbert Turner, 335, Hy.).

Halictus forresti, n. sp.

♂. Length about 6 mm.; black, the anterior half of the clypeus pale dull yellow, the yellow a little produced upwards in the middle line; face narrow; face and front with much short greyish-white hair; scape very short; flagellum extremely long, black; mesothorax dullish; upper edge of prothorax, and tubercles, with much white tomentum; post-scutellum with white tomentum; area of metathorax very coarsely irregularly wrinkled; tegulæ large, dark reddish, with a few minute punctures toward the base; wings clear, iridescent, stigma and nervures dark rufo-piceous; b. n. falling some distance short of t. m.; first r. n. meeting second t. c.; outer nervures distinct; legs black, tarsi dark reddish; abdomen entirely black, the hind margins of the segments shining.

Hab. Queensland (Gilbert Turner, 406, Hy.). Looks much like *H. sturti*, but cannot be its male, the sculpture being so different.

University of Colorado: Oct. 4th, 1905.

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

By G. W. Kirkaldy.

(Continued from vol. xxxviii. p. 236.)

Cymatia,* Flor.

Face excavated in the male, convex in the female. No apparent stridular area on anterior femora. Palæ in the male slender, elongate, subcylindric, inferiorly set with a few strong bristles, and terminated by a crooked knife-like claw. In the female the palæ are similar to those of the male, but lack the claw.

The habits are like those in the following genera. There are two British species, easily distinguished by their size, *bonsdorffii* being double that of *coleoptrata*. It is not likely that the other species will be found in Britain.

1. C. bonsdorffii (C. R. Sahlberg). Figured by Saunders and many others; the male palæ are figured by me (Quekett paper). Distributed probably over the greater part of the British Isles†; recorded from Srath glas to Woking, and from Norfolk to Harris. In Ireland, Mr. Halbert has taken it near Dublin. I have taken it freely in the Scottish Highlands and in Surrey, also in Brittany.

* Greek *kyma*, a wave.

† The detailed distribution of the British Aquatic Bugs will be given in an appendix.

2. C. COLEOPTRATA (Fabr.). Figured by Saunders and many others. Plentiful from Lincolnshire to the southern coast, but not very western in its distribution; I have taken it in Kent and Surrey.

It is usually brachypterous, the pronotum being then very small, and the membrane not distinct. Mulsant and Rey described the macropterous form from a single specimen half a century ago under the name of *Corisa fasciolata*; but a few years ago Dr. Horváth captured three examples in Hungary, and generously gave one to me. The pronotum is normally formed, and the membrane distinct.

GLÆNOCORISA, Thomson.
(= *Oreinocorixa*, F. B. White; Saunders.*)

Face hairy, excavated in the male, flattened in the female. Stridulator, stridular area, and strigil present in the male. There is only one, very rare, British species.

1. G. CAVIFRONS (Thomson) (*Corixa alpestris*, Douglas & Scott). Figured by Saunders; male palæ figured by me. Only taken so far in Britain in one locality, *i. e.*, Beinn Chearan, in Srath glas (Ross), in a little tarn on the summit.

CALLICORIXA,† F. B. White.

Face as in the preceding, but smooth. Stridulator and stridular area present in the male, strigil apparently absent. There is always present in both sexes a characteristic black spot on the posterior tarsus (not merely the fringing hairs, but the tarsus itself).

I am unable at present to clear up satisfactorily the species of this genus, and refer the reader to Saunders, and to my paper in the 'Quekett Journal.'

1. C. PRÆUSTA (Fieber). This is generally distributed. I have taken it all over the Scottish Highlands and islands, where it is by far the commonest corixid; also in Kent, Surrey, Middlesex, &c.

2. C. SODALIS (D. & S.). Mr. Saunders seems doubtful as to the validity of this, and all the specimens I have seen labelled as this species are only *præusta*.

3. C. BOLDI (D. & S.). The unique type is, I believe, at Newcastle Museum. It is probably, as Mr. Saunders suggests, an aberration of *præusta*.

4. C. CONCINNA (Fieber). Palæ figured in 'Quekett Journal.' Distributed well over England, though not common; also in the Perthshire Highlands.

* *Glænocorisa*, from *corisa*, a misspelling for *corixa*, generic name, the affix probably being a misspelling for the Greek *glene*, an eyeball, in allusion to the big eyes. *Oreinocorixa*, from Greek *oreinos*, of a mountain.

† Greek *kallos*, beauty.

5. C. caledonica (Kirkaldy) (= *cognata* of Saunders). From Scotland only; rare.

Arctocorisa,* Wallengren (including *Basileocorixa*, Kirkaldy = *Corixa*, auctt. = *Glænocorisa*, Saunders).

This is the largest genus of Corixidæ numerically, with eighteen described British species. *Arctocorisa* was separated from *Corixa*, auctt. (i. e., *Basileocorixa*) on a feeble character, *viz.*, the entirety of the pronotal keel, but is unfortunately the oldest available name for the fused genus. The species may be identified as follows, but the males should always be confirmed by my descriptions and figures ('Quekett Journal') of the palæ, &c. The pattern and colouring in forms occurring in the peat districts of Scotland and Ireland often become obscure, so that identification of the females is then difficult. The following table is largely adapted from Saunders:—

1.	Corium not rastrate	2.
1*a*.	Corium rastrate, at least at the base	4.
2.	Dark and pale lines on pronotum equally broad	3.
2*a*.	Pronotum pale with narrow dark lines	*lateralis*.
3.	Pronotal keel nearly half as long as pronotum	*selecta*.
3*a*.	Pronotal keel not more than one-fourth as long as pronotum	*lugubris*.
4.	Species not under 7 mill. long	5.
4*a*.	Species 6 mill. or less	11.
5.	Clavus and corium very rastrate, dull, transverse pale lines very narrow, nearly entire	6.
5*a*.	Clavus and corium not so deeply rastrate, less dull, transverse pale lines wider, much abbreviated and interrupted	7.
6.	Apex of corium usually widely pale, pronotum with seven to eight pale lines	*sahlbergi*.
6*a*.	Pronotum with six pale lines, apex of corium not pale	*linnei*.
7.	Pronotum with six pale lines	*undulata*.
7*a*.	Pronotum with seven (or more) pale lines	8.
8.	Pronotal keel strong, almost entire	9.
8*a*.	Pronotal keel more or less feeble, not reaching to more than half the length of the pronotum	10.
9.	Yellow beneath	*germari*.
9*a*.	Black beneath, with pale margins	*carinata*.
10.	Pronotal angles acute	*striata*.
10*a*.	Pronotal angles obtuse	*distincta*.
11.	Intermediate tibiæ scarcely longer than the tarsi, tarsi and claws subequal	*mœsta*.
11*a*.	Intermediate tibiæ much longer than tarsi, tarsi much shorter than claws	12.
12.	Pronotum not longer than vertex, with five to six transverse, pale lines	13.

* Greek *arktos*, the north; Greek *basileus*, king.

12*a*. Pronotum much longer than vertex, with seven to ten pale lines	14.
13. Pronotum with five pale lines	*scotti*.
13*a*. Pronotum with six pale lines	*fossarum*.
14. Transverse markings of corium divided by two black longitudinal lines	*limitata*.
14*a*. Transverse markings divided by three black longitudinal lines	15.
14*b*. Transverse markings undulated and interrupted, not continuously divided by black longitudinal lines	*saundersi*.
14*c*. Transverse markings entire	*nigrolineata*.
15. Male facial impression deeply excavated and extended high up between the eyes; female palæ short, wider near the base	*semistriata*.
15*a*. Male facial impression less deep, more parallel-sided; female palæ longer and narrower	*venusta*.

1. A. LUGUBRIS (Fieber). Generally distributed, but mixed in collections with the next.

2. A. SELECTA (Fieber) (= *lugubris*, Saunders, in part). Described by J. Edwards in 1893 in the Ent. Mo. Mag. Palæ figured by me.

I have taken it in brackish water at Gravesend, Kent. Edwards notes it from the coast marshes of Norfolk.

3. A. LATERALIS (Leach) (= *hieroglyphica*, Saunders). Generally distributed. The ova are figured by Dufour; they are elongate, oval, and pointed anteriorly.

4. A. FOSSARUM (Leach). Generally distributed.

5. A. SCOTTI (D. & S.). All over Scotland.

[*A. prominula* (Thomson), a doubtful Scandinavian form has been reported from Scotland, but the specimens I have seen are merely *scotti*.]

6. A. SAUNDERSI (Kirkaldy). Described by me in the Ent. Mo. Mag. for 1899; and palæ figured in 'Quekett Journal.'

Taken only in one pond in Surrey.

7. A. LIMITATA (Fieber). England from Lincolnshire southwards, and Wales.

8. A. SEMISTRIATA (Fieber). Distributed probably over the United Kingdom, but not common.

9. A. VENUSTA (D. & S.). Same as last.

10. A. NIGROLINEATA (Fieber) (= *fabricii* in Saunders). A variable species in colour and markings. Common and well distributed.

11. A. MŒSTA (Fieber). Generally distributed.

12. A. UNDULATA (Costa) (= *striata*, Fieber). This accords

neither with Linné's type in the collection of the Linnean Society of London, nor with his description. Generally distributed.

13. A. DISTINCTA (Fieber). 14. A. STRIATA (Linné) (=*fallenii*, Fieber). 15. A. SAHLBERGI (Fieber). 16. A. LINNEI (Fieber). All common and generally distributed.

(To be continued.)

AN APPARENTLY UNDESCRIBED SPECIES OF CICADIDÆ FROM CHILI.

By W. L. Distant.

Tettigades ulnaria, sp. n.

Body black, brownly pilose; margins of pronotum, lateral and posterior margins of mesonotum, cruciform elevation, rostrum, and legs, ochraceous; a central fascia to base of cruciform elevation and centres of its anterior angles, anterior tibiæ and tarsi, streaks to anterior femora, bases and apices of intermediate and posterior tibiæ, and the tarsi, black; disk of abdomen beneath ochraceous, and in male with a central black longitudinal fascia; tegmina and wings hyaline, talc-like, transversely wrinkled, both slightly sanguineous at base; tegmina with the venation black, the costal membrane, basal cell, the ulnar veins here and there, and the claval suture, ochraceous; in some specimens the apical veins are also more or less suffused with ochraceous; wings with the venation black, more or less ochraceous at base; tegmina elongate, about three times as long as greatest breadth, the ulnar areas long and narrow, parallel, the first, second, and third about equal in length. Long. excl. tegm., ♂ and ♀, 19 to 22 mill.; exp. tegm. 55 to 70 mill.

Hab. Chili (Colls. Dist. and Paris Mus.).

There are three species of *Tettigades* from Chili in my collection which may be thus differentiated.

A. Second ulnar area shorter than first or third.
  a. Tegmina broad, about two and a half times longer than greatest breadth . . . *T. chilensis*, A. & S.
  aa. Tegmina only about twice as long as greatest breadth . . . . . *T. compacta*, Walk.
B. First, second, and third ulnar areas about equal in length.
  aaa. Tegmina elongate and narrow, about three times as long as greatest breadth . *T. ulnaria*, Dist.

NOTES AND OBSERVATIONS.

Great Migration of "Bumble Bees."—On September 1st, 1905, I noticed that a constant stream of bees was passing south, along the narrow strip of sandbanks which divides Poole Harbour from the sea. All the bees were going towards the thousands of acres of heather in the Purbeck Heaths, which were then a most glorious sheet of purple blossom. Of course I expected to see the bees returning to their nests, but, no—although I and several members of my family watched most closely from 7.30 a.m. till dark each day—out of the countless thousands of bees passing we never saw one with its head north, all going steadily south; this went on—the numbers slightly decreasing—till September 13th, and then the direction of the stream of bees suddenly changed and went north; nor did we see any going south again up to the time we left our cottage, on September 29th. A specimen of these passing bees was caught and sent, through the kindness of a friend, to an expert, who names it "*Bombus terrestris*, neuter sex." As I am an invalid, most of my time was spent in a chair out of the house; these passing bees interested me much, and I watched them closely, as did all the others of my family, four or five adults. We talked of the strange phenomenon to any calling friends, yet from September 1st to September 13th none of us saw a bee going north, but countless thousands, in a regular stream, going south; while from September 13th to September 29th all went north. We were on the narrowest part of the sandbanks, where they are only about sixty yards wide, so we could see from sea to sea; and unless the bees returned to their nests across many miles of open sea, or high up in the air out of our sight, there was no return stream from 7.30 a.m. either day up to dark. As a rule the wind was strong, and the bees had to seek the shelter of each bush or tuft of rushes to get on at all. I shall be pleased to answer any inquiries.—Alex. M. Luckham; Combeleigh, Parkstone, Dorset, December 6th, 1905.

The Entomological Club.—A meeting was held in the Entomological Salon at the Holborn Restaurant, on February 6th last. Mr. Verrall, being the host, occupied the chair. Other members present were Prof. Poulton, Messrs. Adkin, Chitty, Donisthorpe, and Hall, and in addition to these there were over sixty guests. At the conclusion of a most excellent repast, which, in accordance with custom, is styled supper, the Chairman, in proposing the Prosperity of the Club, made an exceedingly happy speech, in which he touched on recent matters electoral. A result of the General Election was also the theme of Mr. Merrifield, President of the Entomological Society of London, who proposed the health of Mr. Verrall. Afterwards Mr. Jacoby played several charming solos on the violin, and these musical intervals contributed much to the general enjoyment of the evening.

The Honorary Secretary presented a List of the Members of the Club from the earliest available date down to the present time, and a resolution was passed that this should be accepted, duly recorded in the archives of the Club, and published in the 'Entomologist.' The subject of the Club's collections was mentioned, but not discussed.

CAPTURES AND FIELD REPORTS.

Notes on Lepidoptera at Witherslack.—I was very much interested in reading the Rev. W. G. Wittingham's account of "Sugar at Witherslack," in the February number of the 'Entomologist,' as I spent a week there from the 14th to the 21st July last, at, I believe, the same farmhouse which he made his headquarters. I sugared in some of the same spots, and I think I know the ash-tree which yielded such excellent results. I found sugar fairly good for a day or two after my arrival, but its attraction fell off towards the end of my visit. Being rather late, many of the good things were over; but I took, amongst other moths, a few specimens of *Cerigo matura* and *Caradrina taraxaci*; also one *Acidalia marginepunctata*, which was at rest on a rock. These three species are an addition to Mr. C. H. Forsythe's list for Lancaster and district. Micro collecting was never seriously attempted, but the following is a meagre list of those taken:—*Scoparia cratægalis*, *S. resinea*, *Pyrausta purpuralis*, *P. ostrinalis*, *Crambus pascuellus*, *C. perlellus*, *Tortrix viburnana*, *Amphisa gerningana*, *Sericoris urticana*, *S. lacunana*, *Mixodia schulziana*, *Bactra lanceolana*, *Eupœcilia angustana*, *Xanthosetia zoegana*, *Aphelia osseana*, *Hyponomeuta padellus*. G. W. Mason; Barton-on-Humber.

Phigalia pedaria (pilosaria).—A specimen was taken at rest on a tree-trunk, near the foot, in Claygate village, Surrey, on January 15th last.—J. W. Lucas.

Notes from Chester.—In the Chester district—never particularly noted for butterflies—it is a matter of regret that species like *Vanessa urticæ*, *V. io*, *V. atalanta*, and *Epinephele tithonus* should have shown in the season of 1905 continued evidence of waning numbers. Hedge-cleaning, nettle and thistle-cutting, in previous Julys must have caused the destruction of hundreds, if not thousands, of eggs as well as larvæ. *Cœnonympha typhon* var. *philoxenus* = *rothliebii* still keeps up appearances in Delamere Forest, and in two of the woods it was a pleasure to see numbers of *Euchloë cardamines* on the wing, June 12th, although all the specimens were evidently very near the close of their brief existence. I paid several special visits to Delamere Forest in June in quest of clearwings. *Sesia culiciformis* was the only species secured, and indeed seen—one on the 3rd and a second on the 10th. Both were netted while resting on the leaves of birch in the full sunlight, and pretty pictures they made on their fresh green surroundings. To get rid of "grease" and preserve the beautiful red belt, I plunged them, when set and dried, into benzoline, and left them there for over a week before adding them to my collection. In looking for Sesias I came across about a dozen larvæ of *Geometra papilionaria*, all of which produced fine imagos in the first half of July. *Acidalia remutata*, as usual, was a common moth in the forest in June. On the 10th I captured a fine fresh form having the pale median band on all wings, edged posteriorly with the usual zigzag line, which was very smoke-coloured. *Panolis piniperda* was a common moth during the spring months. Females engaged in depositing eggs along the wire-like leaves of the Scotch firs were occasionally beaten out by day up to the

end of May. About the end of June I beat out a number of the handsome larvæ, hoping to obtain a supply of the grey form of the imago. Both larvæ and imagos have the curious propensity of jumping when beaten out into the umbrella or beating-tray. Larvæ of *Thera firmata* were to be had also in the forest, even in the early days of July—green, with red-brown (rust-coloured) heads; rust-colour on the sides of the first three segments; legs reddish green; segment divisions dorsally reddish, but becoming less distinctly so towards the anal segment. The moths appeared in August, and I took a freshly-emerged specimen at rest on an oak-trunk, August 10th. A good *Macaria liturata* var. *nigrofulvata* (Collins) was seen on July 31st, although the first bred specimen of the season dated back to June 2nd. Larvæ of *Ellopia prosapiaria* = *fasciaria*, also pine feeders, were common until the middle of May. The following notes on the Delamere type-form of the larva, together with varieties, may be of interest. In each case the observations are made on the final stage:—

Type: Head and body reddish, whitish underneath. Segments tipped with darker reddish tubercles. Two dorsal white lines wide apart. Legs and claspers reddish.

Variety 1: As in the type, but white dorsal lines absent.

Variety 2: Head, body, legs, and claspers grey. Tubercles darker. Body speckled minutely with white, especially on sides. No dorsal white lines.

Variety 3: Head, body, legs, and claspers totally black. Body smoke-coloured underneath.

The perfect insect varies in depth of coloration, but not to such an extent as the caterpillar. There is an unusual form conspicuously red.

On June 24th Mr. J. Thompson, of Chester, beat two larvæ (late ones) of *Chesias spartiata* (green with a yellow line along each side) from broom at Delamere. I found the moths well on the wing, September 30th, wherever the food-plant grew; they were plentiful. In August and September I got a fair number of caterpillars of *Notodonta dictæoides* from the forest birch, as well as *Dasychira pudibunda*; while from Scotch fir I secured three of the yellow form of *Bupalus piniaria*. One of the *D. pudibunda* caterpillars appeared one morning, after changing its skin, with all its hairs rose-pink. The moth sometimes appears with a broad dark smoke-coloured band across the upper wings—an infrequent Delamere form.

On August 28th *Cloantha solidaginis*, fine and fresh from the chrysalis, were found plentifully resting on the heather near Rhos, North Wales, by Mr. Thompson. This, I believe, is a new record. I have never taken the larva of *Acronycta tridens*, nor do I think I have ever taken the perfect insect. *A. psi* (with dark forms) is common enough in the Chester district in all its stages, and I am consequently well acquainted with the caterpillar. In fact, as I had never seen the larva of *A. tridens*, I was glad to receive, in August, 1904, as well as in 1905, several of these interesting caterpillars from Mr. Harwood, of Colchester. The following comparative notes on the full-grown larvæ of the two species may be of interest to young entomologists. The chief points of interest are italicised:—*A. psi:* Broad dorsal *yellow*

stripe, *unmarked*. On each side of the stripe (one on each segment) is a row of large *red spots dotted with black*. An oval-shaped large anal *yellow* spot. *A. tridens:* Broad dorsal *white stripe, marked with red on each segment*. On each side (one on each segment) is a row of large *black spots with white centres*. An anal *red transverse bar*. Both *psi* and *tridens* have a black, dorsal, tufted tubercle on segment five, and both have a dorsal anal tubercle—*yellow* in *psi*, *white* in *tridens*. Both larvæ have black heads. All larvæ of *Acronycta* seem fond of pupating in corks. These should be hollowed out a little with a penknife, and the caterpillars will do the rest. Put as many corks into the cage as there are larvæ, and the latter will find them with unerring discrimination. Another *Acronycta—A. megacephala*—deserves a special note. Mr. Thompson took a caterpillar of the species crawling up a poplar tree near Chester on July 11th. The moth emerged, without forcing, on September 10th. A long series of *Boarmia repandata* bred from Delamere Forest larvæ collected in spring from birch, sallow, and hawthorn (they are night-feeders) showed the local form to be indeed a fine one. The moths appear to be unusually large. The colour of the wings is dark grey with warm brown as well as black suffusions, and with paler grey as well as black markings. *Aplecta nebulosa* (Delamere): bred specimens from var. *thompsoni* parents were true to the variety; while those from *robsoni* parents occasionally reverted to the Delamere type. *Acherontia atropos:* Four larvæ were taken in Cheshire in the month of August. One of these was successfully reared to an imago—a fine dark female—February 11th, 1906, by Mr. Sidney Stendall, of the Grosvenor Museum, Chester, after pupating on September 20th, 1905. The pupa was kept in moss damped every other day and placed near a kitchen fire. Mr. Stendall also captured a fine male at one of the electric lamps, September 11th, 1905, at 10 p.m. Both these insects "squeaked," producing a sound similar to that obtained by rubbing a damp cork on a glass bottle. Very interesting observations were made by Mr. Stendall on this "squeaking," and he found that the sounds proceeded from the region of the head, and that in every case the antennæ "shivered" very perceptibly whilst the sound continued. It is curious that in all the records of *atropos* in the 'Entomologist' for the last twenty years I cannot find more than five references where mention is made of this "squeaking" by the perfect insect. "Squeaking" by the pupa is referred to (xix. p. 44), and "snapping" by the larva (xix. p. 16).

The electric lamps seemed in 1905 to be as efficient as ever in attracting moths, but as females appear so seldom, the sport is very one-sided, and becomes monotonous. Casual visits resulted in the capture of a fine *A. leporina*, June 17th; *Plusia pulchrina*, June 27th; *P. iota* and *Habrostola triplasia*, July 9th; *N. dictæoides*, July 28th; a fresh but late *Uropteryx sambucata*, August 24th; and a worn *N. dictæa* on September 7th.—J. Arkle; Chester, Feb. 8th, 1906.

SOCIETIES.

Entomological Society of London.—*February 7th*, 1906.—Mr. F. Merrifield, President, in the chair. The President announced that he had nominated Mr. Herbert Goss, F.L.S.; Mr. Edward Saunders, F.R.S., F.L.S.; and Mr. Charles Owen Waterhouse, as Vice-Presidents for the Session 1906–1907. Mr. H. J. Carter, B.A., of "Ascham," Darling Point, Sydney, New South Wales, and the Rev. William Henry Heale, of Wolstanton Vicarage, Stoke-on-Trent, were elected Fellows of the Society. The decease of the Rev. Joseph Greene, M.A., was announced. Mr. W. E. Sharp exhibited a specimen of *Lathrobium lævipenne*, Heer, a beetle new to the British list, taken by him in a sandpit near Oxted, Surrey, in August, 1905, and for comparison therewith the nearest members of the group to which it belongs.—Dr. F. A. Dixey, specimens of South African butterflies belonging to the *Nymphalinæ*, *Acræinæ*, *Danainæ*, and *Papilioninæ*, and remarked upon the odours attaching to them which he and Dr. Longstaff had observed in the field. He drew attention to the significance of the fact that scents of an agreeable nature (as in *Pierinæ* generally, *Mycalesis safitza*, &c.) were, as a rule, confined to the male sex, while those of a disagreeable or disgusting character (as in *Acræinæ* and many Papilios) were often common to both sexes. A discussion followed on the organs and uses of scent as purposes of attraction and defence in insects generally, in which the President, Dr. T. A. Chapman, Mr. G. Bethune-Baker, Mr. M. Burr, Mr. G. J. Arrow, Mr. J. W. Tutt, and other Fellows joined.—Dr. G. B. Longstaff, four species of *Acræa* taken in South Africa during the visit of the British Association, viz.:—(1) *A. anemosa*, Hew., from the Victoria Falls, and Mochudi in Bechuanaland; (2) *A. alboradiata*, Auriv., previously known to Mr. Roland Trimen by two females only, and considered by him as a variety of *anemosa*; (3) *A. atolmis*, Westw., to which Westwood gave the names of *atolmis* and *acontias*, although there seems no doubt they are one species; and (4) *A. atergatis*, Westw.—Professor E. B. Poulton exhibited and read a note upon two Diptera, identified by Mr. G. H. Verrall as a *Chortophila*, which had been observed by Mr. A. H. Hamm following the bee *Andrena labialis*, Kirb. He stated that new and interesting light had been thrown on the observation by Col. Yerbury, who pointed out that both flies were males. At first sight it seemed astonishing that the bees should be pursued by the males of inquiline flies; but Professor Poulton suggested the males in this way find their way to the burrows, where they meet the females, which have also reached them in the same manner, or where more probably they lie in wait for the freshly emerging females.—Mr. W. G. Sheldon exhibited a collection of Rhopalocera made by him in Spain during July and August, 1905, together with typical European specimens for comparison; including an aberration of *A. aglaia*, with the black blotches on the superiors enlarged and banded, and with dark suffused ground colour on all wings, and an interesting series of *L. corydon* and var. *hispana* with examples approaching var. *polonus* from Albaraccin, and intermediates between all these forms, and also British, French, and Swiss typical specimens for comparison.—Dr. G. B. Longstaff read a paper "On some Rest Attitudes of Butterflies," and also a paper "On some

Binomic Points in certain South African Lamellicorns."—Mr. Roland Trimen, F.R.S., communicated a paper "On some new or hitherto unfigured Species of South African Butterflies."—Commander J. J. Walker communicated a paper entitled "Some Observations on the Reproduction of Hemiptera-Cryptocera by Claydon Hewett, B.Sc."—H. Rowland-Brown M.A., *Hon. Sec.*

South London Entomological and Natural History Society.—*Thursday, January 25th*, 1906.—*Annual General Meeting.*—Mr. Hugh Main, B.Sc., F.E.S., President, in the chair.—The balance-sheet showed the financial condition to be very satisfactory, there being some £42 balance.—Mr. Tutt complimented the Society on having such a capital Treasurer as Mr. T. W. Hall, and, in proposing a vote of thanks to him, said that the position of the Society was largely due to his high ability and business judgment. Mr. Montgomery seconded.—The Report of the Council was read, showing that the meetings had been well attended, the exhibits varied and interesting, that nine papers and addresses, three lantern demonstrations, and five reports had been given to the Society, that five field meetings had been held, and that the library and collections were constantly being referred to by the members.—The following gentlemen were then declared elected as officers and Council for the year:—President, R. Adkin, F.E.S.; Vice-Presidents, W. J. Kaye, F.E.S., and Hugh Main, B.Sc., F.E.S.; Treasurer, T. W. Hall, F.E.S.; Librarian, A. W. Dodds; Curator, W. West; Hon. Secretaries, Stanley Edwards, F.L.S., F.Z.S., and Henry J. Turner, F.E.S.; Council, F. B. Carr, T. A. Chapman, M.D., F.Z.S., F. Noad Clark, A. Harrison, F.L.S., F.Z.S., A. Sich, F.E.S., E. Step, F.L.S., and W. West, L.D.S.—Mr. Main read his Presidential Address, at first summarizing the new and rare British species, referring to the obituary of the year, and mentioning the chief works on entomology, &c., recently published. He afterwards turned to the subject of melanism, and, noting the more recent ideas concerning it, went on to discuss and criticise the various theories which had been put forward regarding it. He then introduced Mr. Adkin, the new President, who took the chair.—In proposing a vote of thanks to Mr. Main, Mr. Adkin bore testimony to the able way the chair had been filled during the year, and expressed his appreciation of the solicitude Mr. Main had shown for the well-being and convenience of his fellow-members. Mr. Tutt seconded the vote of thanks, and in eulogistic terms expressed his congratulation to both Mr. Main and the Society on the successful year just passed. In reply Mr. Main thanked the members for their kind reception of him, and said that it had been a real pleasure to him to occupy the chair.

Ordinary Meeting.—Mr. Bellamy exhibited (1) a very fine "black" form of *Anthrocera* (*Zygæna*) *trifolii*, captured at Ringwood on June 25th, 1899. It was afterwards ascertained to be the var. *obscura*; (2) an extreme form of *Polyommatus corydon* var. *fowleri* from Swanage, July 30th, 1899, in which the spots on the white border of the hind wings are almost absent; and (3) a yellow form of *Callimorpha dominula*.—Mr. Turner, a number of species of butterflies taken by Dr. Chapman in late July at Larche and Lauteret, including *Colias palæno*, *Polyommatus damon*, *P. escheri*, *P. orbitulus*, *Epinephele lycaon*, *Erebia lappona*, &c.—Mr. Edwards, the pupa-cases of *Cionus scrophu-*

lariæ among the seed-vessels of *Scrophularia nodosa*, showing the remarkable resemblance. He also showed specimens of *Papilio patros* and *P. photinus*.—Mr. Lucas, specimens of the stag-beetle, *Lucanus cervus*, dug up from their cocoons at Kingston in early January.—Mr. Tonge, for Mr. Vine, a pale yellow, bipupillate form of *Epinephele ianira*, and a photographic life history of *Euchloë cardamines*.—Henry J. Turner, *Hon. Report Secretary*.

Birmingham Entomological Society.—*January 15th*, 1906.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. James Simkins, Brooklands, Solihull, was elected a member of the Society.—Mr. A. H. Martineau exhibited the gall and sexual forms of *Biorhiza terminalis*, Fab., and also the root gall and agamic form of the same species, known as *Biorhiza pallida*.—Mr. Gilbert Smith showed living specimens of the new British beetle, *Tetropium crawshaii*, Sharp.— Mr. J. T. Fountain showed a box of Lycænidæ from several localities, including *Lycæna astrarche* var. *salmacis*, Stph., from Castle Eden Dene, and also one which he said he had taken at Weston-super-Mare.—Mr. G. T. Bethune-Baker exhibited a box of Lepidoptera from the Fiji Islands, including some striking Sphingidæ; also six species of Hepialidæ from the Fiji Islands. He pointed out that the scent-glands at the base of the wings of the Hepialidæ were strongly developed, and said that when he received the specimens the scent was still quite strong and resembled incense.—Mr. G. H. Kenrick exhibited several drawers from his collection, containing fine series of various Pieridæ, including in particular some of the species received by him from his collector in New Guinea.—Colbran J. Wainwright, *Hon. Sec.*

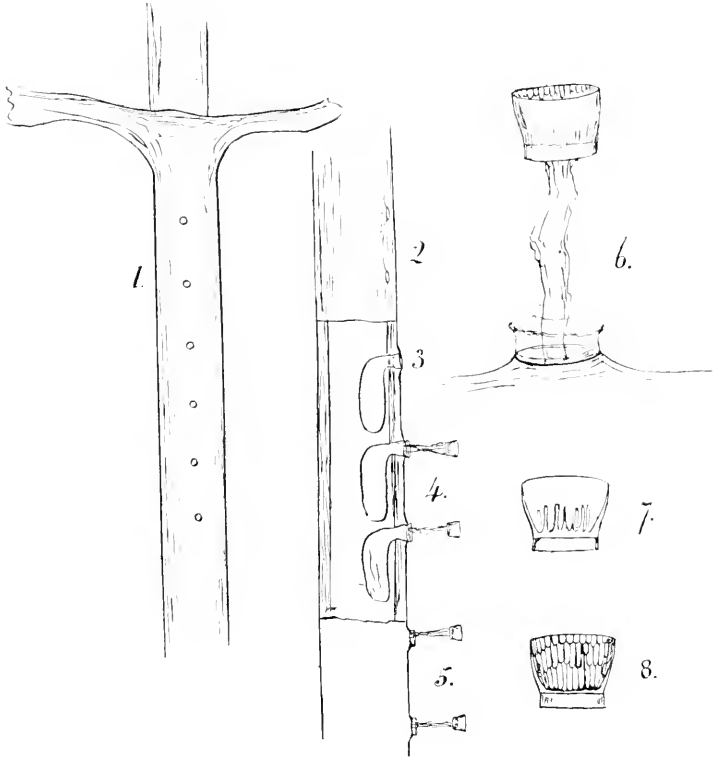
Lancashire and Cheshire Entomological Society. — The usual monthly meeting of this Society was held in the Royal Institution, Liverpool, on Monday, February 19th, Mr. Richard Wilding, Vice-President, in the chair. The meeting took the form of a joint meeting with the Liverpool Microscopical Society. Professor Geo. Henry Carpenter, B.Sc., F.E.S., was elected a member of the Society. The following exhibits were made, *viz.*:—By Dr. J. Cotton, a long series of *Triphæna fimbria* and *T. pronuba*; the series represented the range of variation as met with in the St. Helens district very fully, the rarest form shown being of a unicolorous dull brown, with none of the usual markings visible.—Mr. F. N. Pierce, microscopical preparations to show the difference between the androconial scales and the ordinary scales of *Thecla rubi*; the dissimilarity between the form and depth of the scars, left on the removal of the scales, was also strikingly illustrated.—Mr. E. J. B. Sopp, British Phytophagous Coleoptera, including series of *Chrysomela cerealis*, *Hydrothassa hannoverana*, and other local and scarce species; also a lovely photograph of the egg-capsule of *Periplaneta americana* (cockroach) taken by Mr. Hugh Main, B.Sc.—Mr. R. Wilding, two very rare beetles, viz., *Tetropium crawshayi*, a species new to science, and *Amara anthobia*, new to Britain; both from Leighton Buzzard. Mr. W. A. Tyerman, three cases containing about one hundred butterflies and moths taken by himself on the Gold Coast during April, 1905. The fine condition and great beauty of these insects were much admired. In addition to the above, Mr. McPhail, Mr. F. N. Pierce, and other members of the Microscopical Society, showed many slides

illustrating insect morphology, and thus contributed to the general knowledge of the members of the Society.—H. R. Sweeting and Wm. Mansbridge, *Hon. Secs.*

City of London Entomological and Natural History Society.—*December 19th*, 1905.—Exhibits:—Rev. C. R. N. Burrows, three specimens of banded form of *T. orbona*, from Mucking. Mr. Harrison, a long series of *E. viminalis*, bred from larvæ taken at Windermere in June, 1905, varying from light to very dark grey. Mr. Hodgson, three male *L. bellargus*, taken within ten days of early September frosts, which were of a decided slaty coloration as compared with specimens taken before the frosts occurred. Mr. Pickett, *C. pamphilus*, Dover, August, 1905, including two males with strongly marked black marginal bands; also *A. grossulariata*, bred December 15th. from larva taken October 21st. Mr. Shaw, *B. perla*, from Torquay, July, 1905, including var. *flavescens* (Tutt). Messrs. Mera and Prout, cabinet drawer containing *M. hastata* and its allies. Mr. Prout also exhibited various foreign forms and allies of *M. hastata*.—Mr. Prout read a paper entitled "The *Rheumaptera hastata* Group."

January 2nd.—The first meeting of the new year was devoted, as usual, to a "pocket box" exhibition. Among the numerous exhibits the following may be noted:—Mr. J. A. Clark, melanic specimens of *Malenydris multistrigaria* from Huddersfield.—Mr. G. R. Garland, bred *Angerona prunaria* from Monmouth and Essex parents; the offspring of two banded parents consisted of many typical forms and a small proportion of banded imagines, while typical parents produced two banded imagines. Mr. Garland also exhibited a fine striated female *Spilosoma lubricipeda*, approaching var. *radiata*, captured at Leyton in June, 1904.—Mr. T. H. L. Grosvenor, *Hylophila prasinana*, bred from Tilgate in 1904, with the area between the silver lines on fore wings occupied by a white band.—Mr. H. M. Edelsten, *Colotois pennaria* from Epping Forest, with the wings powdered with black scales.—Mr. A. Harrison, a long series of *Aplecta nebulosa*, bred from larvæ collected in Delamere Forest in the spring of 1905; the specimens ranged from the ordinary pale grey form to var. *thompsoni*, 11 per cent. being more or less melanic.—Mr. L. B. Prout, *Nonagria sparganii*, bred in August, 1905, from pupæ taken in East Kent, some miles from the old South-east Kent locality.—Mr. V. E. Shaw, an aberration of *Aglais urticæ*, captured at Bexley in August, 1905, with hind wings entirely black and the marginal bands on the fore wings much wider than usual.—Mr. A. J. Wellsdon, a specimen (? unique) of *Acronycta leporina* from South Essex, the upper wings being entirely black and the under wings darker than the type; also a gynandromorphous *Agrotis puta*.

January 16th.—Dr. T. A. Chapman exhibited *A. villica* female var. *konewkai* from Sicily, April, 1905, together with other specimens bred from ova laid by the captured female. In this variety the white spots tend to form transverse fasciæ.—Mr. A. W. Mera, a living female imago of hybrid *Nyssia lapponaria* × *N. zonaria*, one of eleven females bred to date, no males having emerged.—Mr. V. E. Shaw, larvæ of *Epunda lichenea* reared from ova laid by female taken at Torquay; the larvæ, although all were in the same stadium, varied from light to dark green and brown.—S. J. Bell, *Hon. Sec.*



EGGS OF *NABIS (LATIVENTRIS?)*.

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THE EGGS OF *NABIS* (*LATIVENTRIS*?).

By T. A. CHAPMAN, M.D., F.E.S. &c.

(PLATE III.)

AT the beginning of last July I found on our downs here, stems of *Chlora perfoliata* with certain circular marks. These were about 0·21 to 0·24 mm. in diameter, were slightly raised—*i. e.* the surface round them sloped triflingly up to their margins. Their position was very regular and orderly, generally on the second or third internode above the ground, though occasionally higher; they were placed in a regular line down one side of the stem in numbers varying, but generally from about four to eight, rarely only one or two; they were almost always at exactly equal distances from each other—*viz.* about 2·0 mm. These proved to be the eggs of a species of *Nabis*, Dr. Sharp believes *lativentris*; the only ground for supposing it to be some other species being that that species is more widely distributed than *Chlora perfoliata*, and therefore if it be *lativentris*, it must be in the habit of ovipositing in various other stems—a highly probable circumstance, since *Nabis*, not being a vegetable feeder, merely the mechanical qualities of the stem can be of any importance. At any rate, the young bugs that hatched from these eggs are certainly some species of *Nabis*. By the time some of these had hatched, and I had learned what the little circles were, I found that (about July 10th) the further eggs discoverable in the field were also hatched, and so my notes on them are founded chiefly on the empty shells, though I had previously determined by section that they were eggs containing developing embryos.

The stem of the *Chlora* consists of a delicate bark, then a dense woody layer about 0·2 mm. thick, and a centre, hollow or with a delicate pith. The eggs occupy a hole directly penetrating the woody layer, and then bend down in the central pith for about 1·2 mm., swelling out a little in it. How they are placed here I do not know, but no doubt when the oviposition

takes place earlier in the season, the stems are comparatively soft and fleshy, and it is not so difficult a procedure as it looks in the hard woody stems I found. Nevertheless I notice that the vegetable fibres are not thrust aside to more than a slight extent, and many look as if they were cut across to form the hole. This hole is very smooth and very circular. The egg-shell in the pith, after the bug is hatched, is quite a substantial colourless bag.

When the egg hatches, it opens by an elaborate lid or stopper, being pushed off, or rather out. This lid occupies the whole thickness of the woody layer, and when pushed out leaves the whole of the tube in this layer lined by egg-shell, so that it is more like a stopper in a bottle than a lid. When pushed out it does not fall, but remains attached to the egg by several twisted films, which retain it, at a distance of about half a millimetre, in a position as if its being pushed back into its place were contemplated. This stopper is of a white pith-like texture and highly organized structure. It is a slightly conical tube, with a diaphragm near its inner opening; the outer surface is longitudinally striated. The inside is impressed with hollows in several irregular series, such as might be made, if it were on a larger scale, by making grooves with rounded ends from the edge to the bottom, whilst it was still soft material, by pressure of a finger, then repeating this in a shorter series and again by another, with only the finger tips within the margin. The flat bottom has also a number of upright, slender processes, sometimes branched, half the height of the hollow they are in.

I have not been able to find any account of the egg-laying of *Nabis*, and one is at first rather surprised to find a carnivorous species laying its egg in plant-tissues. Herein, however, it is quite parallel with *Nepa*. Dr. Sharp (Camb. Nat. Hist. vi. p. 561) refers to some Capsids that have a similar habit.

Betula, Reigate: February, 1906.

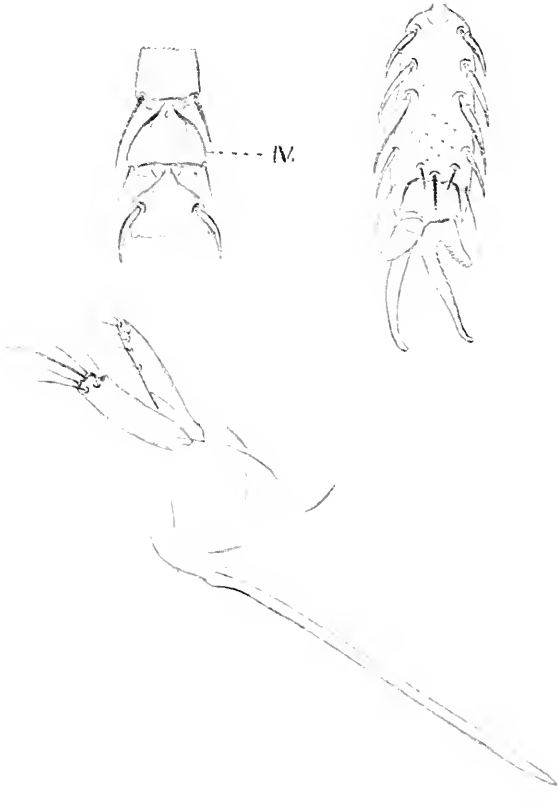
Explanation of Diagram.

Fig.

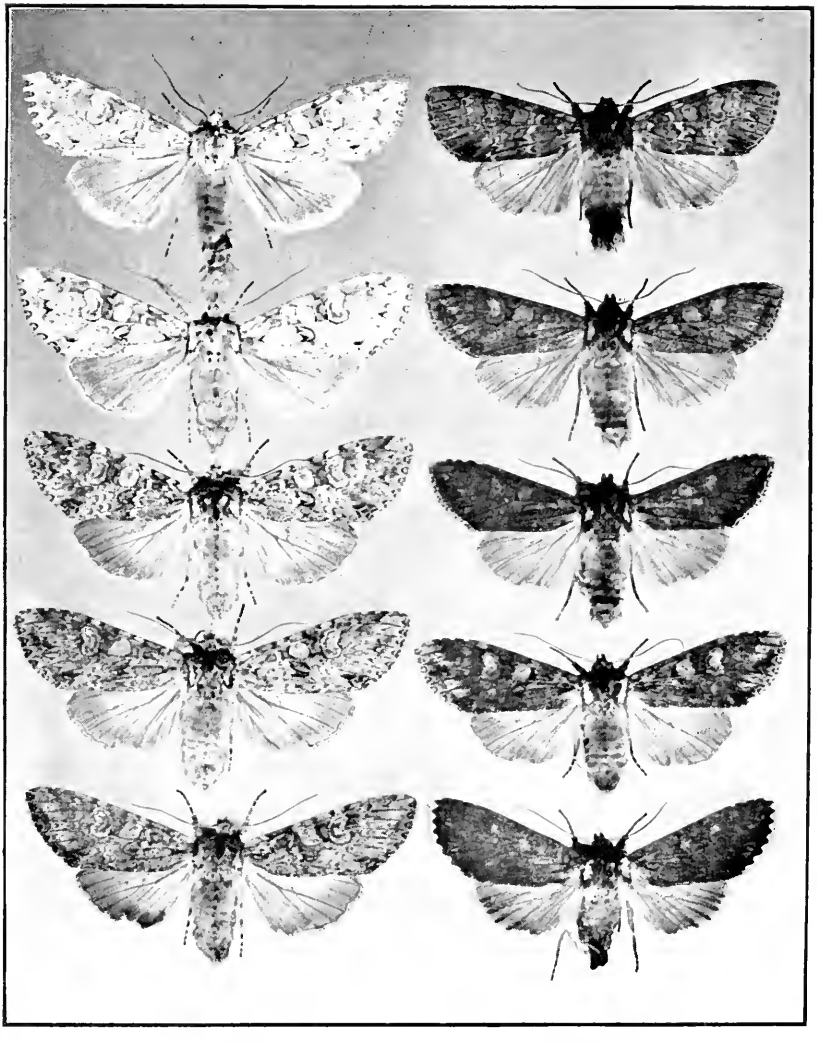
1. Portion of stem of *Chlora perfoliata* × 5 diams., showing disposition of the circles formed by the tops of eggs.
2. More in profile to show prominence × 9.
3.* Section of stem showing unhatched egg × 9.
4.* Section of stem showing two eggs empty × 9.
5. Appearance in profile of undisturbed empty egg-shells × 9.
6. Appearance of a hatched egg × 50.
7. Section of lid of egg to show processes from bottom of cup × 50.
8. Section of lid to show sculpturing of interior of cup × 50.

All these are more or less diagrammatic, and do not profess to be drawings.

* In smaller stems the eggs pretty well fit the pith cavity.



A NEW EGYPTIAN FLEA (*PULEX CHERSINUS*).



Figs. 1–5. Figs. 6–10.

SOME FORMS OF *APLECTA NEBULOSA* FOUND IN BRITAIN, CHIEFLY IN DELAMERE FOREST, CHESHIRE.

A NEW EGYPTIAN FLEA.

By the Hon. N. Charles Rothschild, M.A., F.L.S.

(Plate IV.)

Pulex chersinus, sp. nov.

Closely resembles *P. nubicus*, Roths., Ent. Mo. Mag. (2), xiv. p. 84, n. 2, t. 2, fig. 10, 16 (1903), but differing in the following characters :—

The hind coxa bears posteriorly at the apex three bristles instead of two, and on the inner surface a comb of four or five spines. All the femora have two bristles ventrally near the apex. The tarsi are shorter than in *nubicus*, the proportion of the segments being different. The fourth segment is nearly as broad as it is long, being cup-shaped (fig. 1). The fifth segment bears ventrally at the apex three short stout bristles in all the tarsi (fig. 2).* The proportions of the mid-tarsal segments are 7, 12, 6, 4, 10 in the new species, and 9, 13, 7, 4, 10½ in *P. nubicus*, the proportions of the hind tarsus being 24, 17, 10, 6, 12 in the new species, and 27, 19, 10, 6, 12 in *P. nubicus*. It will be noticed that the first and second hind tarsal segments are shorter in *chersinus* than in *nubicus*, while the distal segments are the same in length.

Modified segments : The clasper bears two processes as in *P. nubicus* (fig. 3), the lower one being distinctly broader than the upper. The processes are of equal length, while in *nubicus* the lower one is much shorter than the upper. The lower process bears one long and several shorter bristles at and near the apex, the most proximal bristle of the dorsal side being situated at the apical fifth, the corresponding bristle being placed a little beyond the middle in *P. nubicus*. The ninth sternite resembles that of *nubicus*, but is distally somewhat narrower.

We have received one male, off *Jaculus gordoni*, from Khartoum, through the kindness of Dr. A. Balfour, of the Wellcome Research Laboratory.

NOTES ON SOME FORMS OF *APLECTA NEBULOSA* IN BRITAIN.

(Plate V.)

In the group of specimens of *Aplecta nebulosa*, arranged and photographed by Mr. H. Main (Plate V.), the object has been to show the extensive colour range of variation to which this species is subject in Britain.

The pale specimen (fig. 1), which is from Ireland, has the ground colour almost pure white (owing to screen marks this is slightly obscured in the figure). Fig. 2 represents a New Forest

* These bristles have come out too black in the figure.

specimen, and this also has the white coloration. Var. *pallida*, Tutt, is described as white, with the markings almost obsolete, and fig. 1 is possibly near this. Figs. 3–5 are grey forms, and are more or less typical examples of the species, and figs. 6–10 show various modifications of the melanic race occurring in the Delamere Forest, from which locality the specimens 3 and 5 were also obtained. Of the melanic forms, figs. 8 and 10 represent *robsoni*, Collins, and *thompsoni*, Arkle, respectively. Except that fig. 10 has a white crenulate line on the outer margin of the fore wings, and that the fringes are white instead of brownish grey, it is not otherwise very clearly separable from fig. 8, which has been recognized by Mr. Collins as agreeing with his type of *robsoni*. Now, it will readily be seen that figs. 6 and 9 are more unlike figs. 8 and 10 than the latter are to each other. It follows then that if it be considered necessary to have names for two modifications of the melanic race, names must also be given to all melanic specimens that are not identical with figs. 8 or 10. Further, the process would not end here, but would have to be extended to the various gradations in the grey form, and to those in the white form also. An alternative course would be to use varietal names only for the main departures from the typical grey coloration, and these are already provided—in *pallida* for the white ground forms, and *robsoni* for the black forms.

The grey form is perhaps more generally distributed in Britain than either of the others, but in some counties—as, for example, in Berkshire—the grey and the white forms both occur, but not in the same wood. The white form appears to be the dominant one in the West of England and in Ireland, and examples of it have been found in Scotland. The melanic form is confined to Delamere Forest and South Yorkshire. Mr. A. Harrison informs me that this form is certainly increasing in numbers in the Cheshire locality. From larvæ collected there in 1905 he reared 11 per cent. of the melanic form, and of these one specimen only had pure white fringes (fig. 10). In 1904 the melanic specimens had been only 5 per cent., and in several previous years the number had been lower than 5 per cent.

Mr. Harrison adds:—"The larvæ of *A. nebulosa* are mostly found on young birch trees, a few only occurring on sallow, hawthorn, and bramble. They outnumbered all the other Noctuid larvæ put together in the part of Delamere Forest that I collected in. They are far more numerous in the Cheshire locality than in Epping Forest or the New Forest—at least, that has been my experience."

Richard South.

TWO NEW SPECIES OF *PRONOPHILA* FROM ECUADOR.

By Percy I. Lathy, F.Z.S., F.E.S.

Pronophila rosenbergi, n. sp.

♂. Upper side: Fore wing dark olive-brown, paler towards base and outer margin; an obliquely placed subapical white band, with white spot below it; two diffused pale spots on outer margin—fringes whitish between nervules—one above the other below lower median nervule. Hind wing dark olive-brown, paler towards base; fringes whitish between nervules. Under side: Fore wing paler than above, especially at apex, which is grey and reddish brown speckled with dark grey; apical white band wider and more diffused towards outer margin, and with two white spots below it, and on its inner edge traces of blue-centred black ocelli. Hind wing mottled grey and reddish brown; a wide irregular reddish brown band across basal third, this band highly angled on its outer edge; beyond this a row of obscure ocelli, blind, excepting two at anal angle, which are blue-centred; outer margin reddish brown.

Allied to *P. thelebe*, D. & H., but may be separated by subapical white band, and the more variegated under side of hind wing.

Pronophila unifasciata, n. sp.

♂. Upper side: Fore wing dark brown, paler towards base and apex; three subapical reddish patches, the centre one being the largest, and two patches of similar colour below these, having on their inner edge traces of ocelli. Hind wing uniform dark brown. Under side: Fore wing paler than above, especially at apex; reddish markings larger and brighter, with exception of lower spot, and on their inner edge three blue-centred black ocelli. Hind wing greyish brown, base dark brown, an irregular wide dark brown band crossing wing at end of cell, this band highly angled on its outer edge; beyond this a row of obscure ocelli, the two at anal angle being most conspicuous; outer margin dark brown.

Nearest to *P. timanthes*, G. & S., but may at once be distinguished by single row of reddish markings of fore wing above; *P. timanthes*, G. & S., also has a row of five ocelli on fore wings below, and in the new species there are only three, and they are more obliquely placed.

The types of both the new species here described are in the collection of Mr. Herbert J. Adams, F.E.S. I have seen one specimen of *P. rosenbergi* in the Hewitson Collection at the British Museum, and there are also two specimens in the Brit. Mus. Coll. from Peru, which probably belong to this species. Of *P. unifasciata*, there is a specimen in the Brit. Mus. Coll. without locality, and three specimens in the Godman and Salvin Coll. from Ecuador. Mr. Adams has one example of each species.

DESCRIPTION OF A NEW SPECIES OF *ODYNERUS* (*LEIONOTUS*) FROM AUSTRALIA.

By P. Cameron.

Odynerus (*Leionotus*) *bisulcatus*, sp. nov.

Black; a small mark, rounded above, over the antennæ, a broad curved mark on either side of the clypeus above two marks, broad on the outer side, gradually narrowed on the inner side, on the pronotum, a small mark on the sides of the scutellum, a small line or mark on the angles of the metanotum, a large mark, longer than wide, transverse at the base, rounded at the apex and below, on the mesopleuræ below the tegulæ, the apex of the latter and a band on the apex of the first and second segments of the abdomen, the second broader and more irregular than the first, and extending on to the ventral surface, where the band is four-lobate, the outer lobes being more developed than the inner, yellow. The knees and tibiæ reddish testaceous, as are also the tarsi, except at the base and apex. Wings hyaline, infuscated in front and at the apex. Clypeus in male entirely yellow. Female and male. Length, 12 mm.

Head and thorax densely covered with fuscous pubescence, that on the head longer and denser than it is on the thorax; the abdomen pruinose, the apical segments pubescent. Front and vertex rugosely punctured, the punctures running into striations below. Clypeus pyriform, longer than broad, shining, strongly but not closely punctured; its apex has a shallow but distinct rounded incision, the sides below forming distinct triangular teeth; above the incision there is a distinct curved depression. Temples broad; behind the top of the eyes is a small yellow spot. Thorax twice longer than wide, transverse in front, the sides at the base above distinctly angled, the part between the angles margined. Mesonotum flattened at the apex, where there are, in the centre, two, three times longer than wide, furrows or depressions. Scutellum flat; the post-scutellum is more prominent, more rugosely punctured, and is gradually narrowed behind. Angles of metanotum somewhat broadly rounded; the metanotum is almost transverse; there is a deep distinctly defined furrow down the middle. First abdominal segment cup-shaped, large, pedunculated shortly at the base, narrowed compared with the second segment; its apex is slightly raised, and there is a short depression in the middle before the apex. The second segment is large, narrowed at the base; looked at from the side the base above is seen to be obliquely depressed; on its basal ventral half is a distinct longitudinal central furrow; the segment is not tuberculate. The male clypeus is yellow; it is longer than wide; its apex is roundly incised, the sides forming triangular teeth; the antennal hook is stout, black, and about three times longer than wide; the spot on the sides of the scutellum is minute, and there is none on the sides of the metanotum; it is more slender, more densely pilose than the female, and the legs are of a brighter, more rufous colour.

Comes near to *O. bizonatus*, Boisd. sec. Sauss.; that species

should be known by the apex of the clypeus being transverse, and having two keels close to the base; its base of thorax, too, apparently is not angled laterally. *O. vernalis*, Sauss., is an allied species; it has a tubercle on the second abdominal segment on the back. Neither with *O. vernalis* nor with *O. bizonatus* does Saussure make mention of the two deep furrows or depressions on the apical half of the mesonotum. In my species they are distinct in both sexes. *O. vernalis* has an indistinct suture on the first abdominal segment. The term "circular," used by Saussure (Vespides, i. 148) to describe the clypeus of *vernalis*, is certainly not applicable to the clypeus of my species in the female, the only sex described of *vernalis*.

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

By G. W. Kirkaldy.

(Continued from p. 64.)

17. A. germari (Fieber). 18. A. carinata (C. R. Sahlberg). I discussed these two fully in the 'Entomologist' for 1898 (xxxi. 249–51), and figured the palæ in the 'Quekett Journal.' In translating Wallengren's Swedish in the former, however, I made a bad mistake, to which Dr. Bergroth kindly called my attention. "Hvarjämte uppehållsorten synes vara en annan" has no reference to the structure of the bug, but means "the habitat also seems to be different," *germari* having been found in a small lake with muddy bottom, far from the sea; while *carinata* lives in small pools on rocks at the seashore, and, in Lapland, on Alpine rocks.

Corixa, Geoffroy.

(= *Corisa*, Amyot & Serville; *Macrocorisa*, Thomson.*)

Of the general structure of *Arctocorisa*, but smooth and polished, and the strigil is on the left side of the male. There are two British species:—

1. Pronotum with at least sixteen pale lines . . *geoffroyi.*
1*a*. Pronotum with not more than fourteen pale lines . *affinis.*

1. C. geoffroyi, Leach. Generally distributed. The ova are figured by Dufour and others; they are subglobular, pointed anteriorly.

N.B.—The Scandinavian *C. dentipes*, Thomson, has been confused with *C. geoffroyi*, but the intermediate tibiæ are compressly dentate at the base in both sexes. It may possibly be found in Britain.

* Greek *koris*, a bug; Greek *makros*, big.

2. C. AFFINIS, Leach (= *atomaria* in Saunders). Generally distributed. Variable in size and pattern.

Fam. NOTONECTIDÆ.

The Notonectidæ have also sprung apparently from a Naucoroid stem, and are usually placed in classifications between the Naucoridæ and the Corixidæ, an absurd position. They are perhaps of all insects the most perfectly adapted for an aquatic existence, their structures being very interesting.

They have been recently investigated systematically by myself.* They are characterized by the rostrum being composed of from three to four segments, the antennæ of four, the insertion of the anterior legs on the *posterior* margin of the prosternum, &c.

There are two British species, each belonging to a subfamily:—

1. Posterior tibiæ and tarsi ciliate; sternites keeled and ciliate; rostrum with four evident segments. Eyes large. Size over 13 mill. . . . NOTONECTA.

1*a*. Posterior tibiæ and tarsi not ciliate; sternites neither keeled nor ciliate; rostrum with three evident segments. Eyes small. Size under 3 mill. . . . . PLEA.

NOTONECTA,† Linné.

The species of this genus are properly called "water-boatmen," though of late years American authors have termed them "back-swimmers," transferring their true title to the Corixidæ. In France they are named "Punaises à avirons," and in Germany "Ruderwanzen," both referring to their oar-like posterior legs.

The head is rounded and very declivous; the eyes very large, the boatman thus being able to look out, both above and below, for "inside-fares." It is carnassial, feeding on any living thing that it is strong enough to surprise or overpower, particularly other waterbugs, larvæ of Ephemerids, &c. The rostrum is stout and the setæ sharp, inflicting a burning smart when the bug is heedlessly seized; so severe, indeed, that it is supposed that some poisonous matter must be injected simultaneously from the salivary glands.

The method of respiration is very remarkable. The boatman is very buoyant, owing to the quantity of air taken in reserve and its position along the sternites (which of course are uppermost), so buoyant indeed that the insect is compelled to use considerable exertion to remain submerged. They are fond, especially during hot weather in the daytime, of remaining

* Trans. Ent. Soc. Lond. 1897, pp. 393–426; and Wien. Ent. Zeit. 1904, pp. 93–135.

† From Greek *noton*, a back; *nekho*, I swim.

stationary at the surface, but on the slightest suspicion, a few strokes of their powerful oars drive them instantly far from danger. The under side of the abdomen, *i. e.*, the deck of the boat, slopes inwards on either side, so that there are two large gutters between the strong central keel and the equally strong outer sides; these sides and the central keel are bridged over all along by thick layers of coarse, oblique hairs, one layer to each side from the central keel, and one from each side to the keel, thus forming a waterproof upper deck. When the boatman rises to the surface for air, the apex of the body projects a little out of the water, the air passes along the tunnel each side under the hairs; along the bottom of the tunnel (or gutter) are six pairs of spiracles into which the air passes. Under water this supply of air is very noticeable, seeming like a mass of mercury.

The anterior pair of legs is raptorial; the middle pair is used for clinging to stems of weeds, &c., while at rest; in this position the posterior legs stand out at right angles to the longitudinal axis of the body, this latter pair being long, with the tibiæ and tarsi densely ciliate. Their speed through the water can be very great, but on land their gait is very clumsy, their progression being effected by a sort of shuffling hop. They are provided with strong organs of flight, and use them indeed with good results.

Copulation takes place beneath the surface of the water; the abdominal segments are telescopic, and the terminal segments are thrust out beyond the apices of the tegmina, so that the spiracles are still protected from the water. The male mounts the female at first in the usual way, but soon after slips down so that the sexes lie almost in the same plane, side by side, the male a little lower; they swim thus, attached only by the genitalia, as quickly almost as when separate.

Observations on the metamorphoses have been made by Roesel, Régimbart, Dufour, De Geer, Girard, Bueno, Enock, and myself; while embryological researches have been made by Heymons, Will, Pedaschenko, Pantel, Sinéty, and others; at the same time full descriptions and figures of the various stages in this, as in all other British waterbugs, are much needed.

The ova of *N. glauca* are oblong, cylindric; they are usually inserted, for about three-fourths of their length, in incisions made in the stems of rushes, or other aquatic plants, though sometimes they are only lightly affixed thereto, or, in exceptional cases, deposited on the bottom, though possibly ova found scattered promiscuously thus may have originally been so lightly affixed to the stem of some plant that a subsequent jar dislodged them. Régimbart has figured the ova of *N. glauca* in situ, and he enquires the reason of these insects thus concealing their ova in plants. At first sight, he says, there is reason to suppose

that it is to protect them from numerous enemies, *viz.*, fish, insects, and so forth. He thinks, however, that the hatching time of the young nymphs tends in general towards the end of winter and the middle of spring, and rarely continues after the end of April. It is not so with copulation and oviposition, which take place particularly in winter and spring (and also in summer and autumn). The ova may thus wait many months after oviposition before hatching. As the level of the water is subject to being lowered, they would find themselves liable to exposure to the air and consequent desiccation; but, as it is, they are concealed in a plant which protects them, and furnishes them with the moisture indispensable to their preservation. Later, the rains of autumn and winter raise the water-level, and the nymphs being again submerged, hatch, and find the conditions necessary to their development.

The ova hatch in about fifteen days, diving down head foremost on emerging, and there are four nymphal instars (in part roughly figured by De Geer), the young swimming upside down from the first.*

Notonecta is subject to water-mites, as are the other aquatic bugs. The odour emitted by the boatman is apparently of a fæcal nature, at least no openings similar to those in *Ilyocoris* have been found; it is very similar to that of the plant "stinking goose-foot" (*Chenopodium vulvarium*).

Notonecta has been found by Enock to be subject to the attacks of a Hymenopterous parasite, viz., *Prestwichia aquatica*, which oviposits in the ova of the *Notonecta*.

There is but a single British species:—

1. N. GLAUCA, Linné. Varies in general colour from pale ochreous to black; in all the mature British examples I have seen the scutellum is black, but in a North African variety it is yellow. The following varieties are well-marked, though intermediate forms occur:—

(a) *glauca*, Linné. Tegmina pale ochreous, more or less specked laterally, &c.; abdomen above black, lateral margins narrowly pale.

(b) *marginata*, Thunb. Tegmina black, with two elongate ochreous spots on the clavus, &c.; abdomen as in the preceding.

(c) *marmorea*, Fabr. Tegmina rich yellow-brown, mottled with a darker brown; abdomen as in the preceding.

(d) *maculata*, Fabr. Tegmina orange irrorated with brownish red and blackish brown. Abdomen above orange banded with black.

A beautiful variety from the Canary Isles (*canariensis*, Kirkaldy), which may be a good species, has purple-black tegmina, irrorated with dark rich castaneous.

* According to Régimbart, the nymphs of Corixidæ present, at their exclusion from the egg, no trace of air on their ventral surface; they are heavier than the water, and appear to commence taking in air only at the end of four or even six days.

Notonecta glauca is generally distributed; var. *maculata* is more local.

N.B.—*Notonecta lutea*, Müller, has been recorded from Britain; and pale specimens of *N. glauca* are, or were, exhibited in the General Insect Gallery of the British Museum as *N. lutea*. *N. lutea* is not likely to occur in Britain, and is a very different species.

(To be continued.)

ON TWO SPECIES OF HYMENOPTERA FROM THE CAPE DE VERDE ISLANDS.

By P. Cameron.

Odynerus atlanticus, Cam.

In the 'Entomologist' for January last (p. 13), I described a wasp under the above name, which it has borne in my collection for many years. Unfortunately I overlooked Mr. W. F. Kirby's paper on the "Hymenoptera of the Challenger Expedition" in the Ann. and Mag. Nat. Hist., May, 1884, where the same species is described, fortunately under the same name, if somewhat briefly.

Priocnemis atlanticus, Kirby.

♀. Length, 21 mm. Antennæ reddish yellow, the scape of a redder hue, and thickly covered with pale golden pubescence; the third joint is about one-fourth longer than the next. Eyes converging slightly below; the ocelli in a curve; the hinder separated from the eyes by almost twice the distance they are from each other. Clypeus boldly convex; its apex narrowly depressed, black, transverse, the sides rounded. Temples short, roundly narrowed. Angles of pronotum broadly rounded, prominent. Post-scutellum more prominent than the scutellum, clearly raised above it, roundly narrowed to a point above, there being a fine keel in the centre. Striation on metanotum strong, becoming coarser towards the apex. Pleuræ obscurely obliquely striated. Abdomen with a greenish iridescence; the pygidium is densely covered with bright red pubescence, sparsely intermixed with longish soft black hair. Radial cellule short; the third abscissa of the radius is one-fourth shorter than the second; the third transverse cubital nervure from shortly below the middle is straight and obliquely curved towards the second; the second recurrent nervure is received the length of the third abscissa of the radius from the base of the cellule. The head and mandibles are brownish, darker on the centre of the vertex and front.

Mr. Kirby describes this species, *l. c.* p. 408. The description therein given may be usefully supplemented from an example taken by Commander J. J. Walker at St. Vincent.

The sides of the pronotum project more prominently than in most African species—than in e.g. *Salius tamiseri*, Guér.; the antennæ, too, appear to be longer and more slender than usual.

ALGERIAN BUTTERFLIES IN THE SPRING AND SUMMER OF 1904.

By Margaret E. Fountaine, F.E.S.

Algeria is a country which would seem to present great possibilities from an entomological point of view, with its lofty mountains, immense forests, and scorching hot plains, with its rich vegetation in the north, and tracts of arid desert in the south. Whether my expectations were altogether realized during the six months from February to August, 1904, that I spent collecting here in "The Garden of Allah," will best be determined by reading the results of my efforts; which I may add seem to me to have been scarcely adequately rewarded. I was at Biskra towards the end of February, where I found *Euchloë charlonia* and *E. falloui*, flying in company with *E. belemia* on the tops of all the low, desert mountains from which, however, the two first-named, at least, never seem to descend, so that the climb up to these stony heights was almost always entirely unproductive of results; though towards the end of March, *Melitæa didyma* var. *deserticola* began to appear in the dried-up tracts of desert between these mountains, but it was far from common, as the season was an extremely backward one, and high winds, not altogether sultry at times, blew almost every day without intermission. At El Kantara, too, where two years previous (1902) Mrs. Nicholl and I had found *E. pechi* quite common on the alfa grass slopes of the surrounding mountains at the end of February and beginning of March, now under the influence of this unsatisfactory season, which was wet as well as cold at El Kantara, I did not see it at all till the 6th of April, and then the males seemed only just to be thinking of coming out. After this I returned north of the Atlas mountains, and visited Hammam R'Irha (a beautiful place, with an excellent hotel, but not much good for collecting); also the cedar forest above Blidah (3500 ft.), where I spent a week and found *E. eupheno*, very plentiful, and a few other things. The trees in this forest are not nearly so large as those in the great cedar forest at Teniet-el-Haâd; but I should imagine that in the summer it might afford excellent collecting, especially for Argynnidæ, as the forest glades were carpeted with purple pansies, and this genus was most sparingly represented in any of the other localities I visited; neither did I see elsewhere the purple pansies. After I had spent a week here in the little pension of Les Glaciers, (most comfortable, and on the borders of the forest), I proceeded to Teniet-el-Haâd (3500 ft.), where I arrived on May 19th. I certainly did better during the five weeks I spent here than anywhere else in Algeria, and the cedar forest was a sight never to be forgotten: for a distance of twenty-five kilometres the moun-

tains are clothed with these magnificent trees, the highest point in this vicinity rather exceeding 5000 ft. All day long strange bright-winged birds sang their wild, untutored songs, till the very heart of the forest seemed to throb with melody; the flowers, too, in the open, sunny glades were a dream; and the butterflies were far from disappointing. Indeed, I have never seen such a profusion of insect-life in any place before; beetles of every hue glittered in the hot, mid-day sun of an African summer, bees in gorgeous apparel of brilliant scarlet, enormous grasshoppers of every shape and form, flies of many colours, though with irritating propensities, not to mention a great monster ant-lion (a kind of *Palpares*) flopping awkwardly about, as though his soft, gauzy wings were so big he did not quite know how to manage them; with now and then a vividly coloured dragonfly, that I would fain capture, but did not always succeed in doing.

But the insects in this much-favoured spot became too much of a good thing at last, and on the last occasion that I visited the cedar forest, flying and crawling earwigs suddenly appeared in such appalling myriads that actually I was obliged to beat a hasty retreat. So numerous were they that all other insect life seemed, by comparison, to be temporarily suspended; the air was full of them, flying as high as the tops of the trees, not thousands, but millions of them, every square foot of ground, every piece of fallen timber, in fact everywhere and everything was infested with these disgusting creatures; they crawled all over us, and soon proved that they were of a kind that knew how to bite. "Ils piquent aussi, ces perce-oreilles"! remarked indignantly a French lady, who (for her sins), in company with some friends, was "making picnic" in the forest that day. As for me I ordered our horses to be saddled, and once mounted rode away as hard as I could, still covered with these loathsome insects, the manes of the horses, too, being full of them. Neither were the earwigs the only disadvantage I had to contend with that day; the weather had become so intensely hot, that the best piece of hunting-ground (a meadow of rich grasses, asphodels, and other flowers, just below the forester's cottage) was now the favoured haunt of numerous snakes. I caught one in my net once, instead of the butterfly I was trying for; luckily she lost no time in forcing an exit for herself through the thin gauze, and escaped with much alacrity back into the thick, damp grass, a line of conduct on her part which met with my absolute and entire approbation. But all this was only on my last visit to the forest, and the preceding weeks had left nothing to be desired. Though I could not help observing that as the summer advanced there had been a decided falling off amongst the butterflies, those which had come out so abundantly towards the end of May and early in June were going over now, and no fresh species

were appearing to take their place. So that this fact, together with my experience with the earwigs, decided me to move on into the province of Oran, and make for Tlemçen and Sebdou.

I arrived at Tlemçen (2800 ft.) on June 21st, and the next day bicycled with my courier, over an excellent though mountainous road to Sebdou (3100 ft.), distant thirty-five kilometres from Tlemçen. Here I found *Cœnonympha fettigii* just out and in excellent condition on June 27th. But it soon became evident that my expectations of Sebdou were doomed to disappointment. It was a wretched little place too, with nothing but a couple of wayside inns for accommodation, while most of the inhabitants were either Jews or Arabs. The country in some directions presented a semi-demi desert appearance; the heat in July became intense, but though in the middle of the day the shade thermometer would stand from 100° to 110° Fahrenheit, the nights were sometimes so cold that it would drop as low as 40°! In the plains at sea-level the thermometer frequently stood at 122° Fahrenheit during this terrible summer, which it may be remembered was unusually warm everywhere, so that I suppose the Algerian climate rose to the occasion proportionately.

I had never before seen any country in the month of July so (almost) destitute of butterflies as this, and ten days I spent at Tlemçen proved that neighbourhood to be even worse. When I returned to Sebdou (July 22nd) I found *Pieris daplidice* var. *raphani* had come out in great abundance; most of the males belonging more or less to this well-marked variety, though amongst the females it was comparatively rare. On July 26th I first took *Satyrus fidia* var. *albovenosa* and *S. statilinus* var. *hansii*, Aust., near Sebdou, and these two Satyrids soon became common on all the surrounding mountains up to about 5000 ft. But, alas! *S. abdelkader* failed to appear, so I began to think my note stating that this interesting Satyrus was "common in the alfa grass, near Sebdou, in August," was a fraud. Anyhow I never came across it, though I searched diligently wherever there was alfa grass in abundance, till the middle of that month, when fever put a summary end to my collecting for that year.

The following is a list of my captures:—

Papilio podalirius var. *feisthamelii*, Dup., and ab. *lotteri*, Aust.—Near Algiers in March (1902); and in the cedar forest above Blidah in May the var. *feisthamelii* was not uncommon. The summer brood at Tlemçen and Sebdou produced ab. *lotteri*, very large and white. A larva I found on a peach-tree near Sebdou in August produced a small specimen of *feisthamelii* almost minus the short black stripe from the middle of the costa on the upper wings. It was brought out by artificial heat on February 6th, 1905.

P. machaon, L.—On the desert mountains near Biskra in March; the specimens were rather small, but do not seem to me otherwise to differ appreciably from the type, except one, which is ab. *sphyrus*, Hb.

But the summer brood of this butterfly in Algeria seems to present a very fine form. In one female I have, taken by my courier near Sebdou in July, the ground colouring is most brilliant, and the abdomen is entirely yellow, thus being analogous with the form *zanclæus* of *podalirius*. Unluckily the very rapid flight of this insect prevented my taking others; however, one which I failed to catch I saw was distinctly the same, and another in a very mutilated condition, which I took later, had evidently also belonged to this form, which would, I suppose, be considered an extreme of var. *aurantiaca*, Spr.

Thais rumina, L.—Taken rarely at Hammam R'Irha in April. I also came across a small colony near Blidah on May 18th; and at Teniet in the forest, &c., it was common in certain places where the *Aristolochia* grew in May and June. The specimens from Hammam R'Irha have the red blotches on the upper wings very nearly replaced with black. All the Algerian specimens are paler in colour than those I took some years ago in Andalusia.

Aporia crataegi, L.—Abundant at Teniet in May and June.

Pieris brassicæ, L.—At Hammam R'Irha and other localities in April and May.

P. rapæ, L.—Not very common at Biskra and El Kantara in March. In the cedar forest above Blidah in May I took a perfectly white male, entirely devoid of all black markings above and beneath.

P. napi, L.—In both the cedar forests in May.

P. daplidice var. *raphani*, Esp.—This is a very marked form of the summer brood; in some of the male specimens the yellow-green markings on the lower wings, under side, are almost entirely confined to the outer margins, leaving the central area creamy white. With the female it was less so. This butterfly was extremely common all round Sebdou in July; I also observed it at Tlemçen.

Anthocharis belemia, Esp.—At Biskra and El Kantara in March; var. *glauce* at Blidah and Teniet in May.

A. falloui, Allard.—Quite distinct from the preceding species, and with a little practice can even be distinguished from it on the wing. It flew on the tops of all the desert mountains round Biskra; but seems entirely confined to the region of the desert, not occurring even so far "inland" as El Kantara.

A. belia, Cr.—At El Kantara in March (1902). Also near Blidah (cedar forest) in May. Most of the Algerian specimens are small, and have an inclination to black markings along the outer margins of the hind wings, especially in the females.

A. pechi, Stgr.—This seems to be a rare butterfly in collections; but it flew commonly enough on all the mountains near El Kantara in February and March (1902). In 1904 the season was so backward that I did not see a sign of it till April 6th, and then it was still very rare, apparently only just emerging. It does not seem to descend into the desert region, and always flies where there is plenty of alfa grass.

A. charlonia, Donz.—This extremely pretty little butterfly flies commonly in February and March round El Kantara and at Biskra, where it is to be found in company with *A. falloui* on the tops of the desert mountains.

A. cupheno, L.—Abounds everywhere north of the Atlas Mountains;

I also saw one male specimen at El Kantara in March (1902). Both sexes vary much in size; and a few of the females I took near Algiers in March (1902) approach the var. *androgyne*, Leech.

Teracolus daira var. *nouna*, Luc.—It was especially the desire to catch this little butterfly that caused me to revisit Biskra this year; but though Mrs. Nicholl had been able to secure easily a good series of it in that neighbourhood during March, 1902, and had also kindly informed me exactly how, when, and where to look for it, I did not come across a single specimen. Perhaps, like *A. pechi*, it was fully a month late, or it may have been such a bad season that it was extremely rare; anyhow, I had to come away without it, and bear my disappointment as best I might. But the unexpected happens to collectors of butterflies just as it does to everyone else, and it was a most unexpected event for me when, on June 27th, on a mountain near Sebdou, I took one male of this species. It was just fresh out, so much so that, though it was the middle of the day, its flight was slow and halting, and it therefore fell an easy prey to my net. Of course, I imagined that a summer brood was now beginning, the elevation being about 4000 ft.; but though I visited the "Nouna Mountain" again the next day, and on many other subsequent occasions, I never saw another!

Colias edusa, F.—Pretty common everywhere. Also the var. *helice* at Sebdou in July, where I took one very fine specimen of the intermediate form, in which the ground colour on all the wings is a pale primrose yellow.

Gonepteryx cleopatra, L.—Common at Teniet in June. The orange patch in the males seems to be slightly less intense than in those I have from the South of France.

Pyrameis cardui, L.—Common everywhere.

Vanessa polychloros var. *erythromelas*, Aust.—This magnificent form of the "greater tortoiseshell" occurred commonly at Teniet-el-Haâd in June; it was not out in the end of May. The ground colour is a vivid orange-red, and it is much more distinct from the type than I imagined at the time, or I might have secured a longer series; but *erythromelas* is a rapid flier and most difficult to catch, the street gutters in the town of Teniet offering perhaps the best chances of a capture. Though the ground colour of this Algerian form is even deeper in tone than any specimen I have ever seen of *V. zanthomelas*, S. V., still it fails to present the other distinctive features of that species, inasmuch that the legs are brown, the light-coloured marks near the costa on the fore wings are yellow and not white, while the brown shadings on the under side of all the wings are darker instead of lighter. So that it cannot possibly be classed as *zanthomelas*, though bearing a strong superficial resemblance to it.

Melitæa ætherie var. *algirica*, Stgr. — Occurred commonly in the cedar forest and other localities near Teniet in May and June. A few of the specimens appear to be typical, and are indistinguishable from some I have from Spain, taken near Seville, but far the greater number belong undoubtedly to the var. *algirica*.

M. didyma var. *deserticola*, Obth.—Taken at Biskra in March and April. Also an intermediate form at Sebdou in June and July; approaching the type from Teniet in June.

Argynnis pandora, S. V.—As I did not spend the summer where the purple pansies grew in the Blidah cedar forest, this seems to be the only *Argynnis* I met with in Algeria, and it was far from common. I observed it at Teniet, and, I think, at Sebdou.

Melanargia lucasi, Rbr.—I caught my first male on May 24th, about three minutes' walk from the town of Teniet-el-Haâd. A week or ten days later this butterfly was swarming everywhere in that neighbourhood. Some of the females were very richly coloured underneath. It seems to me to combine some of the characteristics of *M. iapygia* and *M. galathea*, but does not very closely resemble either of them.

M. ines, Hffgg.—Not very common on the hills round Teniet. A brightly marked form.

Satyrus briseis var. *major*, Obth.—Not by any means widely distributed. I came across a colony of it near Terney, a place about halfway on the road between Tlemçen and Sebdou, in July. It was also abundant in certain mountains about fifteen kilometres west of Sebdou on August 9th, but the specimens were no longer fresh. It was a very large form, nearly twice the size of an ordinary Central European *briseis*.

S. semele var. *algirica*, Obth.—Very abundant all round Teniet, end of May and throughout June. The males on the upper side show an inclination to assuming the coloration of typical females, whilst the females themselves are more brightly coloured than the type, but not so much so as in var. *aristæus*. It also occurred commonly at Sebdou.

S. statilinus var. *hansii*, Aust.—Very common near Sebdou, end of July and August, frequenting the foot of mountains.

(To be concluded.)

NOTES AND OBSERVATIONS.

Thecla rubi.—In the report of the Lancashire and Cheshire Entomological Society, I am credited with exhibiting microscopical preparations to show the difference between androconial scales and ordinary scales of *Thecla rubi*. This was not the object of the exhibit, and I am afraid our good secretaries have missed the point I specially wished to call attention to, which was—the male *Thecla rubi* has the power of entirely shedding the androconial scales in the little patch on the fore wing. If your readers will examine their series with a lens they will probably find in the specimens selected to show this patch most distinctly that all the androconial scales have been shed, leaving the ordinary scales quite perfect. Are they connected with scent-glands ?—F. N. Pierce ; The Elms, Dingle, Liverpool.

Unusual Dates of Emergence of some Moths.—On June 24th, 1905, I received some larvæ of *Macaria alternata*. They were then about a week old, and pupated between July 7th and 12th. One imago emerged on July 18th, which is about the normal time for the second brood specimens to appear, and I expected that all the moths would emerge. No others, however, came up until December 20th, when I

found one in the breeding-cage. A third followed on January 5th, and a fourth on February 5th. Some larvæ of *Nemoria viridata* hatched on June 16th, 1905, from eggs deposited on the second of that month. These pupated in due course. One imago emerged on December 20th of that year, and one on each of the following dates this year—January 8th and 14th, February 2nd and 12th. A male specimen of *Orgyia gonostigma* emerged on November 5th, 1905. The larva from which this resulted pupated on September 26th. Another larva that pupated on October 16th produced a female specimen on November 20th. Two larvæ of *Dasychira pudibunda* that pupated in August, 1905, attained the perfect state on February 12th, 1906. — Arthur J. Scollick; 8, Mayfield Road, Merton Park, Wimbledon.

A Note on Chrysophanus alciphron ab. intermedia (Stephanelli).—Under remarks (Wheeler's 'Butterflies,' p. 16) of a tendency in var. *gordius* to be larger and brighter on the south side of Alps than in the Rhone Valley, mention is made of a female taken by me at Varzo, of which the hind wings are suffused with black, and to a fine black female of Mr. Rowland-Brown's from Val Malenco. I have lately had an opportunity of seeing this latter, and it is practically the same variety as mine from Varzo. Hitherto I had supposed that it was unnamed. But on reference to Drs. Staudinger and Rebel's catalogue the other day, I found ab. female *intermedia*, Stephanelli, thus described: "Al. ant. disco fulvo, al. post. *ut in Alciphron*." This exactly agrees with the above varieties, and most curiously with what Mr. Wheeler says, speaking of my Varzo specimen, "This closely resembles a female in the Geneva Museum from Hyères, *marked Alciphron*." No doubt this, too, is ab. *intermedia*. I therefore subjected all my Varzo and Iselle *gordius* (?) to a strict examination, and find that of four other females two at least are very much darker and more suffused with black on the secondaries than any specimens from the Rhone Valley; while the males, of which I have preserved seven, show a tendency to a very general suffusion of purple, after the manner of *alciphron*. One specimen has the primaries entirely a rich purple-brown, with the black spots showing through, as in type *alciphron*, only the spots are large as in *gordius*. Others approximate more or less this coloration. This extreme specimen, then, I take to be ab. *intermedia*, male, and that this aberration is not confined to the female sex. Two males from Val Anzasca resemble these Italian Simplon forms. Staudinger gives Central Italy as the locality for ab. *intermedia*.—Frank E. Lowe.

The Insect Fauna of Sussex.—In the 'Victoria History of the Counties of England,' Sussex, vol. i., is an account of the insects of the county. This comprises lists of all orders, occupies 128 pages, and is a valuable addition to these county lists. Mr. Herbert Goss is editor of this division of the work, and other well-known entomologists have compiled or otherwise assisted in the preparation of the lists as follows:—Orthoptera (3 pp.), Mr. Malcolm Burr. Neuroptera (5 pp.), Mr. W. J. Lucas. Hymenoptera Phytophaga, Tenthredinidæ, Cynipidæ, Braconidæ, and Chrysididæ (10 pp.), Rev. E. Bloomfield. Entomophaga (2 pp.), Mr. Claude Morley. Hymenoptera Aculeata (6 pp.), Mr. E. Saunders. Coleoptera (28 pp.), Rev. Canon Fowler. Lepi-

doptera (Butterflies), 6 pp., Mr. H. Goss. Lepidoptera (Moths), 40 pp., Mr. W. H. B. Fletcher. Diptera (16 pp.), Mr. J. H. A. Jenner. Hemiptera (12 pp.), Mr. E. A. Butler.

CAPTURES AND FIELD REPORTS.

Notes on Irish Lepidoptera. — In looking over my Westmeath collection of Lepidoptera, and comparing them with Mr. Kane's Irish list, it struck me that the following captures might be worth recording. They are all from the neighbourhood of Mullingar:—*Dasychira fascelina*. One freshly-emerged specimen at rest on heather, July, 1903. I have several times found the remains of the ichneumoned larvæ attached to the heather-tops. Mr. Kane gives two localities for this species, both in King's County.—*Acronycta leporina*. Larvæ not uncommon on alder. —*Tæniocampa opima*. Two at sallow-bloom.—*Hadena protea*. I have a single specimen from a pupa obtained at Clonlost. Only two previous records, *viz.* one from Co. Galway, and one, Kilynin, Westmeath.— *H. glauca*. One bred from a larva taken on heather. — *Apamea ophiogramma*. Does not appear to be common. I took nine specimens one evening. — *Amphidasys strataria*. One only from a pupa. — B. L. Middleton; Mullingar, Ireland.

Lepidoptera in Hertfordshire in 1905.—At a meeting in connection with the Hertfordshire Natural History Society, held at the County Museum, St. Albans, on March 6th, Mr. A. E. Gibbs, F.L.S., Recorder of Insecta for the Society, read his annual report on the Lepidoptera observed in the county during the past year. He said there were only two species to be added to the Hertfordshire list; they were *Senta maritima*, taken at Tring by Mr. A. T. Goodson, and *Xylophasia scolopacina*, recorded from Hitchin by Mr. A. H. Foster. Miss Alice Dickinson, of New Farm, St. Albans, was the only observer who reported the presence of *Colias edusa*, which apparently had not been very plentiful in the British Isles during 1905. *Cyaniris* (*Lycæna*) *argiolus* had also been conspicuous by its absence from its usual Hertfordshire haunts. Miss Dickinson reported the presence of var. *cæruleopuncta* of *Chrysophanus* (*Polyommatus*) *phlæas*, which Mr. Gibbs thought was not so frequently met with in the county as formerly. The presence of *Acherontia atropos* at St. Albans and Baldock was noted, the specimen from the latter place having been picked up in the middle of the North Road, and taken to Mr. Foster. For the second time Miss Dickinson caught a *Cossus ligniperda* at sugar, and Mr. Gibbs remarked that he had also taken it in the same way. Other insects reported by Miss Dickinson were *Notodonta camelina* (beaten from hazel), *Bryophila perla* (at sugar), *Acronycta tridens* (larva), *Neuria reticulata*, *Dianthœcia cucubali*, *Cucullia umbratica*, *Plusia moneta*, *P. chrysitis* and *P. pulchrina*, *Ennomos erosaria*, *Hemerophila abruptaria*, *Anticlea nigrofasciaria*, and *Pelurga comitata*. Mr. Foster, of The Grange, Hitchin, sent in an interesting report, in which he mentioned the capture of three specimens of *Geometra papilionaria* at light; *Eupithecia scabiosata*, in abundance on Pegsdon Hills; *Melanthia albi-*

cillata, in Mr. Grellit's garden ; *Anticlea cucullata*, of which only two specimens were taken ; *Coremia quadrifasciaria*, five examples at rest ; *Cymatophora octogesima*, six at sugar; *Notodonta dictea* and *Apamea unanimis*, at light; *Agrotis ravida*, nine at sugar ; and *Cirrhœdia xerampelina*, comparatively common on street-lamps late at night. Mr. Foster also added eight or nine other insects to the Hitchin list. Mr. P. J. Barraud, of Bushey Heath, reported that the season on the whole had been a good one for Lepidoptera. About the usual number came to light at his window, five species being new to his list, viz. *Dianthœcia cucubali*, *Eupithecia pumilata*, *Scoparia ambigualis*, *Yponomeuta padellus*, and *Harpipteryx xylostella*, making three hundred and six species taken at light in that one locality. Sugaring, which had been of little use during the previous few years, was reported by Mr. Barraud to be attractive during August and September. By the removal of Mr. Arthur Cottam from Watford, Mr. Gibbs said the Society lost one of their most careful observers. Before leaving the county he sent a short note recording the capture on June 3rd, at Aldbury, of a specimen of *Chœrocampa porcellus*, a species which he subsequently took in his garden at Watford, flying over honeysuckle. A list of captures at Watford was communicated by Mr. V. P. Kitchin, of The Grange, other records being supplied by Mr. W. C. Boyd, of Waltham Cross, Mr. G. B. Digby, of Bournemouth, and Mr. A. T. Goodson, of Tring, the latter gentleman remarking that butterflies were scarcer, not more than a dozen specimens of *Nemeobius lucina* being seen, none of which were taken ; while *Gonepteryx rhamni* was also far from plentiful. Among local insects mentioned by Mr. Goodson were *Notodonta dictæoides* (larvæ), *Cymatophora octogesima*, *Plusia moneta*, and *Spilodes palealis*. Mr. Gibbs said he feared his own local observations in 1905 were hardly worth putting on record. The larvæ of *Plusia moneta* were again plentiful in his garden on both aconite and delphinium. Neither sugar nor light yielded anything very remarkable, and very few moths visited ivy-blossom in the autumn, a cold October probably being the cause.—A. E. Gibbs ; Kitchener's Meads, St. Albans.

Hertfordshire Coleoptera.—Four species of Coleoptera have been added to the Hertfordshire list. They are *Stenus opticus*, taken in dead rushes near Tring ; *Podabrus alpinus*, taken at St. Albans by Mr. A. E. Gibbs ; *Longitarsus curtus*, taken at Tring in 1904 ; and *Apion schonherri*, found in haystack-refuse at Tring. Mr. E. George Elliman, who announced these additions in a short paper which was read at a meeting of the Hertfordshire Natural History Society on the 6th March, pointed out that *Longitarsus curtus* had lately been introduced as British by Mr. J. R. le B. Tomlin on specimens found in the Isle of Man. It now appears that these Manx specimens are a small form of *L. melanocephalus*, Deg. Mr. Elliman had submitted the specimens taken by himself to M. Bedel, and he was quite positive as to their identity. The species has been found on *Echium vulgare* in France, but Mr. Elliman believed that in the case of his own specimens they had been living on a species of *Myosotis*. *L. curtus* bears a considerable resemblance to *L. lycopi*, Foudr. — A. E. Gibbs ; Kitchener's Meads, St. Albans.

SOCIETIES.

Entomological Society of London.—*Wednesday, March 7th*, 1906. —Mr. F. Merrifield, President, in the chair. — The Rev. George Wheeler, M.A., of Les Tourelles, Territet, Switzerland, was elected a Fellow of the Society.—The decease of the following Fellows was announced:—Mr. W. P. Blackburne-Maze, Mr. C. W. Dale, and Mr. F. J. Horniman, F.L.S., F.Z.S., &c.—Mr. H. W. Andrews exhibited two specimens of *Microdon latifrons*, Lw., a rare dipteron taken in the New Forest in June, 1905.—Mr. H. M. Edelsten showed examples of *Nonagria neurica*, Hb., and *N. dissoluta* var. *arundineta*, Schmidt, from Germany, with (?) var. *arundineata* from Central Asia, for comparison with *N. dissoluta* and *N. arundineta*, from Kent, Cambridge, and Norfolk. — Mr. L. B. Prout exhibited, and read a note on, a variable series of *Gynopteryx gladiaria*, Guen., and its varieties. — Mr. A. J. Chitty, combs of the honey-bee formed on a branch of nut-tree, the bees having swarmed late in the year. After July they deserted the combs, and having consumed all the honey contained in them, again swarmed on a neighbouring tree.—Prof. R. Meldola, F.R.S., on behalf of Major R. B. Robertson, a specimen of *Prodenia littoralis*, Boisd., which had emerged in a breeding-cage kept, with many others, by Major Robertson, at Boscombe, Hants, for the reception of caterpillars found in that district. The moth emerged on July 16th, 1905. The species, which is figured in Hampson's 'Moths of India,' is said to have a distribution extending from the Mediterranean subregion throughout the tropical and subtropical zones of the Old World.—Commander J. J. Walker said he had taken the larva, known as the Egyptian cotton-worm, in the Central Pacific Islands, feeding on the tobacco-plant.—Mr. O. E. Janson exhibited a *Mantis* on a portion of the bark of a tree as found by Mr. F. Birch in Trinidad, who stated that its close resemblance to a withered leaf was evidently a protection for aggressive purposes.—Mr. M. Burr, a series of *Callimenidæ*; a small family of Orthoptera, consisting of two genera, *Dinarchus*, with the single species *D. dasypus*, Illig., and *Callimenus*, of which all the known species were included, with the exception of *C. inflatus*, Br., from Asia Minor.—Mr. H. Rowland-Brown, specimens of *Argynnis niobe* var. *eris*, female, from the Pyrenees, Cevennes, and South Tyrolese mountains. He drew attention to the remarkable form of the example taken at Gavarnie, in July, 1905, of which the coloration of the upper side of all the wings was ruddy copper-red shot with blue upon the nervures. He also remarked that whereas specimens of *eris* and other Argynnids from the mountainous regions of Central France show a tendency to maintain constant pale forms, those from the Pyrenees are generally more deeply coloured, while the high Alpine forms of Central Europe inclined to melanism.—Prof. E. B. Poulton, F.R.S., an original note-book of Burchell's taken to South Africa in 1812. He said that it established the date of the author's birthday, hitherto unknown, to be July 12th, while it also recorded for the first time the superstitious dread of the native Hottentots for the "Death's-head Moth," known locally as the "Devil Bee."—Dr. F. A. Dixey, specimens of Pierine butterflies from South Africa, India, and Asia Minor, to illustrate how the under sides of the dry-season forms in the group are apt to take a

red tinge; it being especially interesting to note that the same tendency was manifest in all species collected from such widely separate regions. — Mr. C. O. Waterhouse communicated a note on the migration of Lepidoptera against the wind, extracted from a report on "The Pearl-Oyster of the Gulf of Manaar—*Avicula* (*meleagrina*) *fucata*," by Henry Sullivan Thomas, F.L.S., F.Z.S., &c., in the 'Madras Journal of Literature and Science.' A discussion followed, in which Colonel C. T. Bingham, Mr. G. C. Champion, and other Fellows joined.—Colonel C. T. Bingham read a note on "A Plague of Ants in the Observatory District, Cape Town, South Africa," and illustrated his remarks with specimens of the insects referred to by him. —Dr. G. B. Longstaff read a paper "On some Rest Attitudes in Butterflies," illustrated by numerous specimens arranged upon backgrounds of specially-tinted sand-paper approximating to the natural surroundings of the insects in their various habitats. A discussion followed, in which the President, Prof. Poulton, Dr. Chapman, Mr. H. Rowland-Brown, and other Fellows joined.—Dr. T. A. Chapman read a paper entitled "Observations on the Life-history of *Trichoptilus paludum*, Zell."—Prof. E. B. Poulton, F.R.S., read a paper by Mr. Frank P. Dodd "On some Parasitic Hymenopterous Insects of North Queensland," and exhibited a number of interesting specimens to illustrate his remarks.—H. Rowland-Brown, M.A., *Hon. Sec.*

South London Entomological and Natural History Society.—*February 8th.* — Mr. R. Adkin, President, in the chair. — Mr. Kaye exhibited preserved larvæ of *Cidaria sagittata*, and called attention to their close protective resemblance to the *Thalictrum* flowers, and to their proneness to the attacks of ichneumons.—Mr. R. Adkin, cases of *Acanthopsyche opacella* and *Pachytelia villosella*, and pointed out the differences in them.—The remainder of the evening was taken up by the exhibition of a large number of lantern slides:—Mr. West, of Ashtead, sections of woods; Mr. Lucas, rare plants, life-histories of insects, protective resemblance, &c, ; and Mr. Tonge, microphotographs of the ova of nearly every species of butterfly found in Great Britain.

February 22nd.—The President in the chair.—Mr. Handisyde, of Bayswater, was elected a member.—Mr. Edwards exhibited a specimen of *Papilio mycale*, a species very closely related to *P. eurimedes*, from South America.—Messrs. Harrison and Main, *Oporabia dilutata*, from Epping Forest, Delamere Forest, and the New Forest, and pointed out the characters of the forms found in the three areas; and he also showed specimens of the var. *christyi* from Enniskillen.—Mr. H. Moore, a large number of insects of all orders from the island of Trinidad.—Mr. MacArthur, specimens of *Penthina postremana* and *Ephippiphora cirsiana*, which had been successfully cleaned by several applications of ordinary benzoline, although extremely greasy at first.—Mr. Goulton, for Mr. Wilsdon, a beautiful black form of *Acronycta leporina*; a gynandrous specimen of *Agrotis puta*, from Manor Park (bred); *Tephrosia crepuscularia*, first brood captured and second brood bred from the New Forest; and a *Drepana*, bred from oak, which seemed to partake of the character of both *D. binaria* (*hamula*) and *D. cultraria* (*unguicula*).—Mr. Smallman, a dwarf specimen of *Anthocharis genutia* from New Jersey, with varied forms of *Colias philodice*, female, from different localities in U.S.A.—Mr. Kaye read a paper on mimicry, with especial

reference to a few groups of South American butterflies, and exhibited a large number of insects in illustration. — Henry J. Turner, *Hon. Report Secretary.*

Birmingham Entomological Society. — *February 19th*, 1906. — Annual Meeting.—Mr. G. T. Bethune-Baker, President, in the chair. —The various annual reports, statement of accounts, &c., were presented, and the Officers and Council elected for the ensuing year.— Mr. H. Willoughby Ellis exhibited various Coleoptera, including *Mycetochares bipustulatus*, the larva of which was taken in the New Forest, May 30th, 1904, and pupated on June 1st, and the imago emerged on June 10th, 1904; also *Ptinus sexpunctatus* from Solihull, an insect new to Warwickshire; also an *Opilo*, bred from the galls of *Cynips kollari* found at Biskra by Mr. W. H. Wilkinson. It differs so slightly from our British *mollis* that it is probably that species; also a drawer of *Anchomenus*, comprising all the species of the British list. Mr. W. E. Collinge, a small moth from the Fiji Islands, where it has been doing serious damage to the cocoa-nut palms, together with the larvæ and pupæ, and cocoons of the same. He said that so serious was the damage, that in one large wood all the leaves hung down as if dead; unfortunately he could not yet give its name.—Mr. G. H. Kenrick showed various butterflies, including some fine Danaidæ, Acræinæ, &c., from New Guinea, Thursday Island, the Loyalty Islands, &c.—Colbran J. Wainwright, *Hon. Sec.*

City of London Entomological and Natural History Society.— *February 7th.*—Mr. Henry A. King, of "Oakleigh," Coolhurst Road, Crouch End, was elected a member of the Society.—Exhibits:—Mr. A. Bacot, preserved larvæ of *Lasiocampa quercus* and subspecies *callunæ*, *meridianalis*, *spartii*, and *sicula*; also examples of hybrid larvæ, *spartii* × *meridianalis*, *spartii* × *callunæ*, *callunæ* × *meridianalis*, and *sicula* × (*spartii* × *meridianalis*).—Rev. C. R. N. Burrows, preserved larvæ representing over two hundred species, including *Aporia crataegi*, *Eremobia ochroleuca*, *Phlogophora empyrea*, and *Cucullia absinthii*. —Mr. A. W. Mera, preserved larvæ of *Amphidasys betularia* from one brood, those fed on birch being brown, and those on sallow, green.— Messrs. Sequeira, Shaw, and Clark also exhibited preserved larvæ, *Triphæna subsequa* being among those shown by the latter.

February 21st.—Rev. C. R. N. Burrows exhibited *Nonagria neurica* from Mucking, Cambridge, and East Kent; and one example of ab. *hessii* from Rainham.—Mr. H. M. Edelsten, *N. neurica* (Hb.), and *N. dissoluta* (Tr.) var. *arundineta* (Schmidt), received from Herr Pungeler, of Aachen; also *N. neurica* and ab. *hessii*, from various English localities, with ova, larvæ and pupæ.—Mr. F. Capel Hanbury, *Leucania brevilinea*, including a specimen closely approaching var. *belinea*.—Mr. W. J. Kaye, bred *Zonosoma pendularia* from Reading, showing a strong central pink band, and var. *subroseata* from Staffordshire.—Mr. A. Harrison, *Oporabia dilutata* from the New Forest, the pale form commonly distributed over the country; from Epping, generally darker and with little or no trace of the band on fore wings; and from Delamere Forest still darker, but with the bands distinctly marked.— Mr. A. W. Mera, *N. neurica* from Cambridge and Mucking, and Mr. L. B. Prout, ab. *hessii*, from East Kent.—Mr. H. M. Edelsten read a

paper entitled "The Identity of the British *Nonagria neurica*," in which he showed that Hübner figured two different species under this name, and proved that the insect at present known in Britain as *N. neurica* is really var. *arundineta* (Schmidt) of *Nonagria dissoluta* (Treitschke) (=*neurica*, Hübner, figs. 659–61, non 381, *hessii*, Bdv.), and that the form regarded as ab. *hessii* is the type of *N. dissoluta* (Tr). S. T. Bell, *Hon. Sec.*

Lancashire and Cheshire Entomological Society. — The usual monthly meeting of this Society was held in the Royal Institution, Liverpool, on March 19th.—Mr. R. Wilding, Vice-President, occupied the chair.—A paper was read by Mr. W. Mansbridge, upon the Micro-Lepidoptera of the Liverpool district. About seventy species were dealt with, some of them new to the county list. Among the more interesting records was that of the moth *Myelois ceratoniæ* and its aberration *pryerella*, with an intermediate form; these were bred from larvæ found in dates purchased in Liverpool. Another interesting insect was a specimen of *Dioryctria abietella*, a very dark form captured in Delamere Forest. A bred series of the local Tortrix, *Peronea permutana*, from Wallasey, was also referred to by the author, who exhibited most of the species noted in illustration of his paper. Other exhibits were a series of *Semasia wœberiana*, bred by Mr. G. L. Cox, from larvæ found in cherry-bark at Oxton; Mr. E. J. B. Sopp, F.E.S., the exotic cockroaches *Nyctibora holosericea* and *Panchlora virescens*, from the ship-canal docks at Manchester.—H. L. Sweeting & Wm. Mansbridge, *Hon. Secs.*

RECENT LITERATURE.

The Lepidoptera of the British Islands. Vol. X. By Charles G. Barrett. Pp. 381. London: Lovell Reeve & Co. 1905.

Almost up to the day of his much lamented death, the author had been engaged upon the present volume, nearly half of which had then been published, in monthly parts, or was in the press. The remainder of the MS. continuing the work up to the end of the Tortricina was found to be practically ready for publication, and, although the pages were not numbered throughout, this had been done sufficiently far to give a clue to what his intentions had been with regard to final arrangement. It was decided therefore to continue publication of the work to the end of the Group, and to adhere as closely as possible to the order in which the papers were found to be set out. The present volume deals with the Pyralidina—Phycitidæ, Anerastiidæ, Crambidæ, and Galleriidæ; and Tortricina—Tortricidæ, Cnephasidæ, Lozoperidæ, and Sericoridæ.

The British Tortricina are an exceedingly interesting group, comprising a large number of species. Many of these are to be obtained commonly when once their habits are understood. We believe that it has been solely owing to the absence of a guide such as this work will prove to be that the group has been so long neglected, but we are sanguine enough to believe that the time is not far distant when a more active and widespread interest will be taken in our Tortrices.

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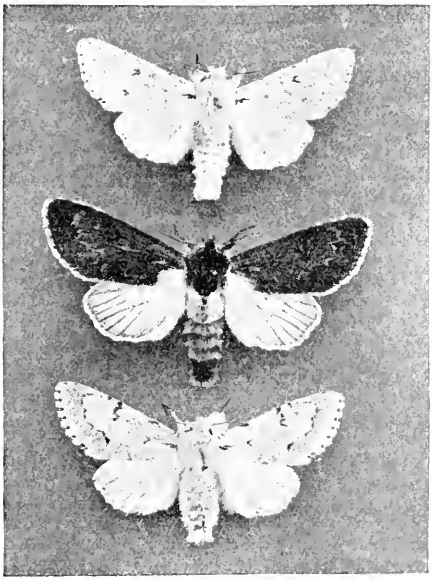
A MELANIC FORM OF *ACRONYCTA LEPORINA*.

BY ALFRED J. WILLSDON.



THE melanic specimen of *A. leporina*, represented by the central figure, was bred last June from an Essex larva.

The fore wings of the insect are glossy black, with white fringes. The black markings of the typical insect are for the most part discernible, and they are partly relieved by a faint white edging. The hind wings are somewhat suffused towards the inner and outer margins, and the nervures are strong and dark. The thorax is quite black, and the abdomen decidedly dark.

The lower insect figured represents normal Essex specimens,

and, so far as I am aware, no intermediate forms have been taken in this district such as those recently referred to in the 'Entomologist' (xxxviii. 289) from the Liverpool district.

The upper figure is of a New Forest specimen for comparison.

I am indebted to Mr. E. C. Goulton for the excellent photograph here reproduced.

DESCRIPTIONS OF TWO NEW SPECIES OF ICHNEUMONIDÆ FROM JAPAN.

By P. Cameron.

Anomalon japonicum, sp. nov.

Black; flagellum of antennæ dark rufous, thickly covered with short, stiff black hair, the scape with longer black hair; the inner eye orbits narrowly to the top of the antennæ; a broader, shorter mark in the centre of the face, slightly dilated towards the apex, where it is bluntly triangular. Base of clypeus broadly in the middle, labrum and the outer orbits narrowly, yellowish fulvous; the base of abdomen widely red; the petiole black in the middle above and in front of the post-petiole, the second segment being also black above. Legs fulvous, all the coxæ, the apices of the hinder femora, and tarsi, black. Wings fulvo-hyaline, the stigma rufo-testaceous, the nervures fuscous, the tegulæ ferruginous. Scutellum yellow. Female. Length 23 mm.

Shirakawa, Japan. (George Lewis).

Head rugosely punctured, thickly covered with long black to fuscous hair, the inner orbits much more closely and finely than the face or front, which is depressed and distinctly furrowed in the middle; the clypeus has the punctures larger and more distinct than they are on the front; its apex is smooth. Mesonotum thickly covered with fuscous hair, coarsely punctured, its middle lobe slightly raised; a shallow furrow in the centre. Scutellum coarsely punctured, thickly covered with long fuscous hair, its base depressed in the middle; the apex black, depressed, the depression keeled laterally; sides of post-scutellum sharply keeled. Median segment coarsely reticulated, the apex depressed, coarsely transversely striated. Pro- and mesopleuræ closely, rather strongly punctured, the apex of the former widely and deeply depressed; the base of the metapleuræ in the middle coarsely rugose, the rest rugosely reticulated.

This species may be known from *A. flavifrons*, Sm., by the smaller size of the latter, by its four anterior coxæ and trochanters being bright yellow, by the face, mandibles, and antennal scape being yellow in front (the sculpture of *flavifrons* is not stated). *A. insidiator* is larger (35 mm.), has the basal two segments of the abdomen black, and the fore coxæ are not black.

Campoplex japonicus.

Black; the third, fourth, and the basal half of the fifth abdominal segments rufous. Wings hyaline, the stigma and nervures black, the areolet triangular, appendiculate above, the pedicle being not much shorter than the branch of the first transverse cubital nervure; the recurrent nervure is received in the basal third of the areolet; the anterior femora and tibiæ testaceous in front. Female. Length 12 mm.

Kobe, Japan. July (George Lewis).

Front and vertex closely, the face and clypeus more closely but not so strongly, punctured; they are thickly covered with long, fuscous hair. Mesonotum closely and uniformly punctured, and thickly covered with short, fuscous pubescence. Scutellum closely, rugosely punctured, sparsely covered with pale hair; the post-scutellum is, if anything, more strongly rugose; the apical slope of the scutellum is longer and more obliquely sloped than the basal. Median segment closely, irregularly transversely striated, the middle at the base more weakly; at the apex the striation is coarser. Pleuræ coarsely closely punctured; the mesopleuræ at the top and in front of the coxæ striated; the punctuations on the metapleuræ above the keel run into striations. Abdomen thickly covered with white pubescence, smooth. Sheaths of ovipositor black, dilated towards the apex, covered with white hair.

NOTES ON THE HYMENOPTEROUS FAMILY MICROGASTERIDÆ.

By Claude Morley, F.E.S., &c.

No more introduction to this ubiquitous family is necessary than to say that it is constituted of those nasty little black "flies," which are all too often bred by lepidopterists, more especially from such hosts as *Abraxas grossulariata* and *Pieris brassicæ*; everyone knows *Apanteles glomeratus* and *Microgaster globatus* by sight, if not by name. My object in publishing these notes is, however, to draw attention to hymenopterous parasites in general, and to point out that their economy is far less perfectly known (and consequently more worthy of study) than is that of their hosts and victims. I shall at all times be very grateful to lepidopterists who will send me their unwillingly bred parasites, and will do the utmost in my power to name such as may appear of interest to the breeder. The Microgasteridæ does not belong to the Ichneumonidæ, but to the Braconidæ; and it is to Marshall's 'Braconides d'Europe' that I owe the identification of the following species, which have at various times been most kindly sent to me by Rev. C. D. Ash, Eustace Bankes, E. C. Bedwell, G. C. Bignell, Dr. Capron, Dr. Chapman, Miss E. Chawner, H. J. Charbonnier, W. G. Clutten, Dr. R. T. Cassal,

W. G. Cross, A. A. Dalglish, W. Evans, E. Goodwin, Selwyn Image, G. W. Kirkaldy, A. M. Montgomery, G. Nicholson, H. Parkes, F. H. Peachell, Albert Piffard, E. W. Platten, Hon. N. C. Rothschild, R. M. Prideaux, Mrs. Redmayne, A. Sich, W. H. Tuck, F. J. Whittle, J. Wigin, and T. C. Woodforde. There are two small genera, each with a single British species (*Mirax spartii* and *Acoelius subfasciatus*), of which I know nothing. The remainder of the family consists of three somewhat extensive genera, of which the first comprises ninety-one species, of which seventy-three are (now) British; of these I find I possess thirty-seven :—

Apanteles, Först.

1. *salebrosus*, Marsh.—Nine imagines and sixteen cocoons ex *Selenia* sp., 1903, probably from Kent (Goodwin).—One and one cocoon, bred from a coleopteron [Marshall thought the records of all hosts, other than Lepidoptera, erroneous in this genus] at Ely, August, 1901 (Cross).—Seventeen and six cocoons ex larvæ of *Eupithecia helveticata*, Milngavie, January, 1899 (Dalglish).—Only previously known from Scotland, in the female sex. The male differs only in sexual features.

2. *tetricus*, Reinh.—I captured a single specimen on flower of *Heracleum sphondylium* at Lyndhurst, in August, 1901.

3. *congestus*, Nees. — Seventeen imagines and ten cocoons ex larva of *Arctia fasciata*, from Cannes; emerged April 25th–May 5th, 1901 (Chapman).

4. *ferrugineus*, Reinh.—Swept from sallow at Barton Mills and Tuddenham Fen, Suffolk, June, 1901. Said to be a social parasite of *Chilo phragmitellus*, which has been recorded from the latter locality.

5. *limbatus*, Marsh.—I possess a single example, taken in the Ipswich district in 1893.

6. *glomeratus*, Linn. — Felden, in Herts (Piffard).—Sixteen and seven cocoons ex one larva of *Abraxas grossulariata*, bred June, 1899 (Peachell).—Six and a bundle of cocoons ex *Pieris rapæ*, Burnley, in October, 1899; emerged June, 1900 (Clutten).—Two and cocoons, with *A. callidus*, ex Geometrides, Dartmouth, autumn, 1900 (Bankes).—I dug up four cocoons near Ipswich, at the base of an elm, in December, 1898, which produced what I believe to be this species, on the 1st of the following July.

7. *vanessæ*, Reinh.—Two and a bundle of cocoons ex *Hadena oleracea* at Ely, in October, 1900 (Cross).—The species is new to Britain, being recorded by Marshall only from Vienna and Germany; it differs from *A. glomeratus* in having the mesopleuræ densely punctate almost throughout. It had previously been bred only from *Vanessæ*, *Argynnes*, and *Limenitis sibylla*.

8. *spurius*, Wesm. — Felden, in Herts (Piffard). — Six and bundle of cocoons ex *Agrotis præcox*, bred June 26th, 1883 (Big-

nell).—Three and cocoons, with two hyperparasitic *Pezomachus intermedius*, Först., from Publow, Somerset, in September [host not specified] (Charbonnier).—Eight and cocoons, Ipswich, early in June (Platten). — Six dug at base of tree, Wednesbury, in November, 1900 (Parkes). — Five and cocoons from Francochamps, Belgium, at 2000 ft., January, 1901 (Kirkaldy).

9. *cleoceridis*, Marsh. — Eight and a bundle of cocoons ex larva of *Tethea subtusa* from Bishop's Wood, Selby, Yorks, in June (Ash). The cocoons are almost white, and enclosed in a common envelope, as in the last species.

10. *geryonis*, Marsh. — Four and seven cocoons ex *C. rhododactylus*, England, July, 1899. I captured a specimen in the Bentley Woods, near Ipswich, at the end of May, 1900.

11. *zygænarum*, Marsh.—Three from cocoons of *Zygæna filipendulæ*, Bristol district (Charbonnier).—Eight and nine cocoons ex live larva of *Z. filipendulæ*, Surrey, June (Prideaux).— Twelve and two bundles of cocoons ex *Z. filipendulæ* at Southend in July (Whittle). — Felixstowe, ex *Z. filipendulæ*, in July (Platten).— I have beaten it from oak at Brandon, in Suffolk, early in June.

12. *caiæ*, Bouché.—Ten ex *Chelonia caja*, Ipswich, May, 1899 (Platten).—Eight and thirteen cocoons ex *Arctia ? caja* larva, Epping, 1901 (Image).—A common parasite of tiger moths.

13. *juniperatæ*, Bouché.— One and one cocoon ex larva of *Eupithecia castigata* at the time of spinning up, Newcastle, in May (Nicholson).—One ex larva of *Amphydasis betularia*, in garden at Methley, near Leeds (Wigin).

14. *placidus*, Hal.—Five and one cocoon ex *Abrostola urticæ*, at Ely (Cross). Received October 18th, 1900; emerged April 9th, 1901. This species has not before been bred, and its cocoons, which are solitary, nearly white, and attached to a leaf, were unknown.

15. *nothus*, Marsh. Five and cocoons ex *Anticlea sinuata*, Tuddenham, Suffolk; bred May and June, 1899 (Rothschild).

16. *difficilis*, Nees. — Twenty-three and thirteen cocoons ex larva of *Amphydasis betularia*, from garden, Methley, Leeds (Wigin). Received October, 1899; emerged May 4th to June 18th, 1900.—Eleven and nine cocoons ex larva of *Xylocampa lithorhiza*, Suffolk, 1898 (Tuck).—Four and four cocoons ex moribund larva of *Notodonta ziczae*, Haslemere (Prideaux). Taken September 26th, 1899; emerged May 11th, 1900.

17. *falcatus*, Nees.—Both sexes at Felden, in Herts (Piffard). —I have taken it on flowers of *Angelica sylvestris* at Barnby Broad, in Suffolk, in August.

18. *cultrator*, Marsh.—Eleven imagines and a lot of cocoons ex *Melitæa athalia*, at Locarno (Chapman); received May, 1900. This species has not before been bred from a determined host.

19. *ultor*, Reinh.—One and five cocoons of this rare species

were bred from a moribund larva of *Notodonta ziczac*, at Haslemere, Surrey, in September, 1899 (Prideaux).

20. *decorus*, Hal.—I have taken the female flying in Bentley Woods, near Ipswich, early in May; and Tuck has captured the same sex at Benacre Broad, Suffolk, in late August.

21. *xanthostigmus*, Hal.—Felden, in Herts (Piffard).

22. *prætor*, Marsh.—Two at Shiere, in Surrey (Capron).

23. *obscurus*, Nees.—Oulton Broad, Suffolk, September, 1900 (Bedwell).—Felden, in Herts (Piffard).—I have taken it on flowers of *Angelica* at Lymington and *Heracleum* at Lyndhurst in August, and beaten it from oaks at Brandon, in Suffolk, in early June.

24. *tenebrosus*, Wesm.—One and one cocoon ex *Pterophorus pterodactylus*, June, 1899 (Chapman).—Three ex *Rumia cratægata*, Methley, Leeds (Wigin); received October, 1901.—Three, received at the same time, ex *Amphydasis betularia*.—Three and four cocoons, November, 1899, ex *Liparis auriflua*, Reigate (Prideaux). Not before recorded from Britain.

25. *impurus*, Nees.—One ex *L. paucillmana*, bred at Cannes in May, 1901 (Chapman).

26. *coniferæ*, Hal.—One in Walberswick salt-marshes, Suffolk, August, 1898.

27. *linicipes*, Wesm.—Dr. Chapman has bred six specimens, which I think must be referable to this species, whose hosts were previously unknown, from eight cocoons ex *Melitæa athalia*, at Cannes or Lacarno, in April, 1900.

28. *fuliginosus*, Wesm.—I have found this species at Claydon, in Suffolk, on *Angelica* flowers, in August, and swept it in Roydon Fen, in Norfolk, in June.—One and one cocoon ex *Sesia fuciformis*, Wateringbury, Kent, July, 1903 (Goodwin).—Two and eight cocoons ex larvæ of *Platyptilia acanthodactyla*, Dartmouth, September, 1904 (Bankes).—Five and six cocoons ex larva of *Spilothyrus alceæ*, Cannes, May, 1901 (Chapman).

29. *octonarius*, Ratz.—Three and bundle of cocoons ex live larva of *Pericallia syringaria*, Surrey, June, 1899 (Prideaux).—One and bundle of cocoons ex *P. syringaria* (Sich).—Sixteen and cocoons, New Forest, June, 1902 (Cross).

30. *astrarches*, Marsh.—I have captured this species by sweeping hedge-bottoms at Lakenheath and Bentley Woods, in Suffolk, in May and June.

31. *fraternus*, Reinh.—Shiere, in Surrey (Capron).—One ex larva of *Buccalatrix cristatella*, bred at Chiswick, early in June, 1901 (Sich).—I have swept it at Ealing in June.

32. *triangulator*, Wesm.—Felden, in Herts (Piffard).—One ex *Coleophora gryphipennella*, Chiswick, June, 1901 (Sich).

33. *pallidipes*, Reinh.—A common parasite of *Plusiæ*.—Three and eight cocoons ex *P. orichalcia*, Ely, 1903 (Cross).

34. *bicolor*, Nees.—I have swept it in the Southwold salt-

marshes in August. — One ex *Psyche opacella*, in June, 1899 (Chapman).

35. *callidus*, Hal. — Felden (Piffard). — Shiere (Capron).— Twelve and cocoons, with two *A. glomeratus* (above), ex larvæ of Geometrides, Dartmouth, autumn, 1900 (Bankes).

36. *lateralis*, Hal.—Taken by Capron at Shiere, and Pifford at Felden, in Herts.

37. *fulvipes*, Hal. — A common species on the wing ; I have taken it in Suffolk—at Wortham, Tuddenham Fen, Barton Mills, and Stanstead Wood—in June.—Six and bundle of cocoons ex *Noctua xanthographa* (Bignell).—Four and five cocoons ex *Epione vespertaria*, York district, July, 1900 (Ash).

The next genus contains nineteen European species, of which thirteen are now known to be indigenous to Britain. I have seen but seven of these :—

Microplitis, Först.

1. *spinolæ*, Nees.—This I swept in the Southwold salt-marshes on August 1st, 1904.

2. *tristis*, Nees.—Forty specimens bred in August, 1900, from larvæ of *Dianthœcia capsincola*, Eastbourne (Montgomery).— Thirty-two bred from *D. cucubali*, in Suffolk, autumn, 1898 (Tuck).

3. *dolens*, Marsh.—One on *Angelica sylvestris* flower at Claydon, Suffolk, August 12th, 1899.

4. *spectabilis*, Hal.—A common species on the wing; bred from *Dianthœcia capsincola*. On April 3rd, 1893, seven specimens emerged from the chrysalids of *Apamea unanimis*, whose larvæ I took at Ipswich during the preceding February.

5. *mediana*, Ruthe.—Captured at Felden, in Herts (Piffard), and on flower of *Angelica sylvestris* at Claydon, in Suffolk, late in September, 1898.

6. *tuberculifera*, Wesm.—Felden, in Herts (Piffard).—Ipswich and Diss, in June ; swept at dusk in Bentley Woods in September, 1897 (C. M.).—Three bred from *Dianthœcia irregularis* in Suffolk, September, 1899 (Tuck).—Bred from *Chesias obliquaria*, at Ely, October, 1900 (Cross).—Bred from larva of *C. obliquaria*, December 7th, 1901 ; four or five of these larvæ were infested, the parasite in each case emerging from the tenth segment, when the host was three-quarters grown; Market Drayton, Salop (Woodforde).

7. *sordipes*, Nees. — New Forest, bred, November 28th, 1900 (Chawner). — Bred at Ely from *Acronycta psi*, in October, 1900 (Cross).—This species has not before been recorded from Britain.

The last genus of this family is comprised of twenty-eight species in Europe, of which twenty-one are British. I can, however, mention but ten of these, including that brought

forward by me as new (*cf.* E.M.M. 1902, p. 4), which had previously been known only from Suffolk.

MICROGASTER, Latr.

1. *alvearius*, Fabr. — Eight specimens bred from *Boarmia repandata*, in Devon (Bignell).—I have found their characteristic cocoons, over which the moribund larva seems to "brood," at Ipswich (*cf.* Entom. 1880, p. 244).

2. *calceatus*, Hal. Bred at Reigate, from *Fidonia piniaria*, in September, 1899 (Prideaux).

3. *connexus*, Nees.—Reared in plenty from two cocoons of *Liparis auriflua*, at Lichfield, in August, 1900 (Mrs. Redmayne). —Nine from the same host in the Bristol district (Charbonnier). —Five ex *Bombyx neustria*, at Bungay, Suffolk, in August (Clutten).—Six from *L. auriflua*, in November, 1899 (Prideaux); probably at Reigate Surrey.

4. *tiro*, Reinh.—I have captured it by sweeping reeds at Henstead, Suffolk, August, 1898. Its hosts have been hitherto unknown, but Dr. Chapman bred one on June 29th, 1899, from a species of *Cnephasia* at Reigate; the cocoon is dull, white, solitary, and nearly smooth.

5. *suffolciensis*, Morl. — The type (in my collection) is from *Nothris verbascella*, at Bury St. Edmunds. — Two females ex *Nothris verbascella*, at Locarno, May 30th, 1903 (Chapman).— The type is a male (female *in errore*), and the female differs from it only in having the antennæ shorter, and the terebra three-quarters the length of the abdomen. I have seen no cocoon.

6. *rugulosus*, Nees. — Bred from *Hydrocampa nymphæata*, at Richmond, October 3rd, 1905; the strong whitish cocoon is found inside the host's aquatic case, attached to one of its walls (Sich).

7. *subcompletus*, Nees. — I have swept it at Eaton, near Norwich, in June; and found it on flowers of *Fœniculum vulgare* at Alderton, Suffolk, in September.

8. *sticticus*, Ruthe.—Tostock, Suffolk, in July (Tuck).—Three from a nearly circular bundle of white cocoons, enclosed in a rolled nettle-leaf, ex *Vanessa atalanta*, Reigate, in July, 1899 (Prideaux).—I have taken it on *Angelica* flowers at Barnby Broad, but it has not before been bred.

9. *globatus*, Linn.—A common species on flowers of *Fœniculum vulgare* and *Angelica sylvestris* from July to October. Bred from *Vanessa atalanta* at Tring, October, 1899 (Rothschild). — Bred from forced *Penthina dimidiana*, Medge Hill, Doncaster, 1901 (Cassal).

10. *tibialis*, Nees.—Very common on flowers of *Anthriscus* and wild carrot. Two bred from Aberdeenshire *Euchromia flammeana*, in June, 1902 (Ash).—Bred from a continental *Depressaria* in 1904 (Chapman).—Gorebridge, N.B., in June (Evans).

The above will, I think, show how much may be done in the elucidation of the life-histories of these obscure parasites by their preservation by breeders of Lepidoptera; no less than forty of the above hosts were previously unknown to be attacked by the parasites here enumerated.

Monks Soham House, Suffolk: April 14th, 1906.

NOTES ON TRICHOPTERA COLLECTED IN SICILY BY DR. T. A. CHAPMAN.

By Kenneth J. Morton, F.E.S.

Some time ago Dr. Chapman kindly handed to me a number of Trichoptera taken by him in Sicily in the spring of 1905. The list of species is not long, but the collection is interesting out of proportion to its size, especially on account of the presence of a species of *Rhyacophila*, which at first I thought to be quite new, but which I am now disposed to regard as a race of the little-known *Rhyacophila rougemonti*.

The existing information as to the Trichoptera of Sicily is, I believe, comparatively old and not extensive, resting mainly on the researches of Zeller, Mann, and Bellier de la Chavignerie. In any case, the species found in the island are probably not numerous, the poverty in aquatic Neuroptera having long ago been pointed out by Blanchard, and properly attributed to the absence of lakes and marshes, and also to the very important fact that the rapid torrents of winter very quickly dry up at the beginning of summer. Thus it is that the characteristic Neuroptera of Sicily and the coast of Calabria are those which are terrestrial—ant-lions, species of *Ascalaphus*, and some Hemerobiids.

The species of Trichoptera found by Dr. Chapman are as follows :—

Stenophylax ——?.—A female of the group containing the large pale species, always difficult to determine in this sex when isolated examples are found. The valves in the present specimen are much retracted, and in the meantime I cannot attempt determination.

Hydropsyche instabilis, Curt. — One female of what I take to be the dark form that McLachlan says is characteristic of the southern parts of Europe (*stictica*, Pictet).

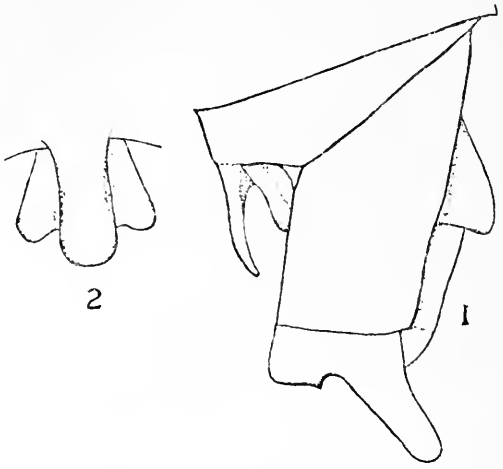
Wormaldia mediana, McL.—A small series of a *Wormaldia* agrees fairly well with the description of this somewhat uncertain species.

Tinodes locuples, McL.—A pair. This species was originally

described from three males taken by Mann in Sicily, now in the Vienna Museum.

Polycentropus flavomaculatus, Pict.—Two males.

Rhyacophila rougemonti, McL., var. *sicula*, nov. var.—In this form the male appendages are very similar to those of the type as figured by McLachlan, although in the single male before me the inner parts cannot be seen clearly. The principal difference



is visible in the lateral view; the second joint of the inferior appendage has its hind margin with a much shallower incision in the Sicilian form.

The discovery of this insect in Sicily throws an important light on the origin of the type. It was given to McLachlan by Professor de Rougemont, and was stated by the latter to have been taken by him at St. Aubin, Neuchâtel. McLachlan was, however, never quite satisfied that this locality was the right one, de Rougemont having also collected in Italy, and this doubt was increased by the discovery of a male very close to the type in Corsica. The species has never to my knowledge been found again north of the Alps, and I am of the belief that de Rougemont made some mistake, and that it will prove to be a purely southern form.

All the examples noticed here were taken at Taormina in the beginning of April.

Fig. 1. Apex of abdomen, from side. Fig. 2. Dorsal process, from above.

13, Blackford Road, Edinburgh: March, 1906.

ALGERIAN BUTTERFLIES IN THE SPRING AND SUMMER OF 1904.

By Margaret E. Fountaine, F.E.S.

(Concluded from p. 89.)

S. fidia var. *albovenosa*, Aust.—This magnificent form of *fidia* occurred at the same time and in the same localities as *hansii*, but was less common, and very shy and difficult to catch. The female was rare.

Pararge egeria, L.—Algerian specimens of this butterfly are a very bright fulvous. It occurs, I might almost say, everywhere throughout the spring and summer. The best I have are from Algiers in February (1902), and from Sebdou in July.

P. megæra, L.—At Biskra in the spring, frequenting the tops of the desert mountains in company with the other butterflies of that district.

Epinephele jurtina var. *fortunata*, Alph.—Common round Teniet in June. Bears a striking resemblance to var. *hispulla*, Hüb.

E. lycaon var. *mauritanica*, Obth.—Not uncommon near Teniet in June, especially in the forest. The females, which were rare, are a dark form, and both sexes have the hind wings beneath a plain even grey, quite unbroken.

E. ida, Esp.—Was practically over at Tlemçen in mid-July. The few females I found worth keeping are very strongly marked on the under side.

E. pasiphaë var. *philippina*, Aust.—Fairly common round Teniet in the end of May. Rather smaller than the type, with the fulvous ground colour more widely extended, also the eye-spots on the lower wings smaller and not ocellated.

Cœnonympha fettigii, Obth.—Very common in the woods of prickly oak on the mountains near Sebdou, end of June and throughout July.

C. pamphilus var. *lyllus*, Boisd.—A remarkably fine form at Sebdou and Tlemçen in July.

Thecla ilicis var. *mauretanica*, Stgr.—First taken at Teniet on June 8th, where it soon became abundant wherever the prickly oak grew. I took one specimen, which resembles the type above, but has the white line as nearly obliterated beneath as in any of the *mauretanica*, though no other Algerian specimen I have the least approaches it on the upper side.

Callophrys rubi var. *fervida*, Stgr.—Near Algiers in March (1902).

Zephyrus quercus var. *iberica*, Stgr.—Swarming in the oak-woods west of Sebdou early in August. Resembles the type above, but has the white line on the under side very faint and indistinct.

Thestor mauritanicus, Luc.—In certain places near Algiers in February (1902). Not common.

T. ballus, F.—Going over in the cedar forest above Blidah in May. Very common at El Kantara and Algiers in February and March (1902).

Chrysophanus phlæas, L.—Occurred in most places throughout the spring and summer.

Cigaritis siphax, Luc.—Scarcely abundant, but fairly common in a few localities near Teniet; but was practically over when I first came across it on May 31st.

Lampides bœticus, L.—At El Kantara in March, and at Sebdou in August.

L. telicanus, Lang.—At Sebdou in August. The specimens were very small.

L. theophrastus, F.—One female only below Teniet in June. Common all round a certain prickly shrub at Sebdou in August. Their preference for this shrub, which the females never seemed to leave at all, made it a somewhat difficult matter to effect a capture otherwise than destructive to the net; however, the males would occasionally make short detours into the open, though invariably returning to the favoured shrub, and the females were so sluggish, even in the middle of the day, that I was able more than once to pick one off with my fingers. This butterfly also occurred, but not at all commonly, at El Kantara in March (1902).

Lycæna martini, Allard. — Common on certain hillsides in the neighbourhood of the Cascade below Teniet. But it was practically over when I first came across it at the end of May, and a male, even in fair condition, was scarcely to be had; but I took a good though short series of females.

L. baton var. *abencerragus*, Pier.—Near El Kantara in March and April; also at Hammam R'Irha in April. Not common, except at El Kantara, in March (1902).

L. astrarche var. *calida*, Bell.—The specimens of this butterfly taken at Tlemçen in July were a deep reddish brown beneath, and certainly belonged to this variety.

L. icarus var. *celina*, Aust.—Most of the males at Sebdou in August, and at Milianah in September, belonged to this variety. I have one from Milianah with a slight inclination to orange spots on the upper side of the hind wings.

L. bellargus var. *punctifera*, Obth.—All the male *bellargus* at Sebdou in July were of this variety; but it was very far from common. I took one in which there were orange spots above the black dots on the upper side of the hind wings, but unluckily the specimen, though fresh, was damaged.

L. lorquinii, H. S.—Was common and quite fresh in the cedar forest at Teniet on May 21st. Unluckily I did not realize the importance of it, so failed to secure a good series, and when I next visited the forest, on May 27th, it was nearly over. My courier took one specimen in the Blidah cedar forest, but we saw no others.

L. melanops, B.—Common at El Kantara in March; also in the Blidah cedar forest in May.

Adopæa lineola, O.—Common at Teniet in June, especially on the foot-hills below the forest.

A. hamza, Obth.—Very common at Teniet in June. The females had to be searched for in the long grass. Comes very close to *A. actæon*, Esp.

Parnara zelleri, Ld.—Very rare at Sebdou in August. I only took one specimen, and saw about three others.

Carcharodus alceæ, Esp.—Not very common at Sebdou in July. A small form.

Hesperia proto var. *mohammedi*, Obth.—Seemed to have several broods. In the first, which I found nearly over at Teniet in May, the few fresh specimens I did get were much paler on the under side than those of the second brood, which appeared in June; the latter coming nearer to the type in the warm colouring underneath. I also took this butterfly at Sebdou in August.

H. sao var. *ali*, Obth.—First taken near Blidah on April 30th. Occurred there in the cedar forest in May. I also took it at Teniet; but it occurred much more commonly at Sebdou than anywhere else. On the wing all through the summer, apparently having a succession of broods. *Ali* seems to me to be an intermediate form between the type and the var. *therapne* of Corsica.

H. alveus, Hb., var. (?).—One of the many varieties of *alveus* occurred at Sebdou and Tlemçen in June, July, and August, but I cannot satisfactorily determine which it belongs to!

Before closing these notes, I would like to give what little information I can about *Satyrus abdelkader*, though unfortunately I have no personal experience to draw upon. I believe the best locality for it in the Province of Oran is not Sebdou (where I doubt if it occurs at all), but a place called Nédroma, fifteen hours' drive from Tlemçen, but from its position on the map, would seem to be more easily approached from Nemours. My informant was an Arab, who volunteered this information, supplying the name of the butterfly too, quite unasked, declaring that he himself had been to Nédroma more than once with French and German collectors, and that in the month of August, *abdelkader* (he would naturally not have forgotten that name) flew in great abundance. This man also stated that it did not occur at Sebdou at all; but I should be sorry to vouch for the truth of any statements made by an Arab. Some day I hope to visit Nédroma and see for myself.

7, Lansdown Place (East), Bath: February 24th, 1906.

Miss Fountaine very kindly handed over to me the Zygænidæ captured by her in Algeria in 1904, and I therefore take this opportunity to add a list of the species included. Superficially, with the exception of *Z. favonia*, Frr., which occurred in May at Teniet-el-Haâd, and seems fairly distinct, the three most interesting, though classed in Staudinger's Catalogue as true species—*Z. loyselis*, Oberth., *Z. algira*, Dup., and *Z. ignifera*, Korb—suggest merely local forms of *Z. sarpedon* (?) and *Z. fausta* respectively. Of the far-ranging *filipendulæ-trifolii* group, I have no examples from this collection; but it includes a single *Z. carniolica* from Sebdou, which seems referable to var. *allardi*, Oberth.—H. Rowland-Brown, M.A.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY'S EXHIBITION.

By Hy. J. Turner, F.E.S.

An Exhibition of this Society was held on the evening of Saturday, March 10th, at their rooms in Hibernia Chambers, London Bridge. Although the Society still continues to hold a special exhibition of varieties each year, some years have elapsed since it had organized so extensive and so representative an assemblage of natural history objects as were placed together on this occasion. In spite of the weather, a large number of members and their friends were present, and the choice, varied, and beautiful objects—which had been tastefully arranged by the Committee and a willing band of helpers—were much appreciated.

In the British section Mr. R. Adkin exhibited (1), a long series of *Aglais* (*Vanessa*) *urticæ*, arranged to show the direction of the minor variation; (2), a collection of the Nycteolidæ and Nolidæ, including fine dark forms of most of the species; (3), the Anthroceridæ (Zygænidæ), with yellow *A. trifolii* and forms of *A. filipendulæ*, grading in colour from rich red through shades of terra-cotta to pale yellow; (4), specimen of *Mesogona acetosellæ*, from Polegate, 1895, and a long and varied series of *Tæniocampa gothica* and *T. incerta* from its main localities; (5), series of *Selenia lunaria* and *S. tetralunaria*, with hybrid *S. bilunaria* × *S. tetralunaria;* and (6), *Abraxas grossulariata* of many forms, including ab. *varleyata*. Mr. B. W. Adkin exhibited (1), local races, varieties, and aberrations of *Cosmotriche potatoria*, including males with female coloration, and *vice versâ;* (2), ditto of *Lasiocampa quercûs* and *Pachygastria trifolii;* (3), a large number of aberrations, of which a specimen of *Cosmia trapezina*—very pale, with almost black transverse band—was particularly notable. Mr. A. W. Bacot (1), the series of hybrids obtained by him from *Malacosoma neustria* and *M. castrensis;* (2), various races of *L. quercûs*, with the results of crossings between the races; and (3), a considerable portion of the progeny obtained from a pairing between *Amphidasys betularia* male and var. *doubledayaria* female, illustrative of the fact that the brood were of the two distinct forms, only one specimen being in any way intermediate in marking. Mr. F. R. Bellamy (1), a black form, var. *obscura* (?), of *Anthrocera* (*Zygæna*) *trifolii*, from Ringwood, 1899; (2), var. *fowleri*, of *Polyommatus corydon*, from Swanage; and (3), ab. *lutea* of *Callimorpha dominula*. Mr. W. Brooks a number of very large, varied, and beautiful forms of *Manduca atropos*, the selection of many years' breeding from Lincolnshire pupæ, and also specimens of the curious air bladders which are found in the body of every imago. In one case only had he found two bladders in one imago (shown). Mr. W. E. Butler (1), summer and autumn broods of *Stauropus fagi*, some extremely dark; (2), a beautiful series of *Tiliacea* (*Xanthia*) *aurago*, the extreme red forms being particularly notable, one with almost a

purple bloom; (3), a *Brenthis selene* with suppressed markings, those which did remain being united into radiations; (4), a yellow *Pyrameis atalanta*, captured; (5), *Polyommatus corydon*, in which the marginal spots on the wings were large and pure white, without any trace of the usually prominent black centres; and (6), a series of *Lachneis lanestris* which had been five and six years in pupa, &c. Mr. J. N. Carpenter showed his long and bred series of *Apatura iris*, *Colias hyale*, *Enodia hyperanthus*, *Satyrus semele*, *Melitæa cinxia*, and *Euchloë cardamines*, of various races and forms. Mr. F. B. Carr exhibited several species of living larvæ of Lepidoptera. Mr. J. A. Clark a case containing a number of extreme and beautiful varieties of *Arctia caja*. Mr. T. W. Hall (1), a long and varied series of the genus *Eupithecia;* (2), a most interesting life-history of the rare *Ægeria* (*Sesia*) *sphegiformis;* (3), series and examples of species, either extinct or disappearing as British, including *Chrysophanus dispar*, *Nomiades semiargus* (*acis*), *Noctua subrosea*, *Lælia cœnosa*, and *Cleora viduaria;* and (4), two cabinet drawers of rare species and varieties, including *Crymodes exulis*, *Xylomiges conspicillaris*, spotless forms of *Mamestra persicariæ*, yellow forms of *A. filipendulæ*, yellow-banded *Æ. culiciformis*, bred *Dicranura bicuspis*, with pupa case, &c. Mr. A. H. Hamm exhibited a case of varieties and aberrations, including a *Chrysophanus phlæas* with a large black costal blotch extending well into the disc of the fore-wing, and a beautiful smoky aberration of *Acidalia immutata*. Messrs. A. Harrison and H. Main (1), long series of various generations of *Amphidasys betularia* and var. *doubledayaria*, from various localities, with six out of the seven gynandromorphous examples obtained from one of the broods; (2), various series of *Aplecta nebulosa*, from the usual grey colour to the almost black form; (3), a large number of aberrations and forms of *Triphæna comes* from many localities, from light grey to red and to almost black; (4), *Satyrus semele*, from the chalk hills of the south-east, with light ground and lighter undersides, and from Cornwall and the Isle of Man, with much darker ground on both surfaces; (5), a drawer of most varied and beautiful *Triphæna fimbria;* (6), three drawers of various broods of *Pieris napi*, including a series of Irish parentage and also a series bred from Swiss var. *bryoniæ;* (7), a long series of *Colias edusa* and var. *helice* bred from a var. *helice* taken in South of France, including some very beautiful intermediate forms; (8), fine series of most of the Lycænidæ, including some very fine forms of *Lycæna arion;* (9), several drawers of Vanessidæ, &c., mostly bred; (10), a large number of aberrations, of which the following are the more notable:—*Nemeophila russula* males, with the marginal bands on the hind wings obsolete, black forms of *Cymatophora duplaris* from Lancashire, males of *Cosmotriche potatoria* with female coloration of pale yellow, and one intermediate in colour between typical male and female, some black aberrations—var. *melanocephala* of *Acronycta leporina* from Lancashire, melanic specimens of *Agrotis exclamationis*, *Grammesia trigrammica* with the submarginal area dark shaded, and one with the wings, thorax, and abdomen dark, as in var. *bilinea*, but with the central line plainly visible, an *Odontopera bidentata* with dark hind margins and pale central and basal areas to fore wings, var. *fuscata* of *Hybernia marginaria* from Lancashire and Cheshire, and intermediates from Epping, &c.;

Melanippe fluctuata of a pale ochreous ground with a much diminished central band, and extremely beautiful rosy specimens, var. *subroseata* of *Zonosoma pendularia*. Mr. J. Hickman exhibited two broods of *Arctia caja* from Wye, in which considerable aberrational intensification of the dark markings was apparent. Mr. L. W. Newman (1), bred series of the genus *Notodonta*; (2), hybrids between *Smerinthus ocellata* and *Amorpha populi*, *Notodonta ziczac* and *N. dromedarius*, *Selenia tetralunaria* and *S. bilunaria*; (3), bred series of *Nyssia lapponaria*, *Leucania vitellina*, melanic *Boarmia gemmaria*, *Dasycampa rubiginea*, &c., &c.; and (4), very varied series of *Melitæa aurinia*. Mr. Percy Richards, a large number of varieties and aberrations, of which the following are a few:—(1), *Dryas paphia*, intermediate between the type and var. *valesina*; (2), a very grey-coloured *Limenitis sibylla*; (3), a suffused red, a salmon-pink confluent spotted, a pale straw-yellow, and forms with yellow hind wing on one side only of *Anthrocera trifolii*; (4), a *Uropteryx sambucata* streaked with grey, quite freshly emerged; (5), *Rumia luteolata*, with the reddish-brown markings absent; (6), a number of intermediate forms between *A. betularia* and var. *doubledayaria*; (7), his specimen of *Plusia ni*, from Kingston Hill; (8), an *Abraxas grossulariata* with deep yellow ground colour; (9), a black form of *Thera variata*, from Kingston Hill; and, on behalf of Mr. E. Warne, a pale-grey-all-over form of *Melanippe fluctuata* and *Bupalus piniaria* with black markings on the grey outer border. Mr. A. Sich exhibited specimens of the new British species discovered by him, *Argyresthia illuminatella*, with allied species for comparison. Mr. R. South (1), various forms of *Aphantopus hyperanthus*, including ab. *lanceolata*, ab. *arete*, ab. *obsoleta*, &c.; (2), a *Brenthis euphrosyne* with much reduced markings on fore wings, and a black patch occupying the whole basal two-thirds of the hind wings; (3), *Pararge megæra* with extra apical spots, and a female with very wide lines on fore wings; (4), orange-tinged *Gonepteryx rhamni*, from West Kent; (5), a var. *eleus* of *Chrysophanus phlæas*, and three very pale-coloured specimens; and (6), examples of var. *syngrapha* of *Polyommatus corydon*, and one specimen with normal fore wings and var. *syngrapha* hind wings. Mr. South also exhibited, on behalf of the Rev. W. Claxton, (1), intermediate coloured males of *Cosmotriche potatoria*; (2), male *Malacosoma castrensis* with female coloration; (3), *Dianthœcia luteago*, var. *ficklini*, from Cornwall; (4), very dark *Psilura monacha* from New Forest parents; and (5), a dark form of *Scopelosoma satellitia*. Mr. H. J. Turner a large number of life histories of the species of the genus *Coleophora*, showing imagines, cases of the larvæ at different stages of growth, and leaves of the food plants mounted to show the characters of the depredations of the larvæ. Mr. C. P. Pickett, very long series with numerous and striking varieties of many species of Lepidoptera.

In Coleoptera the exhibits were very few indeed. Mr. W. West, of Greenwich, exhibited an extremely large specimen of the stag-beetle (*Lucanus cervus*). Mr. W. E. Butler, a series of the Coleopteron *Phymatodes lividus*, a species new to the British List, discovered by him at Reading. Mr. S. R. Ashby, a large number of species of Coleoptera.

Mr. West, of Greenwich, was the only exhibitor of Hemiptera, of

which he exhibited the whole of his collection, comprising more than three-fourths of the indigenous species. The Society exhibited its type collection of Orthoptera. Mr. H. T. Dobson was the only exhibitor of Odonata, by a collection of species made by him last year on the Norfolk Broads, including *Æschna isosceles*, *Libellula fulva*, *L. dubia*, *Sympetrum sanguineum*, &c. Mr. Stanley Edwards showed a very handsome case of working bees, *Apis mellifica*, and also an observation nest of living ants, *Formica flava*.

In the Foreign Section Mr. C. Boxer exhibited a small collection of South African butterflies. Mr. Stanley Edwards exhibited a large number of exotic Lepidoptera from his extensive collection, including several sections of the genus *Papilio*, a number of the larger *Morpho* species, and series of several species of each of the genera *Urania*, *Nyctalemon*, *Thais*, *Armandia*, *Teinopalpus*, *Eurycus* and *Sericinus*. Mr. A. Hall, an extremely fine collection of the various species of the genus *Catagramma* and its allies from South America, together with series of forms and aberrations of *Apatura iris* and *A. ilia*. Mr. W. J. Kaye showed more than two hundred specimens of butterflies taken in one forest path in British Guiana, to illustrate the principal mimetic groups of the locality. They were of the following sections:—Danainæ, Nymphalinæ, Heliconinæ, Ithomiinæ, and Erycinidæ. Mr. McArthur exhibited a case containing the largest and smallest known species of Lepidoptera, viz., *Thysinia agrippina* from South America, and *Nepticula prunetorum*. Mr. W. G. Sheldon exhibited a number of Spanish Lepidoptera, including fine series of the purely Spanish *Satyrus pienri* and *Erebia zapateri*, together with series of *Argynnis pandora*, *A. niobe* var. *eris*, &c.

The Society exhibited several drawers of its collection of Canadian Lepidoptera. Mr. J. W. Tutt exhibited long series of several species of Continental butterflies with a number of palæarctic extra-European species for comparison—(1), *Euchloë enphenoides*, males very variable in size, females extremely dissimilar in the amount of orange marking at the tip of the fore wing, with *E. eupheno* from Morocco; (2), *Leptosia sinapis*, spring form from the Riviera; (3), *Pararge egeria*, with every possible gradation between the dark form of Britain and the bright-tinted southern form; (4), *P. megæra*, with very interesting Corsican forms; (5), *Polyommatus bellargus* and *P. corydon*, including the sky-blue Spanish form of the latter species as well as the white form, and most interesting as showing the lines the variation takes in the two species; (6), long series of *Chrysophanus virgaureæ*, *C. alciphron* including var. *gordius*, and *C. hippothoë* including many exceedingly fine, distinct, and extreme forms from many localities, the females in particular running into most beautiful forms. Mr. West, of Greenwich, a specimen of the Goliath beetle from West Africa. Mr. H. Moore, a number of large European and exotic Orthoptera and a drawer of European Ædipodidæ. Mr. Edwards, cases of exotic Phasmidæ and Mantidæ.

The walls and screens were covered by a large number of photographs and photomicrographs of biological subjects. Mr. F. Noad Clark showed many minute insect structures; Mr. J. Edwards, insects and spiders in their environment; Mr. Goulton, lepidopterous larvæ in

their environment; Mr. Hugh Main, the protective resemblance exhibited by larvæ such as *P. smaragdaria* and *G. papilionaria*; and Mr. Tonge, nature studies of various species of Lepidoptera, the ova, larvæ and imagines in their natural surroundings.

The following gentlemen lent microscopes:—Mr. H. E. Barren, Mr. A. Cant, Mr. A. W. Dennis, Mr. F. J. East, Mr. Stanley Edwards, Mr. H. S. Tremlin, Mr. E. C. Goulton, Mr. W. J. Lucas, Mr. R. A. Priske, Mr. W. West (Ashstead), Mr. C. West, and Messrs. R. and J. Beck (six). The various objects shown by these gentlemen were much appreciated. A notable feature of this table was the Ashe-Finlay comparoscope, exhibited by Messrs. Beck, a microscope arranged with two object-glasses and two stages to exhibit two objects side by side for comparison.

At half-hour intervals during the evening, the following gentlemen exhibited lantern-slides and gave short demonstrations:—Mr. E. C. Goulton, Mr. H. Main, and Mr. H. C. Head showed details of the life-history of various species of Lepidoptera, Mr. Tonge showed the ova of many species of butterflies, Mr. F. Noad Clark minute microscopic insect structures, Mr. F. Enock showed coloured slides of protective resemblances in insects. Messrs. W. J. Lucas, A. W. Dennis, and E. Step also showed slides.

The Society's lantern was under the charge of Mr. F. Noad Clark the whole evening, who carried out all the arrangements for the demonstrations without a hitch. A large number of exhibits of other Orders by members and friends gave variety and attraction to the meeting.

The arrangements for tea were admirably made by Mrs. R. Adkin and Miss Adkin, who, together with Mrs. T. W. Hall and other ladies, attended to the refreshment room.

NOTES AND OBSERVATIONS.

Melanic Lepidoptera.—At the meeting of the British Association, to be held this year at York (August 1st to 8th); it is proposed that there shall be an exhibition of British Lepidoptera, illustrating melanism. The organizing committee of the Zoological Section invite those who are willing to take part to communicate with Mr. L. Doncaster, Zoological Laboratory, Cambridge, stating the species and number of specimens which they are prepared to send. It is hoped that a paper on "Melanism" will be read at the meeting by Mr. G. T. Porritt, of Huddersfield, and that it will be followed by a discussion.

Vanessa urticæ in Hybernation.—In the 'Entomologist' for December, 1905, page 311, I recorded an instance of the early hybernation of a specimen of *V. urticæ* at the beginning of July last. It awoke from its long slumber on April 7th, although numbers of the same species were abroad weeks before. This particular specimen I saw daily, and I think I may truthfully say it never once moved a limb from the first position it took up; spiders' webs had fallen across, and floated from its folded wings, and dust naturally accumulated around

it, yet, on the day of its awakening, it looked clean and fresh, and was exceedingly active. Thus, for nine months, animation seemed to be totally suspended as far as outward appearances were concerned, this repose differing very materially from a former chapter in its life-history, when, in the chrysalis state, the limbs of the future butterfly were being formed; and if an object-lesson on fasting were needed, this might excite the most morbid curiosity.—G. B. Corbin; Ringwood.

Aplecta nebulosa, var. thompsoni (Arkle).—I regret I am unable to agree with any proposal to include the variety *thompsoni* with *robsoni*. The two names mark the two culminating departures from the Delamere type, and each is unlike the other. A long experience enables me to say, without hesitation, that no two examples of Delamere *nebulosa* can be picked out so unlike each other as the varieties *robsoni* and *thompsoni*. In the latter, the ground-colour of the upper wings is jet-black, with white margins and fringes; in the original *robsoni*, as well as in present-day examples, the ground-colour is black-brown, with grey fringes. My experience shows, further, that photographs are frequently unreliable as entomological illustrations. For example, the jet-black of *thompsoni* and the black-brown of *robsoni* appear in a photograph as equal tones. Mr. South writes (*ante*, p. 76):—"Except that fig. 10 (*thompsoni*) has a white crenulate line on the outer margin of the fore wings, and that the fringes are white instead of brownish grey, it is not otherwise very clearly separable from fig. 8, which has been recognized by Mr. Collins as agreeing with his type of *robsoni*." Transposed, this means that *thompsoni* is very clearly separable from *robsoni* by two notable characters—(1), a white crenulate line on the outer margin of the fore wings; and (2), the white fringes. I do not think any attempt will be made to give distinctive names to Delamere *nebulosa* intermediates. The history of *thompsoni* will probably act as a deterrent.—J. Arkle; Chester.

Acronycta leporina var. melanocephala.—I am honoured by Mr. A. M. Cochrane's notice ('Entomological Record,' April 15th, 1906) of my article upon the above insect, which appeared in the 'Entomologist' (vol. xxxviii. 289, and vol. xxxix. 19). I gather from this criticism that the writer of it wishes to set aside the prior claim of Treitschke to the name *bradyporina* for our grey form of *leporina*, and to transfer the name *bradyporina* to the new variety, thus deleting the varietal name *melanocephala*. He further suggests the substitution of a new name, *grisea*, for the present usage of *bradyporina*, thus, in a breath, setting aside the authority of Treitschke, Hübner, and Staudinger on the Continent, and Stephens and Tutt in this country. I wonder what the strict systematists will say to such an attack upon the law of priority. As to the variety described in my notes to the 'Entomologist,' if my critic can show that the form described by the above-named authorities as *bradyporina* had a black thorax, and that, in the coloration of the fore wings and body, black predominated, or that it was materially different from the form so long known as *bradyporina*, or, in other words, if he can show that when grey or dirty-grey was written black was intended, there may be a case for the suppression of the varietal name *melanocephala*. Whatever future research

may decide, I think that most entomologists will agree with Mr. Tutt's acceptance of *bradyporina* for the greyish form we most frequently get in England; and also, when they have seen the, at present, scarce variety which I have called *melanocephala*, that it is distinctly a melanic race, characterized by a predominance of black in the coloration of the fore wings, and with black thorax and abdomen.—Wm. Mansbridge.

Ischnura elegans in Spain.—Mr. K. J. Morton calls my attention to the fact that *Ischnura elegans* has at last been recorded from Spain, on the strength of specimens now in his collection, and which were were sent for *I. graellsii*. The record is in the 'Bulletin of the Spanish Natural History Society.'—W. J. Lucas.

Extraordinary Number of Pupæ of Culex hirsutipalpis.—On November 21st, 1905, while journeying from the Port of Benguella, West Africa, to Chiyaka, in the interior, I noticed two small pools by the roadside near a native village, and which appeared from a little distance to be of a brown colour. On approaching them, I found the surface of the water literally packed with mosquito pupæ. Over most of the surface of the smaller pool (in which they were most numerous, and which comprised an area about two yards square), the pupæ lay as closely together as capillarity would allow, while only in a small space less than a foot square, near the middle of the pool, did they seem to be perceptibly scattered. On watching them for some minutes, I observed a wave-like motion throughout the brood, which went on after the following manner at nearly regular intervals. At one edge of the pool the pupæ sank out of sight and quickly rose again to the surface, their neighbours following suit until the opposide side was reached, the whole procedure producing the odd impression of a bar of clear water, about eight inches wide, which appeared to move across the pool like the shadow of a narrow plank. As the pupæ rose each time many could be seen struggling for room to protrude their spiracles, and the lack of space perceptibly delayed the appearance of some. Of course the pupæ sank when I placed my hand near the water, but after holding it quiet until they rose again, I made a quick dip with a flaring cup about five inches across. In this manner I secured over six hundred pupæ, besides a few larvæ of different sizes. About eleven hundred pupæ would have completely occupied the surface of the water in the cup. There seemed to be but few larvæ in the pool, but I saw eighteen egg-rafts. On breeding out some of the pupæ they were seen to be *C. hirsutipalpis*, Theob.—F. Creighton Wellmann; Benguella, West Africa, February 25th, 1906.

The Barrett Collection of British Lepidoptera.—The first portion of this notable collection, comprising all families to the end of the Geometridæ, was disposed of in 304 lots by Mr. J. C. Stevens at the well-known auction rooms in King Street, Covent Garden, on March 13th last.

Owing to pressure on our space we are unable to report results in any detail, and the following notes therefore only refer to the more important items. Among the Pieridæ there was one lot of sixty-eight specimens including a fine sulphur-yellow example of *Pieris napi*, and

for this lot 50/- was given. A specimen of *Chrysophanus phlæas*, with the hind wings entirely brown and the disc of the fore wings only coppery, made five guineas. Four specimens of *C. dispar* ranged in price from three guineas to five guineas, and a male of this extinct butterfly, together with an example of the *schmidtii* form of *C. phlæas*, went for £2. Five male and two female specimens of *Lycæna acis* were sold for £5 15s. A black *Limenitis sibylla*, from Reading, was not dear at 30/-, the price at which it was bought. Six pounds sterling was given for a specimen of *Vanessa urticæ* with black hind wings; and two guineas for a specimen of *V. antiopa* captured near Hastings in September, 1889. Two other authenticated examples of the last-named butterfly went for 14/- and 20/- each; while a specimen of *Argynnis lathonia*, taken at Dover in 1872, brought in 28/-. Three specimens of *Epinephele tithonus*, one whitish, and one with extra ocelli, sold for 20/-. A parcel of forty-four "skippers," including two specimens of *Hesperia* (*Syrichthus*) *alveus* from Norfolk, realized £2. An example of *Hyloicus pinastri*, from Aldeburgh, sold for 25/-; ten specimens of *Deilephila galii* made £3 2s. 6d., and one example of *D. euphorbiæ*, taken at King's Lynn in 1887 (C. G. B.), went for 45/-. There were eleven specimens of *Lælia cænosa*, and these realized £6 0s. 6d., the highest price being 47/6 for a pair, and the lowest 18/- for four specimens. Of *Epicnaptera ilicifolia* there were two males and a female; the former sold at 21/- and 16/-, and the latter fetched 26/-. Two males and a female of *Drepana harpagula* (*sicula*) realized 51/-, and two *Cerura bicuspis*, together with thirteen *C. furcula*, made 20/-. One example of *Leucodonta bicolor* from Burnt Wood sold for 20/-. Four lots, each comprising ten *Acronycta alni* and five *A. strigosa*, went for 21/-, 24/-, 22/-, and 21/-. Five examples of *Noctua subrosea* were submitted in two lots, one of two specimens, the other of three specimens; each lot sold for 20/-. A specimen of *Hadena satura*, from Reading, with other things included, made 32/6. For three Shetland specimens of *Crymodes maillardi* (*exulis*) the bidding ran up to 70/-; the same number of *Dianthœcia barrettii*, including the original specimen, found a buyer at 45/-, whilst three others from Dublin made only 16/-; for another lot of three specimens, one of which was from North Cornwall, and one bred from a larva, the price rose to 45/-. A lot comprising five *Agriopis aprilina*, one without black markings, sold for 30/-. Seventeen *Nonagria sparganii*, put up in three lots of four specimens and one lot of five examples, realized a total of £4 19s. 6d. Two useful lots of *Senta maritima* (*ulvæ*), each containing eleven specimens, and including the typical and three named forms, made 11/- per lot. The one example of *Synia musculosa* in the collection sold for 21/-; and a lot comprising three *concolor* among other things fetched 20/-. *Leucania favicolor*, the male and female types, made 20/- each, but a reddish male fetched 24/-, and another male went for 22/-. Of *Pachnobia alpina* there were a dozen specimens, and these were sold in half-dozens at 20/- per lot. For two specimens of *Hydrilla palustris* 26/- was given, whilst 10/- bought a couple of *Laphygma exigua*. Twelve specimens of *Xylina conformis*, from South Wales, were sold in fours at 30/- for one lot, and 32/6 for each of the other lots. An odd *conformis* with other species went for 21/-. There were two specimens of *Cucullia gnaphalii*, and each of these made 14/-. A

Norfolk example of *Heliothis scutosa* was bought for 22/–, and a hybrid *A. prodromaria-betularia* for the same sum.

A pair of *Nyssia lapponaria* went for 16/–, and a pair of *Cleora angularia* (*viduaria*) made £2. Among a few varieties of *Abraxas grossulariata* was one of var. *varleyata*, which realized 32/6. A specimen of *Sterrha sacraria*, taken at Dulwich (C. G. B.), produced 16/–. Three specimens of *Lygris* (*Cidaria*) *reticulata*, put up together, brought in 30/–. Fine examples of *Phibalapteryx polygrammata* sold for 22/–; and two lots of *Eupithecia consignata*, ten specimens in each, yielded 12/– and 20/– per lot.

CAPTURES AND FIELD REPORTS.

Vanessa antiopa in Cambridgeshire.—A specimen (recorded in the 'Field,' April 7th) was seen at Little Shelford, on April 3rd, by Mr. G. F. O. Bagnall, which settled by the roadside, but it evaded his attempt to capture it.—F. W. F.

Orobena straminalis in Surrey.—In turning over the 'Entomologist' for 1904, I came across Mr. South's note on Surrey localities for this insect. I took six or eight specimens last summer near Bletchworth.—H. V. Plum; Epsom College, March 9th, 1906.

Eugonia (Vanessa) polychloros.—I should very much like to know what has been other people's recent experience of *E. polychloros* in this country. When I was a child, and for many years afterwards, it was common hereabouts; then it disappeared entirely for several years, and I shall never forget my pleasure at once more seeing hybernated specimens in Harington Hall Wood after its long absence. Soon afterwards it gradually became common again, and was to be met with in all directions until 1901. In that year it was so excessively abundant in North Essex and on the Suffolk side of the River Stour that I could have taken hundreds of broods had I required them. They were so abundant on elm trees in Colchester as to cause people to take steps to destroy them, under the delusion that they were likely to prove exceedingly injurious, and I saw one very tall elm hedge in the outskirts of the town which, for a considerable distance, was entirely defoliated by them. But, strange to say, I only saw two or three of the perfect insects later in the year, and from that time to this not a single specimen has appeared, either in the spring or late summer. How is this to be accounted for? My own theory is that all the specimens which emerged in 1901 at once emigrated, that the species is practically extinct here now, and that it is quite uncertain when a fresh lot of immigrants will appear and repopulate the district, though this may happen any season. I have noticed that certain of the "agricultural entomologists" have continued to offer the larvæ at quite nominal prices, but whether they have been able to supply them I do not know. It would be singular if the exodus of the species from this part of England was due to conditions which have not operated in a similar manner elsewhere.—W. H. Harwood; Colchester, April 17th, 1906.

SOCIETIES.

Entomological Society of London.—*Wednesday, March 21st*, 1906. —Mr. F. Merrifield, President, in the chair.—The Rev. George A. Crawshay, M.A., of "Lowlands," Leighton-Buzzard; Mr. Hereward Dolman, of Hove House, Newton Grove, Bedford Park, W.; Mr. Edward Dunkinfield Jones, of "Castro," Reigate; Mr. John Neville Keynes, M.A., Sc.D., of 6, Harvey Road, Cambridge; Mr. D. L. McCarrison, Indian Police Forces, Madras Club, Madras; and Mr. George E. Tryhane, of Trinidad, were elected Fellows of this Society.—Dr. F. A. Dixey exhibited six female examples of the Pierine genus *Eronia* with corresponding males, and drew attention to the extreme diversity shown by the males in these closely allied species. He considered that this characteristic was due to the fact that in every instance the male had been diverted from the ordinary aspect of the group by the operation of mimicry, either Müllerian or Batesian. The species of entirely different affinities which had acted presumably as models were associated also with the exhibit.—Mr. R. Adkin showed two specimens of *Emmelesia unifasciata* which had emerged in August last from pupæ which had lain over since the autumn of 1900, thus having passed five seasons in the pupal stage.—Dr. T. A. Chapman, M.D., exhibited a number of specimens from the Riviera, Sicily, &c., and read a paper on the "Progressive Melanism in the Riviera of *Hastula hyerana*." A discussion followed on melanism and its causes, in which Mr. G. T. Porritt, Dr. F. A. Dixey, the President, and other Fellows joined.

Wednesday, April 4th, 1906.—Mr. C. O. Waterhouse, Vice-President, in the chair.—Mr. Leonard Doncaster, M.A., King's College, Cambridge; Major F. Winns Sampson, H.M. Travelling Commissioner, Senior Officers' Mess, Old Calabar, Southern Nigeria; and Mr. Raleigh S. Smallman, Wressil Lodge, Wimbledon Common, S.W., were elected Fellows of the Society.—Mr. H. St. J. Donisthorpe exhibited a specimen of the very rare ant *Formicoxenus nitidulus*, a neuter, found in a nest of *Formica rufa* at Weybridge during the present month. Mr. A. J. Chitty said he had taken a single male of the species in the Blean Woods, and the Rev. F. D. Morice reported it common in Switzerland, where he had taken examples of all three sexes abundantly.—Mr. G. C. Champion showed a specimen of *Platypsyllus castoris*, Ritsema, a Coleopterous parasite of the beaver, from France, and suggested that perhaps it might be found on the beavers in the London Gardens of the Zoological Society.—Mr. W. G. Sheldon exhibited several specimens of a Noctua which he said corresponded to Dr. H. Guard-Knagg's original description of *Agrotis helvetina* ('Entomologist's Annual,' 1872). He had purchased them at the sale of the late Dr. Mason's collection, in which they were labelled as light varieties of *Noctua augur*, to which species he thought, in fact, that they should be referred.—Mr. A. H. Jones exhibited examples of butterflies taken by him last year in Majorca showing injury to the wings, caused in his opinion by the attacks of lizards. He remarked that a large proportion of the few butterflies met with in the island were mutilated, especially at the posterior part of the hind wings.—The Rev. F. D. Morice gave an account of the calcaria observed on the legs of some Hymenoptera.

They were, he said, quite constant in each species, and useful, therefore, as distinguishing characters; the only hymenopteron he had come across without them being the ordinary hive-bee. Kirby and Spence considered that they were used for climbing purposes, but this was unlikely, as the spurs occurred in species which did not climb at all. So far as he had noticed they were used by members of this order for the purpose of cleaning their antennæ.—Mr. C. O. Waterhouse said that similar spurs existed in the Trichoptera, though they did not assume as beautiful forms as in the Hymenoptera; but, as to their uses, he was not aware that any observations had been published or made on the subject. Mr. G. C. Champion remarked that they were also well developed on the hind legs of some Coleoptera.—H. Rowland-Brown, *Hon. Sec.*

Lancashire and Cheshire Entomological Society. — The usual monthly meeting of this Society was held in the Royal Institution, Colquit Street, Liverpool, on Monday the 9th inst.—Richard Wilding, Esq., Vice-President, occupied the chair, and eight new members were elected.—F. N. Pierce, Esq., F.E.S., read a short paper on the genital armature of the hybrid moth *Notodonta ziczac* × *N. dromedarius*. The paper was capitally illustrated by drawings and microscopical preparations of the parts described, as well as by the exhibition of the insects. The lecturer further pointed out the difficulty of obtaining specimens of such rare forms for dissection—Dr. J. Cotton, F.E.S., then read a paper upon the lepidopterous fauna of Knowsley Park; some thirteen species of butterflies, and two hundred and ten species of moths were enumerated as having been found in the park; and the lecturer, in the course of his remarks, gave a description of the biographical details of the locality. A discussion ensued, in which most of the members present took part.— Mr. W. A. Tyerman exhibited a long bred series of *Acronycta rumicis*. Mr. W. Mansbridge, a series of *Larentia multistrigaria*, including melanic forms from West Yorkshire; also a specimen of *H. falcataria*, set so as to show the resemblance of the moth to the head of a mouse.—H. R. Sweeting & Wm. Mansbridge, *Hon. Secs.*

OBITUARY.

We have, with much regret, to announce the death of Mr. Ebenezer Sabine, of Erith. He had been in feeble health for some time, and he passed peacefully away on April 12th last. His age was 72 years, and he had devoted the greater part of his life, being a man of leisure, to the formation of an extensive and valuable collection of British butterflies. He was especially keen on varieties, and his literary contributions to this Journal were chiefly upon matters relating to variation in butterflies. Only specimens in the finest possible condition were included in his cabinets, and very many of them were reared by himself from eggs or from collected larvæ.

Although of a somewhat retiring disposition, he was ever ready to furnish information or material to anyone seeking his assistance.

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DESCRIPTION OF A NEW GENUS AND SPECIES OF CICADIDÆ FROM CHINA.

BY W. L. DISTANT.

Sub-family TIBICININÆ.

Division TAPHURARIA.

Hea, gen. nov.

♂. Head short, broad, including eyes about as wide as base of mesonotum, eyes prominent, projecting beyond the anterior angles of the pronotum, front only about half the length of vertex, anterior ocellus placed near front margin of vertex; face almost as far removed from the eyes as its breadth, depressed near base, longitudinally sulcate and with very strong transverse ridges; rostrum reaching the intermediate coxæ; pronotum longer than head but shorter than mesonotum, its lateral margins moderately rounded and sinuate near anterior angles, its posterior angles obliquely prominent; mesonotum with the lateral margins angulate near base, the cruciform elevation short and broad; abdomen about as long as space between apex of head and base of cruciform elevation; tympana entirely exposed; opercula small, not reaching base of abdomen and not completely covering the cavities; anterior femora armed beneath with four spines, the apical spine very short; tegmina and wings hyaline;

tegmina less than three times the length of greatest breadth; tegmina with the basal cell longer than broad, the postcostal area moderately wide, apical areas eight, transverse vein at base of second apical area vertical; lower ulnar area long, narrow, its upper vein curved; wings with six apical areas.

I place this genus near *Dorachosa*, Dist.

Hea fasciata, sp. n.

♂. Head above black, anterior margins of front and vertex, and a narrow central line to both ochraceous; pronotum and mesonotum brownish ochraceous with a broad central greenish yellow fascia margined on each side with black, narrower on pronotum and broader on mesonotum, lateral margins of pronotum pale ochraceous inwardly margined with black; abdomen dark ochraceous, with a central paler longitudinal fascia and with two black spots near base; body beneath and legs stramineous, central transverse ridges to face, space between face and eyes, clypeus, apex of rostrum, shadings to anterior and intermediate coxæ, and streaks to anterior femora black; tegmina and wings hyaline with a slight bronzy tint, extreme bases, the costal membrane to tegmina, and basal half of anal area to wings testaceous red; tegmina with the basal cell and lower ulnar area more or less ochraceous, the margins of the latter and its apex fuscous. Long. excl. tegm. 16 millim. Exp. tegm. 45 millim.

Hab. China.

I have no more precise locality for this species, which was procured at the sale of the collections of Mr. R Cholmondeley some ten years ago. I have refrained from describing it before, trusting that I might receive another better localized specimen from other sources, but this has not occurred.

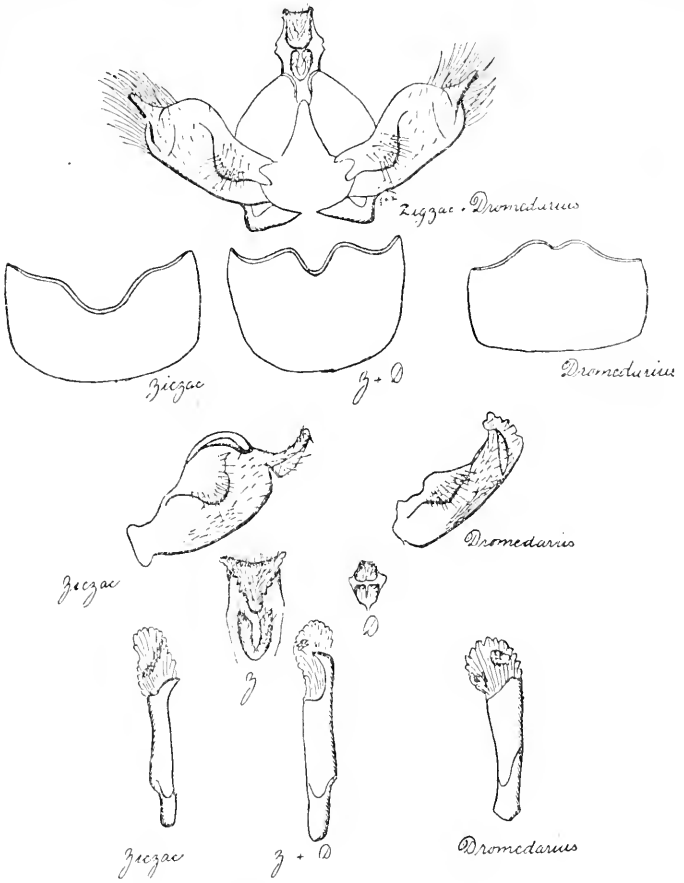
In the type one tegmen possesses eight apical areas, and the other only seven.

NOTES ON HYBRID *NOTODONTA ZICZAC-DROMEDARIUS*.

By F. N. Pierce, F.E.S.

So rarely do hybrids find their way to the microscopist that I would like to place on record the thanks of all structure workers, and those entomologists interested in anatomy, to Mr. L. W. Newman, of Bexley, Kent, who is so anxious for science that he sacrificed two lovely specimens of this rare hybrid *N. ziczac-dromedarius* in order that another link might be added to the all too little known structure of the curiously mixed genital organs of hybrids. About the middle of July last Mr. A. Bacot wrote and asked me if I would undertake the examination of two specimens, which I readily assented to. Mr. Newman had written to him as follows:—"Enclosed are two hybrids

ziczac-dromedarius. I found them *in cop.* at 11 p.m., Friday night, in the cage, and they stayed paired till 9.30 p.m. Saturday night, and then flew round, when I killed them, as both to me look like males. I send them to you to do as you like



with them; pull to pieces and report on the organs, &c., for the good of science."

I made a number of preparations of normal examples of the two species, and then prepared the two hybrids.

The drawings I have made will perhaps give a better idea of these little understood parts than a long description. I will therefore try and point out the more noticeable differences. The first figure is a drawing of the harpes and uncus in position of the hybrid. Both specimens are the same, and do not differ *inter se*. They are distinctly male in character; no traces of female organs are to be found. It is interesting here to note that I

found the same perfectly formed male organ in the male hybrid *Sphinx ocellatus-populi*; but in the female the parts were very distorted, and portions of the male organs intermixed. The condition of the female organ I should say would make it impossible for them to continue the race. On the other hand, the male organs are so perfectly formed, I should think it quite possible that they would cross again with one or other, or perhaps both, of the female parent species.

Below the first figure are the terminal segments of the different bodies, the hybrid being a modification of both species.

We now come to the harpes, which on comparison with the hybrid are found to be very different; and it is not altogether surprising to find that the hybrid has followed one, viz., *ziczac*, more than a modification of each, although there are certain traces of each used to build up the new form of the hybrid.

The uncus is again very different in the two parent species; here the hybrid tends rather to *dromedarius*, but not very distinctly, as it is unlike either, yet savours of both. In point of size *ziczac* is much larger than *dromedarius;* the hybrid is between the two. The penis itself is much nearer *ziczac* than the other species, the main difference between the two being that in place of the long row of teeth of *ziczac* the hybrid has the small patch of teeth that are present in *dromedarius*. Taking the organs all round, there appears to be a little more of the *ziczac* form than *dromedarius*, and perhaps leads one to expect the coloration of the imago to lie in that direction; this is so. After my report to Mr. Bacot he very kindly sent me the remainder of the insects. At first glance the hybrids appear to be a pretty grey form of *ziczac;* then on closer examination we find all the strong markings of each faithfully reproduced. The modified orbicular, the red marking on the inner margin near the apex, and the submarginal row of red spots of *dromedarius* being very noticeable. The hind wings are lighter than either, and have the stronger dark blotch of *ziczac* at the anal angle; in fact, it is difficult to find a single marking that is not reproduced in the hybrid.

The scales are interesting, but difficult to be quite sure that the same portion of each wing is tapped. Generally speaking, the larger scales of *dromedarius* are four-toothed, rarely five. *Ziczac* has five, six, and sometimes more teeth. In the hybrid there are usually three; occasionally there are four teeth, and I have failed to find one with five teeth. In the scaling there appears to be a tendency to produce a new form of scale, possibly an inferior one, rather than a modification of the forms possessed by the parents.

The Elms Dingle, Liverpool: April 9th, 1906.

A NEW SPECIES OF *CHARAXES* FROM RHODESIA.

By Percy I. Lathy, F.Z.S., F.E.S.

Charaxes peculiaris, sp. nov.

♂. Upper side: Fore wing similar to *C. penricei*, Rothsch., but white markings slightly larger, and the blue of the former species replaced by green. Hind wing as in *C. penricei*, Rothsch., but blue replaced by green, and only the faintest trace of red markings on outer margin. Under side: Both wings, as in *C. penricei*, Rothsch., but red markings not so bright and black, and dark markings heavier; the subapical red spot of fore wing is wanting.

Hab. Kavama, North-eastern Rhodesia. In coll. H. J. Adams.

A single male of this remarkable species was obtained.

NEW AMERICAN BEES.—I.

By T. D. A. Cockerell.

Perdita pratti, n. sp.

♀. Length not quite 6 mm. In my tables (Proc. Phila. Acad. 1896) runs to *obscurata*, but differs by the coloration of the clypeus, &c. The abdominal bands are so nearly continuous that it might run to *bigeloviæ*, but it differs from that in the lateral face-marks, &c. It is really close to *P. crawfordi* (described since the tables were published), but differs by having the lateral face-marks more produced above, and the abdominal bands bright yellow.

Maxillary palpi 6-jointed; labial palpi 4-jointed, approximate length of the joints in μ (1.) 675, (2.) 210, (3.) 105, (4.) 90; head and thorax yellowish green, the vertex dullish, the mesothorax fairly shiny, and very hairy; clypeus not hairy; *mandibles dark ferruginous, without any yellow*; apical half of flagellum brownish ferruginous beneath; light marks of face confined to clypeus and lateral marks, which are lemon-yellow; clypeus with the usual dots, the anterior middle more or less broadly brown, and faint brown marks indicating rudiments of longitudinal bars; supraclypeal area black with a purplish lustre; lateral face-marks triangular, much longer than broad, ending in a point on orbital margin a little above level of antennæ, the long inner slope inclined to be notched; upper lateral corners of prothorax yellow, and a little yellowish on tubercles; tegulæ pale testaceous; stigma light yellow, nervures colourless; marginal cell nearly squarely truncate, the post-stigmatal portion longest, but not greatly so; second s. m. large; third discoidal distinct; legs black or piceous, with much light hair, the knees more or less yellowish; abdomen broad, brown-black, with straight chrome-yellow bands, very slightly interrupted in

the middle on segments 1 to 4, those on 3 and 4 abruptly ending some distance from lateral margin; venter brown; claws simple.

Hab. Corpus Christi, Texas, October 20th, 1905; two females (F. C. Pratt). Sent by Mr. Crawford. Probably from flowers of *Helenium*.

Perdita coreopsidis, n. sp.

♀. In my tables (Proc. Phila. Acad.) runs as near to *snowii* as anything, as also does the male. Its appearance is most like *P. mentzeliarum*, but it is very different in detail. The female with spotted abdomen might be considered to run to *P. chamæsarachæ*, but it is not at all like that species.

Length about 6½ mm.; head and thorax brassy green, *very hairy*; vertex dullish, mesothorax shiny; mandibles dull yellow, the apical part ferruginous; labrum dark; face-markings pale rather dull yellow, consisting of a broad band occupying anterior margin of clypeus, and sending a large pointed process upwards in the middle line, and *transversely oblong lateral marks, not at all produced upwards*, nor reaching even the level of top of clypeus; metallic part of clypeus with a strong rosy lustre; scape yellow, with a dark band or streak above; flagellum dark above, dull yellowish beneath and at tip; upper border of prothorax, and tubercles, light yellow; tegulæ yellowish hyaline; wings milky white, nervures and stigma faintly yellowish; marginal cell nearly squarely truncate, its post-stigmatal part considerably the longest; second s. m. large, third discoidal distinct; legs with the apices of anterior and middle femora, and their tibiæ in front, yellow; abdomen broad, rather dull chrome-yellow, with narrow brown-black bands at the apices and bases of the segments, and a large black spot on each side of first, anterior to the band; in a variation the bands are reduced to spots, namely, large transverse subapical subdorsal spots on segments 1 to 4, and smaller, rounder, subbasal lateral spots on 2 to 5. Venter yellow.

♂. Somewhat smaller, with a large subquadrate head, the cheeks with a large blunt protuberance or tooth; face-marks more reduced than in female, being confined to a large pale yellow mark occupying the projecting corners of clypeus, and the linear lateral projection of same, and a very small spot at each lower corner of face; flagellum orange, with some light markings at base above; hind knees (as well as the parts mentioned in female) yellow, and the tarsi yellowish or pallid in front; abdomen with the hind margins of the segments rather broadly whitish hyaline, and the dark colour much increased, occupying all of first segment except a fine yellow streak between it and the hyaline margin, going also a little way up the sides; second segment dark, with a median subapical yellow band, and the posterior lateral corners very broadly yellow; third segment with a broad dark basal band and a pair of spots (in the subdorsal region); fourth and fifth with the base broadly dark; sixth with a broad dark basal triangle; venter yellow, heavily marked with brown. The reduced face-markings, and hyaline hind margins of segments, recall *P. sidæ*, female.

Maxillary palpi 6-jointed; labial palpi 4-jointed, the first joint less than twice length of the others combined, length of second joint 150 μ,

of third 90, of fourth 120—these measurements from a male; claws of female simple, front claws of male cleft; mandibles of female greatly broadened, except the falcate apex. The claws are those of *Cockerellia*.

Hab. Cotulla, Texas, May 5th, 1905, at flowers of *Coreopsis cardaminefolia* (DC.); two of each sex (W. D. Pierce). Sent by Mr. Crawford.

(To be continued.)

NOCTUÆ IN HUNTINGDONSHIRE, 1905, AND A SEQUEL IN THE HIGH COURT OF CHANCERY.

By G. Lissant Cox & Justin Brooke.

During last year's beautiful summer the writers spent an all too short holiday of eighteen days—namely, from June 17th to July 4th—collecting in various parts of Huntingdonshire.

We concentrated our efforts almost entirely on the Noctuæ, and in this brief time either captured or observed no less than seventy-one species. This large number was mainly due to the extraordinary attractions of sugar. Our red-letter day was June 27th, when the average number per tree was one hundred and fifty, and the limits of belief are almost reached when one of us, on a small oak, counted two hundred and eighty insects. Truly an *embarras de richesses!* The entire treacle-patch would be covered, while a jostling crowd carpeted the ground and herbage at the foot of every tree. Still more wonderful, perhaps, was the fact that many moths would fly wildly around and around the sugarer, when, only shortly after sunset, the night's round was being prepared. A few actually committed suicide by flying right into the tin!

This attraction showed an interesting gradual increase from June 17th to the 27th, and then an almost uniform decrease. By July 19th only as many units were seen as thousands a month previously. There were no aphides till July.

In Mr. A. E. Gibbs's interesting article on "The Insects of the Cornish Coast" (*ante*, p. 4) it appears that sugar was very attractive in Cornwall, and that *Agrotis exclamationis* was by far the commonest insect at the end of June. This was also our experience in Huntingdonshire, where this insect came to sugar in almost incredible numbers.

We had intended to take a continuous series of readings during each night from a wet and dry bulb thermometer. We were, however, but two instead of four, and our good resolutions fell through. We did note the temperature before we set out, and after coming home, but, unfortunately for accurate work,

these readings are at different times. Still these, together with a brief description of the day and night weather, and the varying results, have been duly tabulated, and may be of some interest. It will be seen that our best takes (June 27th and 29th) were with a north-east wind, a cloudy sky, and a night temperature of not less than 56° F. In explanation of the words "good" and "bad," it should be stated that they refer to the gross number of insects attracted, and not to their rarity (see p. 130).

As our captures included such species as *Hadena atriplicis*, *Dicycla oo* and its var. *renago*, *Toxocampa pastinum*, *Acidalia rubiginata* (*rubricata*), &c., a few remarks on these and other species may be worth recording.

Cymatophora octogesima.—Three examples came to sugar on three separate nights. One was boxed at 1.10 a.m. on the 22nd, when but six insects altogether were seen at treacle.

C. or.—This occurred sparingly during our visit.

C. duplaris.—Two worn specimens on July 2nd.

Acronycta leporina.—Our first capture came at midnight on June 20th, and settled on the glass front of our forty-candle power acetylene lamp! Two were taken at sugar about 9.15 p.m. Two are of the ordinary light form; the third is dusted with dark grey.

A. ligustri.—We took four. Two are the dark "var. *coronula*."

Xylophasia sublustris and *X. hepatica*.—These two species were fairly common, particularly the first named.

X. monoglypha.—Three very dark—and one absolutely black—specimens were obtained.

Neuria reticulata.—This came to light and sugar; about twelve in all.

Apamea gemina.—This insect came next in point of numbers to *A. exclamationis*. About one in ten was the var. *remissa*.

A. unanimis.—Occurred sparingly.

Agrotis exclamationis.—This occurred in tens of thousands, as noted above. We secured some nice varieties—practically every one figured in Barrett—but still, considering the numbers, the insect varied wonderfully little.

A. obscura (*ravida*).—Three perfect examples were secured at sugar on July 2nd, 3rd, and 4th.

Dicycla oo.—This first came to sugar on July 3rd. Four males and one female. Next day (our last) we sugared an immense area, and only obtained eight. One of these was the var. *renago*. [On July 11th five worn specimens were taken by Mr. R. Brooke, and three ditto on the 17th by Mr. T. P. Gardner. On the 19th they appeared to be over.] This erratic species appears to be maintaining its reputation. The numbers taken from this locality, according to our present knowledge, are roughly:—1902, two hundred (Entom. xxxvi. 14); 1903, twenty; 1904, one (Entom. xxxvii. 214); 1905, twenty-one. This is the only *Noctua* captured which is not in 'The Fenland' list. It surely must have been very much scarcer formerly to have escaped the notice of even the late Mr. F. Bond. Is it not a fact that the var. *renago* is mainly, if not entirely, confined to be counties of Northampton and Hunts?

Aplecta prasina and *A. advena*.—Common, especially the latter.

Hadena atriplicis.—We took but two of this most lovely insect. The first was a freshly-emerged female, which came to sugar at daybreak on June 21st. On the 25th a male, also just out, was secured at sugar, this time fairly early in the evening.

Chariclea umbra.—Three were secured on our last two nights.

Toxocampa pastinum.—We were again fortunate to find a locality for this species. In two nights (June 30th and July 2nd) we took thirty-four perfect specimens. Thirteen of these came to sugar. This habit must be unusual, since Barrett, vol. v. p. 258, says: "So far as I know, is totally insensible to the attractions of sugar." They flew at early dusk, as well as later in the evening, and many were taken without the aid of a lantern. Some females were captured at rest on their food-plant.

Of the few Geometridæ noted, brief mention should be made of *Acidalia rubiginata*. This insect came singly to light on two different nights. This may possibly be a new record for Huntingdonshire, as but one specimen is recorded from Wisbech, Cambs, in 'The Fenland' list.

The following is the complete list of Noctuæ seen or taken in the eighteen days:—*Thyatira batis, T. derasa, Cymatophora octogesima, C. or, C. duplaris, Bryophila perla, Acronycta psi, A. leporina, A. megacephala, A. ligustri, Leucania conigera, L. lithargyria, L. impudens, L. comma, L. pallens, Axylia putris, Xylophasia lithoxylea, X. sublustris, X. monoglypha, X. hepatica, Neuria reticulata, Mamestra brassicæ, M. persicariæ, Apamea basilinea, A. gemina, A. unanimis, Miana strigilis, M. fasciuncula, M. arcuosa, Grammesia trigrammica, Caradrina taraxaci, Rusina tenebrosa, Agrotis segetum, A. exclamationis, A. corticea, A. strigula, A. obscura, Noctua augur, N. plecta, N. c-nigrum, N. triangulum, N. brunnea, N. festiva, Triphæna fimbria, T. orbona, T. pronuba, Mania typica, M. maura, Dicycla oo, Calymnia trapezina, Hecatera serena, Euplexia lucipara, Phlogophora meticulosa, Aplecta prasina, A. nebulosa, A. advena, Epunda viminalis, Hadena dentina, H. atriplicis, H. thalassina, H. oleracea, H. pisi, Cucullia umbratica, Gonoptera libatrix, Plusia chrysitis, P. gamma, Chariclea umbra, Acontia luctuosa, Euclidia mi, Toxocampa pastinum.*

The sequel, adverted to above, as reported in the 'Daily Graphic,' March 30th and 31st, 1906:—

Mr. John Ashton Fielden, owner of the Holme Wood Estate, Holme, Huntingdonshire, sued for an injunction in the High Court yesterday to restrain Messrs. George Lissant Cox, Rupert Brooke, Neville Brooke, and Justin Brooke from trespassing on his property. Mr. Rawlinson, K.C., for the plaintiff, said part of Mr. Fielden's estate consisted of a very valuable game preserve, which was drained land from an old mere. It covered some two hundred or three hundred acres, and was so valuable for sporting purposes that as many as from four hundred to six hundred pheasants had been "bagged" in a day.

June, 1905.	Temp.		Weather.		Sugar.	Light.	Remarks.
	Dry bulb.	Wet bulb.	During day.	During night.			
18, 7.45 p.m. 18, 11 p.m.	56° 49°	53° 48·5°	Dull till 2 p.m., then hot sun; wind moderate S.W.	Clear moonlight; heavy dew; no wind.	Bad.	—	
19, 7 p.m. 20, 2 a.m.	62° 54°	56° 53°	Showery; wind moderate S.W.	Clear moonlight from 11 p.m.; no dew; no wind.	Good.	Good.	
20, 7 p.m. 21, 4 a.m.	63° 56°	58° 55°	Dull; some rain; stiff S.W. wind.	Cloudy, stiff S.W.	Good.	Bad.	Most came to sugar at dawn. Note high temperature.
21, 7.30 p.m. 22, 3 a.m.	64° 51°	60° 50°	Dull till noon; cleared; sunshine; wind moderate N.W.	Clear; heavy dew and mist; no wind.	Bad.	Bad.	
22, 6 p.m. 23, 2 a.m.	67° 50°	63° 49°	Hot sun; wind N.W.	Clear; dew and thick mist; no wind.	Good.	Good.	Note different results on apparently similar days.
23, 6 p.m. 24, 12.30 a.m.	63° 50°	57° 49°	Hot sun; wind N.E.	At 10 p.m. clouded over from N.E.; cold wind, slight, and misty.	Bad.	Very bad.	This mist was reported as coming off the North Sea; not one insect to light.
24, 8 p.m. 25, 1 a.m.	57° 51°	56° 50°	Dull till midday, then sunny; wind N.E.	Mist came on again, only thicker; no dew; stiff N.E. wind.	Very good.	—	Note difference to previous night.
25, 7.30 p.m. 26, 4.30 a.m.	64° 51°	57° 50°	Warm and sunny; wind N.E.	Clouded over at 8 p.m. from N.E., but no mist; stiff N.E. all night; very dark.	Bad.	Very good.	
26, 10.30 p.m.	56°	55°	Dull till noon, then sun; N.E.	Thick mist; no wind.	Good.	—	
28, 1 a.m.	57°	56°	Hot, sunny; thunderstorm near by in afternoon; wind W.	Thunder all round, but gradually cleared; no dew; warm west wind.	Very good; average 150 per tree.	—	The record night.
29, 3 a.m.	53°	53°	Hot, sunny; wind W.; thunder 7 p.m.	Some thunder; rain, then cool, clear, and calm; thick mist.	Good.	Very bad.	
29, 7 p.m. 30, 4 a.m.	63° 56°	60° 55°	Dull; wind N.E.	Cloudy, some rain, slight N.E. wind; very dark and close.	Very good.	Very good.	Record night for light.

In the spring of last year the pheasants were sitting in the covers, and on June 19th the defendants came down into the neighbourhood. They erected a sheet on the roadway at night, and displayed lanterns for the purpose of catching moths and other insects. The reclaimed land was famed for its valuable insect specimens. The defendants were warned by the keeper on the first evening that the surrounding covers were preserves, and they were told to be exceedingly careful not to disturb the pheasants. They said they understood, and remained in the roadway, where they had a right to be. They stayed in the neighbourhood for about ten or twelve days, when the keepers warned them that they were doing what they were not entitled to do. Of course they had a right to walk on the high road.

Mr. Buckmaster, K.C. (for the defendants): But must not sit down. (Laughter.)

Mr. Rawlinson: Well, to put it strictly, they must not.

Mr. Buckmaster: What happens if you are tired?—I do not know, but you must not sit down. What would you do?

Mr. Rawlinson: Well, I should go to the nearest licensed house. (Laughter.)

Continuing, counsel said the defendants were told to take their sheets down, and on the Sunday night the keepers saw two of them go on to the railway embankment, over which the plaintiff had sporting rights. They went wandering about, swinging lanterns in the covers, where also it was found that they had placed "sticky stuff" on the barks of trees. It did not, said counsel, seem a great deal to complain of, but such conduct would seriously injure a sporting estate, while there was also the risk of a big fire. Apparently these defendants came down to spend a holiday in the neighbourhood. When spoken to, they said they intended to return in the following year and bring a caravan. (Laughter.)

Mr. Justice Buckley: What are these defendants?

Counsel replied that one was an undergraduate, and one a medical student. Two of them were under age. The plaintiff was claiming an injunction and damages.

Mr. Buckmaster: Are you asking for an inquiry into the number of butterflies which were caught?

Mr. Rawlinson said there was nothing about an inquiry. These young men had tendered a shilling in satisfaction of any damage done, but of course that was not satisfaction. It had been determined long ago that a game-preserver was entitled to substantial damages against persons who, after warning, trespassed on his property. There was one case decided where £500 damages were given, although there was not a single farthingsworth of damage done.

Jackson, one of the plaintiff's keepers, said he ran after the boys (the defendants) with his stick uplifted, but not with the intention of striking them. He always went about carrying his stick up.

Mr. Buckmaster: So that it is handy for striking if you come across a poacher. (Laughter.)

Mr. George Lissant Cox, one of the defendants, denied that he had committed any act of trespass on the plaintiff's land, or disturbed the game. In July last year, when he was in Huntingdonshire, he was a medical student.

Cross-examined: They had five lamps between them, and he thought they had a right to do as they had on the roadside. At first it was his intention to write to Mr. Fielden for permission to go on his land, but he did not do so because he thought permission would be refused. (Laughter.)

Mr. Rupert Brooke, another of the defendants, said he and his two brothers (who were also defendants) were the sons of Mr. Arthur Brooke, J.P., of South Kensington and Dorking. Except for going once on to the roadside and once into the plaintiff's covert one night they had never trespassed or committed any damage.

Cross-examined by Mr. Rawlinson: What is the sticky stuff you used?—Treacle. (Laughter.)

The Judge: Perhaps you are asking this for ulterior purposes. (Laughter.)

Mr. Rawlinson replied he knew nothing of moths, but confined himself to partridges.

Other evidence was called.

Mr. Buckmaster submitted that the action was a frivolous, vexatious, and contemptible one, and asked the judge to dismiss it.

Mr. Rawlinson pointed out for the plaintiff that a landlord was entitled to his rights, and was perfectly entitled to preserve his land from any sort of trespass.

The Judge, having reviewed the evidence of the alleged trespass by the four boys, said he thought it was not a case for an injunction. They had no intention of infringing anybody's rights. There was also a claim for damages. There was no evidence whatever that any damage was done. In the circumstances it seemed to be an oppressive action. He would make an order for the payment of the shilling out of court to the plaintiff, which had been paid in by the defendants, but the plaintiff would have to pay the defendants' costs.

Royal Infirmary, Liverpool. Emmanuel College, Cambridge.

LIFE-HISTORY OF *APORIA CRATÆGI*.

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

Wishing to see *Aporia crataegi* in a wild state, and being anxious to capture females for the purpose of working out its life-history, my friend, Mr. F. G. Cannon, and I, during July, 1903, purposely visited a certain locality in Kent, which is the home of this fine insect. On the 12th, 13th, and 14th of that month we had pleasure in finding several, both at rest and on the wing, and captured several in very perfect condition. Clover fields appeared particularly attractive as resting places. Many we saw rise from the clover (not in bloom) when the sun shone; we also found them at rest on ears of corn, and upon the blossoms of both red and white clover. Sometimes, while resting on clover leaves, they are very conspicuous, and can easily be detected at a distance of one hundred and fifty and two hundred

yards. On the evening of the 13th I found a pair at rest on a large red clover blossom; they had evidently paired, as the female was in very fresh condition. This one I kept for eggs, and placed her on a plum-tree on the 15th, and two other females I turned on a young plum tree covered over with gauze. On the following day there was but little sunshine, consequently no eggs were laid, but the next day (17th), being warm and sunny, the two females on the small tree deposited three batches of eggs, one batch on the upper side, and the two other batches on the under side of the leaves. The leaf containing the smallest batch I removed for examination. Before putting the butterflies on the trees I fed them with sugar and water, which they drank freely; one continued sucking at the liquid for half-an-hour. I also fed them daily when on the trees.

On the 23rd another batch of eggs deposited on the upper surface of a leaf, and a smaller batch on the under side of another leaf on the following day. Owing to the continuance of cold, dull, wet weather, with only a very slight amount of sunshine, and that chiefly during early morning, they all remained quiet day after day Two died during the first week of August, and the last one died on the 9th August, without depositing any eggs,—this one being that which I found at rest on clover on July 13th, obviously the day it emerged; she, therefore, lived for twenty-seven days, which, probably, is about the duration of life of this species in the perfect state. I may here mention that fields of broad beans and lucerne in bloom are very attractive; the honey-dew on the bean leaves seems the greatest attraction, not only to *A. cratægi*, but to the common Whites as well. Owing to the larvæ dying during hybernation, I again visited the same locality in July, 1904, but found this species much scarcer than in the previous year; however, I captured five more females on the 5th and 6th of that month. These I placed on a small plum-tree on the morning of the 8th; by midday two batches of eggs were deposited, and another batch on the 9th. (The tree, growing in a large flower-pot, was sunk in the earth from July 8th until March 23rd following, when I removed it indoors for examination, and placed it by a window facing north-east exposed to early morning sun). The eggs hatched on August 1st, remaining in the egg state twenty-three days. Respecting the five batches of eggs laid July, 1903; the small batch, consisting of about one hundred ova deposited July 17th, remained, without changing colour, until August 8th, when they became duller on the crown, and on the following day they assumed an olive or greenish ochreous hue, and dark on the crown; during the night they commenced hatching, and all were hatched by early morning on the 10th. They remained all that day clustered together upon the empty egg-shells, but in the evening they gradually moved off. These likewise were twenty-three days in the egg.

As the weather remained so cold and wet, and fearing the other batches out-of-doors would not hatch, I moved another lot indoors on August 20th. The following day they showed signs of changing colour, and these also began hatching on the night of the 23rd, and by the next evening all were hatched. Another batch left on the tree out-of-doors changed colour on the 24th, and hatched on the 26th. The two remaining batches hatched during the first week in September.

The egg measures $\frac{1}{27}$ in. high, and $\frac{1}{50}$ in. across the middle, its greatest diameter; in shape it resembles a rather elongated acorn; the micropyle is flat and smooth, there are usually fifteen, but sometimes sixteen, longitudinal keels, seven running from near the base to the summit, where each terminates in a glassy globe enveloping an opaque white knob; the remaining keels are simple at the ends, disappearing into the surface by the base of the globes; the spaces between the keels are angular, and very faintly ribbed transversely. The colour when first laid is a bright, rich, primrose-yellow, and remains unchanged until a day or two before hatching, as above described. They are deposited in rows closely packed, and stand erect.

I think in a state of nature they would usually be deposited on the under surface of the leaves, otherwise heavy rains would be likely to dislodge them, as I find they are easily removed with a finely-pointed wet sable-hair brush.

Directly after emerging from the egg the larvæ measures $\frac{1}{18}$ in. long; the body is cylindrical, of uniform thickness, and wrinkled transversely; on the upper half the segmental divisions are clearly defined; there are three longitudinal rows of long fine white hairs on each side above the spiracles, each having a large bulbous base, and one immediately below the spiracle having a flatter base; the anterior dorsal ones on each segment curve forwards; the posterior one is shorter and straight, and the subspiracular one curves downwards, all have slightly knobbed and clefted tips. On the ventral surface, including the claspers and legs, are simple white hairs; the spiracles are brown and shining. The entire surface is densely sprinkled with minute dusky points, giving it a rough texture. The body (including the claspers) is pale ochreous yellow, the legs dusky, and the head shining black, with a granular surface, pale olive-brown eye-spots, and beset with about twenty fine whitish hairs, and a pair of very small black bristles in the centre.

After leaving the egg-shells, which are considerably eaten, they spin a web over the surface of the leaf, living gregariously, all feeding upon the same part of the leaf. For the first twelve days they live exposed upon and under a slight covering of web, they then spin a denser web, and all retire within it. The first moult occurred on or about August23rd.

On August 24th a few emerged from the web, and feed on the

upper cuticle of the leaf, over which a thin layer of silk is spun in connection with the silken nest, into which they retreat and rest after feeding; only a few emerge at the time to feed.

Shortly after the first moult it measures $\frac{1}{8}$ in. long. The head is large, black, and shining. On the first segment is a black, chitinous band, and a black chitinous disc covering the dorsal surface of the last segment, resembling the head. The ground colour is an olive-yellow; the surface is sprinkled with minute black points and numerous long and short fine silky white hairs; some are very long and curved. The body is striped longitudinally with brownish on the dorsal surface; one stripe being mediodorsal, the others sub-dorsal. The ground colour of the spiracular region is greyish, with a very fine longitudinal brown spiracular line; the spiracles are black. If disturbed they crawl rapidly, and retreat backwards like a micro-larva. When fifteen days old it measures $\frac{1}{6}$ in. long.

The larvæ from the first batch of eggs, which hatched on August 9th, moulted the second time on September 2nd; others moulted during September. It is in this stage after the second moult that they hybernate.

They feed in relays, numbering about one or two dozen individuals, at a time; they march out of the nest together, and feed in a row side by side, feeding on the cuticle of the leaf, and retire in a body within the nest, formed of a dense silken web spun between the leaves. Many continued feeding until the third week in October, when all entered into hybernation. They hybernate in batches in separate compartments varying in size, and often woven side by side in the interior of the nest, which is a tough, dense, silken mass of a greyish colour, spun over the remaining parts of the leaves upon which they fed, and around the branches, generally between a small fork. On February 16th, 1904, I examined one of the hybernaculums, and found upon cutting open one of the compartments, a little party of larvæ huddled together, the long, soft hair of their bodies intermingling gives them the appearance of being enveloped in down; this, coupled with the density of the wall of the compartment and the massive outer covering of web, affords them great protection against cold and damp, the whole combined forming a very secure and snug abode.

On March 24th, 1905, three larvæ crawled out of one of the hybernaculums, and rested on the outside of the web, followed the next day by others.

On the 26th, a bright sunny day, several emerged from different nests, and fed on the expanding buds, retreating into the webs after feeding. On the 24th I put a few upon a sprig of plum bearing tender young leaves, and by the following day they had fed a little; the next morning I found them feeding

on the base of the leaf upon which they rested, in company similar to before hybernating.

Directly after emerging from hybernation, and after second moult, they are very small, only measuring $\frac{1}{6}$ in. long, and similar in all respects to previous stage, excepting the hairs are longer, forming a somewhat dense covering.

Just before third moult it measures $\frac{1}{4}$ in. long.

First one moulted, third time, April 9th, 1905, others continued moulting during the next few days.

After third moult, and a few days before fourth moult, it measures $\frac{5}{8}$ in. long. The body is nearly cylindrical, and transversely wrinkled; the dorsal surface is black, with a sub-dorsal longitudinal band, composed of orange blotches and speckles, which cuts up the black into three stripes; the sides and ventral surface are olive-drab, minutely speckled with pale ochreous; on the dorsal surface are numerous slender bright orange hairs, and longer silky pure white ones scattered over the body, as well as a large number of shorter ones; all the hairs have shining, black, bulbous bases, each encircled by an ochreous ring; the head and legs are black, the former beset with hairs.

They rest together in compact parties, dispersing to feed each time, and strip the twigs, leaving only the midribs of the leaves, beginning first on the leaves at the end of the branches and feeding downwards, returning to the tips to rest, and spinning webs each journey, backwards and forwards, forming a carpet of silk over the branches along which they travel.

First one moulted the fourth time April 21st, and all passed through this moult by the end of that month. After fourth and last moult, fully grown, about two hundred and eighty days old, the larva measures from $1\frac{1}{4}$ in. to $1\frac{3}{8}$ in. long. During this last stage it increases greatly in size, being only $\frac{5}{8}$ in. long when first moulted, and the skin is rough and ample, which becomes stretched and shining when fully grown. In shape it is almost cylindrical, but slightly attenuated at each end. The dorsal surface is black, with a sub-dorsal, longitudinal, ochreous-orange band, composed of numerous speckles; in the centre of each rises a fine hair, with a tiny black shining bulbous base; all the hairs, excepting the white ones, are either orange or amber, while the black surface is very finely granulated and sprinkled with shorter and very fine black hairs, and a few long wavy white ones, with an ochreous ring encircling the base of each; the whole surface below the sub-dorsal black band is very glossy, of a purplish grey colour, thickly sprinkled with whitish grey spots, each encircling a fine white hair, the entire surface of the body being hairy; the head is dull black and covered with black hairs; the anal segment, including the claspers, is also black, the other claspers are unicolorous with the body; the legs and spiracles are shining black.

They rest stretched out along the twigs, often in small companies, lying side by side, always spinning silk over the branches and leaves. Occasionally I found one suspended, hanging by a web. If touched several times they suddenly start crawling rapidly; they neither feign death nor roll in a ring.

I found before hybernation several had fed on a laurel leaf which had come in contact with the plum branch upon which they were; they ate a large part of the upper cuticle of the leaf. I therefore tried a few larvæ in the last stage with laurel, and although they fed on some of the young leaves, it caused them to vomit, and one died. Plum appears to be mostly appreciated, and forms the chief food in a wild state.

The first larva spun up for pupating early morning of May 14th, 1905, and pupated mid-day on the 16th, the transformation occupying about fifty-five hours. All the remaining pupated during the next week.

Three of the larvæ when about $\frac{3}{4}$ in. long produced ichneumons (*Apanteles*) in a similar manner as they infest *Pieris brassicæ*, emerging in clusters, and spinning lemon-yellow cocoons over the body of the host, after which the latter gradually dies. Three more larger ones, and another full grown, produced ichneumons on May 20th. The ichneumon apparently deposited its eggs in the larvæ in the previous autumn, as a few occasionally crept through the gauze covering the tree, and rested outside for a time, when undoubtedly they were discovered by the parasite.

The pupa averages 1 in. in length; the head is knobbed in front; at the base of the antenna is a short sharply-pointed spike; the meso-thorax is swollen, and keeled dorsally; the waist sunken, a slight abdominal dorsal keel; the base of the wings angular; on the second, third, and fourth abdominal segments is a lateral keel; the tongue-case protrudes beyond the antennæ, and is detached, forming a spike; the anal segment terminates in a flattened, slightly-curved horn, bearing the cremastral hooks, which are firmly attached to an ample pad of silk, and a girdle of silk passes round the body at the waist. The normal ground colour is a pale greenish yellow of more or less intensity, some approaching a greenish whitish; a black stripe passes over the crown and thoracic keel, and a broad black band runs along the ventral surface, including the antennæ, tongue, legs, and costal margins of the wings, only being broken up at the base of the legs by the ground colour and yellow eye-spots. The wings are broadly margined with black, and black vandyke markings on the inner edge of hind margin; a row of five black spots form a median band, and usually there are one or two small discoidal spots; the spiracles are black, and surrounded by conspicuous black markings; on each segment is a dorsal anterior black spot, and three sub-dorsal smaller ones, and two

super-spiracular larger ones, these all form longitudinal rows. The thorax is also spotted with black; the frontal knob, dorsal and lateral keels, as well as two spots on the prothorax and a spot at the base of the wings and anal extremity, are all yellow. The whole surface is irrorated, and, excepting the wings, it is sprinkled with very fine extremely minute hairs. The ground colour is liable to vary as well as the size of black markings. Those that pupated in coloured boxes (which I put the larvæ in when ready to pupate) were affected by certain colours, as those in yellow produced decidedly yellow pupæ; blue and green had the same effect of producing green pupæ, those on black and grey surfaces became greyer, and those on white whiter.

During June, 1905, forty-eight perfect imagines emerged.

NOTES AND OBSERVATIONS.

A New Preventive of Gnat-bites.—All those who study natural history in the field must have felt the want of a good preparation to repel the attacks of flies, gnats, and midges, which in many localities often make collecting anything but a pleasure. Two or three seasons ago the writer discovered a substance which is thoroughly efficacious, and quite harmless to a sensitive skin, besides possessing an odour rather pleasant than otherwise. Several medical friends and other entomologists have used this, and are united in its praise; sometimes we have even taken a siesta on a hot afternoon where flies were swarming, without having been annoyed or even disturbed by them. In boggy woods, such as the Lancashire mosses, where biting gnats, &c., abound, it is best to rub a little of the liquid upon the exposed parts of the skin *before* going into the wood; but for day flies, such as the larger Diptera, it is often sufficient to sprinkle a little upon the cap. The feeling with which one sees a voracious gadfly or "cleg" come charging down, only hurriedly to change his course when the aroma strikes him, is, to say the least, very gratifying. Being of the nature of a slowly volatile essential oil, the liquid does not damage one's clothing in any way; under the registered title, "Terrifly," it is packed in a bottle convenient for the pocket, and containing about sufficient for a season. Further particulars will be found on the advertisement page.—Wm. Mansbridge; Liverpool.

Larvæ of A. contiguaria.—When larvæ-hunting in North Wales at Easter, I was very pleased to find ten larvæ of *A. contiguaria*, feeding on *Cotyledon umbilicus*, among heather, in a very sheltered corner on the rocks. Though I have searched carefully for the past five or six years for this larva, I have never before been able to discover it feeding either by day or night; nor do I remember to have seen any record of its capture. It has been bred in odd specimens from a miscellaneous lot of larvæ, but not identified until the perfect insect emerged.—Robert Tait, Jr.; Roseneath, Ashton-on-Mersey, Cheshire.

Brief Note on Hawaiian Butterflies.—Meyrick incorrectly writes the name of our native Vanessid "*Vanessa tammeamea*" (1899 Fauna

Haw.); the figure in Kotzebue's 'Reise' (iii. pl. v. figs. 8 *a and b*) was, indeed, so lettered, but the orthography, *tameamea*, attached to the Eschscholtz's description (p. 207) ought to stand. The spelling in any case is unfortunate, as the butterfly is named from Kamehameha I. the first Hawaiian "Over-lord"; *t* and *k* are local variants, but the omission of the "h's" completely alters the meaning. *Anosia erippus* and *Pyrameis atalanta*, *cardui*, and *huntera* occur in Oahu, though not recorded from there by Meyrick, who omits mention altogether of *Pieris rapæ*, introduced some years since on cabbages imported from San Francisco, and now fairly common in Oahu, Hawaii, &c.—G. W. Kirkaldy.

The Entomological Club.—A meeting was held on May 18th last, at Wellfield, Lingards Road, Lewisham, the residence of Mr. Robert Adkin, the host and chairman of the evening. Other members present were Messrs. Donisthorpe, Porritt, and Verrall, and besides these there were ten visitors.

Erratum.—In the April number of the 'Entomologist' I recorded, among other insects taken in Hertfordshire, the capture of *Xylophasia scolopacina* at Hitchin, on the authority of Mr. A. H. Foster, of that town. Mr. Foster's insect has since been identified as a variety of *Apamea didyma*.—A. E. Gibbs; St. Alban's.

CAPTURES AND FIELD REPORTS.

Larvæ in North Wales at Easter, 1906.—Hybernating larvæ were very backward, but fairly plentiful, especially *Agrotis agathina*, *Epunda lichenea*, and *Boarmia repandata*. Larvæ of *Agrotis ashworthii* were not so freely obtained as last year, but they pupated more satisfactorily than they have done for some years, quite ninety per cent. having gone down successfully.—Robert Tait, Jun.; Roseneath, Ashton-on-Mersey, Cheshire.

Dasycampa rubiginea at Light.—I captured a specimen of *D. rubiginea* at light on April 11th last.—F. Pope; Weirfield Road, Exeter.

Eupithecia consignata in Hampshire.—On May 24th, 1906, I boxed a "pug" resting on the bark of a small hawthorn tree, in a hedge by the roadside at Hayling Island. It proved to be a female *Eupithecia consignata* in fine condition, and will, I hope, oblige with a nice batch of ova, as she has already deposited thirteen eggs.—Alfred E. Tonge; Anicroft, Reigate, May 26th, 1906.

Field Work in 1905.—Most of the work done in 1905 consisted in night collecting in the cultivated fens, and an occasional evening in the neighbouring Huntingdonshire woods; as a natural result most of the insects taken were Noctuæ. Light and sugar were the means of capture most employed, except when the flowers of various grasses, and later of the common reed, proved more attractive.

January.—Five *Cucullia verbasci* forced out; two *Phigalia pilosaria* emerged.

March.—*Hybernia marginaria*, very common, a large percentage

being dark varieties. A little work was done at sallow-blossoms, but only common species were seen, viz., *Pachnobia rubricosa*, *Tæniocampa stabilis*, *T. instabilis*, *T. cruda*, *T. munda*, and *Calocampa exoleta*—the only hybernated species seen.

April.—*Diurnea fagella*, on oaks; several nearly black, and the majority much darker than Northamptonshire specimens taken during the same month. At sallows, in addition to the species above named, *Mamestra brassicæ*, *T. gracilis*, and *T. gothica* were seen.

June.—Sugar was remarkably successful. The localities worked were chiefly the dykes intersecting the ordinary cultivated fen fields, and occasionally the woods mentioned before. Gate-posts and thistle-heads were sugared; the latter only because of the scarcity of posts, for it was very difficult to select the moth required from among the struggling mass of *Agrotis exclamationis*, *A. segetum*, and other common species. The posts were the best, but even on these it was hard to make sure of everything wanted, owing to the endeavours of an attendant host of moths waiting for a chance to force their way on to the sugar. The species obtained in June and the first few days in July were *Thecla pruni*, very local in Hunts, but common where it occurred. *M. arundinis*, nine specimens were taken by the writer and a friend one night at Wicken. One of these is noticeable for its large size in comparison with most of the modern Wicken specimens. *Spilosoma* (*Arctia*) *urticæ*, three specimens at light at Wicken. *Cymatophora ocularis*, one at sugar on poplars. *Leucania straminea*, three specimens; a new record for this district. *L. obsoleta*, appeared in fair numbers; this species, too, we have never noticed here before. *Senta maritima* (*ulvæ*), a few among reeds, but none of any marked variety. *Xylophasia polyodon*, a positive nuisance; in the fen many were of a very dark brown form. *Neuria reticulata* (*saponariæ*), fairly common. *Miana strigilis*, common; nearly all the specimens noticed during the early part of June were var. *æthiops*; later the numbers of type and variety were about equal. *Agrotis exclamationis*, more numerous even than *X. polyodon*, and in great variety, the most striking form being one having the ground colour rather light, and the three stigmata an intense black. *A. corticea*, rare, two specimens of a smoky black colour. *Acidalia emutaria*, plentiful in the fen dykes. *Bapta bimaculata* (*taminata*), common and variable in size. *Cidaria sagittata*, although we see the larva every year in its natural habitat, this is the first time the imago has been taken in flight. *Nascia cilialis*, a few at light at Wicken. *Dioryctria abietella*, one specimen, the only one ever noticed here. This is a curious occurrence, as it was taken in the garden, where there are only one or two old fir-trees, and there is no fir plantation in the district.

August.—Three specimens of *Tapinostola elymi* were taken on the Norfolk sand-hills. At home, one morning's beating produced two larvæ of *Acronycta strigosa*, but nothing else. On the whole, August was the worst month of the year; nothing came to sugar, nor was anything of note obtained in any other way.

September and October.—Reed-heads were more productive than sugar, and the species taken were *Calamia lutosa*, *Agrotis saucia*, *Xanthia cerago*, *X. silago*, and *X. gilvago*, *Cirrhœdia xerampelina*, and *Epunda lutulenta*; of the latter the males were largely in excess at

sugar, while at reed-heads the sexes were about equal. *Calocampa vetusta* was also taken. A few full-grown larvæ of *L. obsoleta* were taken hybernating in the reed-stems of the preceding year. One pupa of *Sphinx convolvuli*, which, like most of those we have obtained lately, has not survived.

Among a number of insects kindly collected by a friend in Ireland may be mentioned *X. sublustris*, one specimen of an olive instead of the usual reddish tone, and one of *Ino statices* taken on a mountain-side late in August.

The following is a list of the Macros taken; most of them, except as noticed above, occurred commonly:—*P. machaon*, *C. edusa*, *P. cardui*, *M. galathea*, *T. w-album*, *S. ocellatus*, *M. porcellus*, *C. elpenor*, *C. ligniperda*, *I. statices*, *Z. filipendulæ*, *E. jacobææ*, *S. fuliginosa*, *S. mendica*, *S. lubricepeda*, *S. menthastri*, *O. gonostigma*, *T. cratægi*, *S. carpini*, *E. apiciaria*, *A. prunaria*, *S. illunaria*, *O. bidentata*, *E. alniaria*, *B. hirtaria*, *I. vernaria*, *P. bajularia*, *E. omicronaria*, *H. auroraria*, *A. luteata*, *E. heparata*, *A. scutulata*, *A. bisetata*, *A. immutata*, *A. emutaria*, *B. taminata*, *P. petraria*, *A. æscularia*, *O. dilutata*, *L. didymata*, *E. alchemillata*, *E. decolorata*, *E. centaureata*, *E. succenturiata*, *E. subfulvata*, *E. pygmæata*, *E. vulgata*, *E. exiguata*, *E. rectangulata*, *Y. impluviata*, *M. albicillata*, *M. montanata*, *M. fluctuata*, *A. rubidata*, *A. badiata*, *A. derivata*, *C. ferrugata*, *C. unidentaria*, *C. bilineata*, *P. tersata*, *P. vitalbata*, *S. dubitata*, *S. vetulata*, *S. certata*, *C. miata*, *C. sagittata*, *C. immanata*, *C. testata*, *C. populata*, *C. fulvata*, *C. pyraliata*, *C. dotata*, *P. comitata*, *E. mensuraria*, *P. falcula*, *P. unguicula*, *C. spinula*, *T. derasa*, *B. glandifera* var. *impar*, *B. perla*, *A. psi*, *A. aceris*, *A. megacephala*, *S. venosa*, *L. conigera*, *L. lithargyria*, *L. pudorina*, *L. comma*, *L. impura*, *L. pallens*, *C. despecta*, *T. fulva*, *N. typhæ*, *G. flavago*, *H. micacea*, *A. putris*, *X. lithoxylea*, *X. polyodon*, *X. hepatica*, *D. pinastri*, *H. popularis*, *L. testacea*, *M. anceps*, *M. brassicæ*, *M. persicariæ*, *A. gemina*, *A. unanimis*, *A. fibrosa*, *A. oculea*, *M. strigilis*, *M. fasciuncula*, *M. literosa*, *M. furuncula*, *M. arcuosa*, *G. trilinea*, *C. morpheus*, *C. alsines*, *C. blanda*, *C. cubicularis*, *R. tenebrosa*, *A. suffusa*, *A. saucia*, *A. segetum*, *A. exclamationis*, *A. corticea*, *A. nigricans*, *A. ravida*, *A. tritici*, *T. orbona*, *T. pronuba*, *N. augur*, *N. plecta*, *N. triangulum*, *N. brunnea*, *N. festiva*, *N. rubi*, *N. umbrosa*, *N. xanthographa*, *P. rubricosa*, *T. gothica*, *T. instabilis*, *T. stabilis*, *T. gracilis*, *T. munda*, *T. crnda*, *O. ypsilon*, *A. pistacina*, *A. lunosa*, *X. cerago*, *X. silago*, *X. gilvago*, *X. ferruginea*, *C. xerampelina*, *C. diffinis*, *D. capsincola*, *H. serena*, *P. flavicincta*, *E. lutulenta*, *M. oxyacanthæ*, *P. meticulosa*, *E. lucipara*, *A. herbida*, *A. nebulosa*, *A. advena*, *H. adusta*, *H. protea*, *H. dentina*, *H. chenopodii*, *H. suasa*, *H. oleracea*, *H. pisi*, *H. genistæ*, *C. vetusta*, *C. exoleta*, *C. verbasci*, *C. umbratica*, *E. fuscula*, *B. argentula*, *P. chrysitis*, *P. festucæ*, *P. iota*, *P. gamma*, *G. libatrix*, *A. tragopogonis*, *M. typica*, *C. nupta*, *E. mi*, *H. rostralis*, *R. sericealis*, *H. grisealis*, *H. cribralis*, *P. fimbrialis*, *P. farinalis*, *P. glaucinalis*, *A. pinguinalis*, *A. cuprealis*, *P. purpuralis*, *H. cespitalis*, *N. cilialis*, *C. lemnalis*, *P. stratiotalis*, *H. stagnalis*, *H. nymphealis*, *B. fuscalis*, *E. crocealis*, *S. lutealis*, *S. olivalis*, *S. prunalis*, *S. hybridalis*, *S. pallida*, *S. forficellus*, *M. cribrella*, *H. saxicola*, *E. elutella*, *D. abietella*, *R. advenella*, *O. ahenella*.—J. C. and H. F. Fryer; Caius College, Cambridge.

SOCIETIES.

South London Entomological and Natural History Society.—*March 8th.*—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. R. Adkin exhibited pupa-cases, *in situ*, of several species of Ægeridæ (Sesiidæ), including *Æ. culiciformis*, *Æ. scoliiformis*, *Æ. asiliformis*, and *Æ. ichneumoniformis*.—Mr. West (Greenwich), thirty species of Hemiptera, which he was presenting to the Society's collections.—Several members remarked on the season. Sallows had been observed in flower as far back as Christmas, and were probably fully out by the first week in March in the south. *Hybernia rupicapraria* was out early in January; *Tæniocampa pulverulenta*, *Asphalia flavicornis*, *Phigalia pedaria*, *Nyssia hispidaria*, and *T. stabilis* were already out; the last-named one was worn.

March 22nd.—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. A. Harrison, for Mr. C. Oldham, fine examples of male *Cosmotriche potatoria*, with the pale female coloration.—Mr. F. M. B. Carr, Scotch and South English *A. flavicornis*, showing the former to be generally darker, with more strongly marked bands.—Mr. Hy. J. Turner, *Erebia episodea*, *Physciodes ismeria* and *Satyrus nephele* received from M. A. J. Croker, Redvers, Assiniboia.—Mr. L. W. Newman, short series of *Leucania vitellina* and *Nyssia lappona*, with beautiful and extreme melanic forms of *Tephrosia consonaria* and *Boarmia gemmaria*—Mr. S. Edward, a large number of exotic Lycænidæ.—Mr. R. Adkin, a specimen of *Valeria oleagina*, and discussed the reputed occurrence of the species in Great Britain.—Mr. T. W. Hall, dark form of *Crymodes exulis* from Rannock, with a powdered light form from the Shetland Isles for comparison.—Hy. J. Turner, *Hon. Report Secretary.*

Birmingham Entomological Society.—202*nd Meeting*, *March 19th.*—Chairman, Mr. G. T. Bethune-Baker, President.—The meeting was held in the Society's new rooms at Avebury House, 55, Newhall Street.—Mr. J. T. Fountain showed a very fine variety of *Phigalia pedaria*. It was practically a black-veined moth, the whole of the ground being almost equally suffused with grey, and the veins and costa being very decidedly darker; it was found at Highbury, near Birmingham.—Mr. R. S. Searle, three specimens of *Borkhausenia* (*Œcophora*) *pseudo-spretella*, found about three inches under ground when pupæ digging.—Mr. J. T. Fountain, a piece of cork, into which a larva of *Acronycta psi* had bored its way and pupated; he thought it was a very unusual habit for the species.—Mr. Gilbert Smith, a log of larch containing *Tetropium crawshayii*, and gave details of its life-history. He said that it feeds only in larch, and only in trees which had just begun to fail. So few trees were in the right condition, at the right time, as a rule, that he thought the beetles must possess some powerful sense to enable them to find them. Mr. C. J. Wainwright suggested that it was perhaps not the fact that the beetles found the right trees, but that they laid their eggs broadcast, and those which were in the right place started new colonies, and the others died away. Mr. E. C. Rossiter said that he thought it was scent, and that, perhaps, when the trees began to fail, some chemical change produced a stronger or different smell. He said that turpentine was very attractive, and that some years ago he had tried a number of experiments in the open air, in Exhibition Road, London, upon turpentine, orange and lemon

oils, &c., and that they had attracted great numbers of moths, including many *Zeuzera pyrina*, which must have come a long way.

April 30th.—The President in the chair.—Mr. R. C. Bradley exhibited a species of *Cheilosia* taken at West Runton in 1900, when he and Mr. Wainwright found it not uncommonly; it had remained unrecognized until now, but Mr. Verrall having sent some of them on to Becher, it was pronounced by him to be *velutina*, a species new to Britain.—Mr. J. T. Fountain, a varied series of local *Hybernia marginaria*, including one remarkably pale specimen, very pale and quite bleached-looking, and somewhat under-sized, taken at King's Heath on April 1st last. The majority were dark, tending towards *fuscata*, which is a common local form.—Mr. J. Simkins also showed *H. marginaria*, including both light and dark forms, from Solihull; also specimens of *Macrothylacia rubi*, which he had succeeded in rearing by forcing. He fed them on oak, hybernated them in moss out of doors, kept them out of doors until January, and after waiting until they had been frozen hard, brought them into a temperature of ninety degrees. In two days they spun up, and in a fortnight emerged. He regarded the freezing before forcing to be an important item in the process. Whilst in the pupal state he teased them with drops of water; they would then work themselves from the bottom to the top of their long cocoons rapidly, but as soon as the annoyance was over would drop quietly and quickly back, in spite of their recurved spines; he wondered how this was managed, whether by chance the spines were in any way retractile.—Mr. H. W. Ellis showed *Amara nitida*, from Knowle, where it is not uncommon, though usually a very rare beetle. —Mr. Gilbert Smith, a number of working drawers of larvæ, &c., of Coleoptera; one showed a very remarkable larva, apparently of a Lamiid beetle, but whereas Lamiid larvæ are quite legless, this showed remarkable rudimentary legs, which was a new feature altogether. Unfortunately the larva was unique and died, but as far as he could tell it appeared to be near to *Mesosa nubila*.—Mr. G. T. Bethune-Baker, a collection of Lepidoptera, made in the Lake District last year. Also two moths which had previously been exhibited by Mr. W. E. Collinge, and described as seriously destructive to cocoa-nut palms in Fiji; they had proved to be new, and to belong to a new genus of the Syntomiidæ.—Colbran J. Wainwright, *Hon. Sec.*

City of London Entomological and Natural History Society.—*April 3rd.*—Mr. L. W. Newman, of Bexley, was elected a member of the Society.—Mr. E. A. Cockayne exhibited *Hybernia leucophæaria*, from Richmond Park, including two melanic specimens; also very dark *Nyssia hispidaria*, from the same locality.—Mr. G. G. C. Hodgson, a cocoon of *Zygæna filipendulæ*, found on a hawthorn bush two feet above the ground.—Mr. W. J. Kaye, a series of *Anticlea badiata*, bred from Surbiton ova, the emergence extending from February 1st to March 22nd, although the larvæ pupated almost simultaneously.—Mr. A. W. Mera male and female hybrids of *Nyssia lapponaria* × *zonaria*; several pairings *inter se* were obtained, but no ova resulted, despite the fact that the females went through the actions of oviposition.—Mr. A. Sich read a paper entitled, "A Contribution to the Study of the Micro-Lepidopterous Fauna of the London District," and laid before the Society a preliminary list of the Micro-lepidoptera of South-west London.

April 17th.—Mr. C. P. Pickett, *Pararge egeria*, third brood, bred August, 1904, and their descendants, which passed the winter as pupæ and emerged in March and April, 1905.—Mr. T. H. Hamling, larvæ of *C. dominula*, from Kingsdown, Kent, where he had also found larvæ of *Liparis chrysorrhœa* plentiful.—S. T. Bell, *Hon. Sec.*

RECENT LITERATURE.

Proceedings of the South London Entomological and Natural History Society. 1905–6. Pp. i–xvi, 1–123. With Plates, Diagrams, and Map. The Society's Rooms, Hibernia Chambers, London Bridge. 1906.

Among the papers of special interest to the entomologist are—"Our British Plume Moths," by Mr. J. W. Tutt; "On the Lengthened Period of the Pupal Stage in sundry Species of Lepidoptera," by Mr. R. Adkin; "The Genus *Eurymus* (*Colias*)," by Mr. H. J. Turner. In the Presidential Address, Mr. Hugh Main refers to the increased attention now given to the early stages of Lepidoptera, and he touches on the Mendelian hypothesis in regard to insects.

There are also among the papers and other contents of this volume a *résumé* of a lecture by Mr. D. J. Scourfield on Mendel's Law of Heredity, and Reports of the Field Meetings held during the year. Mr. Adkin's account of the Seal meeting is accompanied by a map of the district, as well as two plates showing some of the "Chart" scenery; the latter are from photographs taken by Mr. Step.

The Natural History of Selborne. By the Rev. Gilbert White, M.A. Rearranged, classified in subjects by Charles Mosley. Crown 8vo, pp. 266. London: Elliot Stock. 1905.

This popular work was first published in the year 1789, and since that time it has passed through many and various editions. In the present volume the celebrated letters have been arranged under the different subjects to which they refer. Thus in reference to insects (Entomology), the few letters in which various species are mentioned are given in their original sequence, but are arranged under the names of the orders to which the species belong. There is a useful index, and a facsimile reproduction of the original frontispiece.

We have also received the following:—

A Study of the Aquatic Coleoptera and their Surroundings in the Norfolk Broads District. By Frank Balfour Browne. (Reprinted from the 'Transactions of the Norfolk and Norwich Naturalists' Society,' vol. viii.)

Lepidoptera from the Edinburgh (or Forth) District: Further Records. By William Evans. (Reprinted from 'The Annals of Scottish Natural History,' July, 1905.)

Manchester Microscopical Society: Annual Report and Transactions, 1904. Pp. 86. Plates i–iii. Contains a paper dealing with Forest Entomology, entitled "Further Notes on Arboreal Insects," by A. T. Gillanders.

The Cultivation of Silkworms. A Guide to their Rational Treatment, with notes on every species grown in Ceylon. By Percy N. Braine.

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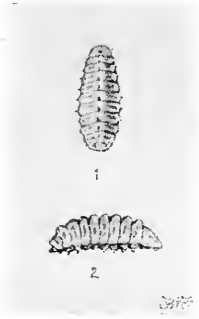
COMPLETION OF THE LIFE-HISTORY OF *LYCÆNA ARION*.

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



Lycæna arion larva.

SINCE July, 1895, I have been endeavouring to complete the life-history of *Lycæna arion*, thereby trying to solve the mystery which has hitherto surrounded the last stages of this remarkable larva. Notes and descriptions of its earlier stages will be found in the 'Entomologist,' vol. xxxii. pp. 104–6 (May, 1899); vol. xxxvi. pp. 57–60 (March, 1903); and in vol. xxxviii. pp. 193–4 (August, 1905), is the description of the pupa which Mr. A. L. Rayward and I had the pleasure of discovering in Cornwall last July. This success led to our determination of again visiting the Cornish coast in the endeavour of finding the larva in its last stage, and our hopes of making its acquaintance were realized on the afternoon of June 3rd last. As may be imagined, it was with no small amount of satisfaction that we then, for the first time, had before us a natural object which had never been seen by anyone before, and had been wrapped in mystery and remained one of the greatest of entomological puzzles.

By the observations I previously carried out in connection with the relations existing between this larva and ants (recorded in vol. xxxvi. pp. 58–9), and not being able to discover any proof showing that they passed their last stage in ants' nests, also from the site chosen by the larva for pupation, it appeared likely that the larva fed on either the blossom or the tender shoots of the younger furze bushes; and this idea was strengthened not only by the position of the pupa, but also by the usual habit of the butterfly in selecting the flower-heads of thyme growing up through the young furze, especially those freshly grown after being burnt down, which are shorter, dense, and of tender growth, to deposit their eggs upon. Therefore, upon arrival at the locality where we previously (last July) watched the females depositing, we set steadily and systematically at work in closely examining every particle of growth and surface of the ground. This occupied the whole of the first day and half of the next; the intervening night was spent in making a careful search by lamp-light. As this all proved fruitless, we then determined on searching all the most likely-looking ants' nests; first one, then another, was carefully dug up and searched without any satisfactory result; but, knowing the object of our investigation must be somewhere in the immediate vicinity, we continued our task, when at length, upon shaking part of the crown of the nest over a cloth, a goodly-sized, plump, cream-coloured, grub-like larva fell out, which I instantly identified as a full-grown *arion* larva. On closer examination, I noticed that the disc on the first segment appeared exactly of the same size as in the larva after the third moult and before hybernating, and that its head was so disproportionately small for the size of its body, that I at once concluded it had not passed through another moult, but could not decide upon this for certain until microscopically examining all detail later on. To our surprise, in the same small portion of ants' nest, we found three more *arion* larvæ. Three were almost similar in size, about $\frac{9}{16}$ in., and one a good deal smaller, measuring only $\frac{3}{8}$ in. long. These four larvæ were only just beneath the surface among the roots of the little plants of grass growing with the thyme; the soil surrounding them was loose and friable, worked up by the ants. There were, in company with the *arion*, ants and their larvæ and pupæ.

Upon the success of finding four larvæ together in the space of about three inches square, we felt almost sure of finding more; but although we devoted another hour or two that evening and part of the next day in examining a great number of ants' nests, we were unable to find any more, which appears remarkable, especially after finding four in one nest. Considering the large quantity of nests examined, I doubt if future searching will prove a very successful undertaking.

Description of larva: The fully-grown larva, after third and

last moult, measures $\frac{7}{12}$ in. long. This remarkable caterpillar passes over ten months of its existence in its last stage, and that is after its third moult, as upon a careful microscopical examination of all structural detail, I find every part absolutely unchanged, which accounts for its extremely small head, which is out of all proportion to the size of the larva, and only proportionate soon after the third moult, when it measures only $\frac{1}{8}$ in. long. The small black dorsal disc on the first segment now appears as a mere speck. The head is set on a very flexible retractile neck which can be readily protruded beyond the first segment while the larva is in motion; but when resting, the head is completely hidden and withdrawn into the ventral surface of the segment. Dorsal view: Both anterior and posterior segments are rounded, the body gradually increasing in width to the tenth segment. The segmental divisions are deeply cut, each segment being laterally convexed. Side view: First anterior and last three posterior segments somewhat flattened dorsally and projecting laterally; second to ninth segments humped dorsally; the medio-dorsal furrow usual to *Lycæna* larvæ is, in *arion*, only indicated on the posterior half of each segment; the sides are sloping and convoluted to the spiracles; the lateral ridge is dilated, swollen, and prominent, but rounded, and the ventral surface is full and of a bulbous character; the rather small feet are well provided with strongly-curved hooks. All other structural details are as in the description given of the larva after third moult in vol. xxxii. p. 105. But on examining the full-grown specimen, I find that all the long dorsal hairs have been broken or worn off short, leaving only a series of basal stumps.

The colour is a pale creamy ochreous, with a pinkish lilac tinge along the lateral ridge and surrounding both the first and last segments. When first found, the entire skin had a shining distended appearance, as if too tight for its obese proportions. Although I have not yet been able to ascertain its actual food or manner of feeding, I think there is but little doubt that it is tendered by the ants (*Lasius flavus*), in the same way as their own larvæ are fed from mouth to mouth with food the ants disgorge. This point of its life-history I hope to clear up later on.

The larva described pupated on the surface of the ground, free of web, on the evening of June 10th. At first the pupa is a clear pale apricot-yellow, which very gradually deepens to a dark amber colour, excepting the wings, which remain light ochreous.

June, 1906.

DESCRIPTION OF A NEW SPECIES OF AUSTRALIAN CICADIDÆ.

By W. L. Distant.

The British Museum has just acquired from Queensland a Cicada of very exceptional interest. It belongs to the genus *Cyclochila*, founded by Amyot and Serville in 1843, of which only one species (*C. australasiæ*), figured by Donovan in 1805, was hitherto known in entomological records.

Cyclochila virens, sp. n.

♂. Body above olivaceous green, the abdomen darker than head and thorax; body beneath paler and brighter green, the abdomen shining brownish green; transverse striations to front and face, anterior lateral margins of vertex, eyes, lateral margins of pronotum, narrow posterior margins to dorsal abdominal segments, lateral margins of clypeus, inner areas of coxæ and trochanters and the rostrum, pale or dark tawny brown; tarsi, anterior tibiæ and apex of rostrum fuscous brown; ocelli bright shining yellow placed in a small triangular black fascia; basal margins of eyes more or less sanguineous; opercula distinctly overlapping at inner basal areas; tegmina and wings hyaline, the venation green; tegmina with the costal membrane, post-costal area, and basal cell green, wings with nearly half of anal area green.

Allied to *C. australasiæ*, Don., but differing by the overlapping basal areas of the opercula, and the straighter and less sinuate lateral margins to same, less ampliate and nonangulate lateral margins of the pronotum, shorter and less produced head, shorter and broader abdomen which beneath is obliquely inclined upward, face less prominently transversely striate, &c. Long. excl. tegm. ♂ 43 millim. Exp. tegm. 122 millim.

Hab. Queensland (F. P. Dodd, Brit. Mus.).

NEW AMERICAN BEES.—I.

By T. D. A. Cockerell.

(Concluded from p. 127.)

Perdita bishoppi, n. sp.

♀. Length 4 mm. or slightly over; male 3½ or rather more; in my table (Proc. Phila. Acad.) the female runs to *P. californica*, male; the male runs to the same, or, by reason of its paler nervures, would run as well to *P. vespertilio*, male.* It is also near *P. vagans*. From *vagans* and *vespertilio* it is readily known (male) by the much shorter lateral face-marks; it also differs conspicuously in the face-marks from *californica*.

* *P. vespertilio* was described only from the male. Both sexes were taken at flowers of *Aplopappus* (s. lat.) on the sand-hills at Mesilla, New

♀. Head dark bluish green, thorax a yellower green, quite hairy; mandibles with the apical half ferruginous, and the basal with a pallid patch; mouth-parts long for so small a species; face-marks dull pale yellowish; clypeus light, except the usual dots; *lateral marks quadrate, somewhat broader than long*, not reaching above level of clypeus; no supraclypeal or dog-ear marks; flagellum brown beneath, extreme tip almost orange; wings strongly iridescent; nervures and margin of stigma sepia; marginal cell ordinary, the post-stigmatal part about as long as substigmatal; third discoidal distinct; legs piceous, small joints of tarsi becoming pallid; *abdomen brown-black, without markings*; venter dark brown; apical plate ferruginous.

♂. Smaller, but in general like the female, having the same face-markings; base of mandibles and flagellum beneath pale; anterior tibiæ wholly light in front.

Hab. Paris, Texas, August 26th, 1905; two females, one male, on plant not determined (F. C. Bishopp). Sent by Mr. Crawford. Also allied to *P. ignota*.

Perdita bishoppi, var. (or *ignota ?*).

At Handley, Texas, August 3rd, 1905; Mr. J. C. Crawford collected two males and two females of a *Perdita* at flowers of *Isopappus divaricatus* (Nuttall). One of the females would pass very well for *P. ignota*, Ckll., except that the front is minutely rugulose, and only the second and third abdominal segments have transverse white marks. This specimen also approaches *P. vespertilio*, in that the face-marks are white, and the flagellum is entirely pale beneath. The lateral marks are reduced to roundish white spots not nearly reaching orbital margin. The nervures and stigma are wholly pale. The female *vespertilio* has a fine broadly interrupted whitish line at the extreme base of second segment, representing the first white band of *ignota* and the insect from *Isopappus*. Comparing the *Isopappus* female more minutely with the type of *bishoppi*, it is seen that the thorax is bluish green instead of yellowish green; the labial palpi seem not to be quite the same—for instance, the second joint is not over 120 μ long, but 150 in *bishoppi*; and, more especially, the apical plate of the abdomen is narrowly truncate, the truncation about 45 μ across, and emarginate, whereas in *bishoppi* the truncation is quite 80 μ across, and not at all emarginate. The pollen-grains collected by the *Isopappus* female, and those by type *bishoppi*, look to me exactly the same; globular, spinulose, about 25 μ diameter, appearing white when seen singly.

So far, the *Isopappus* insect seems quite distinct from *bishoppi*; but the other *Isopappus* female, collected at the same time and

Mexico, June 27th, 1897. The female *vespertilio* differs from *bishoppi* by the white face-marks, the lateral marks somewhat larger and triangular, the flagellum entirely pale beneath, and the pallid tarsi. They are, however, very similar. The lateral marks of female *vespertilio* are shaped as in the male, but considerably smaller.

place, has no white marks on abdomen, the nervures are partly darkened (the marginal cell and border of stigma quite as in *bishoppi*), and the apical plate of the abdomen is entirely as in *bishoppi*. Yet the face-marks are white (the clypeus has two blackish bars), the mandibles have the base wholly dark, and the labrum is dark. The mesothorax is coloured exactly as in *bishoppi*.

The males have small lateral face-marks; not at all the large marks of *P. vespertilio*. They have not the white lines on the abdomen.

It is impossible to reach a perfectly satisfactory interpretation of these *Isopappus* specimens, but they appear to be intergrades (or hybrids ?) between *bishoppi* and *ignota*.

Perdita cambarella, n. sp.

♀. Length about or a little over 4 mm.; male 3½. The female, in my table (Proc. Phila. Acad.), runs to *P. chamæsarachæ*, but differs conspicuously from that by the much less shiny thorax; the abdomen is also a deeper shade of red. The clypeal marking somewhat recalls *P. asteris*. The male shows some resemblance to *P. vagans* and *vespertilio*.

♀. Head and thorax green, for the most part a rather yellowish green, but the face strongly bluish green; thorax above hairy, and dullish; mandibles with a large yellow basal patch; face-markings yellow (reddened by cyanide in type), confined to clypeus and lateral marks; clypeus with the upper lateral corners broadly dark, the yellow sending a large pointed process upwards in the middle line, and a slight projection at each side, reminding one of the rostrum of certain crayfishes (*Cambarus*); lateral face-marks triangular, the upper corner not reaching level of antennæ; antennæ dark above, yellow beneath; prothorax with two yellow marks on upper margin, and marks on tubercles; nervures and broad margin of stigma sepia-brown; marginal cell normal, its post-stigmatal part about as long as substigmatal; third discoidal distinct; anterior knees, and tibiæ in front, yellow; abdomen broad, bright deep apricot colour, without markings, except a fine longitudinal black line on each extreme side of second segment; venter the same colour.

♂. Smaller; head and thorax bluer; clypeus all light; tarsi very pale yellowish; nervures colourless, but margin of stigma pale brown; abdomen suffused with dusky, so that it is brown rather than red, or red with a broad dusky band on second segment only.

Maxillary palpi 6-jointed; labial palpi 4-jointed not especially elongated; first joint about 450 μ, second 120, third, 75, fourth 65; claws of female simple, of male cleft.

Hab. Paris, Texas, August 26th, 1905; at flowers of plant not determined (the pollen collected is very light yellow, the grains spherical); two of each sex (F. C. Bishopp). The name *P. cambarella* has reference to the resemblance of the clypeal marking of the female to the end of the rostrum of *Cambarus*. The specimens were sent by Mr. J. C. Crawford.

University of Colorado: March 15th, 1906.

ON SOME NEOTROPICAL VESPIDÆ.

By P. Cameron.

Eumenes henricus, sp. nov.

Black, the head and thorax densely covered with pale pubescence, which, on the vertex and mesonotum, has a fulvous tint; a mark between the antennæ, its upper part distinctly narrower than the lower, a line on the sides of the upper half of the clypeus, a short narrow line on the top of outer orbits, yellow; the apices of the basal two abdominal segments narrowly, of the others broadly rufous (probably discoloured); the inner apical half of the mandibles and the fore tibiæ in front obscure rufous (perhaps a discoloured yellow). Wings fuscous violaceous. Female. Length to end of second abdominal segment, 13 mm.

Panama. Belongs to the Division Alpha, *b* (Syn. Am. Wasps, 92).

Clypeus smooth, impunctate below, the upper part sparsely, weakly punctured; the rest of the head, thorax, and second segment of abdomen closely and strongly punctured. Clypeus widened below, its apex with a shallow rounded incision in the middle. Thorax short, broad, the sides rounded in front; the sides of the metanotum broadly rounded; the depression is on the apical half only; it is narrow at the base, becoming gradually widened towards the apex. Abdominal petiole long, distinctly longer than the head and thorax united, but not quite so long as the rest of the abdomen; its basal third slightly narrowed, sparsely punctured and shining at the apex, the rest more strongly and closely punctured; close to the apex, in the middle, is a shallow transverse not very distinct furrow, which becomes transversely widened and deepened at the apex; the apex has a raised border; the second segment is elongated pyriform, almost twice longer than the width at the apex; the base is clearly narrowed, becoming gradually wider towards the apex, which is smooth and slightly raised; the petiole is not much depressed above; the apex, looked at especially from the sides, is seen to be transversely furrowed.

The thorax is clearly longer than wide; it has no longitudinal furrows. The species looks like a small form of *E. centralis*, Cam.; apart from the latter having the clypeus, base of legs, and pleuræ marked with rufous, it may be known by the much less strongly punctured head and thorax, by the metanotum being furrowed throughout, and by the abdomen being perfectly smooth.

Polybia tapajosensis, sp. nov.

Black, tinged with brown; the legs and abdomen rufous brown; the apex of the first abdominal segment narrowly yellow; wings fuscous violaceous, the nervures and stigma black. Prothorax without lateral angles. Female. Length to end of second abdominal segment, 13 mm.

Rio Tapajos, Amazons (Prof. J. W. H. Trail).

Head and thorax densely covered with silvery pubescence. Clypeus smooth and shining, longer than wide; in the centre of the apex is a broad flat keel, which becomes gradually widened below, and depressed at the extreme point; on either side of this is a narrower keel; the sides of the apex are depressed, almost foveate. Mandibular teeth rufous. The raised lower part of the front is rounded below; it becomes gradually raised, then becomes gradually obliquely depressed; the upper part is hollowed below in the centre. Base of thorax rounded. Scutellum large, wide; the post-scutellum with a slight rounded slope, its apex broad, transverse. Abdominal petiole slightly longer than the post-scutellum and metanotum united; it becomes widened from the middle, the basal part being distinctly narrowed; it is slightly longer than the second segment, which is bell-shaped, roundly narrowed at the base, without a distinctly narrowed part there. Ocelli ·.· . Meso-pleural furrow single, curved below.

Comes near to *P. rejecta*, with some of the forms of which it agrees in coloration; *rejecta* may be known from it by the angled prothorax, by the post-scutellum being dilated behind in the middle, not transverse, by the metanotum not being furrowed, and the wings are more hyaline.

Polybia melanocephala, sp. nov.

Head and antennæ black, the second and following segments of the abdomen fuscous black, the thorax and abdominal petiole dark rufous, the pleuræ darker coloured than the mesonotum, the base of the thickened part of the petiole with a large black mark; legs coloured like the thorax, the coxæ darker coloured; wings dark fuscous violaceous; the nervures and stigma black. Female. Total length, 12–13 mm.

Rio Purus, Amazons (Prof. J. W. H. Trail). Agrees best with Saussure's Division M. Y. (4).

Abdominal petiole nearly as long as the metanotum and scutellums united. Body covered densely with a short pale pubescence, which appears golden on the mesonotum. There is a distinct malar space, which is fully as long as the antennal pedicle. Ocelli ·.·; the hinder separated from the eyes by four times the distance they are from each other. Clypeus nearly as long as the greatest width. The space between the antennæ is raised, somewhat triangular, the narrowed end below; the upper part with a short wide distinct furrow. Temples roundly narrowed. There is a short furrow or impressed line on the base of the mesonotum, and a wider one below the tegulæ. Scutellum large, wide, not furrowed. Second abscissa of radius one-fourth of the length of the third, and slightly more than the length of the space bounded by the recurrent nervures. Angles of pronotum rounded. There is no sculpture, the entire body being smooth.

A distinct species. In coloration and size it is very similar to *Apoica cubitalis*, Saus., as figured by Saussure, 'Vespides,' i. pl. xviii. f. 3.

Polybia sericeibalteata, sp. nov.

Dark ferruginous, the greater part of the post-petiole and the base of the abdominal segments broadly blackish fuscous; the base of petiole

pale testaceous; the flagellum of antennæ black; densely covered with a pale pile, which is white on the pleuræ, pale fulvous tinted on the mesonotum, and on the abdomen it forms broad apical bands, which have a decided fulvous tinge; the apex of the second and the following abdominal segments are black. Wings hyaline, tinged with violaceous; the costal cellule dark fulvous; the stigma dark rufous. Female. Length (total), 15 mm.

Rio Purus (Prof. J. W. H. Trail).

Body opaque, without punctuation; the sides of the vertex closely, obscurely, obliquely striated. Pronotum rounded, not angled. Centre of mesonotum closely, irregularly, distinctly, transversely striated, the striæ more or less twisted; on either side is a broad fuscous longitudinal line, with a shorter less distinct one at the base; a little behind the middle is a deep clearly defined longitudinal furrow. Post-scutellum hardly raised above the level of the scutellum; its apex is bluntly rounded, almost transverse; the apical slope is short, rounded, it only commencing at the apex, not sloping gradually from the base to the apex, as in *flavicans*. Metanotum widely, deeply furrowed in the middle, the furrow with obliquely sloped sides, *i. e.* it is deepest in the middle. Mesopleural furrow deep, clearly defined, oblique, curved below, not reaching to the middle. Ocelli ·.·, widely separated from the eyes. Front at the antennæ raised; this raised part is obliquely depressed at the base and apex, the basal slope being longer than the lower, and bears a deep furrow in its middle. Clypeus smooth, longer than wide, its apex in the middle broadly rounded, ending in the centre in a blunt black point. Petiole as long as the post-scutellum and metanotum united; the base is distinctly narrowed, the apex pyriform, clearly separated, abruptly dilated, more so than in *dimidiata* or *rejecta*; the second segment bell-shaped, broadly narrowed at the base, appearing therefore wide compared with the apex of the petiole; it is longer than it is wide at the apex.

The colour is darker than in any species of *Polybia* I have seen, the rufous colour being more tinged with fuscous, somewhat as in dark examples of *Polistes rubiginosus*; it is more densely pilose than usual, and the post-scutellum is more rounded, not sloped at the apex; the metanotal furrow is deeper and more clearly defined, and the apex of the clypeus more broadly rounded, not so distinctly brought to a point in the middle as in the typical species, more, *e. g.*, as in *P. filiformis* than in *P. rejecta*. It is related to *P. micans*, Ducke.

Among other species of *Polybia* taken by Prof. Trail are *P. flavicans*, F., Rio Jurua; *P. dimidiata*, Ol.; *P. liliacea*, F.; *P. traili*, Cam., and *P. occidentalis*, Ol., type; and var. *pygmæa*, F., Rio Purus. Three species of *Synœca* were taken on the Rio Purus: *azurea*, Sauss., *surinama*, L., and *testacea*, Sauss. *Apoica arborea*, Sauss., was taken on the Rio Purus.

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

By G. W. Kirkaldy.

(Continued from p. 83.)

Plea, Leach.*

Resembles an animated grain of sand. There is a single British species:—

1. P. leachi, McGregor & Kirkaldy (= *minutissima*, Fabr., nec Linné). Generally distributed. It is probably *N. atomaria*, Pallas. It has a funny paddling gait in the water, more like certain beetles than any of its allies. It probably oviposits in a similar manner to *Notonecta*.

This closes the account of the true waterbugs belonging to the Pagiopodous division. We now have to consider an aquatic family of the Trochalopoda, *viz.*, the Nepidæ, containing two British forms, *Nepa cinerea* and *Ranatra linearis*.

Fam. Nepidæ.

The Nepidæ are apparently descended from a protoreduvioid stock, and have, like the aquatic Pagiopoda, become modified for existence in their newer habitat. Their most conspicuous differential character is the filamentary caudal tube, which is used for respiratory purposes, and is simply two elongate, modified spiracles, and which varies in length according to the species. Fieber, in his anxiety to ally the Nepidæ to the Belostomatidæ (a family of giant, extra-British waterbugs), termed these filaments "aidothecal appendices," although they have been known certainly to be respiratory, not sexual, for one hundred and seventy-eight years; while taking in a fresh supply of air the end of the tube is simply thrust out of the water. In the nymphs the tube is shorter and stouter.

The head is porrect; the rostrum short, stout, and curved, composed of three (apparent) segments; the body flat in *Nepa*, subcylindric in *Ranatra*; the antennæ are composed apparently of three short segments, the second of which is produced laterally. In the water the legs are moved *alternately*, in contrast to the aquatic Pagiopoda, in which they are moved synchronously; the anterior pair are strongly raptorial, the other pair slender, not ciliate; the tarsi are not segmentate, and terminate in two claws. Their gait is leisurely, a sort of paddling rather than swimming. They remain motionless for hours concealed, or partly concealed, in the mud of the ponds or canals in which they live, or clinging to the stems of water-plants, lying in wait for such prey as they can overpower, not sparing their own kin,

* From Greek *pleo*, I swim.

though seemingly content with *Daphnia* or *Cyclops*, among the Entomostraca. Although in a "hand-to-hand" fight they would stand no chance with the fierce *Notonecta*, yet such is the grip of their raptorial front legs, that an unlucky water-boatman venturing heedlessly within range of the stroke of the silent scorpion will be seized and sucked without being able to struggle successfully, or use his powerful beak to advantage. The Nepidæ also suck fishes' eggs, and even attack small fish and tadpoles.

Owing to their remarkable shapes, the Nepidæ were favourite objects of study with the older naturalists, and their structures and life-histories have often been sketched superficially, though precise descriptions and figures are still desiderata. Their anatomy and embryology have been dealt with by such workers as Dufour, Heymons, Korschelt and Heider, Locy, Lacaze-Duthiers, J. Martin, Marshall and Severin, Schmidt and Will. Bachmetjer (1900, Illustr. Zeit. Ent. v. 88) quotes Pouchet that *Ranatra*, *Nepa*, and *Notonecta* can sustain life for three hours at a temperature of −16° C.

Like the other waterbugs, the Nepidæ are subject to the attentions of larval Hydrachnidæ.

There are two genera of Nepidæ in Britain, easily recognized by their shape; each has a single British species.

1. Flat, broad . . . . *Nepa cinerea*, Linné.
2. Elongate, subcylindric . . *Ranatra linearis* (Fabricius).

Nepa cinerea, Linné.*

This is the *Nepa scorpio-aquaticus* of De Geer. The prevailing colouring is dirty brown, but when the tegmina and wings are spread the greater part of the tergites is seen to be bright red.

Handlirsch declares that Swinton's diagrams of the stridular organs in this genus are false, and that *Nepa* does not stridulate. As *Ranatra*, however, has recently been discovered by my friend Bueno to stridulate, it is probable that *Nepa* does also, though both Swinton and Handlirsch have overlooked the proper apparatus.

The earliest representation of *Nepa* known to me is in Moufet's 'Insectorum sive minimorum Animalium Theatrum,' p. 321 (1634), where three recognizable figures of "*Scorpio palustris*" are shown; the third, while representing a nymph, indicates tegmina, the details having probably been filled in from an imago. Frisch, in 1728, in his work above mentioned (vii.

* Latin *nepa*, a scorpion; it was also used by Cicero to denote the constellation of the same name, but Plautus employed it to denote the constellation "Cancer." Geoffroy, following Schaeffer, arbitrarily altered it to *Hepa*.

pp. 22–4, pl. xv. figs. 1–6) gives some reasonably good figures with the name of the "broad waterbug with the two trap-claws and the posterior air-tubes." The present name of "water-scorpion" is that now used, or its equivalent, in almost all European countries.

Nepa cinerea occurs more or less commonly all over lowland Britain.

The metamorphoses were partially figured by De Geer in 1773, while figures of nymphs will be found in most "aquarium" books; the ova are figured by Dufour, Sharp, &c. The latter are oval, terminated by seven filaments, and are inserted in the stems of water-plants.

Ranatra linearis.*

The stridulation of an American species has been described lately by J. R. de la Torre Bueno (1905, 'Canadian Entomologist,' xxxvii. 85–7, figs. 5–11). "Two opposing rasps, one on coxa near base with longitudinal striations, the other on inner surface of cephalic margin of lateral plate of coxal cavity, which plate, by its thinness, must act somewhat in the nature of a sounding-board." Both adults and nymphs stridulate, and under water as well as out of it.

The earliest representation of *Ranatra* is also in Moufet (p. 321)—in a characteristic attitude—where it is termed "*Locusta*"; in 1693 Swammerdam ('Historia Insectorum,' p. 85) calls it "*Scorpius* (*?*) *aquaticus*." Apparently, however, Aldrovandus, in 1602 ('De Animalibus Insectis,' a huge work I do not possess), refers to it under the name of "*Tipula aquatica*"; the true *Tipula* (or rather *Tippula*) of the ancients was, however, probably a Gerrid (almost certainly not a dipteron as Linnæus thought). Frisch in 1728 (vi. pp. 24–5, pl. xvi. figs. 1–6) terms it the "big narrow waterbug with the trap-claws and posterior air-tubes"; according to him the Italians called it "Cavalluccio."†

The metamorphoses of *Ranatra* were well figured by Geoffroy

* The etymology of *Ranatra* is uncertain, possibly a portmanteau word from *rana* and *atra*, "a frog" and "black." A fish (*Lophius piscatorius*) was called "*Rana marina*" by Cicero.

† The earliest representation of *Notonecta* is also in Moufet. On p. 320 he says:—"*Notonecta* we call a certain aquatic insect which swims not on its belly like the others, but lying on its back, from which men have probably learnt to hyptionecticate—that is, their skill of swimming supinely"! Moufet apparently recognized the remarkable colour variation of *N. glauca*, for he says:—"Of these, in some the eyes, scapulæ, and body are blackish; in others greenish, in others bronzy, in others pitchy; for rarely seem two of the same colouring, so varied is the nature of their pattern." Four figures are shown, three representing more or less typical *glauca*, with vars. *maculata* and *marginata*, the fourth a nymph. In Switzerland the "boatfly," according to Frisch, is called "glyssling," from its shining appearance when covered with air-bubbles (from "gleissen").

in 1762. Later, Enock has detailed the method of oviposition (1900, Ent. Mo. Mag. p. 161, &c.).

According to Roesel von Rosenhof, the eggs are simply dropped to the bottom of the water, and hatch in about a fortnight; as, however, in *Notonecta*, this is probably due to the fact that a female held in captivity could not find a suitable place for deposition. In nature they are inserted in the stems of *Scirpus*, or in the leaves of *Potamogeton*, only the filaments being apparent. The ova are more elongate than those of *Nepa*, and are terminated by but two filaments. They are figured by Geoffroy and Dufour. According to Enock they are, like those of other aquatic bugs, parasitized by the curious hymenopteron, *Prestwichia aquatica*. According to Douglas, *Ranatra* winters as a nymph.

Ranatra linearis is rarer than *Nepa*, and apparently does not occur north of the middle of England.

(To be continued.)

THE LEPIDOPTERA OF THE DORKING DISTRICT.

By F. A. Oldaker, M.A.

Having now left Dorking, after a residence there of seven years, I think it may be of interest if I give a complete record of my captures. Many of these have already appeared from time to time in the 'Entomologist,' and my only apology for repeating them is the additional value that may attach to a consecutive account of my work. That work has, I fear, been far from complete, for, owing to my business engagements, I was unable to give the time and attention I should like to have devoted to entomology, but I hope that such as it is the record may be of interest and of some value. The dates attached to the various species in their different stages are in every case the first recorded in my diary.

Pieris brassicæ, *P. rapæ*, *P. napi*. Always abundant, and the larvæ usually swarmed on nasturtiums in my garden.

Euchloë cardamines. Common on Ranmore and in Polesden. Ova found on *Alliaria officinalis*. Larvæ pupated, July 6th. Very little variation observed in the imagines, except as regards size.

Colias edusa. Male taken in Dorking, September 13th, 1900.—*C. hyale*. Two males taken in Holmwood, August 7th, 1901.

Gonepteryx rhamni. Hybernated specimens common everywhere. Ova and larvæ taken on Ranmore. Imago, July 25th.

Argynnis euphrosyne. Common on Ranmore, 1903 (May 27th), and in Polesden, 1901. Other years only seen singly.—*A. adippe*. *A. aglaia*. Abundant on Ranmore in July, 1901, but none seen either before or since.

Vanessa polychloros. Hybernated specimens very common in Dorking, Wotton, and Holmbury St. Mary, in 1900 and 1901 (April 1st). Larvæ emerged May 13th, pupated June 11th; imagines June 29th. A few seen in March, 1902, but none since.—*V. urticæ.* Exceedingly common everywhere. The larvæ to be found in great numbers every year.—*V. io.* Uncertain in appearance. Most abundant in 1901. Pupated, July 1st; imagines, July 12th.—*V. atalanta.* Never plentiful, but several seen nearly every year; imagines, August 26th. —*V. antiopa.* One specimen seen by a gamekeeper on Ranmore in September, 1903.—*V. cardui.* One specimen taken in Dorking, June 11th, 1902. (N.B. This species was very abundant at Bembridge, Isle of Wight, during August and September, 1902.)

Melanargia galatea. One specimen taken at Dorking, July 26th, 1900.

Pararge egeria. Always abundant at Polesden, and fairly plentiful on Ranmore. May 15th.—*P. megæra.* Taken on Ranmore, June 4th, but never common.

Satyrus semele. Common on the chalk slopes on the south side of Ranmore. July 12th.

Epinephele jurtina. Swarming everywhere. Larvæ taken on Ranmore pupated June 22nd; imagines, July 9th. Two bleached specimens taken, September 4th, 1901, and July 27th, 1904.—*E. tithonus.* Common on Ranmore. July 26th.

Aphantopus hyperanthus. Common on Ranmore. July 8th.

Cœnonympha pamphilus. Exceedingly common everywhere.

Thecla w-album. Larvæ taken on Boxhill; pupated, June 10th; imagines, June 28th. Fairly abundant, especially in 1902.

Zephyrus quercus. Larvæ beaten on Ranmore; pupated June 4th; imagines, June 28th. Always abundant.

Callophrys rubi. Very plentiful in 1902, May 12th. Fairly plentiful in other years. Dorking, Ranmore, and Polesden.

Chrysophanus phlæas. Always abundant everywhere.

Lycæna astrarche. Taken sparingly on Ranmore and at Polesden. June 6th.—*L. icarus.* Very abundant everywhere. April 21st. Two interesting aberrations taken in 1902—(1.) Underside with faint marginal spots, and only one inner spot, June 7th. (2.) Gynandromorphous specimen, male on the left side, female on the right, June 14th. (*Vide* Entom. xxxv. 218).—*L. bellargus.* Always plentiful on a certain patch on the south side of Ranmore. May 28th, August 15th. —*L. corydon.* Very plentiful in 1901, on the south side of Ranmore; in other years only a few specimens seen. July 20th.—*L. minima.* Common in a chalk-pit in Dorking, and on the south side of Ranmore. June 10th.

Cyaniris argiolus. Common in 1901. April 30th. Holmwood and Dorking, one or two specimens seen in 1900, 1902, and 1904; but none at all seen in other years.

Nemeobius lucina. Always abundant at Polesden, and getting more plentiful and more widely distributed on Ranmore every year. Ova to be found on the under side of cowslip-leaves, sometimes as many as ten on a leaf, but oftener only one or two on a plant; ova deposited, May 23rd; larvæ emerged, June 4th; pupated, July 8th; imagines, May 15th.

Hesperia malvæ. Generally common on Ranmore. May 15th.

Thanaos tages. Very abundant at Polesden, and on Ranmore. May 15th.

Adopæa thaumas. Very abundant at Polesden, on Ranmore, and in the district generally. July 7th.

Augiades sylvanus. Very abundant at Polesden and on Ranmore. June 10th.—*A. comma.* Common on one particular patch on Ranmore, but none seen elsewhere. July 16th.

Acherontia atropos. One specimen flew indoors in October, 1900.

Sphinx ligustri. Common in Dorking. Larvæ emerged, June 10th; pupated, July 17th; imagines, June 4th.

Deilephila galii. One taken at rest in 1899.—*D. elpenor.* Fairly common in Dorking. Larvæ, July 11th; pupated, August 11th; imagines, June 1st.

Smerinthus ocellatus. Common at the lamps in Dorking. Larvæ, June 5th; pupated, July 12th; imagines, May 16th and August 9th (second brood).—*S. populi.* Very common at the lamps in Dorking. Larvæ, June 4th and August 5th (second brood); pupated July 2nd and September 11th (second brood); imagines, May 12th and July 24th (second brood).

Dilina tiliæ. Common. Larvæ, June 4th; pupated July 7th; imagines, April 26th.

Macroglossa stellatarum. Seen sparingly at intervals, especially in 1901.

Hemaris fuciformis. (Broad-bordered). One specimen taken at Polesden, June 10th, 1901.

Sesia myopiformis. Larvæ found in an apple-tree in my garden; imagines, July 2nd. It seems a remarkable fact, that every year since first observed in 1902, the imagines have first appeared on July 2nd.

Zygæna filipendulæ. In 1900 and 1905 the pupæ were in countless numbers on the south side of Ranmore; imagines, July 17th. In other years some have been seen, but the species was not at all common.

Hylophila bicolorana. Taken at lamps in Dorking, July 22nd.

Nola cucullatella. Larvæ very common on Ranmore in May and early June; spun up, May 31st; imagines, June 26th.

Endrosa irrorella. Taken on the south side of Ranmore, but never abundant. June 27th.—*E. sororcula.* Taken on the same ground as *irrorella.* June 11th.—*E. deplana.* Beaten from yews on Ranmore. July 19th.—*E. lurideola.* Taken on the same ground as *irrorella.* July 10th.

Gnophria rubricollis. Taken at rest on tree-trunks in the Redlands, Dorking, June 7th.

Hipocrita jacobææ. Very abundant at Polesden. Larvæ swarming on ragwort, and one observed feeding on greater knapweed; pupated, July 22nd; imagines, May 13th.

Arctia caja. Very common at the lamps in Dorking, and larvæ frequently found; spun up. June 20th; imagines, July 11th.—*A. villica.* Very abundant in 1905; other years in fair numbers. Ova deposited, June 10th; larvæ, June 23rd; spun up, May 2nd; imagines, June 9th.

Spilosoma lubricipeda. Very common at the lamps in Dorking. Larvæ, June 27th ; imagines, May 22nd. — *S. menthastri.* Very common at lamps. May 10th.

Hepialus humuli. Taken at the lamps and by dusking. June 10th. —*H. lupulinus.* Taken at the lamps. June 7th.

Zeuzera pyrina. Taken at rest, July 6th ; ova deposited, same day. Larvæ, July 23rd, died.

(To be continued.)

NOTES AND OBSERVATIONS.

Collecting in France. — I shall be greatly obliged if collectors visiting French localities other than the Alps will kindly send me a note of the butterflies captured or observed by them, with dates.—H. Rowland-Brown ; Oxhey Grove, Harrow Weald.

Orthetrum cærulescens in Essex.—On July 22nd, 1900, we took, in Epping Forest, near Chingford, a male specimen of this dragonfly, but we have never obtained another example. We were unable to find any other record of the occurrence of the species in Essex, and it is not even included in Doubleday's generous list of 1871.—F. W. & H. Campion ; 33, Maude Terrace, Walthamstow.

Panorpa germanica.—On June 13th last, I took, near Haslemere, an almost immaculate male of this species. The chief markings are a black tip to each of the wings, and a black spot at the pterostigma. This form of the insect looks very different from the usual one, which is very much more spotted.—W. J. Lucas.

Food of Monopis rusticella.—In the ' Proceedings ' of the Zoological Society for 1896, p. 281, Lord Walsingham observed : " It would be curious to ascertain whether our common *T. tapetzella* has ever been found feeding in the dry casts of owls." . . . . I do not know whether this has yet been recorded, but this year I found some owl's casts containing larvæ, and bred from them a number of specimens of *Monopis rusticella.* — (Major) C. G. Nurse ; Timworth Hall, Bury St. Edmunds.

Tephrosia luridata, aberration.—On May 6th, 1906, I had a nice variety of *T. luridata* (*extersaria*) emerge; it is almost white, the ground colour is a shining white, and the usual markings are a pale buff, only just showing out on the white ground. In general appearance it looks very much like a light-coloured example of *Cabera exanthemata*, but more delicate. It was bred from a number of pupæ I had from Mr. Newman, of Bexley. All the other specimens are normal.—William Daws ; Mansfield, Notts.

Note on the Resting Attitudes of some Butterflies.—I have noticed recently, both near Aldbury (Herts) and in the Wye Valley (Mon.), cases of heliotropism with *Syrichthus malvæ* and *Nisoniades tages* (particularly the latter). When settling on a flower-head they

almost invariably shift their position until the head is pointing away from the sun. I have also noticed that *N. tages* frequently deflects the wings downwards, so that the tips of the primaries are below the body. The costa, too, is curved downwards towards the tip, and this adds to the effect. Concerning *Cœnonympha pamphilus*, I made observations on a number of specimens near Aldbury on June 17th, 1906. This species usually rests with the wings closed, and almost always sits sideways to, and leans away from, the sun, thus allowing the rays to strike the wings at right angles. I also noticed *Gonepteryx rhamni* behave in the same way at Chepstow, but in the case of this species only one specimen was observed.—Philip J. Barraud; Bushey Heath, Herts.

The Van de Poll Collections.—We understand that the Van de Poll collections of Lepidoptera have been purchased and are being brought to England by Mr. Percy I. Lathy. The collection of Rhopalocera is considered to be the finest ever formed of the Dutch East Indian fauna. The series of each species is long, and has been specially selected from many hundred specimens to show any variation. The collection contains a great number of rarities and undescribed species. Among some of the most noteworthy of the former are the hitherto unknown females of *Ornithoptera sumatrana*, *Papilio insularis*, *P. hewitsoni*, and *P. egialea*, and a remarkable hermaphrodite of *Ornithoptera trojana*.

CAPTURES AND FIELD REPORTS.

Dicycla oo *var.* renago in Berkshire. — With reference to the remarks by Messrs. G. L. Cox and J. Brooke (*ante*, p. 128), I thought it would be well to notify that *D. oo* var. *renago* occurs in our district.—W. E. Butler; Hayling House, Oxford Road, Reading, June 19th.

Vanessa antiopa in Hampshire.—In the 'Field,' June 9th, Mr. N. L. Cripps reports capturing a worn hybernated specimen of *V. antiopa* near Lyndhurst on May 19th last.—F. W. Frohawk.

Deilephila (Phryxus) livornica in 1906:—

Cornwall.—I have to record the capture, by the Rev. W. B. Honey, on May 30th, of a very fine specimen of *D. livornica* at Porthgwarra, Cornwall.—(Rev.) J. E. Tarbat; Foxham, Hants.

Devonshire.—I thought it might interest your readers to know that on June 11th last I had given to me a living specimen of *D. livornica*, taken in a florist's shop in Exeter (Rush's) on that day. It was unfortunately much rubbed, and the red of the under wings was faded. Curiously, in September, 1901, I had sent me a much rubbed specimen of *D. celerio*, taken at Wylye, Wilts; so I now have the two "striped hawks," both taken in England, and both much rubbed. — R. V. Solly; 40, Southernhay, Exeter, June 21st, 1906.

Hampshire.—I had a specimen of *D. livornica* brought to me to-day by a farm-labourer, who had found it at rest on grass. I should think

it was in fine condition when caught, but, owing to its having been put into the customary match-box, it is now somewhat rubbed.—Chas. J. Bellamy; Ringwood, Hants, June 1st, 1906.

D. livornica has turned up again here this season. I have taken ten since May 30th, and saw at least ten others. I have also taken seven *Heliothis peltigera*, during same period, flying to flower, but at 8.30 of the evening.—W. G. Hooker; Bournemouth, June 12th, 1906.

Kent.—During the naval manœuvres here last week a fine *D. livornica* was taken at one of the land search-lights, and brought to me alive the next morning. Unfortunately it is rather rubbed through being kept in a tin with cleaning gear. It was taken about 10 p.m. on 13th inst. If the nights had not been so cold probably more insects would have been attracted by the lights, which were running all night. (Lieut.) J. J. Jacobs; 63, Marine Parade, Sheerness-on-Sea, June 17th.

I had a specimen of *D. livornica* brought to me on the 5th inst., which had been found by some workmen just outside of Canterbury. The specimen is in very fair condition, and is now in my collection.—F. A. Small; 95, Westgate, Canterbury, June 16th, 1906.

Surrey.—A good specimen of *D. livornica* was taken just outside the College by one of our boys on June 10th.—H. V. Plum; Epsom College.

Sussex.—On June 8th I took a fine specimen of the "striped hawk" (*D. livornica*) in a ride in a wood near this house. It was taken on the wing just at dusk, when a lantern was hardly necessary. It would appear to be an unusually early appearance for this insect, especially as we are five hundred feet above sea-level, and the season is unusually backward. Other good captures so far this season include *P. leucographa*, *N. trepida*, and *N. chaonia*.—John Comber; High Steep, Jarvis Brook, Sussex, June 14th, 1906.

A good specimen of *D. livornica* was captured inside a window yesterday afternoon (June 6th). Recent winds have been from east and north.—(Rev.) L. H. White; Christ's Hospital, West Horsham, June 7th, 1906.

SOCIETIES.

Entomological Society of London.—*Wednesday, May 2nd*, 1906.—Mr. F. Merrifield, President, in the chair.—Commander J. J. Walker showed fourteen examples of both sexes of *Hystrichopsylla talpæ*, Curtis, the largest of the British fleas, taken in the nest of a field-mouse in a tuft of grass at Grange, near Gosport, Hants, on March 28th last.—Mr. G. C. Champion exhibited living specimens of *Apate capucina*, *Deilus fugax*, a *Cryptocephalus* (*rugicollis*), two species of *Anthaxia*, &c., forwarded by Dr. T. A. Chapman from Ste. Maxime, South France.—Mr. F. B. Jennings brought for exhibition an example of the weevil *Procas armillatus*, F., taken near Dartford, Kent, on April 13th last. This species appears to be extremely scarce in Britain, and, with the exception of a single specimen taken near Chatham by Commander Walker in 1896, and exhibited by him at the meeting of the Society held March 18th, 1896, has not been recorded from this country for a

considerable period.—Mr. M. Jacoby exhibited a box of beetles from New Guinea, including *Æsernia meeki*, Jac., *A. costata*, Jac., *A. gestroi*, Jac., and Cetoniadæ and Lucanidæ from South Africa and Borneo.—Mr. H. St. J. Donisthorpe exhibited specimens of *Hydrochus nitidicollis*, Muls., a beetle not hitherto recorded in Britain, taken in the river Meavy at Yelverton, Devon, in April.—The Rev. F. D. Morice exhibited lantern-slide photographs (from nature) of the female *calcaria postica* in Hymenoptera belonging to divers groups, mostly Aculeates, but including also representatives of the Chrysids, Ichneumonids, and Sawflies. He submitted that, in all the examples shown, the structure of the calcaria themselves (and also of the parts adjacent to them) clearly indicated that their main function was that of an elaborately constructed instrument for toilet purposes. The calcaria in all cases seemed to explain satisfactorily all the structural phenomena presented by them (*e.g.* serrated inner margins, pectiniform rows of spines and bristles, brush-like pilose fascicules, &c.). He should be glad to hear of any observations that might have been made as to the structure and functions of calcaria in insects of other orders, having examined them himself only in the Hymenoptera.—Dr. F. A. Dixey exhibited male and female specimens of the African Pierines *Belenois thysa*, Hopff, and *Mylothris agathina*, Cram. He drew special attention to the fact that the resemblance between these two species, which Mr. Trimen speaks of as "deceptively close in both sexes," applies mainly to the dry-season phase of the *Belenois*, and not to the wet. This, he observed, was well illustrated by the exhibit, which included wet- and dry-season examples of both sexes of *B. thysa*; *M. agathina* showing no seasonal change.—Mr. Edward Meyrick, B.A., F.R.S., contributed a paper "On the Genus *Imma*, Walk. (=*Tortricomorpha*, Feld.)."—Mr. H. Eltringham, M.A., F.Z.S., contributed a paper on "The late Professor Packard's Paper on the Markings of Organisms." In the absence of the author, Professor E. B. Poulton, F.R.S., explained the drift of the paper, and expressed his agreement with the main lines of its argument.

Wednesday, June 6th.—Mr. F. Merrifield, President, in the chair.—Mr. H. St. J. Donisthorpe exhibited specimens of *Lomechusa strumosa*, F., taken with *Formica sanguinea* at Woking on May 26th and 29th last. Only two other British examples are known—one taken by Sir Hans Sloane on Hampstead Heath in 1710; the other found by Dr. Leach in the mail-coach between Gloucester and Cheltenham; and these are included in the British Museum Collection.—Mr. H. J. Turner showed a case illustrating a large number of the life-histories of Coleophorids, notes on which have appeared in the Society's 'Proceedings,' or in the 'Entomological Record.'—Mr. A. H. Jones showed on behalf of Mr. Henry Lupton a few butterflies from Majorca, captured between April 8th and April 20th last. Comparing the specimens with those of similar species from Corsica, also exhibited, they appeared to be smaller; the *Pararge megæra* approached the form *tigelius*; the *Cœnonympha pamphilus* differed somewhat in the under side being darker. Only one moth was seen, *M. stellatarum*. But so far under twenty species only of butterflies have been recorded from the Balearic Islands.—Mr. Selwyn Image showed:—(*a*) A specimen of *Crambus ericellus*, Hb., taken at Loughton, Essex, August 8th, 1899—not previously recorded

from further south than Cumberland; (*b*) two specimens of *Nola confusalis*, H.S., ab. *columbina*, Image, taken in Epping Forest, May 5th, 1906 (the first examples of this aberration were taken at the same locality, May 22nd, 1905, and recorded in the Ent. Rec., July, 1905, p. 188); and (*c*) a specimen of *Peronea cristana*, F., the ground colour of upper wings abnormally black, even more intensely black than in the ab. *nigrana*, Clark—taken in Epping Forest, August 19th, 1905.—Mr. J. H. Keys sent for exhibition the type of *Spathorrhamphus corsicus*, Marshall, from Vizzavona, Corsica. This fine Anthribid was supposed by some coleopterists to have been an accidental importation into the mountainous regions of the island, but was no doubt endemic.—Mr. G. C. Champion remarked that he had taken *Platyrrhinus latirostris* in numbers at the same locality, in the beech and pine forests (*Pinus laricio*) along the line of railway, above the tunnel. —Dr. F. A. Dixey exhibited specimens of African Pierinæ found by Mr. C. A. Wiggins on Feb. 2nd, 1906, settled on damp soil near the Ripon Falls, Victoria Nyanza, and caught, to the number of 153, at a single sweep of the net. Eight species were represented; the examples were all males, and, with one exception, belonged to the dry-season form of their respective species.—Professor E. B. Poulton, F.R.S., communicated some notes on Natal butterflies, which he had received from Mr. G. H. Burn, of Weenen, and exhibited the four individuals of *Euralia wahlbergi*, Wallgr., and *E. mima*, Trim., captured by G. A. K. Marshall, near Malvern, Natal. He then explained Mr. Marshall's latest demonstration of seasonal phases in South African species of the genus *Precis*, the proof by actual breeding that *P. tukuoa*, Wallgr., is the dry-season phase of *P. ceryne*, Boisd. — Professor Poulton further showed three hundred and twenty-five butterflies captured in one day by Mr. C. B. Roberts, between the eighth and tenth mile from the Potaro River, British Guiana, and drew attention to the preponderance of males; also specimens of the Halticid beetle *Apteropoda orbiculata*, Mar., with its mimic Hemipteron, *Haltica apterus*, L., from Stone Wood, Oxford; and of the Staphylinid *Myrmedonia canaliculata*, F., with *Formica rufa* race *rugoides* from South Hinksey, the beetle looking extremely like the ant—both taken by Mr. W. Holland. —The following papers were read:—"Some Bionomic Notes on Butterflies from the Victoria Nyanza Region, with exhibits from the Oxford University Museum," by S. A. Neave, B.A.; "On the Habits of a Species of *Ptyelus* in British East Africa," by S. L. Hinde, illustrated by drawings by Mrs. Hinde, communicated by Professor E. B. Poulton; "Mimetic forms of *Papilio dardanus* (*merope*) and *Acræa johnstoni*," and "Predaceous Insects and their Prey," by Professor E. B. Poulton, D.Sc., F.R.S.; and "Studies on the Orthoptera in the Hope Department, Oxford University Museum. I. Blattidæ," "Notes on a feeding experiment on the spider *Nephita maculata*," by R. Shelford, M.A., F.Z.S.—H. Rowland-Brown, M.A., *Hon. Secretary*.

South London Entomological and Natural History Society.—*April 12th*.—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. L. W. Newman, of Bexley, was elected a member.—Mr. Main exhibited a long piece of Gum Animi from West Africa, and called attention to the numerous insects, chiefly Coleoptera, enclosed in it.—Mr. Edwards, a

number of species of the Nymphaline genus *Megalura* of South America, together with *Brassolis astyra* from Brazil.—Mr. H. Moore, immature examples of two species of Mantis from South Africa, and read notes on their habits. Mr. Edwards gave an account of a European Mantis he had kept alive for some time.—Mr. Adkin, a bred series of *Melanippe fluctuata* from Wantage, with the female parents. The latter were large and strongly marked, while the progeny were small and very ordinary. Mr. Adkin also showed specimens of *Crambus tristellus*, (1) almost albino from Pembroke, (2) dark from Perth, and (3) with two transverse lines from Orkney; all from the Barrett collection.—Mr. Clark, photo-micrographs of bacteria, × 1000.—Mr. Main, a nymph of *Periplaneta americana*, which was about to change to the perfect stage. —Mr. Turner read a paper by Mr. A. J. Croker and himself on a number of species taken by the former in Assiniboia, Canada, and exhibited among other species *Pontia protodice*, *Argynnis lais*, *Brenthis bellona*, *Colias eurytheme* and vars., *C. philodice*, *Erebia epipsodea*, *Satyrus alope* var. *nephele*, *Lycæna antiacis*, *L. dædalus*, *Cœnonympha pamphilus*, *Phyciodes ismeria*, &c.

April 26th.—The President in the chair.—Mr. W. Payne, of Clapham, Mr. P. Brown, of Balham, and Mr. D. Peyler, of Clapham, were elected members.—Mr. Kaye, the living larvæ of *Orgyia gonostigma*, and gave notes on their hybernation.—Mr. Moore, a number of species of Lepidoptera from Natal, including *Daphnis nerii*, *Agrius convolvuli*, *Hippotion celerio*, &c.—Mr. Edwards, a box of Lepidoptera from British North Borneo, and called attention to several species much resembling those of Great Britain.—Mr. Adkin, a number of series of *Aglais urticæ*, to point out the lines of variation shown by the species. In doing so he referred to the broods and series brought by Messrs. Harrison, Main, Turner, and others. Messrs. Harrison, Adkin, Bellamy, Kaye, Sich, Edwards, West, and Ashby then made remarks on the season to date.

May 10th.—The President in the chair.—Mr. Rayward exhibited series of *Hybernia marginaria* (*progemmaria*) from Liverpool and Surrey. The former were all dark, the latter had some of the females equally dark, but the males were only moderately dark.—Mr. Sich, living imagines of *Lithocolletis sylvella* from maple leaves collected at Cookham, in October, 1905, and kept in a flower-pot in the open.—A large number of lantern-slides were exhibited, (1) by Mr. Main, larvæ of *Agrotis ashworthii*, *Nisoniades tages*, *Apatura iris*, *Lucanus cervus*, and the pupa of a sawfly; (2) Mr. Lucas, for Mr. Hamm, illustrative of protective resemblance in *Tephrosia biundularia*, *T. luridata*, *Rumia cratægata*, *Cidaria miata*, *Pararge egeria*, &c.; (3) Mr. Tonge; (4) Mr. West (Ashtead); (5) Mr. Dennis; (6) Mr. F. Noad Clark.

May 24th.—The President in the chair.—Mr. Main, a nymph of the European *Mantis religiosa*, sent him by Dr. Chapman from Ste. Maxime.—Mr. Sich, an aberration of *Lithocolletis pomifoliella*, in which the median streak was connected with the first dorsal spot.—Mr. Carr, living larvæ of *Geometra vernaria*, some of which were still in their hybernating skins.—Mr. Kaye, living larvæ of *Thecla pruni*.—Mr. Tonge, a living specimen of *Eupithecia consignata*, just taken on Hayling Island.—Mr. Newman, a long bred series of *Brephos notha* from Worcester; *Polyommatus corydon* var. *fowleri*; an intermediate

form of *Colias edusa*; an extremely dark uniform form of *Ematurga atomaria*; a somewhat streaked *Chrysophanus phlæas*; results of interbreeding *Spilosoma lubricepeda*; and a fine series of bred *Notodonta trepida*.—Dr. Chapman, larvæ of *Thecla rubi*.—Hy. J. Turner, *Hon. Report Secretary*.

RECENT LITERATURE.

The Butterflies of the British Isles. (Wayside and Woodland Series.) By Richard South, F.E.S. London: F. Warne & Co.

There seems to be no end to books on butterflies, and especially on British butterflies. Those we have seen are good, bad, and indifferent, with perhaps some doubt as to the goodness. We are anxiously expecting to see Mr. Frohawk's, which we have reason to hope will be very good without any qualification. The one before us is perhaps the most excellent of its kind we have seen. It does not pretend to be an exhaustive scientific account of our butterflies, but is just the book that will supply the enthusiastic tyro with the information that he wants in a form he may depend upon.

The introductory matter is necessarily short, but deals clearly with the points it is desirable the young collector should know; and the account of each species deals similarly with the salient facts of each stage of the insect. It would be difficult to point out any errors of fact into which the author has fallen; and as to matters of opinion, we have met with nothing to disagree with, though we doubt very much, for instance, as to *Pyrameis atalanta*, whether he is right in considering this to be an immigrant in the same sense that *P. cardui* and *Colias edusa* are, though, assuming a desire to confute him, we cannot for the moment recollect any definite observation of its hybernating successfully in Britain, and can only rely on its being a fairly constant inhabitant of a very large part of our islands, and not varying to the extent they do between swarming and complete absence. The feature of the volume is the excellent series of plates. All the species are figured in both sexes, both surfaces, and often a good selection of varieties. The reproductions are apparently by a three-colour process, and are eminently successful. These processes always leave room for some criticism, but there is here as great a success as in many a more ambitious and expensive volume. The plain figures of the egg, larva, and pupa are especially to be noticed; they are a most valuable part of the account of each species, and are to be commended for their completeness, and for the most part for their accuracy and for the natural effect they produce, though without colour. We should have liked the source of these all to have been mentioned, as a guide to the young collector as to which he might thoroughly rely on. So far as we can guess, those that we find most thoroughly satisfactory are drawn by the artist from the life, or from good photographs; whilst those copied from previous figures vary immensely in merit. The eggs of the blues are very good, and the differences between the species are usually determinable. The larva of *atalanta* strikes us as having been done from life, but the example was too close to pupation for the pur-

pose ; the result is, however, a good representation of the insect at one stage of its existence.

We should have liked the proper names of each species to have been at least as prominent as the English names. Doubtless this is a feature in which our author has had to conform to the real or supposed requirements of the public he is addressing; and since there obviously does exist a public that makes such a book possible, we can only accept with them their admitted prejudices.

Taking the book altogether, and making every allowance for inevitable inequalities, we do not know any work—not excepting the most expensive—yet issued on British butterflies that gives so full and accurate an account of them in all their stages. Indeed, we wonder how such a book can be offered at the price. It is excellently got up ; the beautiful photograph, inside the cover, of *Cœnonympha pamphilus* at rest is almost worth the money.

T. A. C.

Flies and Ticks as Agents in the Distribution of Diseases. (From 'The Proceedings of the Association of Economic Biologists.') By F. V. Theobald, M.A. 1905. Pp. 10.

A very useful paper, giving a synopsis of diseases having a similar origin to malaria, and of the small animals—flies, ticks, &c.—concerned in the propagation of such diseases.

W. J. L.

Report of Economic Zoology (1905). (South-eastern Agricultural College, Wye.) By F. V. Theobald, M.A.

In this particularly interesting and useful report of more than one hundred and twenty pages, with a very large number of illustrations contained in no less than forty-four figures, we see the result of a year's work that falls on the shoulders of Mr. Theobald at the important centre of agricultural study at Wye in Kent. Many of the very numerous foes (and friends), considered more or less fully according to circumstances, are insects; but we find besides, parasitic worms, molluscs, mice, and voles. There are also a few answers to extra-British enquiries. This notice is somewhat late in appearing, and we are looking forward to a new report of equal interest.

W. J. L.

A Preliminary List of Durham Diptera, with Analytical Tables. By the Rev. W. G. Wingate. Pp. i–vi, 1–416 ; plates i.–vii. Additions and corrections, 8 pp. London : Williams & Norgate. Newcastle-upon-Tyne : F. & W. Dodsworth. 1906.

This very useful work forms volume ii. (new series) of the 'Transactions' of the Natural History Society of Northumberland, Durham, and Newcastle-upon-Tyne. The title it bears very inadequately conveys the actual scope and general value of the book. Practically it is an excellent guide to British Diptera, with the addition of localities for the six hundred odd species which the author had so far observed in Durham, and chiefly in the southern half of the county. There are numerous tables of genera and species, and these, in conjunction with

the Fly Chart on plate i., and description thereof on pp. 8–21, also other structural details on plates ii.–vii., should be exceedingly helpful to anyone desirous of taking up the study of this somewhat difficult Order.

Report of Work of the Experiment Station of the Hawaiian Sugar Planters' Association. Bulletin No. 1. Parts v. and vi. Leaf Hoppers and their Natural Enemies. Honolulu. Nov. 13th, 1905.

Part v. of this interesting Bulletin, of which parts i.–iv. were noticed Entom. xxxviii. 288, comprises pp. 165–181, with plates ix. and x., is by Mr. F. W. Terry, and refers to the Forficulidæ, Syrphidæ, and Hemerobiidæ. In part vi. (pp. 187–205, plates xi.–xiii.) the Mymaridæ, Platygasteridæ are dealt with by Mr. R. C. L. Perkins.

OBITUARY.

It is with very sincere and deep regret that I announce the death of my esteemed and valued friend Mr. F. G. Cannon, which occurred at his residence at West Hampstead, on June 7th last, at the early age of thirty-seven. He was the youngest son of Major Osborne Burwell Cannon, late of the 97th Regiment.

During the past few months his failing health gradually became more serious, which compelled him to give up his business duties as member of the Stock Exchange, and finally his case was pronounced hopeless, as rapid consumption set in a few weeks before passing peacefully away.

For seven years he was connected with the London Scottish Volunteer Regiment, in which he ranked high as a first-class marksman. Latterly, up to the time of his illness, he was in the Hon. Artillery Company Volunteer Regiment.

The whole of his leisure was given up to his favourite studies of ornithology and entomology. In both these branches he was a keen and accurate observer; also a successful collector, not only with the net, for he was expert with both shot-gun and rifle alike, being a good all-round sportsman, and endowed with remarkable perseverance and ability as a field naturalist. It is not the fortune of all entomologists at home to possess an almost complete collection of the British butterflies captured by their own hands; with the exception of *Lycæna acis*, *Vanessa antiopa*, *Argynnis lathonia*, *Pieris daplidice*, and *Anosia plexippus*, he had taken all the British species. It was his pleasure to make distant journeys, if only for a single day's collecting, in some remote district where a certain species might be met with on the wing; by so doing he made the acquaintance of all our rarer resident species in their native haunts, and many times I shared the pleasure with him.

His many friends found in him companionship of the highest qualities; his word, deed, and generosity were of the staunchest and noblest character. The great loss of his sincere friendship will be keenly felt by a very large circle of friends.

F. W. F.

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ON A FEW ORTHOPTERA COLLECTED IN SOUTHERN DALMATIA AND MONTENEGRO IN 1900.

BY MALCOLM BURR, B.A., F.E.S., F.L.S., F.G.S.

HAVING recently come across a few notes on some Orthoptera taken in Dalmatia and Montenegro in the summer of 1900, it occurred to me that they might be of sufficient interest to repay publication, if only for the sake of the localities, as little collecting is done in those countries. Want of time prevents me from working out all the material that I have been able to get together on the Orthoptera-fauna of the eastern shores of the Adriatic, but I hope at a later date to be able to make a more satisfactory contribution to our knowledge of the insects of these interesting countries.

As the neighbourhood is comparatively little known to British entomologists, the following notes on the localities may be of interest.

In Dalmatia, Traù is a small but ancient port in the northern part of the coast, and Sebenico is an important naval base not far from it; these two places were only visited during the brief call of the Austrian Lloyd steamer bound for Cattaro. The Bocche di Cattaro is the famous inlet of the sea in southern Dalmatia, recalling the finest scenery of the Scandinavian coast. Budua is a small walled town south of the Bocche. Castellastua is a small village some five hours' ride further south along the coast; Spizza is a tiny village at the extreme south of Dalmatia; it marks the limit of Austrian territory, for a few minutes' walk further south brings the traveller to the Montenegrin portion of the coast-line. Prisdan is a collection of cottages on the coast, which act as the port of Antivari, an important town about two miles inland; the latter has gained in importance since its annexation to Montenegro, and is the chief port of the principality. The Sutorman is a wooded pass over the Rumija range of mountains, which separate the Lake of Scutari from the sea. Podgoritza is an important commercial town on the east of the

same lake, ceded by Turkey to Montenegro in consequence of the Berlin Treaty; as its name implies, it is situated in the alluvial plain of the Zeta, at the foot of the savage Albanian Alps. Spuzh is an ancient stronghold in the valley of the Zeta, a few hours' journey east of Podgoritza. Dukle is the modern name for the ancient Dioclea, now a scattered heap of ruins, formerly the capital of the province of Prevalitana, famous as the birthplace of Diocletian, and the home of the anonymous priest to whom we are indebted for our scanty annals of the earliest Slav settlers. Danilograd is a modern town springing up in the heart of Montenegro, a few hours' journey north-east of Spuzh, on the road to Nikshich. Cetinje is the miniature capital of Montenegro, and Njegush, a little town half-way between Cetinje and the coast, birthplace of the reigning Prince of Montenegro.

These insects were taken on a trip that was undertaken more for pure travel than for entomology, which accounts for the somewhat meagre list of species included in these notes, of which the Phaneropteridæ and Decticidæ are the most interesting. No prolonged stay was made in any one locality except at Cetinje; the various other places were visited in passing on a tramp through the interior and up the coast.

The following are the dates at which the different localities were visited:—

Traù and Sebenico, July 27th; Bocche di Cattaro and Njegush, July 29th; Cetinje, July 30th, and various days early in August; Sutorman Pass, July 31st; Prisdan, August 1st; Spizza, August 2nd; Castellastua, August 3rd; Budua, August 4th; Spuzh, Dukle, and Danilograd, August 7th and 9th.

Ectobia livida, Fabr.—On the Sutorman Pass; one male.

E. lapponica, Linn.—On the Sutorman Pass; one female.

Acrida nasuta, Linn.—Common throughout the lowland country; at Traù, Sebenico, Spizza, Spuzh, and Danilograd.

Stenobothrus petræus, Bris.—This tiny grasshopper was abundant round Cetinje.

Stauroderus bicolor, Charp.—Abundant round Cetinje.

S. vagans, Fieb.—At Dukle.

Omocestus rufipes, Zett.—At Cetinje; not numerous.

Chorthippus dorsatus, Zett.—At Dukle and Spuzh.

C. pulvinatus, Fisch. de W.—At Antivari, Prisdan, Dukle, and Cetinje, but not very numerous.

C. parallelus, Zett.—Common at Cetinje, Sutorman, and Prisdan.

Arcyptera brevipenne, Br.—A few on the Sutorman Pass.

Epacromia strepens, Fabr.—Common on the low ground, at Traù, Dukle, Danilograd, and Prisdan.

Œdipoda cærulescens, Linn.—Common at lower elevations, at Spizza, at Cetinje, and on the hills above Antivari.

O. miniata, Pall.—On the higher ground, as a rule; at Sebenico and Danilograd.

Œdaleus nigrofasciatus, De Geer.—A few at Antivari.

Pachytylus danicus, Linn.—At Traù, Castellastua, and Prisdan.

Sphingonotus cærulans, Linn.—Abundant on the beach at Prisdan.

Acrotylus patruelis, Strum.—At Prisdan.

Acridium ægyptium, Linn.—At Prisdan, and near Antivari.

Podisma alpinum, Koll.—Common on the Sutorman Pass.

Platyphyma giornæ, Rossi.—Common at Dukle, round Cetinje, and in the Bocche.

Caloptenus italicus, Linn. — Common enough; at Danilograd, Spuzh, Sutorman, and in the Bocche.

Tettix subulatus, Linn.—A few at Prisdan.

T. bipunctatus, Linn.—Numerous round Cetinje.

T. depressus, Bris.—Numerous round Cetinje.

Pœcilimon ionicus, Koll.—One male and two females at Castellastua, and two males and a female at Prisdan.

P. affinis, Fieb.—A pair on the Sutorman Pass.

Barbitistes ocskayi, Yers.—A few on the Sutorman Pass and at Prisdan.

Tylopsis liliifolia, Serv.—Common nearly everywhere; at Prisdan, Castellastua, Sebenico, Traù, Sutorman, Antivari, and Spuzh; the variety *margineguttata* occurred at Spizza.

Conocephalus nitidulus, Scop.—A few at Danilograd and Prisdan.

Rhacocleis discrepans, Fieb.—Widely spread, and not rare; common on the hillsides round Cetinje; also at Dukle, Prisdan, and Antivari; also at Traù.

Pachytrachelus striolatus, Fieb.—A few on the Sutorman Pass, and some immature specimens at Njegush.

P. frater, Br.—A pair at Dukle.

Platycleis grisea, Fabr.—A female at Njegush.

P. vittatus, Charp.—A few at Dukle and Prisdan.

P. sepium, Yers.—At Traù, Castellastua, and Prisdan; it is very active, and hard to catch; it seemed to occur most frequently at the foot of stone walls in the blazing sun; the great power of its long hind legs enables it to make trèmendous leaps.

Olynthoscelis chabrieri, Charp.—This magnificent insect was numerous on thick clusters of thorns near Castellastua; it sits on the topmost twigs, and, being as nimble as it is wary, it is very difficult to capture.

O. fallax, Fisch.—On the hills above Antivari.

O. femoratus, Fieb.—A few on the Sutorman Pass, at Prisdan, Castellastua, and Danilograd.

O. dalmaticus, Krauss.—This species is even finer and more active than *O. chabrieri*, though less brightly coloured; it makes terrific springs, and frequently settles on the bare trunks of trees. I was never able to catch one with my net, but my Montenegrin servant succeeded in taking two with his bare fingers; they require some care in handling, as they are capable of inflicting a rather severe bite with their powerful mandibles.

Decticus verrucivorus, Linn. — Fairly numerous at Danilograd, but in these southern countries generally replaced by the following.

D. albifrons, Fabr.—This is a splendid insect. It is abundant amongst dry grass and shrubs; its stridulation is loud and prolonged, recalling that of *Locusta viridissima*, but even more strident. It is not difficult to stalk down, with care and patience.

Ephippigera sphacophila, Krauss.—Fairly numerous, crawling about shrubs in hot valleys. In the Bocche di Cattaro, at Castellastua, and Prisdan.

Œcanthus pellucens, Scop. — On the Sutorman, at Cetinje and Spuzh.

Arachnocephalus vestitus, Yers.—One female of this curious little cricket at Budua.

SOME POINTS IN THE LIFE-HISTORY OF *LYCÆNA ARION*.

By The Honourable N. Charles Rothschild.

It is with no small interest that entomologists have read Mr. Frohawk's interesting notes in the July number of this journal on the life-history of *Lycæna arion*. There are, however, several points which seem to require further elucidation, and which it is hoped Mr. Frohawk will investigate and ultimately settle.

From Mr. Frohawk's latest notes it would appear that the larva of *L. arion* only moults three times. This habit is unusual in the genus *Lycæna*, though present among several species of the genus *Thecla*. We do not think that Mr. Frohawk has completely proved this point, though the evidence he submits certainly points in this direction.

On a former occasion Mr. Frohawk has recorded that a larva of *Lycæna arion* (when in the autumn it refused to eat any more thyme) fed for many weeks upon a certain food he found apparently suitable to it. This would lead one to believe that the young larvæ do not hybernate at once after quitting the thyme, but are fed in the ants' nests; and in connection with this it may be mentioned that the larvæ of the ant (*Lasius flavus*) live through the winter, and are probably fed to some extent during the winter by the ants in the nests, a fate possibly shared with them by the young *arion* larvæ.

The larvæ of *arion*, however, may not be fed by the ants, but may feed on the vegetable refuse, &c., in the nest.

Finally, why is it so difficult to find these larvæ? The perfect insects are so numerous in North Cornwall that one would imagine that the larvæ must be quite common in their habitat, and this Mr. Frohawk did not find to be the case. Has the larva of *Lycæna arion* some curious method of concealment?

148, Piccadilly, London, W.: July 17th, 1906.

ON THE RECENT ABUNDANCE OF *PYRAMEIS CARDUI*, *PLUSIA GAMMA*, AND *NOMOPHILA NOCTUELLA*.

By Robert Adkin, F.E.S.

There can be no doubt as to the abundance of *Pyrameis cardui* in England during the spring of this year, but when and where the species was first seen, or indeed any details of the visitation, appear to be wanting, and the phenomenon is thus shorn of much of its interest. My own experience in the matter is but slight, and at best imperfect, owing to force of circumstances. I, however, give it for what it is worth; but many observers who live in country places, and are thus able to be in constant touch with what goes on around them, and habitually note the manners and ways of even our common species, could doubtless throw a good deal of light on the subject. Up to June 1st I had been constantly in London, and had therefore little chance of seeing whether *cardui* was with us or not; but on the evening of that day I arrived in Eastbourne. It was a very wet evening, and the following morning was cloudy and dull; the afternoon, however, came out bright, and while walking home along the parade I saw an evident Vanessid, which I took to be *cardui*, fly wildly up the bank which separates the parade from the roadway and disappear over the top.

The 3rd was a brilliant day, and leaving home directly after breakfast for a morning on the downs, I had to pass the long slopes that form the front of the cliffs towards the sea. In places these were a blaze of yellow blossom, owing to the bird's-foot trefoil (*Lotus corniculatus*), horseshoe vetch (*Hippocrepis comosa*), and kidney vetch (*Anthyllis vulneraria*), which here grow in huge masses, being at the height of their flowering. Crowds of *cardui* were feeding on the latter, but the *Lotus* and *Hippocrepis* appeared to offer no attraction to them. As the butterflies sat feeding on the flowers with the full sunshine upon their extended wings, the majority of them looked as though they were in the most perfectly fresh condition; but on capturing and examining a number of them, this was found to be by no means the case. Not only were the colours under closer inspection seen to be more or less faded, but the fringes showed very decided signs of wear, suggesting that the insects had been on the wing for a considerable time, yet very few of them showed any signs of mutilation.

In the adjacent "hollows" on the downs, *Plusia gamma* was simply swarming among the grass which here grows to perhaps a foot in height, and on the rougher ground *Nomophila noctuella* darted out of the tufts of scrubby grass in considerable numbers.

Several *gamma* also came to light in the house on the evening of this day.

The morning of the 4th was dull, but the sun came through by midday. During the afternoon I again visited the flowery slopes, and found *cardui* still feeding on the *Anthyllis*, but in smaller numbers than on the previous day, and by the 6th only a stray one or two could be found there, although the weather continued gloriously fine. But from this time up to the 21st, when I left the neighbourhood, wherever I went through the surrounding country for many miles round the species was seen, but only in very small numbers, seldom more than one or two at a time.

The disappearance of *gamma* was even more marked, as, although I was frequently over the same ground where I had found it so abundantly on the 3rd, it was rarely that even one was seen, except on the 17th, when perhaps half-a-dozen were noted during a long morning's collecting, and no more came to light at night. *Noctuella* was again seen on two occasions only, namely, a single individual each on the 10th and 17th.

The slopes where *cardui* was so abundant face almost due east. The prevailing wind when I reached Eastbourne was westerly, therefore blowing off the land, and I understand had been so for some days previously to my arrival; but it had not been stable, often shifting for a few hours or falling calm. On the morning of the 4th it veered into a light easterly sea breeze, and remained so for several days. Of the exact conditions of wind and weather prevalent at the time when the insects first became so abundant on the slopes facing the sea, I have therefore unfortunately no very definite record, but it will be noted that it was on the wind becoming permanently east that the dispersal of the insects that had congregated on the coast commenced.

The foregoing might conveniently be put into tabulated form, thus :—

Locality.—Eastbourne, Sussex coast.

Period of Observation.—June 2nd to 21st, 1906.

Species.—*Pyrameis cardui*, June 3rd, locally abundant; 4th, locally common; 5th to 21st, generally distributed sparingly.

Species.—*Plusia gamma*, June 3rd, locally abundant; 4th to 17th, very sparingly.

Species.—*Nomophila noctuella*, June 3rd, locally very common; 4th to 17th, rarely.

A number of such brief tables got together would, without doubt, throw light upon a much discussed but none the less interesting subject.

Lewisham: July, 1906.

NOTES ON THE VEGETABLE CATERPILLAR OF NEW ZEALAND.

By Alfred Philpott.

At a meeting of the South London Entomological and Natural History Society, held on Oct. 26th, 1905, there was exhibited by Mr. Step a larva of the New Zealand vegetable caterpillar (*Hepialus virescens*), and the fungus (*Cordiceps robertsii*) which attacked it.

This insect-vegetable combination never fails to arouse interest, whether the beholder be a trained entomologist or an ordinary observer without any special predilection for the study of insects. It is unfortunate that but little is known of the caterpillar and its parasitic foe, still more unfortunate that several errors have crept into the little we know of its life-history. In almost every account of this curious abnormality it is stated that the insect is extremely rare, that it is found only under the rata-tree (*Metrosideros*), and that the caterpillar is the larval stage of the handsome green and white moth (*Hepialus virescens*). These three statements are all contrary to fact. The caterpillar has been found practically throughout New Zealand; in some cases—for instance, where alluvial gold-mining has been carried on—in great numbers. The dead and dry caterpillar is probably often overlooked, bearing as it does, even with the fungus-spike attached, a close resemblance to a fragment of a dead root. With regard to the larva's invariable association with *Metrosideros*, this is so far from being the case that in several districts where the larva has been commonly met with, the rata-tree is unknown. As to the moth into which the caterpillar would in the ordinary course of events develop, Mr. G. V. Hudson has pointed out ('New Zealand Moths and Butterflies,' p. 132) that the supposition that *H. virescens* is the imaginal form is certainly erroneous, as the larva of that species lives in stems of trees, and never goes underground, even to pupate, while the larva of the vegetable caterpillar is subterranean in its habits. Mr. Hudson suggests *Porina mairi* in place of *H. virescens*, but the extreme rarity of this moth renders it improbable. The type of *P. mairi* was discovered by Sir Walter Buller thirty-nine years ago, and I do not think that a second example has yet been brought to light. It is, I think, more probable that *Porina dinodes* will turn out to be the correct species. No other moth in this district (Southland) is large enough to warrant the assumption that its larva may be the host of the fungus. When full grown the larva of *dinodes* is nearly four inches long, and inhabits a tunnel driven in rather an oblique direction to a depth of fifteen to twenty inches. A comparison of fungus-

attacked larvæ with living larvæ of *P. dinodes* found within a few yards of each other, shows that the two are very similar, if not identical. It is of course possible—as Mr. Hudson suggests in a letter to me—that more than one species is attacked, and that the same species may not be selected in the North Island as in the South.

Underwood, Invercargill, New Zealand.

A NEW SPECIES OF *PSEUDAGENIA* FROM AUSTRALIA.

By P. Cameron.

Pseudagenia australis, sp. nov.

Black; the antennæ orange-yellow, the apical two or three joints infuscated above; a narrow line on the lower inner orbits, commencing opposite the antennæ, where it is united to a line of similar width, which goes round the sides and apex of the clypeus; mandibles yellowish testaceous from shortly beyond the middle to the teeth. Palpi black, paler at the apices of the joints, densely covered with short white pubescence; the anterior tibiæ are brownish in front; the four anterior calcaria black, the posterior white, narrowly black at the base; the longer one extends to shortly beyond the middle; wings clear hyaline; a narrow brownish, not very distinct, cloud along the transverse basal and the transverse median nervures; there is a cloud in the base of the radial cellule, in the second cubital, and between the recurrent nervures in front. ♂. Length, 9 mm.

Eyes slightly but distinctly converging above; the ocelli in a triangle, the hinder separated from the eyes by about one-half more than they are from each other. The eyes at the top are separated by about the length of the pedicle and third antennal joint united. Apex of clypeus broadly rounded. Face and clypeus densely covered with silvery pile, the cheeks less densely with long silvery hair. Temples roundly narrowed. There is a narrow interrupted furrow down the front. Pronotum roundly narrowed from the apex to the base; in the middle it is about two-thirds of the length of the mesonotum. The third abscissa of the radius is as long as the basal two united; the first recurrent nervure is received shortly beyond the middle, the second near the apex of the basal fourth of the cellule; the transverse median shortly beyond the transverse basal; the accessory in the hind wings shortly behind the cubitus. The first abdominal segment is long, becoming gradually wider towards the apex, where it is more than twice the width of the base; it is distinctly longer than the second segment, which is as wide at the apex as it is long; the segments in fresh examples are banded with silvery pubescence. Metanotum shagreened. The apices of the wings are slightly infuscated. The labrum appears to be obscure testaceous.

Allied to *P. fusciformis*, Sauss. Judging from Saussure's figure of that species, the present has both the temples and pronotum more largely developed than in *P. fusciformis* or *P. novaræ*, Sauss. Orange-yellow antennæ appear to be not uncommon with Australian Pompilidæ.

NEW AMERICAN BEES.—II.

By T. D. A. Cockerell.

Perdita jonesi, n. sp.

Runs in my tables to *P. octomaculata* and *affinis*, and is very closely allied to them, differing as follows:—

♀. Length, 5½–6 mm.; head and thorax dark blue-green, abdomen brown-black, with oblique chrome-yellow marks on sides of first four segments. It is a little smaller than *octomaculata*, the abdominal markings are smaller, the prothorax is without yellow spots, and the tubercles are either all dark or with minute yellow dots; the tegulæ are smaller, and light reddish brown instead of hyaline with a yellow spot; the wings are smoky and iridescent, with dark (solid brown) stigma and nervures; the outer border of the third discoidal cell is longer, and the marginal cell seems a little longer; the yellow of the front legs is reduced; the face is narrower, the black bars on the clypeus are much heavier, and the lateral face-marks are reduced, being subpyriform, pointed above. From *P. affinis* it is readily known by the longer and narrower marginal cell, the chrome-yellow abdominal spots, the unspotted prothorax, and the smaller lateral face-marks.

♂. Length scarcely 5 mm.; lateral face-marks rounder and less pointed above; abdomen spotted only on second and third segments. Runs in my tables to *P. affinis*, but the face-marks would agree better with the female than the male of that species, and even for that sex the lateral face-marks are much too small, and the black on the clypeus is much too heavy. The anterior femora, instead of being entirely yellow in front, are yellow only at the knees, while the middle and hind femora and tibiæ are not striped with yellow as they are in *affinis*.

♂, var. *a*. Similar, but the abdomen has yellow (reddened by cyanide in type) spots on the first five segments, the tubercles have a yellow spot, the lateral face-marks are much larger, the clypeus is yellow without well-defined black bars, and there is a subquadrate yellow supraclypeal mark. There are even minute dots representing the dog-ear marks. The knees are all yellow, and the anterior and middle tibiæ have heavy yellow stripes.

Hab. Rosser, Texas, June 7th, 1905; female (= type) and male taken by Mr. F. C. Bishopp at flowers of *Monarda citriodora*, and female and male, var. *a*, taken by Mr. C. R. Jones at flowers of *Parosela* (?). The male var. *a* may possibly be a distinct species, but the female taken with it agrees with the

other female. The species is quite distinct from *P. monardæ*, Viereck.

Perdita dallasiana, n. sp.

♂. Length just over 4 mm.; head and thorax rather yellowish green, marked with yellow; thorax, upper part of head, and cheeks conspicuously though not densely hairy; head round, cheeks normal; face entirely pale dull semipellucid yellow up to level of antennæ (this also including labrum, and mandibles except the extreme tip, which is reddish), the light colour having a broad but short angular projection upwards in the middle line, and on each side meeting the orbital margins at an angle of perhaps 50°, the apical point, however, sending a line upwards, which diverges a little from the eye; cheeks, except the upper part, yellow; antennæ light yellow beneath and dark above; front dullish; prothorax light yellow with a green transverse band, which reaches the hind margin for a short distance in the middle line; mesothorax rather shiny, the median groove very distinct; pleura with two yellow marks, one just behind the tubercles, and a larger transverse one lower down; legs very light yellow, marked with very dark brown; all the femora have large marks behind, as also do the tibiæ; tegulæ pellucid; wings very iridescent, with brown nervures, the stigma narrowly margined with brown; marginal cell ordinary; third discoidal cell weak; first five abdominal segments with broad dull yellow entire bands on a dark brown ground; those on segments two and three bend abruptly backwards at the sides, leaving a brown triangular antero-lateral corner on each side of the segment, and preventing the brown from reaching the lateral margins posteriorly; on segments four and five the lateral backward processes are wanting, and so the bands end some distance from the lateral margins; segments six and seven entirely yellow; ventral surface of abdomen entirely yellow, rather inclining to orange. Runs in my tables to *P. hirsuta*, Ckll., though the hair of the front, while arranged as in *hirsuta*, is not so conspicuously abundant. It may be known from *hirsuta* by the yellow line extending upwards at the sides of the face, the greater amount of yellow on cheeks, the marks on pleura, the colour of the hind legs, &c.

Hab. Dallas, Texas, on *Helianthus*, July 13th, 1905 (W. W. Yothers); also a specimen with the marking of the abdomen a little different, from Rosser, Texas, June 7th, 1905 (C. R. Jones).

Perdita xanthismæ sideranthi, n. subsp.

♀. Runs in my table (Proc. Phila. Acad. 1896) to *P. austini*, but is not related to that species. The form with a supraclypeal mark runs near *P. stolleri*, but differs by the higher clypeus, much duller mesothorax, &c. It differs from true *xanthismæ* as follows: dog-ear marks absent; supraclypeal mark absent, or rarely represented by a narrow transverse band; abdomen dark brown or practically black, with broad cream-coloured bands on segments two to five, these bands notched in the middle posteriorly; venter darker.

This certainly looks like a distinct species, but the abdomen is very variable, and the lightest specimens do not differ materi-

ally from the darkest from Goldthwaite, at flowers of *Xanthisma*. The wings, hairy thorax, &c., are the same.

Hab. Ennis, Texas, Sept. 27th, 1905; taken by F. C. Bishopp at flowers of *Siderantlus rubiginosus*—seven specimens. Also two taken by J. C. Crawford at Handley, Texas, Aug. 3rd, 1905, at flowers of *Isopappus divaricatus*.

Flowers visited by Perdita.

I have just received from Mr. Crawford the names of some of the flowers upon which the Texas species of *Perdita* were caught. The flowers were identified at the Department of Agriculture in Washington.

Perdita bishoppi and *P. cambarella* were at flowers of *Heterotheca subaxillaris*. *P. cambarella* is evidently close to *P. mellina*, which visits the *Heterotheca* in Arizona. The ornamentation of the male abdomen is practically the same in both, but the face-marks differ conspicuously.

P. jonesi was taken at flowers of *Monarda citriodora*; but *P. jonesi*, var. *a*, was from *Petalostemon multiflorus*.

At Barstow, Texas, July 22nd, Mr. Crawford took a variety of *Perdita verbesinæ* at flowers of *Verbesina encelioides*.

Boulder, Colorado: April 30th, 1906.

NEUROPTERA TAKEN IN FRANCE BY DR. T. A. CHAPMAN IN 1905 AND 1906.

By W. J. Lucas, B.A., F.E.S.

Dr. Chapman has given to me two small collections of Neuroptera, taken casually in France in July–August, 1905, and April–May, 1906, which contain the following insects:—

Lautaret, Hautes-Alpes, August 1st–10th, 1905.—*Æschna juncea*, one male, two females (dragonfly); **Dictyopteryx alpina*, one (Perlid); *Hemerobius quadrifasciatus* (brown lacewing).

Larche, Basses-Alpes, July 21st–30th, 1905.—**Rhyacophila vulgaris*, four males; **Drusus discolor*, one female; **Potamorites biguttatus*, one male (caddis-flies).

Hyères, April 2nd–18th, 1906.—**Sympycna fusca*, four males, three females; **Orthetrum brunneum*, one teneral male; *Brachytron pratense*, two males; *Sympetrum striolatum*, three males, one female, all teneral (dragonflies).

Gapeau, April 14th, 1906.—*Tinodes wæneri*, thirteen (caddis-fly).

S. Maxime, April 20th–May 10th, 1906.—*Pyrrhosoma nymphula*, one male (dragonfly); *Nemoura variegata*, two (Perlid); *Mesophylax aspersus*, one (caddis-fly).

Non-British species are marked with an asterisk (*); *M. aspersus* is probably only an accidental introduction into the British fauna. Mr. K. J. Morton has been good enough to assist in the identification.

Kingston-on-Thames.

A NEW GENUS AND FIVE NEW SPECIES OF ICHNEUMONIDÆ FROM AUSTRALIA.

By P. Cameron.

CRYPTINÆ.

PHYGADEUONINI.

Gavrana, gen. nov.

Areolet 4-angled, the nervures uniting in front; the cubitus obsolete beyond it. Disco-cubital nervure unbroken. Transverse basal nervure interstitial. Transverse cubital nervure in hind wings broken far below the middle. Scutellum roundly convex, broader than long; its sides stoutly keeled. Metanotum regularly areolated; the areola more than twice longer than wide, rounded at the base, transverse at the apex, which is narrower than the base; the spiracles small, twice longer than wide. Apex of clypeus transverse; labrum projecting. Mandibles bidentate; the upper tooth much longer than the lower. Abdominal petiole long and slender. The basal joints of the antennæ long; the third is distinctly longer than the fourth. Face not thickly covered with white pubescence. Parapsidal furrows not extended to the middle of mesonotum. Metanotum shining, rugosely punctured; it has five apical areæ. There are no dorsal keels on the first abdominal segment. The radius originates behind the middle of the stigma. Disco-cubital cellule at base much wider than the second discoidal cellule at the apex.

Belongs to the Phygadeuonini. In Dr. Ashmead's "System" (Bull. U. S. Nat. Mus. xxiii. 27) it would come near *Isotima*, Foer. It looks more like an Ichneumon than a Cryptid.

Gavrana maculipes, sp. nov.

Rufo-ferruginous; the front and vertex broadly, occiput except at the edges; antennæ except for a white ring of three joints beyond the middle, the sides of mesonotum narrowly, a broad line on the apical half in the centre, the parts surrounding the base and sides of scutellum, the space at the sides of post-scutellum, the base of metanotum narrowly, a broad line, dilated at the apex, in the centre of propleuræ, the parts round the tubercles, the sutures at the apex of the mesopleuræ, and more broadly at the base of mesopleuræ, the apex of the hind femora, their tibiæ more broadly, and the basal, second and apical joints of hind tarsi, black. The following parts are yellow: the eye-orbits—the hinder broadly below—face, clypeus, labrum, mandibles, palpi, the top and bottom of propleuræ, scutellar keels, apex of scutellum, post-scutellum, apex of metanotum laterally, the breasts, the base of meso-

pleuræ from the black line, its lower part broadly, apex of metapleuræ, the four anterior coxæ, trochanters and their femora, tibiæ and tarsi in front, and joints three and four of the hind tarsi. Wings hyaline, the stigma and nervures fuscous. ♂. Length, 9 mm.

Face and base of clypeus closely and somewhat strongly punctured; the apex of the latter smooth; the front and vertex are more closely punctured; there is a short narrow keel below the ocelli. Pro- and mesothorax closely punctured; the scutellum is more strongly and much more sparsely punctured. Metanotum closely, strongly, transversely striated; the base in the middle smooth; the areola irregularly, sparsely wrinkled; the apical areæ are more stoutly transversely striated; the posterior median almost smooth above, below sparsely striated; the lateral areæ have the striæ stout; the spiracular area is closely rugosely punctured. Abdominal petiole smooth and shining. Under side of tarsi spinose; the apices of the joints more stoutly spinose.

HEMITELINI.

Otacustes? rufipes, sp. nov.

Rufo-ferruginous; the mesothorax largely suffused with black; a narrow pale yellow line on the pronotum; the vertex, front, and occiput black, the orbits narrowly yellow; the red colour on the face and clypeus is suffused with yellow; legs coloured like the abdomen; the antennæ dark testaceous, the scape yellowish below, the flagellum black above. Wings hyaline, the costa and stigma fuscous, the nervures blacker. ♀. Length, 5 mm.

Front and vertex closely, uniformly punctured; there is a broad, short, curved furrow below the anterior ocellus. Face closely punctured, clearly separated from the clypeus; there is a narrow keel down the middle. Apex of clypeus broadly rounded, the margin depressed. Palpi yellowish. The basal two joints of flagellum equal in length. Thorax closely punctured, the pleuræ more strongly than the upper part. Areola wider than long, rounded at the base, transverse at the apex. Radial cellule small, the radius roundly curved, not reaching half-way to the apex. Areolet large; long, counting along the radius, wider in front than behind, receiving the recurrent nervure beyond the middle; the cubitus is obsolete beyond it; the second transverse cubital nervure is more distinct than is usual with the Hemitelini; the radius issues from beyond the middle; the stigma is large. Antennæ over 20-jointed. Second discoidal cellule closed. Metathoracic spiracles oval.

This is probably not a true *Otacustes*; in the generic tables given by authors it runs into that genus.

ICHNEUMONINI.

Probolus albocinctus, sp. nov.

Black; the legs, except the coxæ, trochanters, and the apex of the hind femora, and the second abdominal segment, red; the tenth to fifteenth joints of the antennæ, scutellum, except at the base, an interrupted band on the apex of the third abdominal segment and the penultimate, white; wings hyaline, the stigma testaceous, the nervures black. ♀. Length, 13 mm.

Head strongly punctured, the front and vertex more closely and regularly than the face. Face and oral region thickly covered with pale hair. Scutellum shining, weakly punctured, flat. Thorax closely, somewhat strongly punctured, the median segment more coarsely than the rest. Areola quadrate, almost twice longer than wide, of equal width throughout, transverse at the base and apex. Post-petiole strongly, regularly, longitudinally striated, the central area clearly defined. Gastrocœli transverse, stoutly striated, the striæ mostly curved, clearly separated. Areolet 5-angled, wide in front, as wide there as the space bounded by the recurrent and the second transverse cubital nervures; the recurrent is received shortly beyond the middle; the disco-cubital is broken by a stump; the transverse median nervure is received distinctly beyond the transverse basal. Tarsi spinose, especially at the apices of the joints. Tubercles white. Temples longer than the eyes above. Occiput roundly incised. The apex of the hind tibiæ may be black.

ANOMALONINI.

Anomalon trichiosomum, sp. nov.

Black; the first abdominal segment, the sides of the second to fourth, and the hind legs rufo-testaceous; the four anterior legs yellowish testaceous; all the coxæ and the apex of the hind tibiæ broadly and irregularly black; the middle joints of the hind tarsi are tinged with yellow, the last black. There is a large yellowish mark on the centre of the face, dilated laterally in the middle to the eyes, the dilated parts gradually narrowed to a point on the outer side; there is a similarly coloured transverse mark on the clypeus, which is, laterally, gradually narrowed to a point. Mandibles with a pale yellowish mark in front at the base. Palpi pale yellow. Wings hyaline, iridescent, the costa and nervures black, the stigma testaceous. ♀. Length, 22 mm.

Head, thorax, and base of legs densely covered with long grey pubescence, the rest of the legs and body with a sparser and shorter whitish pile. Front depressed, the parts bordering the sides of the ocelli stoutly striated, the striæ oblique and twisted; the centre of the front is irregularly, stoutly reticulated; above the antennæ is a stout plate. Sides of face irregularly, coarsely reticulated, the centre irregularly rugose. Mesonotum smooth and shining, the apical slope in the middle closely, irregularly, longitudinally striated. Scutellum coarsely, rugosely punctured, with a smooth spot in the centre; it has an oblique slope towards the apex. Median segment coarsely, irregularly reticulated, densely covered with long pale hair. Pro- and mesopleuræ moderately finely but not closely punctured; the metapleuræ much more closely, regularly, and strongly punctured. Sheaths of ovipositor rufo-testaceous, black above; its basal third narrowed above, clearly separated from the thicker apical part. Transverse median nervure received shortly beyond the transverse basal; the transverse median nervure in the hind wings is broken shortly above the middle.

Laphyctes? trilineatus, sp. nov.

Black; a line on the inner orbits from the antennæ to the base of the mandibles, the line narrowed at the top and bottom, a line in the

middle of the face, becoming gradually widened below, where it is united to the clypeus, the clypeus, mandibles, except the teeth, palpi, and malar space, except in the centre, yellowish testaceous; the abdomen ferruginous, the second segment on the top, and the last two broadly on the top and on the sides, black. Four front legs yellowish testaceous, their femora more rufous in colour, the coxæ black; the hind coxæ, trochanters, apical half of tibiæ and metatarsus, except at apex, black; the femora and basal half of tibiæ rufous; the apex of metatarsus and the other joints of tarsi yellow. Wings hyaline, the base of costa testaceous; the rest of it, the front of stigma, and the nervures black; the posterior part of stigma testaceous. ♀. Length, 17 mm.

Head and thorax densely covered with white pubescence. Front and vertex closely, rugosely punctured, the centre weakly, obliquely striated. Face strongly, closely punctured, more closely on the sides than on the middle. Thorax closely, distinctly punctured, and densely covered with short white pubescence. Parapsidal furrows narrow, but distinct. Scutellum much more strongly punctured than the mesonotum; the punctuation on the apical slope running into longitudinal striæ. Median segment coarsely, irregularly, transversely reticulated. Transverse median nervure interstitial; the recurrent nervure is received very shortly beyond the transverse cubital. Transverse median nervure in hind wings broken distinctly below the middle. Parallel nervure broken shortly below the middle.

This is not a typical *Laphyctes*, but there is no other known genus in which it can be placed. The apex of the clypeus ends in a distinct point or tooth. The eyes converge slightly below; the malar space is very small. The upper tooth of the mandibles is a little longer than the lower. The short spur of the hinder tibiæ is twice longer than the width of the metatarsus. The antennæ are as long as the head, thorax, and basal two segments of the abdomen united. The sides of the clypeus above are bordered by deep oblique furrows; there is a short not very distinct furrow in the middle above. The base of the third discoidal cellule is not so wide as the length of the transverse median nervure.

THE LEPIDOPTERA OF THE DORKING DISTRICT.

By F. A. Oldaker, M.A.

(Concluded from p. 160.)

Porthesia similis. Larvæ common on whitethorn, May 28th; spun up, June 16th. Imagines, July 7th, Also taken freely at the lamps.

Dasychira pudibunda. Common at the lamps, June 12th. Larvæ also frequently taken. Imagines, April 23rd.

Orgyia antiqua. Larvæ very common on all kinds of food-plant, especially on wistaria in my garden. Larvæ, May 27th; spun up, July 15th. Imagines, August 30th.

Pœcilocampa populi. Taken at the lamps, November 10th. Ova deposited, November 26th. Larvæ, March 31st, died.

Malacosoma neustria. Common at the lamps, July 22nd. Larvæ, April 6th ; spun up, June 30th. Imagines, July 16th.

Lasiocampa quercus. Fairly common on Ranmore. Spun up, May 16th and August 2nd. Imagines, June 5th.

Gastropacha quercifolia. Larvæ found on whitethorn at Polesden ; spun up May 23rd. Imagines, June 30th.

Drepana lacertinaria. Caught by beating at Polesden, June 6th.—*D. falcula.* Common at the lamps in Dorking, May 28th. Larvæ, June 13th ; pupated, July 7th. Imagines, July 17th.—*D. cultraria.* Caught by beating at Polesden, May 27th.

Dicranura vinula. Larvæ common on sallows, and imagines on the lamps in Dorking. Ova deposited, May 30th. Larvæ, June 25th ; spun up, July 23rd. Imagines, May 18th.

Pterostoma palpina. Taken at the lamps in Dorking, May 23rd.

Lophopteryx camelina. Taken at rest on palings, June 6th. Larvæ beaten from oak, August 6th. Imagines, September 2nd.—*L. carmelita.* One specimen taken at a lamp in Dorking, May 1st.

Pheosia tremula (*dictæa*). Common at the lamps in Dorking, May 7th.—*P. dictæoides.* Taken sparingly at the lamps, May 31st and September 4th.

Notodonta trepida. Taken in some numbers at the lamps in Dorking. May 3rd. — *N. trimacula.* One specimen taken at a lamp in Dorking, May 23rd.

Phalera bucephala. Common at the lamps and at rest. May 23rd.

Habrosyne derasa. Taken at the lamps in Dorking, July 17th.

Cymatophora duplaris. Taken at the lamps in Dorking. July 16th.

Polyploca flavicornis. Taken at the lamps in Dorking, April 14th.

Bryophila perla. Very common at the lamps in Dorking. June 27th.

Acronycta psi. Larvæ common on many trees. Pupated, October 1st. Imagines, May 26th.—*A. aceris.*—Taken at the lamps. July 18th.—*A. megacephala.* Taken at the lamps. July 17th.

Diloba cæruleocephala. Very common at the lamps, October 19th.

Leucania conigera. Fairly common at the lamps. July 17th.—*L. lithargyria.* Taken at the lamps, July 11th.—*L. comma.* Common at the lamps. June 16th.—*L. impura.* Taken at the lamps. July 12th. —*L. pallens.* Common at the lamps. July 1st.

Nonagria arundinis. One specimen taken at a lamp, October 12th.

Hydræcia micacea. Common at the lamps. September 26th.

Xylophasia rurea. One specimen taken at a lamp, June 20th.

Dipterygia scabriuscula. One specimen flew into the dining-room to the gas, June 15th.

Neuria reticulata. One specimen taken at a lamp, June 24th.

Epineuronia popularis. Taken freely at the lamps. September 4th.

Charæas graminis. Taken at the lamps, July 30th.

Cerigo matura. Common at the lamps. July 22nd.

Luperina testacea. Very common at the lamps. September 4th.—*L. cespitis.* One specimen taken at a lamp, July 16th.

Mamestra brassicæ. Taken at the lamps, July 16th. Imagines from dug pupæ, June 15th.—*M. persicariæ.* Very common at the lamps. July 17th. Ova deposited, July 18th. Larvæ, July 24th. Imagines, June 2nd.

Apamea didyma. Common at the lamps. August 25th.

Miana strigilis. Taken at the lamps. July 25th.—*M. fasciuncula.* Taken at the lamps. June 27th.—*M. bicoloria.* Taken at the lamps. June 30th.—*M. arcuosa.* Taken at the lamps. July 18th.

Grammesia trigrammica. Common at the lamps. May 31st.

Cavadrina morpheus. Very common at the lamps. June 4th.

Rusina tenebrosa. Taken at the lamps. June 21st.

Agrotis puta. Common at the lamps. May 18th.—*A. segetum.* Common at the lamps. July 1st.—*A. exclamationis.* Very common at the lamps, June 11th.—*A. corticea.* Taken at the lamps. June 28th.—*A. cinerea.* Males taken in fair numbers at the lamps; once I took five off one lamp, but no females. May 28th.—*A. nigricans.* Taken at the lamps. July 1st.—*A. tritici.* Taken at the lamps. July 20th.—*A. strigula.* Taken at the lamps. August 4th.

Noctua plecta. Taken at the lamps. July 4th.—*N. c-nigrum.* Common at the lamps. September 29th.—*N. xanthographa.* Common at the lamps. July 16th.

Triphæna pronuba. Taken commonly at rest. June 28th.—*T. ianthina.* Taken at the lamps. July 23rd.—*T. comes.* Taken at the lamps. June 25th.

Amphipyra pyramidea. Taken at the lamps. July 24th.—*A. tragopogonis.* Taken at the lamps. July 20th.

Mania typica. Caught beating on Ranmore, July 15th.—*M. maura.* Flew into the dining-room, July 10th.

Pachnobia rubricosa. Taken at the lamps, May 8th.

Tæniocampa gothica. Taken at the lamps. March 21st.—*T. incerta, T. stabilis, T. munda.* Taken at the lamps. March 26th.—*T. pulverulenta.* Taken at the lamps. March 21st.

Orthosia lota. Taken at the lamps, November 1st.—*O. macilenta.* Taken at ivy-blossom, October 28th.

Anchocelis pistacina. Taken at the lamps, September 25th; ivy, October 29th.—*A. lunosa.* Common at the lamps. September 12th.

Cerastis spadicea. Taken at ivy-blossom, October 28th.

Scopelosoma satellitia. Taken at the lamps, November 1st.

Xanthia citrago. Taken at the lamps, October 11th.

Calymnia trapezina. Larvæ beaten from oak on Ranmore; imagines, July 12th.

Dianthœcia carpophaga. Taken at the lamps, June 21st.

Aporophyla lutulenta. Taken at the lamps, September 21st.

Miselia oxyacanthæ. Larvæ beaten from whitethorn on Ranmore; imagines, October 10th. Taken from ivy-blossom, October 28th lamps, October 19th.

Phlogophora meticulosa. Taken from lamps, May 30th, November 5th; ivy-blossom, October 28th.

Aplecta prasina. Flew into dining-room, June 20th.

Hadena protea. Larvæ beaten on Ranmore; imagines, September 10th.—*H. dentina.* Common at the lamps. June 17th.—*H. oleracea.* Common at the lamps. July 1st. Ova deposited, July 2nd. Larvæ, July 26th; pupated, September 17th. Imagines, June 8th. Fed on geranium.—*H. pisi.* Taken at the lamps. June 29th.

Gonoptera libatrix. Larvæ beaten from oak on Ranmore; imagines, July 27th.

Habrostola tripartita. Taken at the lamps, June 20th.

Plusia moneta. Taken at the lamps, July 14th.—*P. chrysitis.* Taken at the lamps, July 5th.—*P. iota.* Taken at the lamps, July 18th.—*P. gamma.* Common at lamps and on Ranmore. June 7th.

Anarta myrtilli. Taken on Ranmore, July 6th. Larvæ found at night, August 4th. Imagines, May 19th.

Acontia luctuosa. Taken in fair numbers on the south side of Ranmore. May 18th.

Phytometra viridaria. Common at Polesden. May 19th.

Euclidia mi. Common at Polesden. May 19th.—*E. glyphica.* Common at Polesden and Dorking. May 18th.

Catocala nupta. Common at Dorking. July 7th.

Laspeyria flexula. Two specimens taken at Polesden, July 12th.

Zanclognatha grisealis. Taken at the lamps, July 1st.—*Z. tarsipennalis.* Taken at the lamps, May 28th.

Hypena proboscidalis. Taken at the lamps in Dorking, July 14th. Beaten on Ranmore, June 29th.

Urapteryx sambucaria. Quite common at the lamps in Dorking. July 9th.

Epione apiciaria. Taken at lamps, September 4th; deposited same day. Larvæ, May 31st; spun up, July 8th. Imagines, July 16th.

Opisthograptis luteolata. Very common everywhere. May 15th.

Venilia macularia. Beaten on Holmwood Common and on Ranmore. May 25th.

Metrocampa margaritaria. Fairly common at the lamps and at rest. June 29th. Deposited, July 9th. Larvæ, July 19th. Imagines, June 24th.

Eurymene dolabraria. Beaten on Ranmore, June 18th.

Selenia bilunaria. Common at the lamps. March 26th and July 26th. Larvæ, May 20th; spun up, June 10th. Imagines, June 29th.—*S. lunaria.* Taken at the lamps, May 28th.

Gonodontis bidentata. Common at the lamps. May 18th.

Crocallis elinguaria. Taken at the lamps, July 25th.

Ennomos alniaria. Very common at the lamps. August 31st. Larvæ, May 9th; pupated, July 5th. Imagines, July 15th.—*E. fuscantaria.* Taken at the lamps, August 27th. Larvæ, May 19th; pupated, June 21st. Imagines, July 19th.

Himera pennaria. Common at the lamps. October 30th. Larvæ, March 19th; pupated, May 3rd. Imagines, November 11th.

Phigalia pedaria. Taken at lamps, February 8th.

Amphidasys strataria. Common at the lamps. March 20th. Deposited, April 14th. Larvæ, May 20th; pupated, July 17th. Imagines, March 7th.—*A. betularia.* Common at lamps. June 6th. Larvæ, July 6th; pupated, August 20th. Imagines, June 4th.

Hemerophila abruptaria. Taken at the lamps, May 15th.

Boarmia repandata. Beaten on Ranmore, July 4th.—Var. *conversaria.* July 19th.—*B. gemmaria.* Taken at the lamps, July 7th.—*B. consortaria.* Taken at the lamps, June 5th.

Tephrosia crepuscularia. Taken at the lamps, May 10th.

Pseudoterpna pruinata. Beaten on Holmwood Common, July 15th.

Geometra vernaria. Beaten on Ranmore, July 16th.

Hemithea viridata. Beaten on Ranmore, June 17th.—*H. strigata.*

Beaten on Ranmore, July 6th. Imagines from beaten larvæ, June 18th.

Ephyra punctaria. Beaten in Dorking, June 29th.—*E. annulata.* Beaten on Holmwood Common, May 20th.—*E. pendularia.* Taken at the lamps, May 31st.

Asthena luteata. Beaten at Polesden, June 4th. — *A. candidata.* Beaten on Ranmore, May 24th.

Acidalia dilutaria, A. virgularia. Taken at the lamps. June 14th. —*A. ornata.* Common at Polesden and on the south side of Ranmore. June 4th and August 10th. — *A. subsericeata.* Taken at the lamps, July 1st.—*A. remutaria.* Beaten at Polesden, June 3rd.—*A. imitaria.* Taken at the lamps, July 16th. — *A. aversata.* Taken at the lamps, July 4th.

Deilinia pusaria. Very common at lamps and by beating. June 11th. Imagines from beaten larvæ, May 31st. — *D. exanthemata.* Common on Ranmore. June 10th. Imagines from beaten larvæ, June 4th.

Bapta temerata. Beaten on Ranmore, May 17th. — *B. taminata.* Beaten on Ranmore, June 4th.

Macaria liturata. Beaten at Polesden, June 24th.

Thamnonoma vauaria. Taken at the lamps, July 6th.

Strenia clathrata. Taken at the lamps, May 24th.

Panagra petraria. Taken at the lamps, May 20th.

Ematurga atomaria. Beaten at Polesden, June 3rd.

Bupalus piniaria. Taken on Ranmore, June 1st.

Minoa murinata. Taken at the lamps, July 11th.

Abraxas grossulariata. Very common everywhere. Larvæ on red currant and *Euonymus*; pupated, June 14th. Imagines, July 5th. Light variety taken, July 25th.

Ligdia adustata. Taken at the lamps, May 21st.

Lomaspilis marginata. Taken at the lamps and beaten at Polesden, May 27th.

Hybernia rupicapraria. Taken at the lamps, February 13th.—*H. leucophæaria.* Taken at the lamps, March 8th.—*H. aurantiaria.* Taken at the lamps, November 13th.—*H. marginaria.* Taken at the lamps, February 13th.—*H. defoliaria.* Taken at the lamps, October 19th.

Anisopteryx æscularia. Taken at the lamps, March 8th.

Cheimatobia brumata. Swarming at the lamps. November 1st.

Oporabia dilutata. Common at the lamps. October 19th.

Larentia viridaria. Common on Ranmore. June 2nd.

Emmelesia alchemillata, E. unifasciata. Taken at the lamps, July 1st.

Tephroclystia linariata. Taken at the lamps, July 18th.—*T. oblongata.* Taken at the lamps, May 18th, August 15th.—*T. subfulvata.* Taken at the lamps, July 23rd. — *T. scabiosata.* Taken at the lamps, July 18th.—*T. satyrata.* Beaten at Polesden, May 24th.—*T. castigata.* Beaten at Polesden, June 2nd. — *T. pusillata.* Beaten at Polesden, May 24th.—*T. vulgata.* Taken at the lamps, July 10th.—*T. absinthiata.* Taken at the lamps, June 16th. — *T. minutata, T. assimilata.* Taken at the lamps, July 15th.—*T. exiguata.* Taken at the lamps, May 31st. —*T. sobrinata.* Beaten on Ranmore, July 27th.—*T. pumilata.* Taken at the lamps, May 23rd.

Lobophora viretata. Taken at the lamps, May 29th.

Thera variata. Taken at the lamps, June 20th.

Hypsipetes sordidata. Taken at the lamps, June 22nd.

Melanthia bicolorata. Taken at the lamps, July 18th.—*M. ocellata.* Beaten on Ranmore, June 11th.—*M. albicillata.* Taken at the lamps, July 17th.

Melanippe procellata. Beaten on Ranmore, July 9th.—*M. unangulata.* Beaten on Ranmore, June 17th.—*M. rivata.* Beaten on Holmwood Common, June 7th.—*M. sociata.* Beaten on Holmwood Common, May 25th.—*M. montanata.* Beaten on Ranmore, May 31st.—*M. fluctuata.* Common everywhere, April 27th.

Anticlea cucullata. Beaten on Ranmore, July 27th.—*A. badiata.* Taken at the lamps, March 25th.

Coremia ferrugata. Taken at the lamps, May 10th.—*C. unidentaria.* Taken at the lamps, May 24th.

Camptogramma bilineata. Common everywhere. June 3rd.

Phibalapteryx vitalbata. Taken at lamps, May 8th.

Eucosmia certata. Taken at lamps, May 14th.

Scotosia vetulata. Beaten on Ranmore, June 12th.

Cidaria truncata. Taken at the lamps, September 25th.—*C. suffumata.* Beaten on Ranmore, and taken at the lamps. May 31st.—*C. fulvata.* Very common on Ranmore, June 4th.—*C. dotata.* Taken at the lamps, July 4th.—*C. associata.* Taken at light, July 8th.

Pelurga comitata. Taken at lamps, June 21st.

Eubolia cervinata. Taken at lamps, September 24th.—*E. limitata.* Beaten in Dorking, July 26th.—*E. plumbaria.* Taken at lamps, June 15th.—*E. bipunctaria.* Taken on the south side of Ranmore, June 30th.

Anaitis plagiata. Beaten at Polesden, May 4th.

Chesias spartiata. Taken at lamps, October 12th.

January 27th, 1906.

NOTES AND OBSERVATIONS.

An Entomological Hoax (?).—I think the following facts may be of some interest to you. I was on Ranmore Common on June 26th, and in one spot found several pupæ, which appeared to be those of *Papilio machaon*, pinned to the tree-trunks. Three of the cases were empty, and the others had not emerged. I went to the common again on July 7th, and whilst I was resting, my little niece, who was with me, took my net to see if she could catch something, and to my surprise she soon returned with a specimen of *Limenitis sibylla*. I went to the spot where she found it, and after waiting for some time I saw another, but it was flying round a tree just out of reach, and soon went away out of sight; although I kept a good look-out I did not see any more. I exhibited the specimen at the South London Society on Thursday last, and the general opinion was that whoever had put the *Papilio* pupæ there had also introduced the *Limenitis*. I might mention that the place where *L. sibylla* was taken was far away from the spot where I found the *P. machaon* pupæ, and I did not have time to go and look at the latter again.—Arthur W. Dods; 97, Darenth Road, Stamford Hill, N., July 16th, 1906.

Joint Cocoons.—In breeding *Bombyx castrensis* this year I have three times found two pupæ in one cocoon, *i. e.*, not merely two cocoons joining one another, but two pupæ actually touching each other as they lay side by side in a single large covering of silk. Evidently the larvæ worked in concert with some degree of intelligence. Their heads pointed in the same direction, and one opening served for both to emerge. I have not seen this noticed before. Is it a known habit?—W. Claxton; Navestock Vicarage, Romford.

Sesia culiciformis, variety.—Last spring I obtained pupæ of *S. culiciformis* from two woods in Worcestershire, and on May 27th was surprised to see a fine specimen with no trace of a belt of any colour, and absolutely without the usual red and golden coloration on the wings. The palpi, too, are black; in fact, the insect has no sign of other colour than purplish black. I should be interested to hear if there are other specimens of this variety in existence. All my other specimens so far are of the ordinary type.—H. V. Plum; Epsom College, May 29th, 1906.

Ephemera lineata.—On July 16th last a young entomological friend, Master J. Edwards, gave me a specimen of this may-fly, which he took on the wing the evening before at Knight's Park, Kingston-on-Thames. In previous years I have received one or two odd specimens from Kingston, Surbiton, Teddington, and Walton-on-Thames. Eaton, in his Monograph (Trans. Ent. Soc. Lond. 1871), gives the Thames and the Kennet near Reading as its British localities. Possibly this one spent its early days in the Hogg's Mill Stream, which passes through Kingston on its way to join the Thames. The species is distinguished with no great difficulty by means of the linear marks on the dorsal surface of the abdomen. It is later in emerging and somewhat larger and paler than the common may-fly, *Ephemera vulgata*. The remaining British species of the genus, *E. danica*, apparently prefers faster cooler streams.—W. J. Lucas; Kingston-on-Thames.

Erratum.—In my note on *Orobena straminalis* (*ante*, p. 118), I see that "Bletchworth" is printed instead of "Betchworth."—H. V. Plum.

CAPTURES AND FIELD REPORTS.

Deilephila (Phryxus) livornica, &c., in Dorsetshire.—I note the report of my captures of *D. livornica* and *Heliothis peltigera* in your valuable paper of this month (*ante*, p. 162), but I forgot to add that they were taken in the Dorset portion of Bournemouth—*i.e.* Branksome—not Hampshire. Would you kindly notify this for county references in your next issue?—W. G. Hooker; 125, Old Christchurch Road, Bournemouth, July 14th, 1906.

Larva of Deilephila (Phryxus) livornica in Sussex.—A larva of a hawk-moth, which I believe to be *D. livornica*, was found in a sunny garden in Lewes, and brought to me yesterday. It was reposing for change into its last (?) skin. Probably others are to be found this year

if searched for. It is said to feed on vine, fuchsia, *Galium*, and *Rumex*, and to be probably polyphagous.—F. Merrifield; 14, Clifton Terrace, Brighton, July 21st, 1906.

On July 18th, at 8.30 p.m., I took a fine specimen of *D. livornica* flying round *Delphinium*. I have heard of two others being obtained in Brighton this summer.—F. S. Pardoe; Belvedere, Upper Drive, Brighton, July 21st, 1906.

Deilephila livornica in Co. Cork.—To add to the localities (*ante*, p. 161) of the visit of this moth to these islands this year, I send a notice of the capture of a specimen at Schull, in the west of the county, on June 8th, hovering at dusk over flowers of honeysuckle. Another one was seen by me, but not secured, at the same locality on the 10th of the same month.—(Major, I.M.S.) C. Donovan; Passage West, Co. Cork, July 7th, 1906.

Phibalapteryx polygrammata.—I send you notice of the capture of a specimen of *Phibalapteryx polygrammata*, which I took in a field near here on the evening of July 1st. It was slightly worn. Is not this rather late for this insect? E. Newman gives March and September as the months for this moth. — (Captain) B. Tulloch; Broom Villa, Strensall, York, July 2nd, 1906.

Dicycla oo *var.* renago in Essex.—With reference to the distribution of var. *renago* of *Dicycla oo* (*ante*, pp. 128 and 161), I fancy it is to be found wherever the type occurs freely. In one of its Essex localities, where some seasons I take the species commonly, about ten per cent. are usually of the variety. — Geo. T. Porritt; Huddersfield, July 4th, 1906.

Dicycla oo.—With reference to the remarks that have appeared about this moth, it may be worth while to note that five or six years ago both *oo* and *renago* were abundant in this locality, but have not appeared since until this evening, July 11th, when I have just taken a specimen of *renago* in my garden.—W. Claxton; Navestock Vicarage, Romford, Essex.

Orobena straminalis in Surrey.—On July 24th last Master Norman Riley kindly brought me a few "Micros" that he had boxed from a fence in the Carshalton district. Among them was a fine example of *O. straminalis*.—Richard South.

Sirex gigas.—On July 2nd a fine male specimen of *Sirex gigas* was caught by Mr. Thomas Clayton in the waggon shop at the iron-works, Barrow-in-Furness. Last year one was caught in the ship-yard, on June 9th, and is in my possession. — C. E. Morgan; East Mount, Barrow-in-Furness.

A Unique Experience.— Two nights ago I was sugaring in my garden, which contains several species of poplar. At 9.45 I saw and boxed, on a Scotch-fir trunk, a beautiful male specimen of *Cymatophora octogesima*. Knowing it to be rather skittish, I rushed indoors and put it in a cyanide bottle. On my return to the tree I could hardly believe my eyes when I saw on the same patch of sugar another lovely

C. octogesima. This, which turned out to be a female, I also succeeded in boxing. Although I have occasionally taken it here before, it is always scarce, as I believe to be the case wherever it occurs.—(Rev.) Gilbert H. Raynor; Hazeleigh Rectory, Maldon, June 27th.

SOCIETIES.

The South London Entomological and Natural History Society. *Thursday, June 14th*, 1906.—Mr. R. Adkin, F.E.S., President in the chair. — Mr. Penn-Gaskill exhibited a dark suffused specimen of *Tephrosia biundularia* from the Midlands.—Mr. West, examples of *Euclidia mi* and *E. glyphica*, taken in his garden at Ashtead. — Mr. Sich, an assemblage of thirty-nine pupæ of *Pieris brassicæ*, which had been formed in a tumbler placed with the larvæ in the breeding-cage. Light and dark specimens were intermixed at random.—Mr. Lucas, a female example of the snake-fly, *Raphidia notata*, from the Black Pond, Esher; and also a very sparsely marked example of the scarce scorpion-fly, *Panorpa germanica*, from Haslemere.—Mr. Carr, pupæ of *Porrittia galactodactylus* from Horsley.—Mr. F. Noad Clark, on behalf of Mr. Griffiths, a plant of the local *Potentilla argentea* from Chalfont Road, and ova of *Hadena pisi*.—Mr. Tonge, clusters of ova of *Pachetra leucophæa*, which had been found at night on grass-stems, with the female sitting just above them.—Mr. Bellamy read a paper entitled "The Spring in the New Forest, and Whitsuntide Experiences."—Several members reported that *Phryxus livornica* had been met with in a few places, and that *Pyrameis cardui* and *Plusia gamma* were common in some parts of the South of England, and were moving on.

June 28th.—The President in the chair.—Mr. McArthur exhibited specimens of *Dicranura furcula* and *Axylia putris*, taken around the electric lights at Hammersmith. He noted at the same time numbers of *Triphæna pronuba*, *Agrotis exclamationis*, and *Noctua plecta*. He also showed the pupa of *Thecla pruni*.—Mr. Bellamy, two specimens of *Phryxus livornica* taken in June at Ringwood; an example of *Hesperia malvæ* var. *taras* from Holmsley; and a partially radiated form of *Abraxas grossulariata*.—Mr. Tonge, the ova of *Aporia crataegi*, in situ on a leaf of hawthorn, sent from Hyères by Mr. Powell.—Mr. Penn-Gaskill, living specimens of *Harpipteryx xylostella* and *H. nemorella*, with the elongated cocoons of the species. The larvæ were found on honeysuckle at Wimbledon.—Mr. West (Greenwich), a series of the rare Hemipteron, *Pœcilocytus vulneratus*, from Yarmouth.—Mr. Main, the egg-case and young of *Phyllodromia germanica*. He said that the young emerged almost as soon as the egg-case was deposited.—Mr. R. Adkin, examples of *Notodonta chaonia* and *Lophopteryx carmelita*, which emerged in April, 1906, from 1904 pupæ.—Hy. J. Turner (*Hon. Rep. Secretary*).

City of London Entomological and Natural History Society.—*May 1st*.—Rev. C. R. N. Burrows exhibited preserved larvæ, including *Acidalia degeneraria*, *Sesia chrysidiformis*, and *Melitæa artemis*.—Mr. J. A. Clark, *Mesophleps silacellus* taken at Falmer, July, 1905.—Mr. W. J. Kaye, *Orgyia gonostigma*, including first brood reared July, 1905, from wild Essex larvæ, and a second brood bred in September

and October of same year, from ova laid by the first brood.—Mr. V. E. Shaw, *Hybernia progemmaria* var. *fuscata*, and melanic *Phigalia pilosaria*, both from Saltaire.—Rev. C. R. N. Burrows reported that he had bred *Lycæna argiolus*, in the spring of the current year, from larvæ taken during the spring of 1905.

May 15th.—Rev. C. R. N. Burrows exhibited preserved larva of *Leucania favicolor*.—Mr. W. J. Kaye, *Eupithecia helveticaria* var. *arceuthata* from Surrey.

June 4th.—Dr. T. A. Chapman exhibited larvæ of *Euvanessa antiopa* in last stadium, from South France.—Mr. E. Harris, a series of *Hemerophila abruptaria* darker than the usual London form, bred from light parents, the offspring of a cross between light and dark forms.—Mr. C. P. Pickett, a cocoon of *Plusia moneta* about twice the normal length and open at both ends; also *Fidonia atomaria* with two extra rudimentary wings. Mr. Pickett reported that he had obtained fifty ova from a pairing of *Smerinthus populi* and *S. ocellatus*, and five ova from a cross between *S. ocellatus* and *S. tiliæ*.

June 18th.—Mr. A. J. Willsdon was elected a member.—Mr. A. Bacot exhibited larvæ of *Pyrameis cardui* reared on burdock, which apparently bore out a suggestion made by Dr. Chapman that the larva of this species is more densely covered with hair in the last stadium if fed on this pabulum as compared with thistle-fed larvæ.—Mr. A. W. Mera, *Sesia culiciformis* from Essex, with the band round the body white instead of red; also *Tæniocampa opima* from the Brentwood district, where the collecting-ground was blackened by fire some years ago. The specimens were of much lighter coloration than those taken shortly after the fire, suggesting response to environment by some more rapid means than selection.—Mr. C. P. Pickett, a rust-red specimen of *Smerinthus tiliæ*, *S. populi* with a lilac-tinted bloom on the wings, and *Procris geryon* from Chiltern Hills.—S. J. Bell, *Hon. Sec.*

OBITUARY.

Baron Charles Robert v. d. Osten Sacken.—In the death of Baron C. R. Osten Sacken, which took place at Heidelberg on May 20th last, it may truly be said that Dipterology—or, in fact, Entomology—has lost one of its brightest ornaments. For many years his general knowledge of the Diptera exceeded that of any other student of the Order. In many ways he constituted the *beau idéal* of a scientific entomologist; absolute master of numerous languages, independence of means, social rank, retentive memory, accurate observation, possessor of an almost perfect library of works upon Dipterology, and polished manners—these qualities all combined enabled him to hold the highest rank in his special branch of science. The last work he published was his autobiography, issued when he was seventy-five years old, and since then (three years ago) nothing has appeared from his pen. In a short notice it is impossible to do justice to his work, but it is duly appreciated by all those who have had opportunities to profit from it.

G. H. V.

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LIFE-HISTORY OF *PIERIS DAPLIDICE*.

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

ON October 3rd, 1901, I received, from Hyères, four *Pieris daplidice* females, but only one reached me alive, and in a very feeble condition; therefore, I immediately fed it with sugar and water. After drinking for about fifteen minutes it considerably revived. I then placed it on some mignonette (*Reseda odorata*) in the sun, when she at once commenced depositing, and in a short space of time (about half an hour) about three dozen eggs were deposited on various parts of the plant, but most were on the under side of the leaves. Those laid upon the bloom exactly resemble the anthers in size and colour. They are laid singly, and stand erect.

Again, on October 8th, Mr. F. Raine kindly sent me three more females from Hyères. These deposited a few eggs on the morning they arrived (October 10th), and continued depositing daily when the sun shone sufficiently.

The egg is $\frac{1}{30}$ in. high, of an elongated conical shape, widest at the middle, and slightly concaved directly below the apex; the extreme summit is flat and finely pitted in the centre; there are thirteen or fourteen (usually thirteen) longitudinal keels, all running the entire length, and about thirty transverse ribs; both these and the keels are of glistening whiteness. When first laid the colour is a light yellowish green; it gradually turns yellower, and on the third day assumes an orange colour, and finally, on the fourth day, attains a deep orange (not one out of the large number of eggs I obtained was of the colour described by Buckler, and quoted by recent authors, as being "bright pinkish red colour," nor is the newly-hatched larva red, as stated by Tutt, 'British Butterflies,' p. 241). The egg is wonderfully similar to that of *Euchloë cardamines*, but has not the transparent elongated apex, and all the keels in *daplidice* run to the summit, whereas in *cardamines* some vanish before reaching it.

Just before hatching the colouring becomes much duller, and the little larva shows clearly through the glistening shell.

All the three dozen eggs laid October 3rd hatched on October 13th, remaining ten days in the egg state.

The larva directly after emergence is very small, measuring only $\frac{1}{24}$ in. long; it is uniformly cylindrical, and very much like *cardamines*. The head is shining black, and beset with a number of fine bristles. The body is of a rich raw-sienna colour, the segments are bilobed transversely; on the side of each segment are five large olive-brown blunt tubercles with pale centres, each bearing a long, stiff, black, clefted, knobbed spine. These are situated over the body similar to *cardamines*; others are also placed on the claspers. The spiracles are black. The dorsal surface is smooth, but granulations gradually develop on the sides, and the ventral surface is strongly granulated, where they form small points.

Just previous to the first moult it measures $\frac{1}{9}$ in. long. Several moulted first time on October 18th, the first stage occupying five days.

After first moult (ten days old) it measures $\frac{1}{5}$ in. long. The ground colour is a pale lilac-grey, mottled with dark olive; a pale medio-dorsal line formed by the mottlings not uniting in the centre; there are four longitudinal lemon-yellow stripes, two on either side, one being subdorsal, and which is the broadest and brightest, and the other spiracular. On the side of each segment are nine large shining olive-black tubercles, six above and three below the spiracle, and five small ones placed between the two subdorsal stripes. As in the previous stage, each tubercle emits a black bristle with a clefted knob, which carries a minute globule of clear white liquid. The head and spiracles are similar to first stage, the legs are black, and the claspers tinged with lemon-yellow. They rest in a straight attitude. I could not detect any traces of cannibalism in these larvæ, in this respect differing greatly from *cardamines*.

Several moulted the second time October 23rd, the second stage also lasting five days. A large number died just before and after second moult, owing to the dull and cold weather. When thirteen days old, after second moult, it measures $\frac{7}{16}$ in. It is uniformly cylindrical. Excepting the head, which is ochreous blotched with black, and the brighter colouring and better defined pattern due to its increased size, it is similar in all respects to the previous stage.

The third moult occurred on the evening of October 27th, the third stage occupying only four days. After third moult (nineteen days old) it is $\frac{5}{8}$ in. long. All the colours are brightly and clearly defined; the stripes are rich gamboge-yellow; the medio-dorsal line is slightly paler than the broad dorsal slate-blue band, which is chiefly formed by a border of dark mottlings along either

side. The larger wart-like tubercles are very conspicuous, black and shining. All the spines (bristles) are in this stage simple and finely pointed, and many of the smaller ones are whitish. The longest are slightly curved, and have the apical half white. The head is coloured like the body, the yellow spiracular stripe extending over the face.

A few succeeded in moulting the fourth time during the last days of October, and one moulted on November 3rd, but on that day a dense fog set in, and lasted until the evening of the 8th. This, accompanied by frost at night, proved fatal to all the larvæ. They were in various stages, many were quite small.

After fourth and last moult (fully grown) it measures 1 in. in length. The body is cylindrical, tapering at the ends; the segments are subdivided by six transverse wrinkles, which number only two in the first stage. The ground colour is a clear lilac; a very fine and faint medio-dorsal line, and four rich yellow longitudinal bands, two on each side; the first is subdorsal and widest, broken up on the fourth wrinkle with pale grey; the second band is spiracular, and extends over the side of the head; it is also broken up into a series of markings by the central third portion on each segment being of a pale greenish grey, which encloses the very pale inconspicuous spiracle. At the base of each clasper and leg is an ochreous-yellow blotch, forming a disjointed third band. The whole surface is densely sprinkled with black shining warts, varying greatly in size, each bearing a fine simple spine, the majority being shining black; those on the ventral surface are whitish, the head of similar colouring as the body, and likewise covered with warts and spines. The legs are mottled black and whitish; the lilac ground colour of the body is mottled with dusky spots, on which are placed the smallest black warts. Excepting the first stage, the larva is similar in pattern throughout.

The above description of the full-grown larva is from a specimen found by Mr. Raine at Hyères feeding on wild mignonette (*Reseda lutea*), who very kindly sent it direct to me. It arrived on November 16th, and, after feeding on that and the following day, it spun up for pupation on the 18th, and pupated on the 20th November.

Mr. Raine also found a pupa at the same time, which he also sent me, and from which the following description is made:— The pupa measures $\frac{3}{4}$ in. long. In shape it exactly resembles *P. napi*, having a pointed beak, a strongly angulated thoracic dorsal keel, subdorsal abdominal angular projections, and a basal wing-point. The colour is a very pale lilac-grey, with creamy buff subdorsal and spiracular stripes corresponding with those of the larva; a medio-dorsal whitish line dotted with black at the segmental divisions along the abdomen. The entire surface is sprinkled with minute black dots, black markings on the keel,

and a black streak on either side of the beak. The wings are buffish, with black speckled nervures. Like other Pieridæ pupæ, it is attached by the cremastral hooks to a layer of silk, and a silken girdle round the waist.

A female imago emerged on December 11th, 1901.

The English climate of late autumn and winter is obviously quite unsuitable for the existence of *P. daplidice*, as well as both species of *Colias* and *Argynnis lathonia*. I have always found that the first spell of cold and damp weather (especially fog and frost) to be fatal to them; when in the larval state they immediately cease feeding and rapidly die, and unless protected against such climatic conditions the pupæ likewise perish, which is the cause of these species being unable to become established in Britain.

A NEW GENUS OF CRYPTINÆ (ICHNEUMONIDÆ) FROM SUMATRA.

By P. Cameron.

Phædraspis, gen. nov.

Scutellum roundly convex, strongly keeled laterally on the basal half. Metanotum with two complete keels, the apical laterally projecting into broad teeth. Spiracles about three times longer than wide. Antennæ stout, not much thickened towards the apex, ringed with white; the third and fourth joints almost equal in length. Sides and apex of clypeus depressed, margined; the apex transverse, broad. Abdominal petiole stout, the post-petiole large, broad. Radial cellule short; transverse median nervure received behind the transverse basal; disco-cubital unbroken; areolet large, five-angled, receiving the recurrent nervure near the apex; the transverse median nervure in hind wings broken at the middle. Apical segments of abdomen spotted with white. Temples appearing short from being very obliquely narrowed. Malar space as long as the antennal scape. Tarsi spinose, the fourth joint deeply incised. Metapleural keel complete. Mesonotum, scutellum, apex of first, and the whole of the second segment, and the legs, red.

Characteristic of this genus are the raised scutellum, strongly spined laterally at the base, the metanotum with two transverse complete keels, with the second broadly toothed laterally, and the transverse median nervure in hind wings broken in the middle. The legs longish, somewhat slender, entirely red. Metanotum punctured at the base, the rest closely strongly reticulated. The genus, in the arrangement of Schmiedeknecht (Opus. Ichn. 414), would come in near *Lobocryptus*, Schm., from the form of the scutellum.

Phædraspis rufobalteata, sp. nov.

Black; the mesonotum, with scutellum, the upper edge of the pleuræ narrowly, apical half of post-petiole, the second abdominal segment entirely, and the legs, red; the apical two segments white above; antennæ with the five middle joints white, except below: wings hyaline, the nervures and stigma black. ♀. Length, 12 mm.; terebra, 4 mm.

Bindji, Deli, Sumatra; January (Dr. L. Martin).

Face and clypeus closely, strongly punctured; the labrum and mandibles red, the latter black at the apex. Middle of front somewhat strongly, transversely striated; the sides and vertex almost smooth. Pro- and mesothorax closely, strongly punctured, the mesonotum thickly covered with fulvous pubescence; the scutellum is more strongly but not so closely punctured as the mesonotum. Post-scutellum smooth. Pleuræ coarsely, closely punctured, more or less striated, and becoming coarser towards the apex. Petiole smooth, the post-petiole strongly but not closely punctured; the sides of the raised central part of the post-petiole smooth and shining at the base; the second and third segments closely punctured; there is a white narrow line in the middle of the sixth segment; the apical entirely white above; the second and third ventral segments are red.

LARVÆ OF *LYCÆNA CORYDON* AND THEIR ASSOCIATION WITH ANTS.

By A. L. Rayward.

When at Reigate on June 18th last, I was fortunate enough to find on the *Hippocrepis comosa*, which is abundant on some of the hillsides there, a number of almost full-grown larvæ of *L. corydon*.

Of some thirty or more larvæ thus obtained, most, and in fact nearly all, had ants—all of the same species, *Formica flava*—upon them; and in one instance where the *comosa* was growing on the crown of an ants' nest, two larvæ found resting on two adjacent leaves of the food-plant were literally covered with the ants, more than twenty being counted on one of them.

Subsequent examination with a lens at home disclosed the fact that the transverse gland, or sac, present on the dorsal area of the seventh abdominal segment of the larva of *L. arion*—as reported by Mr. F. W. Frohawk (Ent. xxxvi. p. 59), and known to exist in other species of Lycænidæ, was well developed in these larvæ of *corydon*, and the following interesting demonstration of its function was obtained.

An ant was placed in proximity to one of the larvæ which was being examined under a microscope, and it at once began to run to and fro about the body of the larva, waving its

antennæ excitedly. In a few moments it found its way to the gland on the seventh abdominal segment, and stroked it with a rapid movement of the antennæ and first pair of legs. This action was repeated several times, when suddenly the gland was distended, and one or two—and occasionally, during subsequent experiments, three—tiny beads of a crystal-clear fluid were slowly expelled, and were greedily sucked up by the ant.

Several larvæ and a number of ants were experimented with in this way, and there was usually little difficulty in obtaining a successful demonstration, although it was observed that some ants found their way to the gland much more quickly than others, possibly because of their having had previous experience of the function of this organ.

I also observed that at intervals, while the ants were running over the body of the larva, two prominent tubercles, situated near the lateral ridge on the eighth abdominal segment, one on either side, behind and lower than the ninth spiracle, were quickly evaginated and withdrawn, sometimes singly, but frequently both together. Though these tubercles are supposed to be—and very probably are—scent-organs to attract the ant *to* the gland, it was noticed during these experiments that they were most active when the larva appeared to resent the attempts of the ant to obtain fluid from the gland, as was sometimes the case. At this time the gland was contracted and withdrawn below the surrounding surface of the segment, and the rapid erection and withdrawal of the tubercles generally resulted in momentarily distracting the ant's attention, causing it to leave the gland, to which, however, it usually quickly returned.

Wallington, August 4th, 1906.

CURRENT NOTES: 1905–6.

By G. W. Kirkaldy.

These notes are intended to present some account, necessarily imperfect, of current literature, particularly in groups and faunas of special interest to the British entomologist. There are many papers published, *e.g.*, in America, of great value to British workers, although dealing exclusively with American forms. Such are those by Nathan Banks, Bueno, Daecke, MacGillivray, Needham, and Williamson, noticed in the present instalment. It is taken for granted that readers of the 'Entomologist' are familiar with the periodicals of their own country.

1. Banks, Nathan: "A Revision of the Nearctic Hemerobiidæ" (Trans. American Ent. Soc. xxxii. 21–52, pl. iii–v. (Feb., 1906) [Neuroptera]).
2. Bueno, J. R. de la T.: "Ways of Progression in Waterbugs" (Entom. News, xvii. 1–4 (Jan., 1906) [Hemiptera]).
3. Daecke, E.: "On the Eye-coloration of the Genus Chrysops" (*l. c.* 39–42, pl. i. (Feb., 1906) [Diptera]).
4. Del Guercio, G.: "Contribuzione alla Conoscenza delle forme e della Biologia del *Paracletus cimiciformis*, Heyden" (Redia ii. 90–8, pl. viii. (1905) [Hemiptera]).
5. *Id.*: "Contribuzione alla Conoscenza delle *Sipha*, Pass.," &c. (*l. c.* 127–53, pl. xiii–xiv. (1905) [Hemiptera]).
6. *Id.*: "Contribuzione alla Conoscenza delle metamorfosi della *Sciara analis*, Egg., con notizie intorno alla *Sc. analis*, Bezzii v. n. ed. ai loro rapporti con alcuni Sporozoari ed Entomozoari parassiti" (*l.c.* 280–305, text-figs. 1–21 (1905) [Diptera]).
7. *Id.*: "Sulie differenze esistenti fra la *Schizoneura reaumuri*, Kalt. ed il *Pachypappa vesicalis*, Koch," &c. (*l. c.* 306–15, text-figs. 1–9 (1905) [Hemiptera]).
8. Felt, E. P., and others: "20th Report of the State Entomologist on Injurious and other Insects" (Bull. New York State Mus. 97 (Ent. 24), 359–597, pls. 1–19, text-figs. 1–24 (Nov., 1905)).
9. Hine, J. S.: "A Preliminary Report on the Horse-flies of Louisiana, with a Discussion of Remedies and Natural Enemies" (Circ. State Crop Pest Comm. Louisiana, 6, pp. 1–43, text-figs. 1–20 (1906)).
10. Koorders, S. H., and Zehntner, L.: "Over eenige Ziekten en Plagen van *Ficus elastica*, Roxb." (De Cultuurgids, vii. 439–72, pls. i–iv. (1905)). [Reprinted as Bull. Algemeen proefst. Salatiga, 3, pp. 1–34, pls. i–iv. (1905)].
11. MacGillivray, A. D.: "A Study of the Wings of the Tenthredinoidea, a superfamily of Hymenoptera" (Proc. U. S. Nat. Mus. xxix. 569–654, pls. xxi–xliv. (No. 1438) (1906)).
12. Marlatt, C. L.: "The Annual Loss occasioned by Destructive Insects in the United States" (Yearb. U. S. Dep. Agr. 1904, 461–74 (1905)).
13. Needham, J. G.; Morton, K. J.; and Johannsen, O. A.: "Mayflies and Midges of New York" (Bull. New York State Mus. 86 (Ent. 23), 1–352, pls. 1–37, text-figs. 1–18 (June, 1905)).
14. Pictet, A.: L'influence de l'alimentation sur la détermination du sexe chez les Lépidoptères" (Arch. Sci. Phys. Nat. 4, xix. 102–5 (1905)).
15. Schneider, J. S.: "Sydherö. Et lidet bidrag til kundskaben om den arktiske skjærgaards malakologiske og entomologiske fauna" (Tromsö Mus. Aarsheft. xxvii. 170–205 (1906)).

16. Schroeder, C.: "Eine Kritik der Erklärungsversuche der lebhaften Hinterflügelfärbung in genus *Catocala*, Schr." (Biol. Cent. xxv. 51–63 (1905) [Lepidoptera]).
17. Slingerland, M. V.: "Formaldehyde as an Insecticide" (Ent. News, xvii. 130–3 (Apr., 1906).
18. Stevenson, E. C.: "The External Parasites of Hogs" (Bull. U. S. Bur. Animal Ind. 69, pp. 1–44, figs. 1–29 (1905) [Pediculidæ and Acarina]).
19. Vosseler [J.]: "Die Wanderheuschrecken in Usambara im Jahre 1903–1904," &c. (Ber. Land-und Forstwirtsch. in Deutsch-Ostafrika, ii. 291–374, pls. xii. and xiii. (col), text-figs. 1–2 (Oct., 1905) [Orthoptera]).
20. Williamson, E. B. and Calvert, P. P.: "Copulation of Odonata" (Ent. News, xvii. 143–50, pl. vii. (May, 1906) [Neuroptera]).
21. Editorial in Entom. News. xvii. 180 (May, 1906).
22. Bergroth, E.: "Stridulating Hemiptera of the subfamily Halyinæ, with Descriptions of New Genera and New Species" (P. Zool. S. London, 146–54 (Oct. 17th, 1905) [Hemiptera]).
23. Banks, C. S.: "The Principal Insects attacking the Cocoanut Palm (Part I.)" (Philippine Journ. Sci. i. 143–67, pls. i.–xi. (Feb., 1906) [Coleoptera]).
24. Ballou, H. A., and others: "Notes on West Indian Insects" (West Indian Bull. vii, 40–63).
25. Ballou: "Cotton Stainers" (*l. c.* 64–85, one map [Hemiptera]).
26. Lameere, A.: "Notes pour la Classification des Diptères" (Mém. Soc. Ent. Belgique xii. 105–40).
27. Plateau, F.: "Le Macroglosse (observations et expériences)" (*op. c.* 141–80, text-figs. 1–6 [Lepidoptera]).
28. Schouteden, H.: "Catalogue des Aphides de Belgique" (*op. c.* 189–246 [Hemiptera]).
29. Girault, A. A.: "The Bed-bug," &c. (Psyche, xii. 61–74 (Aug. (?), 1905), and xiii. 42–58 (June (?), 1906) [Hemiptera]).
30. Mitchell, E. G.: "Mouth Parts of Mosquito Larvæ as indicative of Habits" (*op. c.* 11–21, text-figs. 1–3 [Diptera]).
31. Washburn, F. L.: "The Diptera of Minnesota" (Bull. Minn. Agr. Sta. 93, pp. 19–168, pls. i.–ii. (col.), text-figs. 4–163 (dated Dec., 1905, published 1906)).
32. Kieffer, J. J.: "Diptera Fam. Chironomidæ" (Gen. Insect fasc. 42, pp. 1–78, pls. 1–4).

Nathan Banks's revision (1) of the Nearctic Hemerobiidæ will be very useful to the British neuropterist, as it is thirty-six years since the British forms were discussed by McLachlan, and the European forms have never been adequately reviewed.

Vosseler (19) discusses at length certain migratory locusts in German East Africa, with detailed biological notices.

Koorders and Zehntner (10) give an account of the diseases and pests of caoutchouk in Java. Among the insects figured in one or more stages are *Oleandrus graniger* and *Gryllacris* sp. (Orthoptera), and *Glyphodes vivitralis* (Lepidoptera). C. S. Banks (23) writes on the pests of the coconut-tree in the Philippines. *Oryctes rhinoceros*, *Rhynchophorus ferrugineus*, *Cyrtotrachelus* sp., &c. (Coleoptera), are discussed and figured.

Felt's report (8) deals principally with studies in Culicidæ by Dr. Felt, and a comprehensive list of the "Jassidæ" of the State, by H. Osborn. Needham's report (13) is the third of the valuable series of studies on the aquatic insects of New York State, directed by Dr. Felt. It treats, in the same comprehensive manner as the previous publications, of Ephemeridæ, Hydroptilidæ, Nematocerous Diptera, &c.

Pictet (14) discusses the influence of food on the development of sex in Lepidoptera, while Schroeder (16) writes on the interpretation of the bright colouring of the hind wings in *Catocala*.

Del Guercio (4–7) contributes four valuable biological studies on Diptera and Hemiptera. Bueno (2) reviews the methods of progression, both on land and in water, of various genera of American waterbugs. Bergroth (22) discusses stridulating Hemiptera of the family Cimicidæ, subfamily Halyinæ, and describes the organs in certain Cimicids. Williamson and Calvert (20) query "the accepted statement that in pairing the male dragonfly grasps the female by the prothorax," and show that in certain forms the female is grasped by the head.

Daecke's paper (3) is interesting, but as the colour fades when the fly is dried, and the variation is apparently overlapping to a large extent in different species, the value of the design for purposes of specific determination is not yet strongly evident. MacGillivray (11), after briefly noticing the origin of the hymenopterous type of wing, proceeds with a detailed study of the wing areas, of the dynamical control of wing-type, of the phylogeny of the sawflies, and concludes with tables for separating the families and subfamilies according to the structure of the organs of flight. Steven's bulletin (18) contains articles on *Hæmatopinus suis*, the hog-louse, and *Sarcoptes scabiei* var. *suis*, and *Demodex folliculorum* var. *suis*, two species of mange-mites.

Marlatt (12) estimates conservatively the annual loss from pests in the United States at over seven hundred million dollars (say one hundred and forty million sterling). Slingerland (17) finds that formaldehyde "has little or no insecticidal qualities, when used in practicable quantities, and especially against household insects."

The 'Entomological News' (21) contains a remarkable quotation from a recent American paper (the 'Medical Brief,' p. 282,

April, 1906) of the seriousness of which there can be, it is said, no question :—"Take the human seed-germs (spermatozoa), put them upon a plate, first spreading some alkaline nourishment upon the plate—for instance, a little soap; place the plate in a room of proper temperature, and in sixteen to twenty-four hours swarms of *ants* will be running about. In other words, these living human germs, placed under this different condition other than the mother-soil, develop into ants. These little fellows can be watched and be seen to gradually develop and start off on the run. This would evidently appear that living germs, when placed by accident, or otherwise, under very different conditions, produce very different forms of life. But what relationship do we owe to the ant? Perhaps this is why the claim is made that the ant has more characteristics of the human being than any other animal." As the 'News' says, this is carrying us back before the time of Redi, who lived about 1618.

The "Notes on West Indian Insects" (24) comprise (1) a reprint of a paper by A. H. Clark in 'Psyche' (1904) on the Insects of Barbados and other islands, annotated by G. T. Carter; (2) a reprint of Notes on Orthoptera, by J. A. G. Rehn (in 'Entomological News,' 1905); and (3) original notes on a few insects of general interest, by H. A. Ballou. This is followed by an extensive systematic and economic article on "Cotton-stainers" (*Astemma* or *Dysdercus*), bugs of the family Pyrrhocoridæ, a genus which damages cotton almost all over the world.

In the 'Entomologist' for 1900 (vol. xxxiii. pp. 361–3), I reviewed, very briefly, Prof. Lameere's "Notes pour la Classification des Coléoptères." In the 12th Memoir of the Entomological Society of Belgium * Lameere has expounded his views on the classification of the Diptera (26). The division of this order into Orthorrhapha and Cyclorrhapha is rejected, and the following two suborders accepted, *viz.*:—

(1.) *Nemocera*, with the eyes (originally) remote and similar in the two sexes;

(2.) *Brachycera*, with the eyes contiguous, at least in the male, or kainogenetic † and dimorphic.

In the first the antennæ are long and dimorphic, and the maxillary palpi well developed; in the second the antennæ are shortened and similar in the two sexes, the maxillary palpi are reduced, but these characters are not absolute as is that furnished by the eyes.

According to Lameere, the *Nemocera vera* form one group, the other being formed of the *Brachycera* and the *Nemocera*

* To celebrate the Jubilee of the foundation of the Society.

† Or cenogenetic, *i.e.*, "relating to modified evolution, in which the non-primitive characters make their appearance in consequence of a secondary adaptation of the embryo to the peculiar conditions of its environment."

anomala, so that the gist of his classification is (1) that the *Nemocera anomala* of Osten Sacken (Bibionidæ, &c.) are removed from the vicinity of the *Nemocera vera* and placed near the Stratiomyidæ with the *Brachycera*, and (2) the merging of Œstridæ, Nycteribiidæ, Hippoboscidæ, &c., in Muscidæ.

Mitchell (30) deals with the mouth parts of mosquito larvæ as indicative of habits, dividing them into two categories; (1) insectivorous, normally preying on small aquatic larvæ, and (2) non-insectivorous, feeding on vegetable matter, protozoa, &c. Somewhat intermediate are the *Urano-tænia* and *Anopheles* groups. "That the differences in habits are correlated with marked differences in the structure of the mouth parts" is demonstrated by figures and comparative tables. Washburn (31) has continued the well-known Minnesota *résumés* of our knowledge in various orders of American insects, by a useful summary of the Diptera. The late Otto Lugger dealt with the Orthoptera, Lepidoptera, Coleoptera, and Hemiptera. These well-illustrated bulletins are actually reports on the economic insects of Minnesota, but they are useful for all workers. The structure of the Diptera is first discussed (pp. 22–32, figs. 4–15), the various families being then considered in turn.

The Chironomidæ have been revised generically by Kieffer (32), the known species being listed. Four excellent plates elucidate the text, in which fifty-four genera are admitted. By an oversight, *Tanytarsus lacteiclavus*, Grimsh., and *Chironomus hawaiiensis*, Grimsh., both from the Hawaiian Islands, have been omitted, and a preoccupied generic name (*Ceratolophus*) has been used.

Of special interest to British workers will be Schouteden's "Catalogue of the Belgian Aphidæ" (28), a critical list running to fifty-eight pages. Girault (29) has discussed the bed-bug (*Clinocoris lectularius*) at some length, with especial regard to its food supply, metamorphoses, and pathogenic relations.

Plateau (27) has contributed some extensive observations and experiments on *Macroglossa stellatarum*. He refrains from formulating any conclusions, owing to the incompleteness of his experiments—lengthy and laborious though these were—as his fields of observation were destroyed by the creation of a new railway station, and the *Macroglossa* thus rendered very rare. After discussing certain details of the habits of the moth, the learned Belgian treats of (1) the attraction of *Macroglossa* and other insects by coloured cloth and coloured paper; (2) its flight in front of flowers painted on these substances; and (3) *Macroglossa* and artificial flowers. These are followed by a note on *Macroglossa* and the bracts of *Salvia horminum* (a sage not, I think, found in Britain).

ON SOME BRACONIDÆ FROM THE HIMALAYA.

By P. Cameron.

I am indebted to Col. C. T. Bingham for the under-noted species: —

Xiphozele, gen. nov.

First abscissa of cubitus long, angled below the middle, its basal abscissa obliquely sloped to below the middle, where it receives the recurrent nervure, the apex obliquely sloped upwards; the first cubital cellule is very large, much longer along the costa than it is wide at the base; the second cellule long, especially along the cubitus; transverse median nervure interstitial, much thinner than the others, angled outwardly above the middle. First abscissa of radius long, as long as the first transverse cubital nervure, about one-fourth shorter than the second; it is thicker than the second, the latter thicker than the third, which is roundly curved forwards at the base. Stigma long, lanceolate; the radius issues from behind its middle, but not much. Anal nervure not interstitial. Radial cellule in hind wings divided at the apical third; from the præbrachial a longish nervure runs obliquely downwards from beyond its middle to the probrachial, which it does not quite reach. Clypeus roundly convex, clearly separated behind; its apex transverse, clearly separated, obliquely projecting. Eyes large; malar space small, but distinct. Ocelli large, the anterior smaller than the others. Temples distinct, rounded, oblique. Mesonotum trilobate. Abdomen strongly compressed, beyond the middle as in *Ophion*; the first segment cylindrical, narrowed at the base to the spiracles, which are prominent, and placed shortly but distinctly behind the middle. Legs long, slender; the spurs more than half the length of the metatarsus; claws broadly dilated at the base, narrowed and curved at the apex; hind coxæ long.

An easily recognized genus from the very large first cubital cellule, caused by the obliquely sloped basal abscissa of the cubitus, and by its being so distinctly angled shortly beyond the middle. As a consequence of this slope, the prædiscoidal cellule is narrowed at the apex, it being there half the width it is at the base. Characteristic, too, is the narrowed, angled, transverse median nervure, which does not reach the præbrachial, but is united to a short thickened nervure, which is more developed beyond than behind it; a similar but shorter thickened nervure or cloud runs into the anal nervure. Palpi long, pilose. Metanotum transversely striated, without any longitudinal keels; the pleuræ project beyond it; spiracles linear. Occiput margined.

This genus belongs to the Zelini, and from its divided radial cellule comes near to *Homolobus*, Foerster; from *Zele*, as well as from the other genera, it should be easily known by the large first cubital cellule, the angled basal abscissa of radius, the peculiar transverse median nervure, narrowed at apex of first dis-

coidal cellule, by the transverse præbrachial nervure sloping towards the apex, not towards the base of the wing, and by the compressed abdomen.

Xiphozele compressiventris, sp. nov.

Testaceous; the fifth and following segments of the abdomen black; the legs paler, especially the hind tarsi; wings clear hyaline, the parastigma and stigma testaceous, the costa and nervures black. ♀. Length, 21 mm.

Sikkim.

Mesopleuræ closely, distinctly punctured, more or less reticulated in the middle, almost smooth at the apex above. Metanotum strongly, but not closely, transversely striated; the metapleuræ at the apex widely irregularly reticulated. Abdomen about three times longer than the thorax.

From the coloration of this species, and from its large eyes and ocelli, I should think that it is of nocturnal habits like *Ophion* and *Paniscus*, to which it has a great resemblance.

Batotheca leucomelæna, West.

Spinaria leucomelæna, Westwood, Tijd. voor Ent. 1882, 31, tab. 7, f. 2.

Sikkim.

Described from Cambodia, Siam.

Spinaria flavipennis, sp. nov.

Luteous; the flagellum of antennæ black, the sides of the basal three abdominal segments, the ventral surface, and the apical segment white; wings luteous-hyaline, a triangular, oblique cloud at the base of the stigma and a broad one round the apex, except in the radial cellule; the costa, stigma, and nervures bright luteous. ♀. Length, 12 mm.

Sikkim.

Abdomen strongly, closely, longitudinally striated throughout, the striæ becoming weaker towards the apex; the apex of the third segment with a blunt, short triangular tooth in the middle, its sides and the sides of the fourth with a longish spine, broad at the base, becoming gradually narrowed towards the apex; the fourth stoutly keeled down the middle, the keel stronger at the apex, projecting and running down the apical slope of the segment; its base behind the furrow is smooth, impunctate; the furrow before this smooth part is closely crenulated; the last segment becomes gradually roundly curved to a sharp point, or longish tooth. The basal three abdominal segments are as long as the head and thorax united. Metanotum keeled down the middle, the base bordered by a curved irregular keel, forming a large basal areæ; the rest irregularly reticulated, the basal reticulations more irregular and larger than the apical; there is a stout, irregular, curved keel outside and inside the spiracles. Propleuræ with two curved keels, united below and with a longish keel behind them, in the centre. Mesopleural furrow wide, shallow, irregularly

striated. Pronotal spine long, sharp-pointed, roundly curved towards the head. The spines on the sides of metanotum stout, oblique, short, rounded and narrowed at the apex.

Spinaria bhotanensis, sp. nov.

Length, 12 mm. ♀.

Buxa, Bhotan (Dudgeon).

The resemblance of this species to *S. flavipennis* in form and coloration is very great; the two may be separated thus:—

The radial, the second and third cubital cellules, and the lower part from the recurrent nervure smoky, the basal cloud reaching to the apex of the basal abscissa of cubitus; the depressed lower part of mesopleuræ wide at the base, gradually narrowed towards the apex, closely reticulated-striated . . . . . *bhotanensis.*

The radial, second cubital and base of third, and the base of discoidal cellules unclouded; the depressed lower part of mesopleuræ not much narrowed at the apex, irregularly striated and punctured . . . . *flavipennis.*

The hind wings are clouded from near the middle; the cloud in the first cubital cellule is along the cubitus, extends to the apical fourth, becomes gradually narrowed to a fine point, and extends slightly into the discoidal cellule. The pronotal spine is long, curved; the top of the part in front of it is depressed, narrowed obliquely towards the spine, the base rounded laterally, the middle with a slight incision. Centre and base of metanotum irregularly, widely reticulated; the central keel larger than the others; the apex with three areæ, of which the central is not so wide, and has a keel down its middle; the lateral spines stout, oblique, wide at the base, narrowed and rounded at the apex. All the abdominal segments are stoutly, closely, longitudinally striated; the ventral surface, the sides of the basal two, and the apical segments are white; the latter is narrowed gradually to a long spine. Before the middle of the propleuræ are two stout, roundly curved keels, close to each other, and with a short oblique one in front. The keels bordering the scutellums are stout. Last joint of hind tarsi black, as in *flavipennis*.

If it were not for the marked difference in the clouding of the wings, I should have felt inclined to regard this species as a form of *flavipennis*.

NOTES AND OBSERVATIONS.

Notes on the Occurrence of Pyrameis cardui in the Early Summer of 1906.—With reference to Mr. Adkin's interesting article on the abundance of *Pyrameis cardui* in June of this year (*ante*, p. 173), I think perhaps some observations I made on the occurrence of this insect in the early part of the summer, or perhaps, to be more correct, in the late spring, may be of further interest to your readers. All during May I paid frequent visits to the coast between Eastbourne and

Birling Gap, but I saw nothing of this insect until almost the end of May, and then only two or three solitary specimens. On the day (June 3rd) that Mr. Adkin saw them in such numbers on the slopes of these cliffs, I was at Abbott's Wood, near Polegate, some five miles inland, and was surprised to see scores of *P. cardui* hovering over the flowers in a neighbouring field, most of them in perfect condition. I captured a number of them, and found in most cases that their fringes were intact and their colours almost as fresh as in the autumnal specimens. They certainly did not appear to have been very long on the wing. This, however, does not preclude the supposition that they are immigrants, as I am convinced that a passage across the sea, even on a high wind, would do less damage to their wings than a few days fluttering about amongst herbage. As some evidence of this, the greater number of those I examined on the 3rd were in good—almost perfect—condition, whereas in a few days, at the same spot, I was scarcely able to find a single specimen that was not worn or damaged in some way. By the 8th and 9th their number was considerably reduced, but as I left for Norfolk on the evening of the 9th, I was unable to continue my observations. On my return at the end of the month they had all disappeared. Particulars of the direction and velocity of the wind for the last few days in May and the beginning of June may be of interest in the matter; I therefore give them in tabular form:—

	Morning.	Afternoon.		Morning.	Afternoon.
May 28.	*W. 4.	W. 4.	June 1.	S.S.W. 4.	Calm.
,, 29.	W. 4.	W.N.W. 4.	,, 2.	W. 3.	Calm.
,, 30.	W. 2.	W. 1.	,, 3.	N.N.E. 4.	Calm.
,, 31.	W.N.W. 1.	W. 2.	,, 4.	E.N.E. 3.	E. 2.
			,, 5.	E. 2.	S.S.E. 3.

The prevailing winds during May were S.W. and W., and these continued up to the morning of the 3rd, and would be unfavourable to the crossing of any insects from the Continent; but early on the morning of the 3rd the wind changed to N.N.E., and was moderately strong, and would have been more favourable for their passage, and the continuing easterly winds for their dispersal over the country. It would be of great interest if observers in the Midlands and West of England would send in reports as to the exact dates of their having seen this insect, and whether singly or in some number.—J. E. Campbell-Taylor; Belmont, Polegate, Sussex.

Dates of Appearance of Zygæna filipendulæ and Z. trifolii.—I should like to raise a question as to the approximate date of their emergence. I find that nearly all authorities give early June, or at any rate June, as the time. Now my own experience is that they are more frequently met with in July. I saw nothing of them this year until July 1st, on which date I took both *Z. filipendulæ* and *Z. trifolii*, freshly emerged, at Polegate. On the 7th I found about thirty cocoons of the former on the slopes near Beachy Head, and these emerged

* The figures following the direction indicate the velocity on the scale of 0–10.

between the 24th and 26th. On the 8th I again took both flying in the sunshine in a meadow near Hailsham. And it has been my experience in past years that July is the month in which they mostly occur.—J. E. Campbell-Taylor ; Belmont, Polegate, Sussex.

Notes on the Capture of Boletobia fuliginaria. — During the years 1904–1905, I was a student at the Royal Staff College, Camberley. Whilst doing schemes in the evening after dinner in my study I used to keep the door into the garden and the windows open, in order to give the local Lepidoptera every opportunity to come in and be caught. On the evening of July 12th, 1904, several moths came into the study and flew around the incandescent light. I caught one that I thought I wanted, and whilst getting it into the killing-bottle I noticed that there was another moth resting at the bottom of my net. It proved to be a specimen of *Boletobia fuliginaria* in good condition. About half an hour later I chanced to look at the open door leading into my garden, and there on the woodwork sat another specimen. On July 16th I found a third on a window of the Staff College itself, and on July 20th a fourth specimen came into my study. I saw it come in, having been very much on the *qui vive* every evening after my first captures. It flew with a slow, flapping flight, and, as they are so dull-coloured, was exceedingly hard to see. The same year a brother officer took a specimen at light at his house, and in 1905 I could not come across any more specimens, but this same brother officer took two, one at light, and the other at sugar. The larvæ of *B. fuliginaria* are supposed to feed on fungus growing on rotten wood. The house I lived in had some stables and outbuildings near it, which contained plenty of rotten wood, but although I searched carefully, I never succeeded in finding the larvæ. I now possess four specimens of the above-mentioned insect, three of them being very good specimens, the fourth, which I captured in the Staff College, being slightly rubbed.—B. Tulloch (Captain) ; Strensall, York, Aug. 4th, 1906.

Sesia andreniformis bred.—The Hon. N. Charles Rothschild records in the Ent. Mo. Mag. for July that a fine *Sesia andreniformis* emerged on June 10th last from a larva he found mining in a stem of *Viburnum lantana*.

Meteorological Conditions affecting Lepidoptera.—I have read with considerable interest the article of Messrs. J. Lissant Cox and Justin Brooke on the "Noctuæ in Huntingdonshire," &c. (*ante*, p. 127), as it contains some remarks on a subject which one does not usually meet in entomological literature—namely, about the influence of meteorological conditions on the appearance of moths. I find that the conclusions arrived at by the authors coincide entirely with my observations made some years ago (a short abstract of them was published in the 'Entomologist,' vol. xxix. pp. 101–103). Apparently the influence of meteorological conditions of the night on the frequency in occurence of moths is the same in such different places as Huntingdonshire and St. Petersburg ; the insignificant number of observations at present available does not permit of further conclusions. I should like to draw the attention of entomologists to this subject, as systematic observations on the influence on meteorological and other

conditions on the habits of moths, carried out in different localities, are sure to afford valuable hints for the biology of Lepidoptera.—B. Menschutkin; St. Petersburg-Sosnowka, Polytechnical Institute, Laboratory of Organic Chemistry, Aug. 9th, 1906.

Notes on Pyrameis cardui.—At Dovercourt several worn examples of this butterfly were noticed during May. On June 1st I went to Instow, North Devon, and on the 2nd of the month, which was rather cold with a fresh north-westerly breeze, and on the 3rd, which was brighter, warmer, and less windy, a few were seen flying about the gardens and elsewhere. On the 4th, a delightfully bright hot day, with a light north-westerly breeze, I went to some high moorland to look for *M. artemis*, and here there were numbers of *cardui* passing from south-east to north-west, flying at great speed, and scarcely ever alighting on flowers or on the ground. During the three hours I was there, there was a constant succession of them, and there were always two or three in sight at the same time. I must have seen many hundreds in the course of the morning, and on my way home they still kept passing, and I saw great numbers again in the afternoon, all apparently migrating in the same direction. All that passed near seemed to be bright fresh-looking insects. On the 5th and 6th, which were very bright warm days, with a gentle breeze from the south-west, I was collecting on some rough high land, some 750 ft. above the level of the sea, and situated sixteen or eighteen miles to the south-west of the ground I was on on the 4th, and here *cardui* were plentiful, but seemed to be stationary. On the 7th, another lovely day, I was working on some slopes above the River Yeo, between Barnstaple and Lynton, about twenty miles to the north-east of where I was on the 5th and 6th, and here I also found *cardui* flying in some numbers, and noticed several females busily engaged depositing their ova upon various species of thistles. The whole time I was in North Devon—from June 1st until July 19th—I do not think a day passed without seeing this butterfly, but towards the end of my visit many of them were in an extremely ragged condition. On July 14th, while looking for *P. lithodactylus* among fleabane (*Inula dysenterica*), I noticed a small larva of *cardui* sitting quite exposed on the upper surface of a leaf, and upon searching the plants I saw that a quantity of larvæ must have been feeding, to judge by the number of empty "tents." I found two or three more small ones and one nearly full grown. The young larvæ appeared to attack the flower-buds first, spinning the terminal leaves together over the bud, which they devour, and then leave and spin "tents" lower down the stem. This was the first occasion upon which I had met with larvæ of *cardui* upon fleabane, and I do not think that it has been recorded as a food-plant. I have since seen larvæ and empty tents upon several species of thistle. The larvæ I found produced butterflies on August 3rd–5th, and I have seen many fresh-looking butterflies in this neighbourhood during the past week.—Gervase F. Mathew; The Green, Ferndown, Dorset, August 20th, 1906.

CAPTURES AND FIELD REPORTS.

Pachetra leucophæa near Boxhill.—While sugaring for *Agrotis cinerea* near Boxhill in early June this year, I was agreeably surprised to take several fine specimens of *P. leucophæa*, and later I also found a few females, with batches of ova, on the grass-stems by searching with a light. One female also came to sugar. Messrs. Tonge, Grosvenor, and Hodgson of this district also took this species in the same locality, obtaining, however, only females and ova.—A. J. Wightman; Redhill, August 21st, 1906.

An Entomological Hoax?—In the August number of this magazine, p. 188, Mr. Arthur Dods records the capture of *Limenitis sibylla*, and the finding of pupæ of *Papilio machaon* on Ranmore Common. I may say that I placed about seventy pupæ of *P. machaon* there in June, but I know nothing of the *L. sibylla*. The pupæ of *P. machaon* were of continental origin, and as this species is anything but a marsh species there, I saw no reason why it should not breed on Ranmore Common.—A. J. Wightman; Redhill, August 21st, 1906.

Hyloicus (Sphinx) pinastri.—Yesterday I noticed an example of this fine moth at rest on a pine-trunk. The specimen was in bad condition, as one might suppose considering the date, but I was none the less pleased to see it, as it shows the species is still maintaining itself, and has not died out from its old haunt as I had feared. Its occurrence in the garden of the old Rectory here, extending over a period of thirty years, may be of interest. The first capture was made by one of my brothers in 1875, another in 1876 or 1877, and a third in 1879. Then came a long interval; no more were noticed until 1893, when I was fortunate in securing three larvæ. In 1894 my brother captured a fine imago on July 1st; and in 1899 a larva was found late in September and given to me by the gardener. Since the latter date, although careful search has been made, no sign of this moth has been seen, and I was therefore very delighted to see it again yesterday. — (Rev.) A. P. Waller; Waldringfield Rectory, Woodbridge, August 13th, 1906.

Leucania favicolor in the Isle of Sheppey. — Whilst sugaring for *M. abjecta* early last month, I took six specimens of *L. favicolor*, both red and yellow varieties, on the salt marshes near Queenborough. This is, I believe, the first record for *L. favicolor* in the Isle of Sheppey. — J. J. Jacobs; 63, Marine Parade, Sheerness-on-Sea, August 15th, 1906.

Epione advenaria, &c., in Oxfordshire. — On May 28th of this year I netted a specimen of *E. advenaria* in good condition on the slope of the Chiltern Hills, near Watlington. I have also met with the following insects on the hills not hitherto, I believe, recorded for the county. *Eupithecia pusillata* occurred sparingly among spruce in two localities for the last three years, and at one of these localities *Coccyx pygmæana* was found in some abundance. In June, 1903, I took two perfect specimens of *Agrotis cinerea* at sugar at places a mile

apart.—John W. B. Bell; Pyrton Vicarage, Watlington, Oxon, August 14th, 1906.

Deilephila (Phryxus) livornica in North Somerset. — A fairly perfect specimen of the striped hawk moth, which had been taken at rest inside a room, was brought to me on the 3rd inst.—Bernard B. Gough; Compton Martin, near Bristol, August 6th, 1906.

Deilephila (Phryxus) livornica in Kent.—Mr. Sydney Webb, of Dover, informs me that a living specimen was brought to him on August 20th last.—Richard South.

Deilephila (Phryxus) livornica in South Devon.—We understand that quite a number of this species were taken at Paignton and Torquay in June and July last.

Heliothis peltiger at Lewes.—I, to-day, captured a fine male specimen of this insect flying in the sunshine on a slope of the South Downs.—Philip H. Vinall; 220, High Street, Lewes, August 24th, 1906.

On July 18th last I found a larva near Lewes, feeding on *Ononis*, which I could not determine to my satisfaction. On the 15th inst. the question was settled by the emergence of a fine specimen of *Heliothis peltiger*. — Hugh J. Vinall; 3, Priory Terrace, Lewes, August 24th, 1906.

Heliothis peltiger in South Devon.—During May this species was frequently taken at flowers of valerian; and larvæ were very plentiful during June and July feeding on rest-harrow. An example of the second brood was captured at bramble-blossom on August 11th. Ova were obtained from two females, but the larvæ from these died off before attaining full growth. The smaller larvæ collected from rest-harrow also failed to mature, and it was found that only those larvæ that were nearly full grown when taken reached the pupal stage. J. Walker; 3, Goodwin Terrace, Carlton Road, Torquay.

Argynnis paphia *var.* valesina in Gloucestershire.—On Saturday, August 11th, I spent an hour on the hills above the town of Wotton-under-Edge in order to obtain some fresh specimens of *Vanessa cardui*, which is now in perfection and very abundant. I was taking these along a hedgerow on the flowers of *Eupatorium cannabinum*, and whilst in the act of securing one of them, I saw close to me a specimen of *P. valesina* feasting on the flowers of the same plant. I had my net over it in a minute, and it is now on my setting-board. Within twenty yards I saw a second specimen, but in my anxiety to net it I missed, and it went sailing up over the tops of the beech-trees growing on the other side of the road, and was lost to sight. I wandered a little way on to the verge of Westridge Wood, and here *A. paphia* was in greater abundance than I had ever seen it before, males and females in all directions. *V. io* was everywhere, and I netted one *V. atalanta*, which insect is certainly getting much scarcer—I might almost say very scarce—about here. The chalk hill blues were greatly in evidence on the hillsides. It is now, according to my notes, some twenty odd years since *P. valesina* was captured in Gloucestershire before. It

was about that time taken by Mr. W. R. Newstead at Great Witcomb. V. R. Perkins; Wotton-under-Edge, August 13th, 1906.

Larvæ of certain Species of Lepidoptera abundant.—Has anybody noticed the large numbers of larvæ there are this year? *Smerinthus ocellatus*, *S. populi*, *Saturnia carpini*, *Euchelia jacobææ*, *Orgyia antiqua*, *Dicranura vinula*, *Cerura furcula*, *C. bifida*, *Notodonta ziczac*, *Phalera bucephala*, and *Clostera reclusa* are a few from the many we have taken in the vicinity of the Long Valley and Racecourse. — G. Hobbs; 37, Alexandra Road, Aldershot, August, 1906.

Sirex gigas.—On August 21st a very fine female specimen of *Sirex gigas* was caught by Mr. Stephen Reynolds on the summit of Mis Tor, Dartmoor.—H. McArthur; 35, Averill Street, Fulham Palace Road, London, W., August 24th, 1906.

Prionus coriarius in Essex.—I captured a female *Prionus coriarius* flying at dusk in my garden here on July 27th. This is the first time I have met with this conspicuous beetle, though, on referring to the 'Entomologist,' I find that it has been taken not uncommonly in Epping Forest, and Fowler records it from Loughton and Colchester. W. S. Gilles; The Cottage, Boching, Braintree, Essex, July 28th, 1906.

Plusia ni and Laphygma exigua at Tenby.—Whilst collecting with Mr. Spottiswoode Graves at Tenby on June 9th, we secured a worn *Plusia ni*, which laid a few eggs in the collecting-box, and which I succeeded in rearing; the second brood emerging from 24th to 30th July. The larvæ fed freely on broccoli and lettuce. I have also taken at Tenby during August four *L. exigua* at sugar. I believe both species are a new record for Tenby.—J. A. Finzi; 53, Hamilton Terrace, N.W., August 22nd, 1906.

Phibalapteryx polygrammata: a Correction.—Owing to the kindness of Mr. E. R. Bankes, of Corfe Castle, I find that the *P. polygrammata* I reported (*ante*, p. 190) as taken at Strensall is only *P. lignata* after all. The mistake arose through my having compared the moth with the figure in Newman's 'British Moths.' I was not aware that the figures on pages 174–175 should be transposed.—(Captain) B. Tulloch; Broom Villa, Strensall, York, August 16th.

Laphygma exigua in Surrey.—On August 27th, 1906, I boxed an example of *Laphygma exigua*, which was at rest on a fence near an electric lamp at Kingston Hill, Surrey. The specimen was eventually found to be a female, and has deposited about a dozen ova.—Ernest Warne; The Mount, Liverpool Road, Kingston Hill, Surrey, August 28th 1906.

[In addition to the above record Mr. Percy Richards reports three specimens from Kingston Hill in August, and one from Oxshott, August 23rd.—Ed.]

Laphygma exigua in Kent.—I have to report the capture of a grand male (in bred condition) of *L. exigua* here last night. I boxed it while it was fluttering in the grass. Mr. V. E. Shaw was a witness of the capture.—L. W. Newman; Bexley, Kent, August 27th, 1906.

Chrysophanus phlœas ab. schmidtii in Essex. — My friend Mr. King, who only recently commenced collecting Lepidoptera, this morning took a very fine specimen of *C. phlœas* ab. *schmidtii* at Chingford.—Wm. G. Pether; 24, Wallace Road, Canonbury, N., August 5th, 1906.

Notes from the Wye Valley.—Whitsuntide this year was spent in the Wye Valley, on the Monmouthshire side of the river, between Bigsweir and Redbrook. Favoured with good weather on the whole, I met with some success. The best place for the sun-loving insects was the bank between the railway and the river. Here the three common Pieridæ, *Euchloë cardamines*, *Argynnis euphrosyne*, *Syrichthus malvæ*, *Nisoniades tages*, and *Euclidia glyphica*, were about in numbers, and the following less commonly: *Gonepteryx rhamni*, *Vanessa cardui*, *Pararge megæra*, *Polyommatus phlœas*, *Lycæna alexis*, *Euclidia mi*; and one *Anaitis plagiata* was found on a post in the full sun. *Heliaca tenebrata* appeared in the same locality amongst the long grass towards evening. From the railway bank a delightful path leads through the woods back to the village, in a lateral valley where I was staying. By beating and dusking along this footpath I obtained a lot of Geometræ, including *Epione advenaria*, *Ephyra punctaria*, *E. annulata* (*omicronaria*), *Numeria pulveraria*, *Minoa murinata* (*euphorbiata*), *Emmelesia affinitata*, *E. albulata*, *E. decolorata*, *Cidaria corylata*, and *Herminia griseatis*; while a few *Melanippe hastata* were found flying in the sunshine. There were not many insects to be found in the higher ground, but of course *Venilia maculata* and *Ematurga atomaria* were common in suitable localities, and a few *Cidaria suffumata* were netted at dusk. One *Ligdia adustata* was beaten out of a hedge near Bigsweir. I did not do any larva-beating, but found a batch of forty *Tæniocampa miniosa* on a twig of oak. Larvæ of *Hybernia defoliaria*, and of course *Cheimatobia brumata*, swarmed, and a few *Abraxas grossulariata* were noticed. From a bed of nettles near Llandogo I took twenty larvæ of *Botys ruralis* in about half as many minutes. I was successful in obtaining a number of ova from *Epione advenaria* and *Tortrix ministrana*, but could only induce females of *Melanippe hastata* and *Ephyra punctaria* to lay a few each.

Not much work was done with the Diptera, but with the kind assistance of Mr. H. W. Andrews I have been able to name the following:—*Tipula gigantea* (one), *Atherix ibis* (one), *Dioctria œlandica*, *Chilosia variabilis*, *Leucozona leucorum*, *Rhingia campestris* (common), *Volucella bombylans*, *Eristalis nemorum*, *E. pertinax*, *Xylota lenta*.

Very few Hymenoptera were noticed, beyond the common bumblebees, but I found two localities for *Eucera longicornis*, in one of which it was very common.

The following is a full list of the Lepidoptera observed:—*Pieris brassicæ*, *P. rapæ*, *P. napi*, *Euchloë cardamines*, *Gonepteryx rhamni*, *Argynnis euphrosyne*, *Vanessa cardui*, *Pararge megæra*, *Polyommatus phlœas*, *Lycæna icarus* (*alexis*), *Syrichthus malvæ*, *Nisoniades tages*, *Hylophila prasinana*, *Spilosoma lubricipeda*, *Tæniocampa miniosa* (larvæ), *Heliaca tenebrata*, *Euclidia mi*, *E. glyphica*, *Epione advenaria*, *Rumia luteolata*, *Venilia maculata*, *Odontopera bidentata*, *Iodis lactearia*, *Ephyra punctaria*, *E. annulata* (*omicronaria*), *Asthena candidata*, *Acidalia remu-*

taria, Cabera pusaria, C. exanthemata, Panagra petraria, Numeria pulveraria, Ematurga atomaria, Minoa murinata (*euphorbiata*), *Abraxas grossulariata* (larvæ), *A. sylvata, Ligdia adustata, Hybernia defoliaria* (larvæ), *Cheimatobia brumata* (larvæ), *Emmelesia affinitata. E. albulata, E. decolorata, Eupithecia castigata, Melanippe hastata, M. montanata, Coremia designata, C. ferrugata, Cidaria corylata, C. suffumata, Anaitis plagiata, Herminia grisealis, Aglossa pinguinalis, Botys ruralis* (larvæ), *Scoparia ambigualis, Crambus pratellus, Tortrix ministrana, Penthina sororculana* (*prælongana*), *Ephippiphora pflugiana, Nemophora swammerdammella, N. schwarziella, Gelechia ericetella, Harpella geoffrella, Glyphipteryx fuscoviridella.*—Philip J. Barraud; Bushey Heath, Herts.

SOCIETIES.

Birmingham Entomological Society.—*May 21st*, 1906.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. C. J. Wainwright, referring to Mr. Bradley's exhibit of *Cheilosia velutina*, Loew, at the last meeting said that on reference he found that he had four males and three females, taken at West Runton at the same time Mr. Bradley took his. He said the insects did not tally exactly with Becker's own description of *velutina*.—Mr. W. E. Collinge showed Coleoptera from an old beech at Erdington.—Mr. Wainwright, various Lepidoptera.—Mr. J. Simkins, fine forms of *Tæniocampa incerta*, Hufn, and other Tæniocampidæ, &c., from Solihull.—Mr. G. T. Bethune-Baker, various new species of Lycænidæ from Africa, New Guinea, &c., and communicated a paper in which they were described.—Colbran J. Wainwright, *Hon. Sec.*

RECENT LITERATURE.

1. *A Text-book of Botany.* By J. M. Coulter, A.M., Ph.D. 320 figs. Sidney Appleton. 1906.
2. *British Flowering Plants.* By W. F. Kirby, F.L.S., F.E.S. 120 coloured plates. Sidney Appleton. 1906.

So much do the vegetable and insect worlds interact the one on the other that no entomologist can afford to be altogether ignorant of botany. In No. 1 he will find an excellent up-to-date book, which will give him a real insight into the subject. Besides being treated in a way that anyone may understand, the subject is elucidated by very many illustrations, many being photographic. The entomologist may perhaps like best the chapters on "Flowers and Insects" and "Plant Associations." No. 2 does not profess to teach botany, but is intended to assist in the identification of, and to provide information about certain British flowers. Written by so well-known an entomologist as W. F. Kirby, we are not surprised to find many insects referred to. The notices of the plants are concise and interesting, and should serve their purpose well. The pictures are often rather crude, both in draw-

ing and colouring, but still they will usually enable the user easily to identify the plants figured. Complaint is made in the preface that the author cannot notice "every species or even every genus of British plants," yet space is wasted on some common plants like the cowslip, and quite a number of non-British species are introduced, which, besides making the title incorrect, gives one the impression (erroneous no doubt), that the text was written to suit the plates.

3. *Annals of the Natal Government Museum.* Vol. i. pt. i. Edited by E. Warren, D.Sc.Lond. London: Adlard and Son. 1906.

The editor is to be congratulated on this production. The plates are of the very first order. We look forward to some entomological articles in future numbers.

4. *On the Life-histories of the Ox Warble Flies Hypoderma bovis, (De Geer) and H. lineata (Villers).* By A. D. Imms, B.Sc. Lond. Pp. 18, including a bibliography of the subject. Journal of Economic Biology, vol. i. pt. 1, 1906.

5. *Diversities among New York Mosquitoes.* By Dr. E. P. Felt. New York, 1906. From Proceedings of Second Anti-Mosquito Convention. 18 pp., with fourteen plates and other illustrations.

Means of distinguishing mosquitoes are discussed.

6. *L'Enseignement de la Zoologie appliqué à l'Agriculture.* By F. V. Theobald, M.A. 1905. 15 pp. Contains, besides other matter, suggested courses of study.

7. *Ueber der Laich der Trichopteren.* Von A. J. Silfvenius, Mag. Phil. Helsingfors, 1906. (Acta Societatis pro Fauna et Flora Fennica, 28, no. 4.) Pp. 128, including a bibliography and 2 plates.

W. J. L.

Illustrations of British Blood-sucking Flies. With Notes by Ernest Edward Austen, Assistant, Department of Zoology, British Museum. Pp. 74, with 34 coloured plates. Natural History Museum, South Kensington. 1906.

Of the blood-sucking flies known as midges, gnats, horse-flies, clegs, brimps, &c., most residents in the country, or visitors thereto, will have at some time had more or less unpleasant experience. To some persons the hum of *Tabanus bovinus* is more disconcerting than the challenge of an angry bull; such people have had experience of the insect as a rural phlebotomist, and dread a repetition of the operation. The silent-winged and ubiquitous *Hæmatopota pluvialis* is the fly which most frequently draws blood from the entomologist, but the latter is also well acquainted with the bump-raising powers of British species of *Anopheles*, *Culex*, &c., which Mr. Austen, in the volume before us, states "are as much entitled to be called mosquitoes as are tropical species belonging to the same genera."

It is estimated that there are some seventy-four blood-sucking flies in Britain, and enlarged portraits of the most important of these

will be found on the thirty-four plates on this most valuable and exceedingly attractive book. These plates are of exceptional merit, and have been reproduced from water-colour drawings by Mr. A. J. Engel Terzi, which are, or will be, on view in the North Hall of the Natural History Museum at South Kensington. In the notes, furnished by Mr. Austen to accompany the plates, much information of general interest concerning these insects is given, and technicalities have been minimised. There are remarks on the life-histories of the species, and on their distribution both in Britain and abroad.

Transactions of the City of London Entomological and Natural History Society for the year 1905. The London Institution, Finsbury Circus. 1906.

In addition to the usual interesting matter comprised in the "Reports of Meetings," there are some capital papers in this little volume of sixty-two pages. Mr. Louis B. Prout's contribution on "The British Species of *Perizoma* (*Emmelesia*)" (20 pp.) is perhaps the most important. Mr. Pickett's paper refers to the aberration of *Lycæna* (*Polyommatus*) *corydon*; and the Rev. C. R. N. Burrows has some informative remarks on *Orgyia gonostigma*.

Proceedings of the Hawaiian Entomological Society for the year 1905. Pp. 36, with Index and 2 Plates. Honolulu, 1906.

Considering that this Society only came into being on December 15th, 1904, the inital volume of its Proceedings is a remarkably good one. The main object of the Association is "to promote the study of entomology, and to encourage friendly relations between those in any way interested in the science." Up to date of publication the membership was twenty. The President in 1905, and nominated for 1906, is Mr. R. C. L. Perkins; the Editors of the Proceedings are Messrs. G. W. Kirkaldy and Otto H. Swezey. The two plates, which are well executed, represent mouth-parts of Tenthredinidæ.

The Agricultural Journal of India. Agricultural Research Institute, Pusa. Calcutta: Thacker, Spink & Co. 1906.

We have received Parts 1–3 of this Journal, which is published quarterly, and is the official organ of the Department of Agriculture in India. The contents, which, in the present numbers, are chiefly of importance to the agriculturist and economic entomologist, are, some of them, contributed by others than the officials of the department. The eighteen plates, one of which is a photographic group of officials, and another comprises coloured figures of "Moths of Hairy Caterpillars," are exceedingly well done, and these, and the contents as a whole, will be of interest to entomologists generally.

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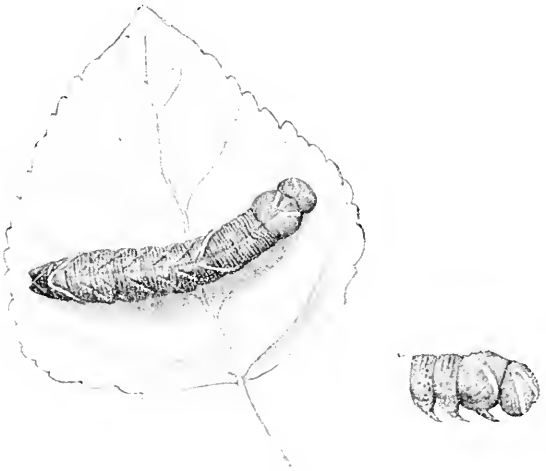
IMPERFECT MOULT IN A LARVA OF *AMORPHA (SMERINTHUS) POPULI.*

By T. A. CHAPMAN, M.D., F.Z.S. &c.



MR. SOUTH forwards to me a larva, given to him by Mr. Norman Riley, of *Amorpha* (*Smerinthus*) *populi* in its last instar, the victim of an accident at moulting, *viz.* the retention of the larval head of the previous skin, the moulting otherwise being successful. This accident is not very rare, and is more or less familiar to those who breed many Lepidoptera. I fancy I have seen it perhaps fifty times. A short memorandum on the condition of such a larva may be useful, as I do not for the moment recollect any notice of it in our text-books or magazines.

At moult the new head is much larger than the old one, and the difficulty of the new head being within the smaller old one is overcome by its leaving the old one and occupying the prothoracic segment of the old skin. Room is made for it there by

the distension of the membrane uniting the prothorax with the head on one side and the mesothorax on the other, and to some extent by the compression of the prothorax itself. My command of terminology is not sufficient to enable me to express myself briefly, and yet avoid (from a purist point of view) talking nonsense. Thus, to talk of the old head and the new head is, strictly speaking, nonsense. There is only one head; what is old and new is the hard chitinous covering or cuticle—hard on the mature head, soft at, and for a short time after, each moult. This hard covering is cast at each moult, and the first stage of the exuviation is this retreat of the head proper into more expansible quarters. The mouth-parts only, remain in the old head, the space in which, that they do not occupy, being filled with fluid, the same fluid that bathes the larva under the old skin. I believe that when the skin is actually cast the larva laps up the remains of this fluid, as the head is full of it just before, but is quite empty, if not dry, as soon as it has taken place.

In the moult to pupa the head always splits up, but in larval moults it remains entire. There is much variation as to one detail, bearing closely on the accident or malformation under consideration.

In some species the head remains attached to the cast skin, more or less fixedly. This may be readily seen in the cast skins of the larvæ of the gregarious Vanessas as they remain attached to the larval webs. In other cases they are so lightly attached to the skin that they fall away from it almost at once. In the majority of cases, amongst Noctuæ, &c., the head is separately detached. In the breeding-cage these heads will be found lying on the floor, whilst the skin proper remains attached to the larval resting-place, except when the larva eats it, as often is the rule (the head is never eaten). In this section the old head is not drawn off by any traction of the old skin when it slips backwards, but seems to be quite loose, and falls off. Whether it be the rule in certain species, or only an exception occurring in some individuals, one often notices the old head has to be shaken off by the larva, or even rubbed off against the surface the larva rests on. Whether this is the rule in some species or not, it is usually, I think, pathological, and is a step in the direction of Mr. South's specimen. In this instance the old head remains in the position it occupied, after the new head had taken up its quarters in the prothoracic skin, the moult in all other respects being successfully accomplished. This accident is, in my experience, always fatal; the larva is effectually muzzled, but more than this, the muzzle is of a special character. It can, in nine cases out of ten, be readily removed by a little force, but the new head has hardened in the muzzle, and the circular opening has impressed itself round the base of the

mouth-parts, pinching in a circular depression, and so deforming the relations of parts that the mandibles are quite useless and unable to bite. When the head falls off normally, and the new head is relieved from the pressure of the old skin and head, it undergoes some little further expansion before it hardens; it is probably this expansion that normally makes the old head fall off, but when it does not, it results in the strangulation above the mouth-parts and the accompanying deformity.

When a larva fails in this or any other way to moult successfully, there is usually some ascertainable cause; often removal from the silken carpet or cocoon spun for the occasion has a disastrous effect; some debility, as by rearing in captivity under bad conditions, may frequently be suspected. In the larva of *A. populi* under discussion a cause of debility is very evident; it has no caudal horn, the site of the horn is occupied by a vacancy in the yellow stripes. There can be little doubt that the horn was lost by some accident, bitten probably by one of its brethren, the larva being one of a brood reared together, and by this accident, probably in the previous instar, whatever it was, more or less general damage by bleeding probably occurred, as well as the local injury.

Betula, Reigate, September, 1906.

LARVÆ OF *LYCÆNA BELLARGUS* AND THEIR ASSOCIATION WITH ANTS.

By A. L. Rayward.

Since finding larvæ of *Lycæna corydon* in association with ants—as reported by me in the last number of the 'Entomologist'—I have been desirous of discovering the larva of *L. bellargus* in its natural habitat, as from the fact that it is very similar in its structure and habits to that of *corydon*, and feeds on *Hippocrepis comosa*, which is one of the food-plants of that species, I was led to expect that it might be similarly associated with ants, and be possessed of as highly-developed a secretory gland as that found on the dorsal surface of the seventh abdominal segment of its ally.

This expectation proved to be well-founded, for of seven full-grown larvæ of *bellargus* taken by Mr. A. Harrison and myself at Folkestone on August 11th and 12th last, at least two had ants upon them when found, and in one instance an ant was observed to be busy stroking the gland with its antennæ in the endeavour to excite the flow of the liquid secreted by that organ, and with the desirable qualities of which it was evidently familiar.

The ants found attendant upon these larvæ were black, and of a different species from those discovered associated with the larvæ of *corydon* at Reigate, which were *Formica flava*; oddly enough, however, I was unsuccessful in my efforts to obtain a demonstration of the function of the gland by means of these black ants, some of which I brought with me on my return from Folkestone, while complete success attended the first attempt when an example of *F. flava*—taken from a nest introduced some time ago into my garden for the purpose of experimenting with the larvæ of *L. arion*—was made the medium.

Possibly *flava*—which is common on the *bellargus*-affected hillslopes at Folkestone—is more generally associated with these Lycænid larvæ than are other species of ants, and the instinct for "nursing" more highly developed than is the case with the black ants referred to, which have been identified for me as workers of *Lasius niger*.

That ants are not essential to the well-being of *corydon* or *bellargus* appears to be certain, as both species have, I believe, been successfully reared through from the egg without any intervention or assistance from them, and a brood of the latter species, reared by me last year from ova deposited in captivity, were kept under conditions which certainly precluded the possibility of their aid. It appears probable, nevertheless, that under entirely normal conditions ants may protect the larvæ in some measure from the attacks of their natural enemies, and, if that be so, the relationship would seem to be a mutually advantageous one.

Wallington: Sept. 19th, 1906.

SOME NOTES ON SCANDINAVIAN AND LAPLAND BUTTERFLIES.

By H. Rowland-Brown, M.A., F.E.S.

(plate vi.)

My plans for an entomological excursion to Sweden had been carefully arranged before I left England, and arrived at Gotenburg in the middle of June last. My original itinerary comprised an expedition to Narvik, the terminus of the Ofoten Railway, crossing thence to Swedish Lapland, and reaching Abisko on the Torneå Lake about the end of the month. But advices from Herr J. Sparre-Schneider at Tromsö, who kindly furnished with much local information, decided me to reverse the order of my going. The season of 1906 in the higher north, owing to the depth and quantity of the snow, was evidently very

H. R.-B.

SNOW MOUNTAINS AND BIRCH FOREST, ABISKO, SWEDISH LAPLAND.

late, and with this in mind I determined to see what I could of Southern Sweden first, and so time my arrival in Lapland as I anticipated with the height of the summer. My forecast—sanguine in every respect both as to time, occasion, and results—was, however, doomed to disappointment, and, although in the five weeks or so I was in Scandinavia I experienced in every other respect much that was delightful as well as novel, the Fates were dead against my butterfly hunting from start to finish; not because I hit invariably the wrong localities, but chiefly because the skies were persistently overcast, though the weather was otherwise fine, and the heat sometimes quite suggestive of the "Midi." My brethren of the net will, I feel sure, sympathize with me under these entomologically depressing conditions; the more so when I say that hardly a day passed in Lapland without the sun bursting forth in full splendour at about 11 p.m., and remaining in a clear sky until 3 or perhaps 4 a.m. Meanwhile, I had equipped myself with all available information as to localities, and further was glad to hear from Prof. Aurivillius that the headquarters chosen by me north of the Arctic Circle was largely unexplored ground for insects. For the benefit of any collector who should chance to follow in my footsteps—and the enterprise of the Swedish State Railways, coupled with the good pioneer work of the Swedish Touring Club, is rapidly developing these hitherto inaccessible regions—I venture to suggest one or two works as useful guides, for the majority of which I am indebted to Herr Sparre-Schneider, the Conservator of the Tromsö Museum and a scientist thoroughly acquainted with the insect-fauna of Finmark. But Herr Lampa's Swedish lists are rendered much less useful than they would be otherwise by the omission of dates, and this under the peculiar conditions of the Scandinavian climate is, of course, a serious drawback. Nor does there seem to be any recent Swedish work on the subject to assist the ordinary collector; though possibly a better knowledge of the language would have helped me to discover something of the kind in the Stockholm Natural History Museum. Prof. Aurivillius's 'Nordens Fjärilar' (1888–91), with its excellent letterpress, and luminous woodcuts in such striking contrast to the wretched coloured plates which represent any other butterflies than those of Scandinavia, is therefore the best handbook in print, so far as I know; while, save in the environs of the Capital, there have not been such developments, either of building or of industries, as to destroy old localities, and I fancy, given the right conditions, I should have found most of the Lapland butterflies as plentiful—or otherwise—in the haunts where they were recorded by Wallengren and by Zetterstedt over half a century since. It is, therefore, principally with the hope that I may be able to put dates to the emergences of species actually

encountered that I venture to place these few remarks before your readers.

The day I arrived in Gotenburg, after a passage in the s.s. 'Calypso' from Hull of unruffled calm and consequent comfort, was brilliantly hot with a clear sky, and I at once determined to pay a visit to Trollhättan by rail, since it was rumoured that all the seats and berths on the Gotha Canal-boat were booked, and I had no desire to be included among the congested crews. The season—at all events, in this part of Sweden—appeared to be well advanced, and I presently discovered that the southern half of the peninsula was suffering from an unusual drought. On the railway to Trollhättan I saw a single specimen of *Papilio machaon*, the only example encountered, though I was informed later by a young collector whom I met that he found the larvæ not uncommon in this neighbourhood. On the hills surrounding the famous waterfalls, and through the shady pine-woods, *Pararge mæra*, a typical form but very dark, was everywhere in evidence, while I also noted, more or less commonly, *Cœnonympha pamphilus*, *C. arcania* (one), and *Pieris rapæ*. These butterflies presented no marked difference from those of their species encountered elsewhere on the northern continent, and the same may be said of the little bag I made next day at Jönköping, the pretty town which lies at the southern end of Lake Vettern. Here in the public park—a wide stretch of heath, marsh, and woodland—I found a pleasing variety, though I should have worked this single afternoon with considerably more zeal had I realized that this was the last of the sunshine at suitable collecting places for many days to come. Indeed, so misty and threatening was the weather next morning that I had to abandon altogether my steamer trip to Stockholm by lake and canal, and to take train direct. I had, however, time to make the acquaintance of a fine form of *Polyommatus hippothoë*, of which the males were more or less worn, but the females large and fresh, with a wide tawny suffusion on the upper wings. They haunted a little ditch at the edge of a copse, by the side of which the grass grew tall and rank, and divided the honours with *Argynnis selene* (typical but small), *A. euphrosyne*, *A. ino* (males), in fine condition, and occasional *Melitæa athalia*, while on the dusty road *P. mæra* was again conspicuous; the males with a supplementary well developed small eye-spot above the customary ocellation on the upper side of the fore wings.

The neighbourhood of Stockholm is scarcely favourable to butterfly life, and I saw very few species on the many pleasant excursions, which for a week or so now occupied my time—these undertaken mostly by steamer to one or other of the resorts to which all good Swedes betake themselves when the days lengthen out into twenty-four hours of sunshine and twilight. I do not note having met with any butterflies at all actually in the capital,

where there are several well-planted, flowery public gardens; but on June 29th, on the island of Vaxholm, where there are fine fir-woods and heathy commons among the many well-cultivated enclosures, I observed *Pieris brassicæ*, *Vanessa urticæ*, *Argynnis lathonia* (one), a fresh specimen of *Grapta c-album*—which puzzled me somewhat, as I cannot now determine to what brood it belongs, though it must surely have been a hybernator—*Pararge mæra* (similar to the Jönköping form), *Cœnonympha pamphilus*, and *Lycæna icarus* (males).

July 3rd should have seen me on my way to the far north, but, having proceeded in the morning by boat to Upsala to visit the University and the grave of Linnæus in the beautiful cathedral, there was some mistake about booking my berth on the Lapland Express; and, having boarded the train, I discovered that I could get no further than Bräcke. As there would not be another *direct* train for three days, I determined to see something of Jemtland, and proceeded to Östersund, a charmingly situated town on the Storsjö, where I awaited the boat which was to steam that day to Hallen, in the heart of what promised to be, entomologically speaking, a fine country. Having some six hours to spend here, I at once took out my net, and made along the railway, which is the connecting-link with Throndjem and Central Norway generally, and presently came upon some likely ground, where the spring flowers of our English woods were now in full bloom, the pink campions making a splendid show in all suitable situations. But once more the sun, which had hitherto shone with some brilliancy, played truant. I had noted *P. hippothoë* var. *steiberi*, the males not uncommon, and a little coppice produced *Lycæna argus*, L., and *L. argyrognomon* var. *ægidion*, Meissner, with the only *Leptidia sinapis* I met with in Sweden; but I had scarcely entered the outskirts of the woods when down came the rain, and, though it cleared somewhat for a few moments at a time, the butterflies refused to fly. On the lower saplings, however, I discovered not a few *Chrysophanus amphidamas*, but so worn as to be wholly useless for cabinet purposes. The day, moreover, resulted in the loss of my only pair of forceps—a disaster which travelling collectors will fully appreciate. A cold wet journey across the lake of some two hours, and I reached Hallen, the aspect of which at once determined me to accept the proffered hospitality of a seat on an hotel carriage destined for Bydalen—yet another three hours' drive, during which it poured incessantly. However, the morning of the 5th actually dawned fine, and I enjoyed, in the fitful intervals of sunshine, which lasted up to about two o'clock, some novel collecting in lovely country reminiscent of the lower and warmer valleys of the Alps. But it was curious to note that almost every butterfly I met with was outside the flowery meadows, which seemed here to offer little attraction to insects of all orders. By the river, on a piece of

waste, I found *Argynnis pales* var. *arsilache*—a grand form with heavily marked males, and larger than the type, such as it appears in the Central Alps; while *A. euphrosyne* var. *fingal* and *A. selene* var. *hela* were also not uncommon among the raspberry-bushes and campanulas bordering the road up which I had come the previous night. Here also I was presently to make my first acquaintance with the typical Scandinavia *A. frigga*, not always easy to distinguish on the wing from the light form of *A. thore*, which is the var. *borealis* of Staudinger, and described somewhat inadequately, I think, as "multo dilutior." I found also *C. amphidamas*, again, but even more battered than at Östersund, with quite typical female *L. icarus*, and few male *Pieris napi*, and *C. phlæas* presenting no special distinction. July 6th was devoted entirely to journeyings round the Storsjö, upon which there was no connecting steamer with Östersund; but, though it took me practically the whole day to get back to Bräcke by carriage, ferry, and rail, the road lay for the most part through splendid marsh and forest, containing I know not what entomological possibilities in the way of those Œneidi and Scandinavian Erebias for which ultimately I was doomed to have travelled some two thousand odd miles in vain!

Picking up the Lapland Express in the early morning of the 7th, I now proceeded direct to Abisko on the Torneträsk, through interminable forests, over vast rivers spanned by swinging bridges, past lonely sidings, where ever and again the thirsty engine paused for water, and then perhaps through miles of desert marsh, where the seeded cotton-grass, suggestive of *Cœnonympha davus*, nodded in the fresh sweet wind like a million suspended pearls.

A more comfortable and picturesque journey I have never made. The "express" is a leisurely affair compared with the "flyers" of France and England; it is capitally appointed with restaurant, and the roomiest sleeping berths in which I ever travelled, while the fare for a journey in distance equal to that of Stockholm to Rome, costs less than three pounds, second class; the second class being in every way equal in comfort to the "first" of other countries. Already the Swedes have made their "Världens Nordligaste Järnväg" the most favoured of tourist excursions; while the "Svenska Turistförening"—which I had joined, and advise every traveller in Sweden to join—has made Lapland easy of access by means of its "huts" planted at favourable centres for tourists, and naturalists in search of happy hunting-grounds. The so-called "hut" at Abisko is, in fact, a small hotel, built of the inevitable birch wood, scrupulously clean (as every inn in Sweden), and managed by a lady whose command of modern languages is as thorough as her capacity to keep and maintain in perfect comfort and temper thirty or so tourists, upon whom the mosquitoes descend in

overpowering force so soon as they show their noses unveiled outside the doors over which waves the gay blue-and-yellow flag of the Fatherland.

Of the Lapp mosquito there is nothing good to be said, and woe to the Briton who comes unprovided with a regular veil, and enough fine muslin at least to fill the windows of his sleeping-room during the brilliant sunshiny nights. I found nothing that would keep them at bay. The first three days I was at Abisko there was no ray of sunshine; only hot cloudy weather, and the mosquitoes consequently in tormenting myriads. When I did start collecting again, on July 12th, I was encased in stout boots, riding breeches and leather gaiters, buckskin gloves (to which presently I was compelled to safety-pin my sleeves, as the brutes settled savagely on my wrists), and a long veil, which effectually prevented my spotting any small butterfly at a distance. This latter I abandoned as the sun grew hotter, for the mosquitoes then descend into the grass, and are only troublesome to the face in the birch-woods, with which even in this latitude the mountains are plentifully forested—not the little dwarf shrubs common to less favoured regions until the arctic creeping variety alone survives—but tall upstanding trees that take the sense with sweet perfume suggestive of spring woods, and the fair mythology which lends a charm even to the nomenclature of Scandinavian butterflies.

The marshes that lie between the railway and the lake into which the Abisko river falls with a Niagara-like torrent of cold green water—at this season, at all events—appeared almost entirely devoid of butterfly life. Except a single *Colias nastes* var. *werdandi*, Zett., and sporadic *Lycæna optilete* var. *cyparissus*, Hb. (if variety it really be), I found nothing; only a few Geometers kicked up from the ground-growth of moss, or disturbed from the scattered birches. The best collecting-ground—indeed, the only productive ground—was in a lateral valley on the left bank of the river inland from the railway, and here, right up to the snow-line, which was very low in this backward season, I met with all the butterflies which I have to report. They are few in species, but, with the exception of *Argynnis freija*, were individually plentiful, *A. thore* var. *borealis* notably so, swarming in the open glades of the woods which abutted on the stream; while *Colias* var. *werdandi* became commoner with each upward step, though, to my surprise, it was hopelessly battered in nine individuals out of ten—a fact all the more remarkable, seeing that spring insects like the Argynnidi were only just emerging. *Werdandi*, then, must be among the first arrivals; and it was the only *Colias* I met with in Lapland. On the high banks facing the sun, and well flowered, *L. icarus* and *L.* var. *cyparissus* were very common, though not in such numbers as the little *L.* var. *ægidion*, which has a curious habit of lying flat on a leaf or

flower-head for protection. I took two very fine *icarus* females (=var. *cærulea*), completely suffused with sky-blue to the wing margins, with brilliant orange ocellations on the margin of the fore and hind wings alike, and in size equal to the largest males. They seem most to resemble the Sligo specimens described and figured (Pl. II. fig. 11) in the 'Entomologist,' vol. xx. p. 74, by Mr. South, or rather to come between this and the figure of *L. bellargus* var. *ceronus* (Pl. II. fig. 12), while the only male retained is referable to the ab. *icarinus*, Scriba. Meanwhile, on the hawkweed, *Erebia ligea* var. *adyte* was not uncommon, and in superb condition; and flitting restlessly up the river-bed, and over the rocks, occurred a fine brightly-marked form of *E. lappona*, of which some were the ab. *pollux*, Esp., with the central band on the under side of the hind wings tending to obsolescence; though in some examples the band is very sharply defined; while it is perhaps worth remarking that the ocellations of the lower wings, where not absolutely obsolete, are in all my six examples reduced to mere black spots. With them, and higher up, *Argynnis pales* var. *lapponica* was in profusion, but the two or three *A. euphrosyne* I captured belong, not as might be expected, to the smaller and darker var. *fingal*, but are in every way similar to the typical form of the English woods. *A. selene* I did not meet with at Abisko in any form. But among the fritillaries, I have since identified one rather worn male *A. aphirape* var. *ossianus*, and a very fresh female, so I must have overlooked this species on the spot—a matter of some disappointment, as I did not meet with it elsewhere. Of the skippers, the only species captured was *Augiades comma* ab. *catena*, singly. *Pieris napi*, just emerged, with one very tawny ab. *bryoniæ* (female), represented the "whites." The Vanessidæ were entirely absent, as well as the Parnassidæ, of which family the only example I saw in Sweden (where it occurs commonly enough on the southern and central mountains, I believe) was beside the railway near a station named Skorped, in Angermanland. With further occasional *Polyommatus* var. *steiberi*, I do not remember to have observed any other butterflies at Abisko, and must conclude therefore that I was much too early on the ground, which, being at an elevation of about 1100 ft. above the sea-level, and at rather more than sixty-eight degrees north, would evidently be better investigated in a late season like this some weeks later in July. As it was, the country further north-west along the railway to the frontier, which I visited in excursions to the beautiful Björkliden Fall, and the Lapp encampments at the head of the Torneträsk, on Pålnoviken Bay, was promising in appearance, with an abundant flora and much grass; but save as producing a few more Geometers, picked up by the lake-side, the days I made these little expeditions were all against collecting other than pleasant recollections and photographs of the primitive people whom so far contact

with railway civilization has done little to alter. Had I known before I met a tourist at Abisko that Kvickjock is now to be reached from Luleå and Jockmock without the least difficulty, I think I should have divided my attention in Lapland between these two places. As it was, I had made arrangements to return by the Norwegian coast, and on July 15th (the weather having again reverted to the worst), I determined to try my luck on the "other side," taking, the same afternoon, a steamer from Narvik—which in its surroundings promises well for entomological research—and, after yet another cold and wet day, arriving at Hammerfest towards the evening of the 16th.

(To be continued.)

ON SOME NEW GENERA AND SPECIES OF INDIAN ICHNEUMONIDÆ.

By P. Cameron.

ICHNEUMONINI.

Lissichneumon, gen. nov.

Metanotum impunctate, shining; the areola longer than wide, its apex transverse, the base open, confluent with the lateral areæ, the lateral two being also confluent; the spiracular area open at the base on the outside; the spiracles linear. Scutellum keeled at the base. Petiole long, slender; the base slightly broader than it is high. Ventral keel distinct to the apex of the fourth segment. Areolet large, 5-angled. Transverse median nervure received shortly beyond the transverse basal; the disco-cubital broken by a stump.

The body is very smooth and shining; the first abdominal segment is longer and more slenderly built than usual, the post-petiole not being defined, the apical half becoming gradually, but not much, dilated; there are eight segments. Apices of tarsal joints spinose. Apex of clypeus bluntly rounded. Gastracœli shallow, small, smooth, the apex widely distant from the base of the segment. Base of metanotum with a deep crenulated furrow. Labrum hidden.

The precise affinities of this genus may be left over for discussion when the female becomes known. It should be known by the very smooth and shining (including the metanotum) body, by the confluent areola and lateral areæ of metanotum, and by the long, slender abdominal petiole.

Lissichneumon levis, sp. nov.

Black; smooth and shining, the pleuræ, median segment and coxæ thickly covered with long white pubescence; the face, clypeus, mandibles except at the apex, a line on the inner orbits to opposite the ocelli, a line, gradually narrowed above, on the lower two-thirds of the

outer, a broad line on the pronotum not extending to the base, an interrupted line on the apex of the scutellum, dilated into a round spot at the apex of the keel, yellow; legs red; the four front coxæ and trochanters yellow; the hind coxæ and trochanters black. Under side of antennal scape yellow; the flagellum brownish below. Wings hyaline, the stigma and nervures black. ♂. Length, 12 mm.

May. Simla (Major C. G. Nurse).

Face and clypeus strongly but not closely punctured, the apex of the latter smooth; the apical row of punctures on it separated from the rest; the upper part of front and vertex sparsely, weakly punctured; the part between the ocelli more strongly and closely punctured. Scutellum somewhat densely covered with long white hair. Posterior median area from near the top stoutly, irregularly, longitudinally striated; spiracular area at the base and middle irregularly longitudinally striated; its apex with a few oblique ones.

HERESIARCHINI.

Stenodontus spilocephalus, sp. nov.

Black; the eye orbits except for a narrow line on the malar space, a narrow curved line below the antennæ, a mark in the lower part of the face in the middle, a large, wide, oblique mark on the sides of the clypeus, a line on the base of pronotum, one on the sides above, two lines on the middle of mesonotum, on the apical half, the sides and apex of scutellum, the scutellar keels, post-scutellum, a mark, longer than wide, on the apex of metanotum on the sides, tubercles, an oblique mark, dilated at the base above, roundly in the middle below, a more regular mark, narrowed at the apex, on the apex below and moderately broad lines on the apices of all the abdominal segments, pale yellow. Antennal scape dark rufous below; the tenth to sixteenth joints white below. Legs red, the four anterior coxæ largely yellow, the posterior black, yellow at the base below, and at the apex above; the trochanters marked with black, the apices of the tarsi blackish. Wings hyaline, the stigma pale testaceous, the nervures black. ♀. Length, 9 mm.

Simla. May (Major C. G. Nurse).

Head almost smooth; finely punctured at the ocelli; the pubescence short, white, sparse. Mandibles yellow at the base, the middle rufous, the apex black. Palpi white. Thorax finely, closely punctured; the scutellum more sparsely than the mesonotum; the latter is keeled laterally to shortly beyond the middle. Areola longish horseshoe-shaped; the round base margined by a narrow furrow, not by a keel; the apex is rounded inwardly; the basal half smooth, the apical weakly, irregularly striated; the part behind it is smooth, shining and confluent with the lateral areæ; the apical slope is more closely punctured than the rest. The first abdominal segment becomes gradually widened towards the apex, the post-petiole not being defined. Gastracœli separated, striated at the base, rufous at the apex; the middle segments are closely, minutely punctured; the apex is narrowed; the ovipositor largely projects. Areolet 4-angled, the nervures meeting in front, the recurrent nervure received in the middle; trans-

verse median nervure interstitial; disco-cubital broken by a minute stump.

What I take to be the male has the hind legs almost entirely black and the four anterior are darker coloured; the apex of the scutellum is black. The antennæ are black, stout, serrate towards the apex. The fore coxæ are for the greater part pale yellow; the middle yellow at the apex; the four posterior spurs are blackish, not reddish as in the female.

I should think, from their appearance, that the coloration of the legs varies a good deal.

This species appears to agree with *Stenodontus* (*Gnathoxys*, Wesm.), except that the scutellum is keeled laterally to shortly beyond the middle: according to the generic definitions *Stenodontus* has it margined only at base.

JOPPINI.

GLYPTOJOPPA, gen. nov.

Scutellum roundly convex, rounded behind; the sides not margined. Metanotum deeply, widely depressed at the base, the areola horseshoe-shaped; the other areæ distinct; the segment is short and with the sides broadly rounded. Areolet 5-angled, wide in front; the disco-cubital nervure broken by a very long stump; the transverse median nervure received distinctly beyond the transverse basal. Post-petiole wide, clearly separated; there is a distinct, deep, transverse furrow at the base of the third segment; it is closely striated.

The antennæ are short, taper towards the apex, and are serrate. Temples wide, obliquely, roundly narrowed; the occiput slightly incised. Wings yellowish hyaline, the apex clouded.

The metanotum is more regularly areolated than in typical *Joppini*, but in other respects it agrees more with that group than with the *Ichneumonini*, *e. g.*, in the form of the scutellum, and in the deep depression at the base of the metanotum. Its characteristic features are the roundly convex scutellum, deeply depressed base of metanotum, horseshoe-shaped areola, and the deep, striated furrow at the base of the third abdominal segment.

Glyptojoppa sulcata, sp. nov.

Testaceous, the mesonotum more rufous in tint; the breast, the antennæ towards the apex and the furrows at the base of the third abdominal segment, black; wings hyaline, tinged with yellow; the apex from the stigma smoky; the stigma and nervures testaceous. ♂. Length 14 mm.

Middle Tenasserim, Salween Valley. July (C. T. Bingham).

Head and thorax closely, distinctly punctured, covered with a short fulvous pile; the scutellum has a longer pile; the median segment more rugosely punctured and with a longer and denser pile. Abdomen closely, distinctly punctured, the post-petiole more strongly than the rest; the gastracœli deep, with three oblique keels on the outer side

and three straight ones on the inner side; the furrow on the third segment is wider in the middle and is closely striated there; the sides are smooth.

(To be continued.)

NOTES AND OBSERVATIONS.

Pyrameis cardui and other probably Immigrant Species.—With reference to Mr. R. Adkin's note in 'Entomologist,' p. 173–174, *Pyrameis cardui*, *Plusia gamma*, and *Nomophila noctuella* were abundant on the North Cornish coast on the day of my arrival there, June 2nd last, and during the following week. There seems to have been a great abundance of these three species in the west and south-west of Europe this year. During a recent holiday on the Continent in July and August, I found them wherever I made any observations, including in the following districts: Department of Aisne, some fifty miles east of Paris; in all districts in the Isle of Corsica; the Alpes-Maritimes, a little to the north of Nice; Beauvezer, in the Verdom Valley; and Digne, in the Basses-Alpes. In the neighbourhood of Vizzavona, in Corsica, at an altitude of about 3500 feet, *P. cardui* especially swarmed, and far outnumbered every other large Diurni occurring there. On the evening of the 3rd June, I took my net, and walked at dusk along the top of the cliffs on the North Cornish coast; there was a small light-coloured *noctua* flying about here in some numbers—probably I saw about two dozen specimens. The ground was difficult, however, and I only succeeded in netting four examples. My surprise was great on getting back to my lodgings to find these were *Laphygma exigua*, which, so far as I am aware, has not been recorded from this coast. On the following evening I sugared on the spot, but only obtained one specimen of *L. exigua*. I, however, boxed two examples of *Heliothis armiger* from the sugar. On subsequent nights I obtained at sugar one more specimen each of both these species. Although some of the *L. exigua* especially were perfect specimens, all the examples of both species were in a condition that would lead one to suppose they had flown a long distance, and I have not much doubt but that they had crossed the sea. I may mention that *Heliothis armiger* was common in the neighbourhood of Vizzavona, in Corsica, where it had much the same habits as *Plusia gamma*, settling in the day-time in the grass, and flying off very much after the style of that species when disturbed.—W. G. Sheldon; Youlgreave, South Croydon, Sept. 18th, 1906.

Joint Cocoons.—I was much interested to see the note under the heading, "Joint Cocoons," in the August number of the 'Entomologist,' as I have had a similar experience in breeding *Malacosoma neustria* and *Eriogaster lanestris* this year. In the case of the former, I imagine that the use of joint cocoons was more or less due to the exigencies of pupation within the comparatively narrow limits of a small breeding-cage. I give the figures, as I think them rather interesting. Forty-

seven full-fed *neustria* larvæ pupated. In three instances four pupated together, in five instances two, and in another three, *i.e.*, twenty-seven pupæ in ten cocoons. A curious result was that, in two of the quadruple cocoons, the first imago ready to emerge proved unable to force an exit, and, consequently, the remaining three were imprisoned, for there was only one exit, and they could not or would not break through elsewhere. In every case they were genuine joint cocoons without so much as the slightest film between the pupæ. The same thing happened with a brood of *E. lanestris*, but on a much smaller scale. In about eighty cocoons there are three instances of joint ownership, three, three, and two respectively. I am not absolutely certain, in this instance, that there is no partition, as they are not due to emerge till next year. But they are not merely stuck together (that frequently happens), but in one lump, so to speak. It may be worth mentioning that the *lanestris* were in a cage three or four times as large as that in which the *neustria* pupated, so, perhaps, there was less likelihood of joint cocoons.—E. Mannering; 46, Wickham Road, Beckenham, August 25th, 1906.

Acidalia immorata.—After a failure to get larvæ of this species through last winter, I have succeeded in breeding a second generation from ova laid by some females caught by me in the locality near Lewes on June 30th last. The ova were laid on July 1st and 2nd, and I got about forty in all. They hatched on July 17th and 18th, and were at once placed on leaves of *Plantago lanceolata*, and as soon as they were large enough were transferred to a potted plant and kept out of doors. Two of the larvæ at once proceeded to grow at a great pace, and, as they appeared to me large enough to be full-grown, I removed them from the growing plant, and took them indoors on August 26th. They fed for a few days longer, and one spun up on August 28th and the second on September 1st. The first larva spun against the side of a glass pot in which it was kept, making a slight silken cocoon, under a dead leaf, on the surface of the earth covering the bottom of the glass; the second also spun up under a dead leaf on the surface of the earth. The cocoons were both large for the size of the pupa, and, as a matter of fact, would hold at least six pupæ. The first larva pupated on September 2nd, and it produced a female imago on September 14th. The imago from the second pupa has not yet emerged, but will probably do so in a few days. With regard to the larva, it is very small and thread-like at first, and is practically unicolorous light greenish-brown until half grown, when it assumes the full markings of the adult larva. There is very little to add to the description of the larva in Barrett's 'Lepidoptera of the British Isles.' It tapers towards the head, the dorsal lines are continued over the head, the dots on either side of the dorsal lines as in a small brownish cloud; the under surface is putty colour, with traces of wavy lines; the dark brown side line is continued along the sides of the head, and there is a buff stripe below it, in which are the spiracles, which is continued down the claspers. When full grown it is a little over an inch in length. The larva feeds in a somewhat peculiar way, as it does not rest on the leaf on which it is feeding but on a neighbouring leaf or grass-stem. When young it eats pieces from the margin of the neigh-

bouring leaf, and when adult it begins feeding at the tip of the plantain leaf and eats that right down from the point almost to the bottom before proceeding to the next leaf. I have still about thirty larvæ, half grown, which will, I presume, hybernate in the usual way.—Francis C. Woodbridge, Northcroft, Uxbridge, September 14th, 1906.

Dicranura bifida Two Years in Pupa.—I have this summer bred two *Dicranura bifida* from larvæ taken near Market Rasen, Lincolnshire, in 1904. Other larvæ taken at the same time emerged as perfect insects in 1905.—G. W. Mason; Barton-on-Humber.

Autumnal emergence of Lepidoptera.—The hot summer of 1906 seems to have been favourable to the production of what is known as second broods of Lepidoptera; and the following instances of this have come under my notice:—

Arctia caia, of which species I obtained about a dozen ova in the middle of July. The larvæ from these duly hatched, and from the first evinced their purpose of getting through their metamorphosis in record time. Nine pupated between August 17th and 28th; one or two larvæ died, from injury, in early August, and one continued feeding until September 1st, when it became sickly and subsequently died. Nine moths emerged between September 8th and 12th. All were of average size and of the ordinary form.

Twelve eggs of *Parasemia plantaginis* were received on June 29th, and had been laid by a female in Aberdeenshire a few days previously. The majority of the larvæ from these were lost whilst quite young. Five, however, fed up, and, as regards four of them, pupated, and produced moths on August 30th and 31st—all females. The fifth larva is (September 27th) still feeding.

One male example of *Cerura bifida* emerged on August 21st. This was from one of five pupæ resulting from a few eggs obtained on June 29th.

A number of larvæ of *Spilosoma lubricipeda* were fed from the egg on sallow, and many of these had pupated by August 30th, on which day a female specimen emerged. Other larvæ of the same brood continued feeding until about the middle of September. So far no more moths have appeared.

Perhaps the most remarkable instance is that communicated by Mr. L. W. Newman, of Bexley, who sent me a specimen of *Moma orion* that emerged on September 2nd, and had only been in the pupal stage about seventeen days. He also reported on September 5th, that among other things *Cerura bifida*, *C. furcula*, and *Hemerophila abruptaria* "have all been emerging, two or three each, out doors in the sleeves." The weather has evidently also had a retarding influence on some species that more or less regularly attain the winged state twice in the year. In this connection Mr. Newman mentions *Drepana cultraria*, the larvæ of which pupated in June, but only one moth had emerged on September 5th.—Richard South; 96, Drakefield Road, Upper Tooting, S.W.

CAPTURES AND FIELD REPORTS.

Deilephila (Phryxus) livornica in Dorset.—On September 10th last I captured a very fine fresh specimen of *D. livornica*, flying over petunias, in the public gardens at Weymouth. This is, surely, a very late date for this insect?—R. A. Jackson, R.N.; Charity Farm, near Hollingbourne, Maidstone, September 23rd, 1906.

Deilephila livornica in Hampshire.—On September 2nd I was given a specimen of *D. livornica*, in perfect condition, by a friend, who caught it on a garden wall near Milton, Hants.—R. B. Murray; Oak House, Brockenhurst, Hants.

Deilephila livornica and Laphygma exigua in Somersetshire.—I note, in the 'Entomologist' for this month that *D. livornica* has been taken at Compton Martin, near Bristol, August 6th. I took a specimen in good condition hovering over verbenas on September 5th here; I had seen one the evening before at the same spot. *Laphygma exigua* came to light July 29th, August 6th, and August 11th, the first two good specimens, the last much rubbed.—Herbert C. Swayne; Ynyswytryn, Glastonbury, September 18th.

Deilephila livornica in Sussex.—On the 12th inst. I had brought to me a living specimen of *D. livornica*. It was in perfect condition, and had been taken in a florist's garden in this neighbourhood. I have never heard of it being taken in this district before.—C. Hamlin; Forest Cottage, Balcombe, Sussex, September 17th, 1906.

Laphygma exigua and Heliothis peltigera in Isle of Wight.—I spent some weeks in the Isle of Wight this autumn, and was fortunate enough to secure a few *L. exigua* and *H. peltigera* in a locality not far from Freshwater.—James Douglas; Dunolly, Sherborne, Dorset, September 20th, 1906.

I may, perhaps, mention that I have just bred a specimen of *H. peltigera* from larvæ taken at Sandown in July last, and that I took a few *L. exigua* at sugar at Shanklin on the 10th inst.—T. Maddison; South Bailey, Durham, September 19th, 1906.

Laphygma exigua, &c., in the Isle of Wight.—I was staying at Freshwater September 8th to 14th, and sugared regularly each evening. A few examples of *L. exigua* appeared on most nights, the earliest was taken at 7.10 p.m., and the latest at 11.40; about 9 o'clock seemed to be the best time for this species. *Aporophyla australis* and *Agrotis obelisca* were fairly common. Two specimens of *Heliothis peltigera* were obtained, and on the last night of my stay a grand female of *Leucania vitellina* was secured. *Agrotis segetum* and *A. suffusa* were both in large numbers.—L. W. Newman; Bexley, Kent.

Laphygma exigua in Somersetshire.—You may be interested to hear that I have discovered a locality for *Laphygma exigua* in Somersetshire this year. Up to the present I have succeeded in obtaining fifty-two specimens, and have also a nice batch of larvæ feeding. The

larvæ I have do not answer to the description given in Newman.—G. F. Rawlings; 8, Augusta Place, Bath, September 16th, 1906.

Deilephila livornica in Kent.—Another example of *D. livornica* was taken this morning outside the General Post Office on the window-sill. Condition as good as bred. The one I reported, *ante* p. 211, was of larger size but much wasted.—Sydney Webb; Dover, September 8th, 1906.

Laphygma exigua in Essex.—Last night, September 18th, I had the pleasure of taking a specimen of this rarity at sugar in my garden. I boxed it carelessly, thinking it was *Caradrina cubicularis*, which is coming rather freely to sugar now; but when I came to set it this morning, the orange spots and small size at once told the tale. I am still holding my breath at the thought of how near I was to leaving it alone.—Rev. W. Claxton; Navestock Vicarage, Romford.

Leucania extranea at Tenby.—On the 29th August I took a rather worn specimen of *L. extranea* at Tenby at rest on a twig near to sugared posts.—J. A. Finzi; 53, Hamilton Terrace, N.W., September 5th, 1906,

Heliothis peltigera in Wiltshire.—On Wednesday, 12th inst., I was fortunate enough to capture a very fine specimen of *Heliothis peltigera* on sugar at Clarendon Wood, near here. As I believe this to be the first record of the capture of this insect in Wiltshire, it may be of interest.—W. A. Boyne; Wilts and Dorset Bank, Salisbury, September 14th, 1906.

Colias edusa at Littlehampton.—A specimen of the above was seen on the river bank at Littlehampton on the 5th September.—Philip J. Barraud; Bushey Heath.

Colias edusa at Folkestone.—I saw a specimen of *C. edusa* near the Warren at Folkestone on August 29th last, and took one on the Downs over the town on the 30th.—F. Rogers; 58, Grandison Road, Clapham Common.

Colias edusa in Suffolk.—I noticed a fine male example of this butterfly, apparently freshly emerged, in my garden on August 31st. I have not seen any since.—(Rev.) A. C. Waller.

Colias edusa in Dorsetshire.—Mr. Lucas informs me that this species was seen at Lulworth, end of August last.—Richard South.

Sphinx convolvuli in Suffolk.—A very damaged female was brought to me on September 14th. This is the only instance of its occurrence about here this year that I know of.—(Rev.) A. C. Waller; Waldringfield Rectory, Woodbridge, September 19th, 1906.

Sphinx convolvuli in Surrey.—I have just received a living specimen of *S. convolvuli*, which had been found at rest on a paling at West Clandon, near Guildford, on September 16th last.—Herbert C. Swayne; Ynyswytryn, Glastonbury.

Polygonia c-album in Surrey.—In your book on 'British Butterflies,' in citing the haunts of *P. c-album*, I see that you have not

mentioned Surrey as a county in which it has been taken, so I thought you would be interested to know that one has been captured in that county this year. My mother, Mrs. H. A. Perkins, of Old Bank House, East Grinstead, who is an enthusiastic entomologist, while in Dormans Park, on the borders of Surrey near East Grinstead, caught a splendid specimen of a male of this species on September 11th, 1906. Personally I consider this a good catch, as for over twelve years I have collected, and in that time not once have I seen it on the wing south of London.—Alec W. Perkins; 17, Lime Hill Road, Tunbridge Wells, September 13th, 1906.

Cucullia gnaphalii at Light.—On June 27th last I took a fine specimen of *C. gnaphalii*, Hb., at the electric light over my porch. I should be glad to know of any recent records of this moth.—John Comber; High Steep, Jarvis Brook, Sussex, September 14th, 1906.

Limenitis sibylla in Epping Forest.—On July 22nd last we saw resting on a bush, but failed to take, the only *L. sibylla* ever noticed by us in Epping Forest.—F. W. and H. Campion; 33, Maude Terrace, Walthamstow, September 10th, 1906.

Dianthœcia irregularis, Hufn., = echii, Bork., in North Lincolnshire.—Mr. A. Reynolds, of Owston Ferry, has recently presented to the Lincoln Museum a bred specimen of this local insect. He states that he took the larva about ten years ago on viper's bugloss (*Echium vulgare*) in the neighbourhood of East Ferry.—G. W. Mason; Barton-on-Humber.

Chrysophanus phlæas, var.—On the 8th inst. I caught a remarkably beautiful variety of this species, combining both the *eleus* and *schmidtii* forms. The spots are greatly enlarged and much clouded, whilst the ground colour is a lovely creamy silver.—Martin J. Harding; Church Stretton, Salop, September 19th, 1906.

Sirex juvencus in Nairnshire.—A specimen of this hymenopteron was captured on grass at Nairn, on September 15th last, by Mrs. Grant, Drumnadrochit, and sent to me. I find that the last previous capture in the north was at Hopeman, on September 13th, 1899.—Henry H. Brown; Cupar-Fife.

Noctuæ at Sugar in Daylight.—During a visit to the New Forest in the early part of July, I one afternoon happened to be passing some trees which had been sugared the previous evening, and on one of the patches was surprised to see a specimen of *Noctua brunnea*. On looking at my watch, I found it was exactly four o'clock; the sun was shining brilliantly, and there was a cloudless sky. One is familiar with the visits of *Catocala sponsa* and *C. promissa* to sugar while it is yet daylight; but I have never come across before a case of such an early appearance as that mentioned above.—(Rev.) J. E. Tarbat; Fareham, Hants.

Laphygma exigua and Agrotis agathina in Dorsetshire.—I have pleasure in stating that on the 14th inst. I secured, at Branksome (Dorset), two male specimens of *Laphygma exigua* at light. I also took

a fair number of *Agrotis agathina*. In regard to the latter, it may be well to state that, although a large number of lamps were examined, it was found that only the brightest lights were selected by the insects. They also show a marked partiality for the framework of a lamp, and in one case, where I captured five *agathina* on a single lamp, it was quite impossible to see them until the post had been "swarmed," when the insects were discovered in very awkward corners. I imagine it is a little late for *agathina*, but those I took were certainly in very good condition.—Sydney T. Thorne; 162, Ashley Road, Upper Parkstone, Dorset, September 22nd, 1906.

Lepidoptera of County Cork.—Among the few good captures this year, the following are of interest:—*Pericallia syringaria*, L. A female emerged on June 25th from a pupa reared from a larva feeding on ash in the garden here. This is the second reliable record for Ireland; the first was taken in Co. Waterford.—*Acronycta alni*, L. A single larva, on August 10th, on an elm-trunk in the lawn; it was unfortunately ichneumoned. It, however, formed a cocoon in dead wood, but died before pupating; I possess the shrivelled-up larval skin. Birchall obtained a specimen in Co. Wicklow, and there is a tradition of its being taken on the walls of Trinity College, Dublin.—*Catocala nupta*, L. A slightly torn imago was secured last night at sugar spread on an elm in front of this house. This is the first certain record for Ireland.—*Dianthœcia barrettii*, Dbl. I find this handsome species widely distributed along the coast of the county. The insects differ considerably from the specimens occurring at Howth. I had an opportunity of comparing mine with a fine series of over thirty, recently procured at the classical locality near Dublin. The Cork specimens are large, of a dark slate colour, with very distinct markings in a light whitish-grey, and no indication of yellow shading.—C. Donovan, Major, I.M.S.; Ardmore House, Passage West, Co. Cork, September 17th, 1906.

Deilephila livornica and Heliothis peltigera in Ireland.—I have read with interest the notes in the 'Entomologist,' for I am able to give a further record of the occurrence of this moth in Hampshire and in Ireland. On each of the evenings of June 2nd, 5th, and 6th, between 8.30 and 9 o'clock, I saw one specimen flying over rhododendron blooms in my garden near Christchurch. Each specimen appeared to be in fine condition, but was too wary to be caught. On June 7th I went to Ireland to spend a month near Cork. In the drive leading to the house where I was staying are many rhododendrons of great height, mixed with large fuchsia trees. On the evening of June 9th, I went out about 8.30 and walked along this drive for about 100 yards. At first there was no moth to be seen, but at 8.45 the rhododendrons were alive with *D. livornica*, and it was a grand sight to watch them at the top flowers of every bush, hovering to and fro in a state of restless activity and, at the least alarm, darting off to a considerable distance. I cannot say how many specimens were seen, but the moth was flying in large numbers. No specimen was taken on this evening, for the lower blooms were but seldom favoured with a visit. From the 10th to the 15th further specimens were seen, but each night

brought fewer, and the last observed was on the 15th. Three specimens only were taken in fair condition. Considering the large number of specimens seen on the 9th, and that the season for this species was then well advanced, one can conjecture only the numbers which must have been flying in County Cork during the last week in May and the first week in June. The blooms of the fuchsias were not attractive. I have seen it recorded that fuchsia and dock, both of which were growing in profusion, are food plants of the larvæ of this species. Search was made for ova, but none were found. The small number of captures is accounted for by the fact that *D. livornica* is a most restless and suspicious insect. It gives the watcher but one stroke at it with the net, and if it is missed it darts off and does not again return. The instinct of self-preservation is evidently well-developed. The period of flight each night lasted about half-an-hour. At 8.30 there might not be a specimen to be seen, but five or ten minutes later they would suddenly appear in force as on June 9th, and at 9.15 all would have disappeared. Some writers describe *D. livornica* as an immigrant, but why? Many species of birds fly north in the spring to find suitable places in which to breed. Insects, with their limited powers of flight and short span of life, cannot be impelled by the same motives. Nature does not act in a haphazard fashion, and as the food plants must occur plentifully on the Continent, and at the very spots where these moths emerge from the pupa, why should this insect—assuming it not to be an indigenous British species—pay the British Isles the compliment of flying across the sea merely as if on a pleasure trip? *Vanessa cardui* is said to cross the English Channel to the eastern counties with a favourable wind behind it. It is, however, a far longer journey across the Atlantic Ocean to Cork, and it has been observed that, whatever butterflies may do, moths usually prefer to fly against rather than with the wind. Another point against the immigration theory is that those persons who have seen *D. livornica* flying at dusk have observed that the period of flight does not last much more than half-an-hour. Of course no one can tell how this insect spends the rest of its time, and it may be that after supping it flies a few hundred miles purely out of exuberance of spirit.

Another insect taken at Cork was *Heliothis peltigera*—one on the sea-shore, mid-day, flying over kidney vetch, and the other in a high walled-in garden flying at dusk over the flowers of lupin. This insect is also dubbed an immigrant, but its powers of flight are very considerably less than those of *D. livornica*. The specimens taken by Mr. Hooker in Dorset are in much better condition than the two taken in Cork, but his specimens were taken about a fortnight earlier. Mr. Hooker also took a specimen on September 4th in the Isle of Sheppey. The food plants given in 'Larva Collecting and Breeding,' by the Rev. J. Seymour St. John, grow in England. With great deference I submit that some more conclusive evidence is required than has yet been published before *D. livornica* and *H. peltigera* can be described with justice as aliens.—A. Druitt, Willow Lodge, Christchurch, September, 1906.

SOCIETIES.

The South London Entomological and Natural History Society. —*July* 12*th*, 1906.—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. Bellans, of Bedford Park, was elected a member.—Mr. Goulton exhibited the living larvæ of *Phytometra viridaria* (*ænea*) feeding on *Polygala vulgaris*, and also larvæ of *Cidaria suffumata*.—Mr. Step, ova and larvæ at different instars of *Dicranura vinula*, and a series of photographs of Lepidoptera at rest, the most interesting of which were *Scoparia ambigualis* and *Aplecta nebulosa*.—Mr. Turner, ova, *in situ*, of *Coleophora viminetella* on willow, *C. solitariella* on *Stellaria holostea*, and an imago of *Goniodoma limoniella* bred from *Statice limonium* stems from Southend.—Mr. West (Greenwich), short series of *Cryptocephalus parvulus* and *C. punctiger*, together with several *Balininus cerasorum* from Darenth Wood on July 1st.—Mr. Garrett, living larvæ and pupæ of *Euchloë cardamines*.—Mr. F. B. Carr, a cocoon and pupa of *Sarrothripus undulanus* (*revayana*).

July 26*th*.—The President in the Chair.—Mr. West (Ashtead), a short series of *Plusia moneta* obtained in his garden.—Mr. Moore, a varied series of *Epinephele ianira* from Boulogne.—Mr. Rayward, pupæ of *Polyommatus corydon* and *Thecla rubi*, the former from larvæ reared on horse-shoe vetch, and the latter from ova laid on flower heads of dogwood. He also showed ova of *Lycæna arion* and *Plebius ægon*, and referred to the relatively small size of the former. He further reported that of some thirty larvæ of *P. corydon* taken at Reigate on June 18th, nearly all were attended by ants, *Formica flava*, and gave most interesting details of their interrelations.—Mr F. Noad Clark, a photograph of the ova of *Trochilium crabroniformis*, laid by a female taken by Mr. Edwards at Horsley.—Mr. West and Mr. Ashby, thirteen species of Longicorns taken in the New Forest from May 26th to June 9th, including *Asemum*, *Callidium violaceum* (in numbers), *Anoplodera sexguttata*, *Leiopus nebulosus*, *Clytus mysticus*, *Toxotus meridianus*, &c.—Mr. R. Adkin, the beautiful red form, var. *furuncula*, Hub., of *Miana bicoloria*.—Mr. Noad Clark, beautiful micro-photographs of the ova of four species of Coleophora recently obtained by Mr. Turner, together with an enlargement of the micropyle of each.—Mr. Tonge, a photograph showing the wonderful protective resemblance of the larva of *Catocala nupta*.—Mr. Sich, (1) living specimens showing a case of Müllerian mimicry between the Gelechiid, *Recurvaria* (*Aphanaula*) *nanella*, and a Hemipteron, *Phytocoris tiliæ*, frequenting elm bark; (2) a very aberrant form of a Pygæra bred from Chiselhurst; and (3) the ova of *Lycæna alcon* on a gentian, with a photograph of the same by Mr. Clark.

August 9*th*.—The President in the chair.—Mr. Sich, living examples of the Tineid, *Ochsenheimeria vacculella*, with a short summary of the little that is known of the species.—Mr. West and Mr. Ashby, a further portion of the Coleoptera collected by them in the New Forest, including *Trachys troglodytes*, *Elater sanguinolenta*, *E. lythropterus*, &c.—Mr. Adkin, imagines of *Pygæra pigra* and *P. curtula*, with hybrids for comparison with Mr. Sich's *Pygæra*. Finally

this last was considered to be a beautiful aberration of *P. pigra*.—Mr. Adkin also showed full-fed larvæ of *Acidalia marginepunctata* (*promutata*) from Eastbourne ova. Most were ready to pupate, only about ten would probably hybernate.—Mr. Main, a European Mantis in the pre-imaginal stage, a larva of *Papilio podalirius*, and a female of *Parnassius apollo*, with ova of the same, all from the Rhone Valley.—Mr. Rayward, living larvæ of *Agrophila trabealis* (*sulphuralis*) from Cambridge, and of *Cupido minima* from Horsley.—Mr. Tonge, (1) a living larva of *Phryxus livornica* from Lewes; (2) and a preserved larva from Alberto, Spain; (3) a larva of *Sesia stellatarum* from Dunwich; and (4) a series of photographs of Lepidoptera at rest taken during the Society's Field Meeting at Leith Hill on June 30th, including *Bromolocha fontis* (*crassalis*), *Cucullia umbratica*, *Larentia viridaria*, &c.—Mr. Edwards, var. *cæca* of *Aphantopus hyperanthus*, and a female *Trochilium crabroniformis* from Horsley on July 14th.

August 23rd.—The President in the chair.—Mr. Harrison and Mr. Main, (1) a long bred series of *Moma orion* from ova from a New Forest female; and (2) a bred series of *Phorodesma smaragdaria* from Essex. One of the latter was of a more intense green and without the usual white markings.—Mr. Barnett, (1) a short series of *Anthrocera trifolii*, from Wanbury, mostly with confluent spots, and one with ill-developed scales; and (2) several examples of *Epinephele ianira* showing pale coloration, and one female with an unusually pale band on the fore wing.—Mr. Crow, living larvæ of *Melanthia albicillata*, on bramble.—Mr. Carr, living larvæ of *Acidalia imitaria* from ova, on dandelion.—Mr. Turner, (1) examples of the hemipteron, *Carpocoris* (*Pentatoma*) *fuscispinus* from Morgenbachthal and Lucerne; (2) *Heliothis peltigera* taken at Brockenhurst on June 4th; (3) a series of *Bromolocha fontis* (*crassalis*) from Leith Hill in early July; (4) *Ægeria culiciformis* from Beaconsfield; (5) *Coleophora limoniella* bred from larvæ taken at Fobbing in 1905, together with a spray of *Statice limonium* showing the larval cases; (6) specimens of *Polyommatus escheri*, the small form from Gavarnie, in the Pyrenees, with alpine forms of the same species and of *P. icarus* for comparison; (7) on behalf of Mr. Harrison, specimens of *Melitæa dictynna* from Meiringen, with *M. athalia*? taken at the same place and time; and (8) on behalf of Mr. J. W. Tutt, several species of *Ascalaphus* and *Myrmeleon* from the Alps.—Mr. West and Mr. Ashby, some fifty further species of Coleoptera taken in the New Forest this year, including *Calosoma inquisitor*, *Notiophilus rufipes*, *Pæderus caligratus*, *Philonthus splendens*, *Ips 4-guttata*, *Helodes marginatus*, &c.—Mr. Adkin, a series of *Polyommatus bellargus*, females, from Eastbourne in June, and read notes on the geographical distribution of the blue race of this sex.—Mr. Sich, a bunch of poplar twigs, in the leaves of which were the larvæ of three leaf-miners, *Gypsonoma aceriana*, *Phyllocnistis suffusella*, and *Nepticula trimaculella*, and pointed out the characters of the mines with reference to the various details of the different life-histories of the species.—Mr. Main, (1) a batch of the very beautiful ova of *Satyrus briseis* from Switzerland; and (2) on behalf of Mr. Oldham, a fine bred male example of *Cosmotriche potatoria* with female coloration.—Mr. Rayward, pupæ of *Polyommatus bellargus* from Folkestone larvæ, and

gave a most interesting account of the interrelations of ants and the larvæ of this species. In the discussion, Dr. Chapman said that he was on one occasion easily able to find larvæ of *Rusticus argus* by the groups of ants attendant upon each larva.—Dr. Chapman, (1) *Ophiodes lunaris*; (2) *P. corydon* only 28 mm. in expanse; (3) *Colias edusa* only 37 mm. in expanse; (4) *Pseudophia* (*Ophiodes*) *tirrhœa*, properly of a North African group; (5) *Marasmarcha fauna*, a rare Plume close to *M. phœodactylus*, all from St. Maxime, on the Mediterranean Coast of France.—Hy. J. Turner, *Hon. Rep. Sec.*

City of London Entomological Society.—*September 4th*, 1906.—Dr. T. A. Chapman, Vice-President, in the chair.—Mr. A. Bacot exhibited larvæ of *P. podalirius* in ultimate and penultimate *stadii* from Switzerland; also a normal specimen of *L. quercus* bred from a larva that had been subjected to a pressure of about forty atmospheres for several periods of about one hour.—Dr. T. A. Chapman, *L. bœtica* and *L. idas* from N. Spain, the latter having hitherto been recorded only from Sierra Nevada.—Mr. J. A. Clark, *B. fuliginaria* taken in St. Katharine Dock, July, 1906.—Mr. C. P. Pickett, *A. sylvata*, a long and variable series from Bucks, including many lead-coloured forms; also a hermaphrodite *A. prunaria*.—Mr. V. E. Shaw, *N. trepida* bred from New Forest ova.

September 18th.—The President in the chair.—Mr. A. Bacot exhibited larva of *D. nerii* in first stadium, the caudal horn being about half the length of the body.—Rev. C. R. N. Burrows, *A. betularia*, female, intermediate between type and var. *doubledayaria*, *T. fulva* var. *concolor*, *L. exigua* and *M. unangulata*, the latter having white band suffused with brown, all from Macking.—Mr. G. G. C. Hodgson, *A. aglaia* ab., resembling *A. adippe*, owing to marginal band being lightly marked, especially as regards the intramarginal black lines.—Mr. L. W. Newman, *E. autumnaria* bred from wild parents, heavily suffused with dark scales; a series of *L. exigua*, Isle of Wight, 1906; melanic *E. atomaria* from Bury, Lancs. and a long series of *B. notha* that had been three years in pupa.—Mr. L. B. Prout, a *Eupithecia* which he considered referable to *E. satyrata*, beaten from juniper near Dorking, and at first believed to be *E. helveticaria* var. *arceuthata*.—Mr. V. E. Shaw, *P. leucophæa* taken at sugar in East Kent, June, 1906; also *A. grossulariata* abs., from Bexley, with central band on hind wings well defined, but the black marginal spots obsolescent.—Mr. Newman reported that larvæ of *B. repandata* reared on birch had produced a second brood in September, but others fed on hawthorn had made very little progress: also that of about one hundred and twenty pupæ of *D. falcula* sixty emerged in April and the remainder in June.—Rev. C. R. N. Burrrows stated that Rev. G. H. Raynor had bred *C. argiolus*, female, third brood, resembling spring form.—S. J. Bell, *Hon. Sec.*, Pen-y-bryn, Knight's Hill, W. Norwood.

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A NEW MEGARHINUS.

BY F. V. THEOBALD, M.A.

Megarhinus herrickii, n. sp.

Megarhinus portoricensis. Herrick (non Von Roder) (Entom. News (1905), p. 281).

Allied to *M. portoricensis*, Von Roder, but differs in the following respects:—

(i) The last segment of the male palpus much longer than the penultimate, at least twice as long; and (ii) the head iridescent bluish green instead of brown with a shiny white border around the eyes, white scales laterally, and azure blue spots in front; (iii) the hind tarsi are white except a black ring at the distal ends, whilst in *portoricensis* the penultimate tarsal segment only is white save for a small basal dark spot.

Habitat.—Mississippi State, U.S.A.

Observations.—This species is referred to by Professor Glenn Herrick as *portoricensis*, but he points out very obvious and marked differences. This new species has been named after him.

The specimens, he says, were bred from larvæ taken "in the cup-like bottom of a massive iron post supporting one corner of a large water tank. . . . Here we found five large, dark brown, very spiny larvæ, and also remnants of cast pupal skins, conspicuous for their long spines, made especially prominent by the colonies of Vorticellæ clinging to them. . . . We fed the larvæ entirely on *Culex* larvæ and great numbers of the latter were devoured. For example, three *Megarhinus* larvæ in four days ate eighty-three large *Culex* larvæ, besides many small ones just hatched from eggs.

"The larvæ transformed to pupæ on September 28th.

"The pupal stage lasted four days, while that of a third extended over a period of five days. The anal flaps seem to have a characteristic shape, and the edges, for the most part, are beset with short stiff spines." (September 20th, 1906.)

SOME NOTES ON SCANDINAVIAN AND LAPLAND BUTTERFLIES.

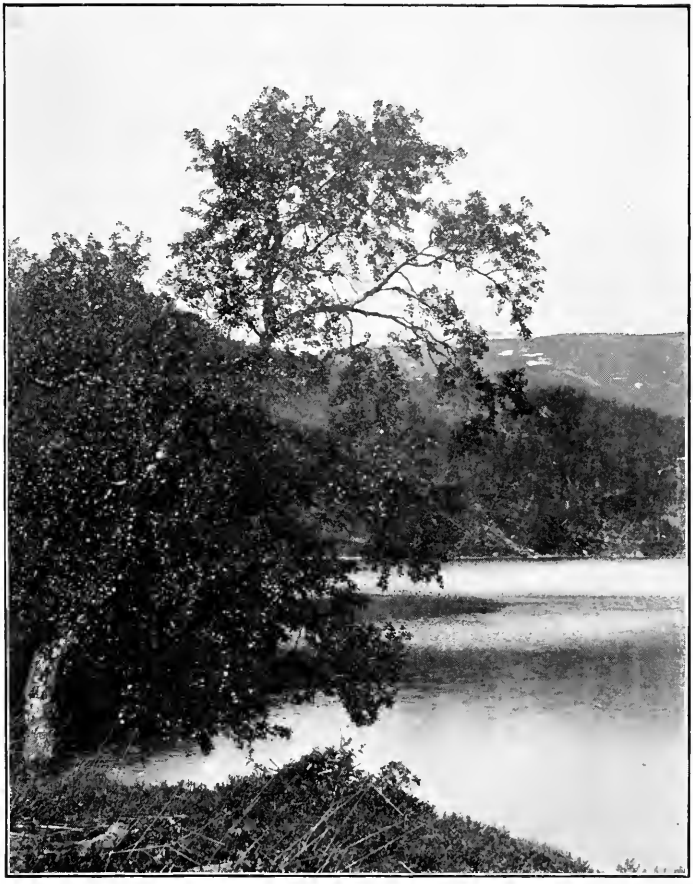
By H. Rowland-Brown, M.A., F.E.S.

(PLATES VII. AND VIII.)

(Concluded from p. 227.)

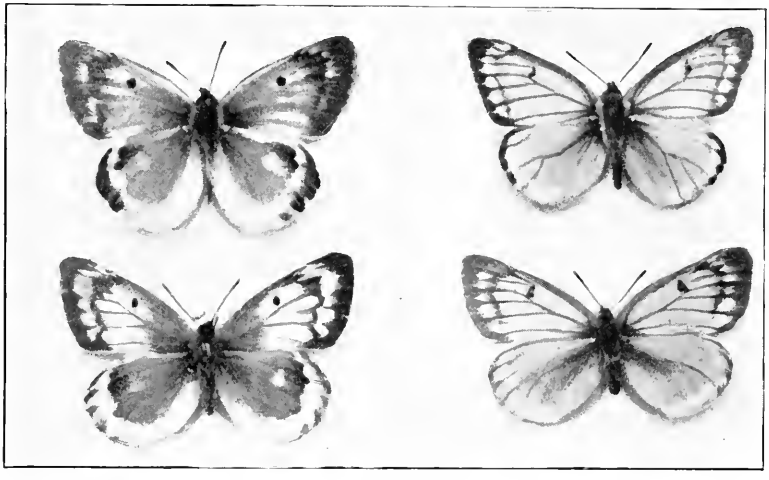
Thus, I am afraid the hopes I had entertained of studying the effect of the twenty-four hours' daylight on Lepidoptera generally came to little or nothing. With regard to butterflies, when the sun was out, I did not observe any before 7.30 or 8 a.m.; after 4 p.m., or even earlier, they disappeared, but whether until next morning remains to be proved, for, as I said before, the sun generally retired about the same time, and did not again show from behind the clouds until close on 11 p.m., or later, during the days that I was within the Arctic Circle on Swedish soil. I noticed that the Geometridæ, as might be expected, would fly continuously, however dull the weather, and whatever the hour. But of true night-flying Noctuas, it is a fact that, until I arrived at Alten, I did not encounter one single specimen; so that I must assume for the study of this particular group also the collector should defer his investigations until considerably later in the year. Still, among the day-fliers, I found the pretty yellow-underwinged *Plusia hochenwarthii*, Hochenw., and another *Plusia* with whitish lower wings, probably *P. parilis*, Hb.

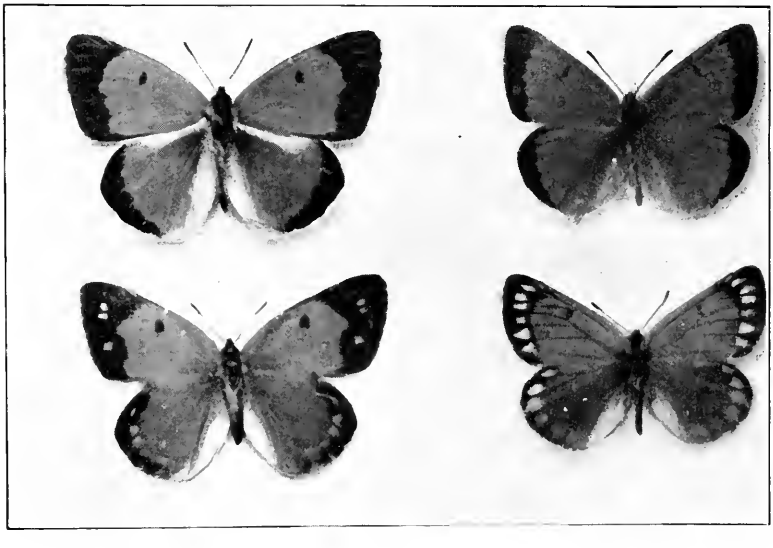
July 17th was spent at Hammerfest, waiting for the little steamer which leaves for Alten at midnight, but, as it rained all day, I had no opportunity for observations. But the butterfly fauna, at all events, of this most northerly and smelly town is extremely limited, and the vegetation barren compared with the eastern end of the fiord, up which, in deluges of rain, I presently proceeded. Entomologically, the 18th was an utter failure, though no rain fell, and I found some very promising collecting-ground close to the pretty church at Bossekop—well-wooded, and with a flora delightful to the eye after the sterile north Norwegian coast-land. *L.* var. *ægidion* was evidently common among the *Vaccinium*, and *L.* var. *cyparissus* also; while I took a single specimen of *Chrysophanus* var. *hypophlœas* (=*americana*, d'Urban) asleep on a flower. A few Geometers were also flitting languidly about—nothing else; the atmosphere warm and oppressive, with an abundance of mosquitoes, but still nothing like the pest they were at Abisko. July 20th, when I made a little expedition to the slopes of Skaaddevarre, was also destined to be a *dies non*, though I had hoped to meet with *Argynnis chariclea* here, as recorded by Staudinger. Meanwhile the sun broke through the clouds on the afternoon of the 19th, and the sky cleared as if by magic, with the result that such



H. R.-B.

NORTH-WEST END OF THE TORNEATRÄSKE, SWEDISH LAPLAND.





H. R.-B.

SOME SPECIES OF THE PALÆARCTIC GENUS *COLIAS*.

1. *Colias phicomone*, ♂. (Cauterets, C. Pyrenees).
2. *Colias phicomone*, ♀. (Berisal, Switzerland.)
3. *Colias nastes*, var. *werdandi*, ♂. (Abisko, Swedish Lapland.)
4. *Colias nastes*, var. *werdandi*, ♀. (Abisko, Swedish Lapland.)
5. *Colias edusa*, ♂ (Middlesex).
6. *Colias edusa*, ♀ (Middlesex).
7. *Colias hecla*, ♂ (Alten, Finmark).
8. *Colias hecla*, ♀ (Alten, Finmark).

butterflies as were about began to fly in numbers. However, as I was too soon apparently at Abisko, in the mild and favoured valley of the Alten I was too late, and most things, with the exception of *Argynnis pales* var. *lapponica*, which occurred in countless profusion and first-rate condition, was both worn and torn. Striking the river-bank about two miles from Bossekop inland, I had the pleasure of netting *Erebia medusa** var. *polaris*, and on making inquiry at a farmhouse, where I saw signs of a ferry, the very civil proprietor informed me that at a certain place somewhat higher up the stream there were a quantity of butterflies about: and he was good enough also to put his boat at my disposal. No sooner had I set foot on the further bank—or rather on a sandy well-wooded spit close in under the hills—than this piece of welcome news was confirmed. The first insect I captured was *Colias hecla* (= var. *sulitelma*, Auriv.), and it must be very common here a little earlier, for I took specimen after specimen hopelessly rubbed and shredded, but still enough fresh ones to constitute a decent cabinet series. *E.* var. *polaris* was also present in force—hardly ever settling, but flitting restlessly over the sun-warmed stones very close to the ground. But the most attractive plant was evidently a sort of *artemisium* in full aromatic bloom, on which *L. icarus*, *L.* var. *ægidion*, and the inevitable *L.* var. *cyparissus* disputed possession with our northern "Clouded Yellow," and here and there the fine form of *phlœas*, to which I have alluded. A splendid "tiger" was also much in evidence, to be presently identified as *Parasemia plantaginis*, while the air was musical with the harp-strings of a thousand active Diptera. Such a halcyon day I look back upon with the more pleasure as contrasted with the entire week of cloud and mist which attended me on the return journey right down to Molde. As the boat did not leave Alten until close on midnight on the 21st, I put in another morning at this favoured spot, and was vouchsafed at least two hours of sun, during which, if I took nothing new, I added considerably to my store of the two prevailing butterflies of the locality. But of the other arctic species to be found hereabouts I saw nothing, it being a considerable surprise in this apparently forward season not to encounter *Colias palæno* var.

* I took this butterfly also in Bossekop village. As to its identity, there seems to be some doubt. The question is whether it be a good species, or merely the boreal form of *medusa*, F. Mant. Mr. H. J. Elwes, in his "Revision of the Genus *Erebia*" (Trans. Ent. Soc. 1898, p. 176), suggests that it may be a true species—"var. vel bona sp.? *polaris*, Stgr. Cat. p. 10 (186)"—"subtus subfasciata, trans. ad var. *uralensem*." Dr. T. A. Chapman, exhibiting a series from same locality (Proc. Ent. Soc. 1898, p. xlii), reports, "Some approaching typical *medusa*, and only a few near *polaris* as described, which is therefore an aberration rather than a constant variety. The whole series, however, with a different facies from that of an equal series of Central-European specimens"—which seems further to support the view adopted also by Herr Schneider, that the *polaris* of the north is sufficiently far from the type as to be reckoned a good species.

lapponica, which I missed in Sweden also. As an index of what other collectors may look for, I fear, therefore, that my list necessarily remains very incomplete, and under the circum-

Rhopalocera.	Saltdalen, 66° 50′—67°.	Tromsö and Maalselvdalen, 69°—69° 40′.	Alten, 70°.	Sydvaranger, 69°—70°.
Papilio machaon	—	+	+	+
Pieris brassicæ	+	+	—	+
P. rapæ	—	—	—	+
P. napi var. *bryoniæ**	+	+	+	+
Colias palæno and var. *lapponica*	+	+	+	+
C. werdandi	+	+	—	—
*C. hecla**	+	+	+	—
Thecla rubi	+	—	—	+
Chrysophanus hippothoë	+	+	+	—
C. phlæas var. *americana**	+	+	+	+
P. amphidamas	—	—	—	+
*L. argyrognomon** (=var. *ægidion*)	+	+	+	+
L. optilete var. *cyparissus**	+	+	+	+
L. aquilo	+	+	—	—
L. astrarche	+	+	—	—
*L. icarus**	+	+	+	—
L. minima	+	—	—	—
Vanessa urticæ and var. *polaris*	+	+	+	+
V. antiopa	+	+	—	+
V. cardui	+	—	—	+
Melitæa parthenie	—	—	—	+
M. iduna	—	—	—	+
Argynnis aphirape and var. *ossianus*	—	+	+	+
A. selene and var. *hela*	+	+	+	+
A. euphrosyne and var. *fingal*	+	+	+	+
A. pales and var. *arsilache**	+	+	+	+
A. chariclea	—	—	+	—
A. polaris	—	+	—	+
A. freya	+	+	+	+
A. frigga	—	+	+	+
A. thore	+	+	+	—
A. ino (Nordvaranger)				
A. aglaia	+	—	—	+
*Erebia polaris**	—	—	+	—
E. lappona	+	+	+	+
*E. ligea**	+	+	+	—
E. embla	—	—	—	+
E. disa	+	—	+	+
Œneis norna	+	+	+	+
Œ. bore	—	—	—	+
Pararge mæra	+	—	—	—
Cœnonympha tiphon	—	—	+	—
Syrichthus andromedæ	+	+	—	—
S. centaureæ	—	—	+	+
*Hesperia comma**	—	—	+	—
Carterocephalus silvius	+	—	—	—

stances, so far as Northern Norway is concerned, I take the liberty to reproduce for the British collector the interesting catalogue of butterflies, forty-six species in all, compiled by

Herr J. Sparre-Schneider,* which in a separate form may not be easily available. The localities, it will be seen, range from latitude 66° 30′ to 70°, and include the famous Sydvaranger, to reach which the traveller must proceed round the North Cape to Vadso.

Those with an asterisk I myself met with at Alten.

In conclusion, I may add that the immediate neighbourhood of Bergen, for butterflies, is unproductive; though all British observers I have met this year agree that the season in Norway generally has been peculiarly poor in butterflies. I spent most of the 27th at the very pretty suburban resort of Fjösanger, but, though well-wooded and with heathy tracts, covered with bracken and heather now coming into bloom, I saw nothing beside the commonest wayside butterflies—a scarcity already noted by me thirteen years ago, when in the whole course of a wet August (1893) I only met with three species of butterflies, two of them—*Erebia ligea* and *Lycæna argus* (= *ægon*, Bergstr.), near the same locality.

I append the following notes on the principal Arctic species collected:—

Pieris napi.—The males taken at Abisko are large and strongly marked on the under side. The females are fine examples of the var. *bryoniæ*, with a deep tawny-primrose wash on the upper side of the wings. Most examples met with were worn more or less, this being the case especially with the females.

Colias nastes, var. *werdandi*.—Seven at Abisko only, where it must have been plentiful, and an early arrival. The females on the wing bear a striking resemblance to those of *C. phicomone* of the Swiss Alps, but the discoidal spots on the upper wings are elongated, and seldom approach the roundness common to the spots on those of Central European and Pyrenean forms. Staudinger retains this as a var. of the Greenland *nastes*; Lampa and the Swedish entomologists, following Zetterstedt, maintain it as a separate species.

C. hecla (= var. *sulitelma*, Auriv.).—The same relationship suggests itself with *edusa*, but with a similar reduction of the upper wing-spots, which in some specimens are actually ocellated. The spots also differ in intensity until I find one very small male in which they have disappeared altogether; while, further, the distinguishing features of *C. boothii*, Curtis, of which *hecla* was supposed to be a variety—the narrow unveined border and greenish tint of the wings generally—are noticeable. Lampa describes an ab. of the female, which he calls *sandahli*, apparently answering somewhat to this male, of which the colour inclines to pale ochre-gold, with the yellow spots between the third and fourth nervure wanting; perhaps this male from Alten is the correlative of this form.

Lycæna optilete, var. *cyparissus*.—Comparing Lapland and Alten specimens with those in my collection from the Central Alps, I find

* (Extract from Tromsö Museum Yearbook 15, 1893; Sydvarangers Lepidoptera (*ib.* 18), Tillæg til Tromsö Lepidopt. (*ib.* 23).

no practical difference. Some of the latter are quite as small as the Abisko forms, and the markings and coloration of the under side is equally pale; while some Arctic specimens are as large as the largest *optilete* from Brenner and elsewhere in that region.

L. icarus.—The males from both localities vary not at all from the ordinary British type on the upper side, or the under side. The females, in addition to those mentioned as ab. *cærulea* from Abisko, are much suffused with blue. In the Alten specimens this tendency is less pronounced; but one shows an almost black ground colour, the blue shining lustrously over it, as in the females of *ægidion*.

L., var. *ægidion*.—All the Abisko females shot with bright blue, and resembling those of the type (= *callarga*, Stgr.). Alten forms, as with preceding species, less brilliant.

Argynnis aphirape, var. *ossianus* (?).—I am in some doubt whether this form from Abisko should not properly be referred to the type.

A. euphrosyne. — This, from Abisko, is certainly typical, and I did not come across the var. *fingal* there. Rather smaller than British form.

A. thore var. *borealis*.—So much lighter, and more distinctly marked, in both sexes than the type from Central Europe, that it presents superficially the appearance of a distinct species.

A. pales.—I have two short series from Abisko and Alten, respectively. Of the former, some of the males are clearly referable to Staudinger's var. *lapponica*—a connecting-link between the type and var. *arsilache*; but, as Sparre-Schneider remarks, this butterfly in the north does not vary nearly as much as in the Swiss Alps. My observations there further bear out his statement, that *pales* is monomorphic in these regions; that is to say, it does not present the familiar *napæa* form of the female. The Alten specimens, as a whole, I refer to the var. *arsilache*. They are much more variable; the females very large and splendidly marked on the under side, fore and hind wings alike. Schneider mentions that the tendency to melanism is rare; but I took one beautiful male (thought at the time to be *A. chariclea*), in which the inner marginal band of upper and lower wings is much suffused on the upper side, while the under side is also more sombrely coloured than usual. The females are remarkably fine, one of them measuring as much as two and a half inches across the expanded wings. (Specimens from Bydalen also strongly marked throughout, the males large and brilliant.) As to the separation of *pales* and *arsilache*, as good species respectively, these northern examples suggest much the same divergence as those from the Alps. There is a distinct mountain and bog development. Surroundings and, according to Schneider, different food-plants seem to have given rise to forms, or species-in-the-making, at least as well pronounced as, say, *Parnassius apollo* and *P. delius*.

A. freija appeared to be rare at Abisko, but probably not out at the time I was there. Two specimens only.

Erebia medusa (? var. *polaris*).—Seen at Alten only. Males with none, or at most a single ocellation on upper side of fore wings. Females extremely variable in size, and extent of rusty blotches and eye-spots.

E. lappona.—Broad rusty blotches of a lively brown, and very

pronounced spots in them on the upper wings. Abisko specimens altogether brighter than Swiss and Pyrenean.

E. ligea, var. *adyte*.—I follow Lampa in classing my series from Abisko as this form; but save that they are smaller than the type, I see little superficial difference.

Augiades comma, var. *catena*.—Common, but much worn, at Abisko. From the brighter green of the under side, no doubt referable to this variety.

The Geometridæ which I brought home have been most kindly identified for me by Mr. L. B. Prout, and are reported by him as follows:—From Abisko: *Acidalia fumata*, *Larentia truncata*, *L. munitata*, *L. hastata* var. *subhastata* (very common), *Zanclognatha* sp. ?, and a Pyralid sp. ?. From Alten: *Larentia munitata*, *L. cæsiata*, *L. montanata* var. *lapponica*, *L. hastata* var. *subhastata*, *L. albulata*, *L. incursata*, and *Pygmæna fusca*.

Oxhey Grove, Harrow-Weald.

BIBLIOGRAPHICAL AND NOMENCLATORIAL NOTES ON THE HEMIPTERA.—No. 6.

By G. W. Kirkaldy.

(A.)

My kind friend Mr. Prout has been so good as to send me brief notes on Gistel's 'Naturgeschichte der Thierreiche' (1848), a work scarcely dealt with as yet in hemipterous literature. Mr. Prout tells me that, owing to Gistel's peculiar views on nomenclature, it is impossible for one who is not a specialist in Hemiptera to be certain of indicating accurately the hemipterous contents of the work. The following few notes, however, will be of interest to workers in this order, and it is to be hoped that the hemipterous portion will be made fully known very soon.

The Hemiptera are discussed on pp. 148–51 and in the Preface:—

(1). || *Platycoris*, Gistel, p. 149 = *Pyrrhocoris*, Fallen, 1814, type *apterus*.

(2). *Eupheno*, Gistel, *l. c.* = || *Macrophthalmus*, Laporte, 1832; =|| *Macrops*, Burm. 1835 = *Caridomma*, Bergroth, 1894; = *Sorglana*, Kirkaldy, 1900.

(3). *Cheilocacc*, Gistel, p. 150, type *reginæ-noctis*. Genus not valid, as it is not described apart from the species.

(4). *Mylpha*, Gistel, *l. c.*, n. n. for "*Pœciloptera*," the reason apparently not being stated.

(5). *Cyphoma*, Gistel, p. 151 = *Dorthesia*. The latter is altered because it is a personal name!

(6). *Estphonia*, Gistel, p. viii = *Acroœra* (!), Spin. I presume Gistel means *Arocera*, which is apparently not preoccupied or otherwise invalid.

(7). *Thops*, Gistel, p. x = *Micropus*, Spin. The latter is not preoccupied in zoology, and is moreover a synonym of *Ischnodemus*.

(8). *Hoplomus*, Gistel, *l. c.* = *Oplomus*, Spin.

(9). *Amyctus*, Gistel, *l. c.* = || *Pachymerus*, Lep. Serv. 1825 (= *Pamera*, Say, 1832).

Among new species or specific names are :—

(1). *Nepa ingenicula*, p. 149.

(2). *Naucoris brasiliensis*, l. c.

(3). *N. plana*, l. c.

(4). "*Cercopis harrisii*, Gistel = *furcata*" [!], p. 150.

(B.)

The following new names are necessary in the Fulgoroidea:—

Kirbyella (Eutropistidæ) = || *Kirbya*, Melichar, 1903.

Synaphana (Fulgoridæ) = *Penthicus*, Stål, 1870, O. V. A. F., xxvii. 742 (nec Blanchard), type *variegata* (Guér.), and subgen. *Ereosoma* (= *Aphana*, Stål, *op. c.*, 741 (nec Burm.), type *astræa*, (Stål).

Guérin founded *Aphæna* in 1833 with *discolor*, *variegata*, and *nigromaculata* (*rosea* excluded because compared with *discolor*). In 1835 Burmeister referred to the first two only, and in 1839 Spinola cited *discolor* as the type. The selection of *variegata* as the type by Stål and others is therefore incorrect.

Aphrodisias (Fulgoridæ) = || *Compsoptera*, Stål, 1869, Berlin Ent. Zeit. xiii. 236, type *cacica* (Stål). This fine species has been omitted from the 'Biologia Centrali-Americana.' It was recorded from Mexico. *Compsoptera* is preoccupied by Blanchard, 1845 (Lep.), a name not in Scudder or Waterhouse.

Varcilla (Ricaniinæ) = *Varcia*, Melichar (nec Stål), type *nigrovittata* (Stål).

[*Varcia*, Stål, 1870 = *Aphanophrys*, Melichar, 1898, type *hilaris* (Stål).]

Brachyceps (Issidæ) = || *Brachycephalus*, Signoret, 1866, type *lucida* (Sign.).

(C.)

The following Fulgoridæ have been omitted by Distant and Fowler from their homopterous contribution to the 'Biologia Centrali-Americana':—

(1). *Philatis productus* (Amphiscepini), Stål, 1862. I have not Stål's description of *Mycterodus productus*; but it is probable that *Batusa*, Melichar, is a synonym of *Philatis*, Stål.

(2). *Aphrodisias cacica* (see above).

(D.)

Copidocephala (Fulgoridæ), Stål, 1869 = *Coanaco*, Distant, 1887 (same type).

Prolepta (Fulgoridæ), Walker, 1851 = *Cynthila*, Stål, 1863, type, *apicalis* (Westwood).

Opinus, Lap. 1832 = *Tapeinus*, Lap. 1832 = *Sminthocoris*, Distant, 1904, Faun. Ind. Rh. ii. 275 and 279. As *O. pictus* is the type of *Opinus*, a not preoccupied name, I do not know why Mr. Distant has added to the synonymy of this Reduviid genus.

Laccifer (Coccidæ), Oken, 1815, Lehrb. Nat. i. 430 = *Tachardia*, Blanchard, 1886, type *lacca* (Kerr), Oken.

ON SOME NEW GENERA AND SPECIES OF INDIAN ICHNEUMONIDÆ.

By P. Cameron.

(Concluded from p. 230.)

OPHIONINÆ.

Limnerium himalayense, sp. nov.

Black; the four anterior coxæ except at the apex, the posterior and the hinder trochanters, black; the apex of the posterior tibiæ and the hind tarsi of a less deep black colour; the apices of the four anterior coxæ, their trochanters, the mandibles, except the teeth, palpi and tegulæ, yellow; the rest of the legs red; wings hyaline, the stigma fuscous, the nervures darker coloured; the areolet oblique, distinctly appendiculated; the recurrent nervure received shortly beyond the middle; the space between it and the second transverse cubital nervure as long as the pedicle. Metanotum with only faint indications of keels at the base, there being no areæ. ♀. Length, nearly 5 mm.

Simla. August (Nurse).

Opaque, granular, sparsely covered with white pubescence, which is longer and denser on the metathorax; the sculpture is stronger on the metanotum, the apical slope is obscurely transversely striated; there is an obscure, oblique, irregularly punctured furrow below the middle of the mesopleuræ. Antennæ densely covered with stiff microscopic pubescence. Tibiæ distinctly spinose, clearly narrowed at the base. Spurs white.

Comes close to *L. erythropus*, described here; it may be known by the appendiculated areolet, by the greater part of the four anterior coxæ being black, and by the black hinder tarsi and apex of tibiæ, the hinder trochanters also being black, not red. The ovipositor is short, about half a millimetre.

Limnerium erythropus, sp. nov.

Black; the legs, except the hind coxæ, which are black, and the four anterior trochanters, which are yellow; the hind tarsi are infuscated; the mandibles, palpi and tegulæ yellow; wings hyaline, the nervures and stigma black; the areolet 4-angled; the nervures

meeting in front, the recurrent nervure is received shortly beyond the middle. ♀. Length, 5 mm.; ovipositor, ½ mm.

Simla. August (Nurse).

Petiolar area longer than wide, of equal width, not very distinct; the lateral areæ large, semicircular; the other areæ are obsolete. Lower two-thirds of the propleuræ at the apex stoutly striated. Median segment more strongly rugosely punctured than the rest; the spiracular area slightly striated.

Neobosmina pilosella, sp. nov.

Black; the head and thorax densely covered with long silvery pubescence; the mandibles, except at apex, palpi and tegulæ, whitish yellow; the anterior legs testaceous, the femora more rufous in tint, the coxæ black; the hind legs black; the tibiæ broadly in the middle below dark reddish; the calcaria dark testaceous, the stigma and nervures black; the apical four abdominal segments laterally and the apices of the third and fourth broadly above and of the fifth narrowly ferruginous. ♂. Length, 8 mm.

Simla. August (Nurse).

Antennal scape testaceous below; the flagellum densely covered with short stiff black pubescence. Head opaque, closely, finely punctured, the centre of front finely, closely, irregularly striated. The eyes have a greenish violaceous tint. Thorax closely, regularly punctured, the punctures distinct and clearly separated; the metathorax more strongly punctured; the areola smooth at the base, the rest closely, finely, irregularly, transversely striated-reticulated; the apical slope is more strongly transversely striated, the striæ more distinct on the posterior median area; the spiracular area more finely, irregularly, closely, obliquely striated beyond the spiracles. Petiolar area with a stout keel; it is longer than wide, rounded, not much narrowed at the apex; the areola is fully twice longer than wide, transverse at the base and apex, of almost equal width at top and bottom; it becomes gradually, but not much, widened to near the middle, then more distinctly narrowed to the apex; the basal keels are stronger than the apical.

The coloration of the legs probably varies as regards the amount of black. The middle legs are darker coloured than the anterior. I unfortunately only know the male. The species may be separated from *N. mandibularis*, Cam. (which is also found in Simla), thus:—

Petiolar area triangular, narrowed to a point at the apex; the areola narrowed to a point at the base; the hind legs with the apical half of the femora and the tibiæ, except narrowly at the apex, red .	*mandibularis.*
Petiolar area wide at the apex; the areola not narrowed to a point at the base; the hind femora entirely and the tibiæ, except broadly in the middle below, black	*pilosella.*

PIMPLINÆ.

BATHYMERIS, gen. nov.

Face of equal width. Mandibles of unequal length. Clypeus bordered laterally by a deep triangular furrow, and by a narrower one above. Temples short, sharply dilated behind. Median segment long, of equal width, closely reticulated. Wings without an areolet. Transverse median nervure interstitial. Transverse median nervure in hind wings broken largely above the middle. First abdominal segment long, at the base half the width of the apex; the second segment longer than wide, the third square, the others wider than long; the abdomen is long, narrower than the thorax, tapering towards the apex. Legs long, slender. Mandibles edentate, bluntly rounded at the apex. The clypeus is broadly impressed at the base. The antennæ are of moderate length; the apical joints slightly serrate, broader than long. There are no transverse or oblique depressions on the abdominal segments.

Comes close to *Xorides*, which may be known by the face being distinctly narrowed in front and by the mandibles being of equal length.

Bathymeris longipes, sp. nov.

Black; the face, a line, roundly curved below, on the lower part of the propleuræ, tegulæ, the large tubercles, a long curved line, narrowed below, under the hind wings, the base of the first abdominal segment and the apices of the others more narrowly, yellow; the four front legs pale yellow, the hind femora reddish fulvous, the rest yellow; with the apical two-thirds of the coxæ, apical joint of trochanters, a mark of the same length on the apices of the femora and tibiæ and the apical joint of the tarsi, black. Wings hyaline, the nervures and stigma black. ♀. Length, 17 mm.; terebra, 9 mm.

Sikkim (Bingham).

Head smooth, bare, except the cheeks, which are covered with white pubescence. Mesonotum closely, finely punctured, the furrows and the apical depression closely striated; the scutellums are much more coarsely punctured; the median segment closely reticulated, more finely on the sides than on the back. Pro- and mesopleuræ smooth, striated, finely below and round the tubercles. Basal three segments of the abdomen closely, finely punctured except at the apex; the third less strongly than the others. Flagellum of antennæ covered with a microscopic pile; the first joint is distinctly shorter than the second. The hind coxæ are about four times longer than wide and reach to the middle of the second abdominal segment. The clypeus is broadly dilated round the edges with a broad depression above. Ocelli in a triangle placed in front of the hinder edge of the eyes; the hinder separated from each other by about the same distance as they are from the eyes.

CRYPTINÆ.

Rothneyia fortispina, sp. nov.

Black; the four front legs rufo-testaceous, the hind coxæ, trochanters and basal three-fourths of femora of a more reddish testa-

ceous colour; the apex of femora, tibiæ and tarsi black; flagellum of antennæ dark testaceous; the wings hyaline; the nervures and stigma black. ♂. Length, 7 mm.

Haundraw Valley, Middle Tenasserim. August (C. T. Bingham).

Antennæ stout, slightly longer than the body, 26-jointed, tapering towards the apex; the scape below densely covered with long white pubescence; the flagellum densely with a short stiff fuscous pile; the third joint a little shorter than the fourth. Face closely, distinctly punctured; the clypeus distinctly, but more widely punctured; they are, as are also the cheeks, densely covered with longish white pubescence. Mesonotum closely, somewhat strongly punctured, densely covered with white pubescence; the apex smooth. Scutellum depressed, rugosely reticulated above; the apex roundly incised, largely projecting over the post-scutellum; the lower part bordered, and with a stout keel down the middle. Base of metanotum with three areæ, the central narrow, of equal width; the large lateral obliquely narrowed from the outer to the inner side; the tooth-bearing part depressed, margined and bearing a few irregular longitudinal striæ; the narrowed apex closely, transversely rugose; the apical slope transversely, closely reticulated. Propleuræ finely punctured; the centre below stoutly striated; there is a broad punctured band round the top and base of the mesopleuræ, the rest smooth and shining; the mesosternum is more strongly punctured. Metapleuræ at the base above closely, somewhat rugosely punctured, the rest closely, strongly reticulated. First abdominal segment rugosely punctured in the middle, the sides stoutly, irregularly, longitudinally striated; the second is strongly, longitudinally, rugosely punctured; the third more finely; its apex roundly incised.

There are two known species of *Rothneyia*, both described from females. When describing the genus (Manchr. Mem. xli. (1897), No. 4, p. 19) I suggested that it should form the type of a new tribe—Rothneyini. I am still of that opinion. An examination of the species here described, as well as of my genus *Acanthoprymnus*, enables me to correctly locate the genus. It will form a tribe of the Cryptinæ, near Phygadeuonini. In the species here described there are clear indications of parapsidal furrows at the base of the mesonotum, and there is a still more distinct, deep mesosternal furrow. The areolated metanotum is also not unlike what we find in that tribe; on it the spiracles are roundish. The transverse median nervure is received shortly behind the transverse basal; the disco-cubital nervure is unbroken; the areolet has the apical nervure distinct but bullated; the discoidal cellule is closed at the apex; the transverse median nervure in hind wings is broken below the middle. Clypeus not separated from the face; its apex broadly rounded. Mandibles broad, bidentate. In the male, of the three dorsal abdominal segments, the third (apical) is the largest; in the male there are seven ventral segments.

ON THE NOMENCLATURE OF THE GENERA OF THE HEMIPTERA.

By G. W. Kirkaldy.

(Part I. 1758–1843, concluded from vol. xxxvi. p. 233.)

The alterations necessitated by finding that the date of publication of the hemipterous part of the 'Voyage of the Coquille' was 1838 instead of 1830 (see 'Entomologist,' xxxv. p. 316), are now made, as well as a few others caused by further investigation. To render more complete the generic nomenclature of the Hemiptera as a whole, the genera of the Sternorhynchi are added; so that all the genera of the Hemiptera, from 1758–1843, are, it is believed, now recorded.

(A). Sternorhynchous Genera, 1758–1843.

1758. Linné, (β) *Cossus* (445), *Chermes*, *Aphis* (451).

1762. Geoffroy, 482–513. (δ) *Psylla*, unnecessary substitution for *Chermes*, 1758.

1784. *Bosc, Journ. Phys. xxiv. 171–3. (α) *Orthezia* t. *characias* (=*urticæ*).

1785. *d'Orthez, *op. cit.* xxvi. 207. (δ) *Dorthesia*, unnecessary alteration of *Orthezia*, 1784.

1789. Olivier, Enc. Méth. iv. 24–61. (δ) *Psilla*, 1762.

1796. Latreille, Précis, 93. (β). *Aleyrodes*.

1798. *Latreille, Bull. Soc. Philom. Paris, ii. 113. (α) *Livia* t. *juncorum*.

1801. Lamarck, 298–300. (γ) *Aleyrodes*, 1796, type *chelidonii* (=*proletella*), *Psylla*, 1762 (thus *Chermes*, 1758), t. *ficus*. (δ) *Coccus*, 1758, t. *mexicanus*, invalid; *Aphis*, 1758, t. *ulmi*, invalid.

1802. Latreille, Hist. Nat. Crust. Ins. iii. 264–7. (γ) *Aphis*, 1758, t. *sambuci*.

1803. *Illiger, Illiger's Mag. ii. 282–98. (α) *Diraphia* t. *juncorum*.†

1815. Oken, Lehrb. Nat. i. 430. (α) *Laccifer* t. *lacca*; Leach, Edin. Enc. ix. pt. 1, 126. (α) *Cionops* t. *characias*.‡

1818. *Rafinesque, Amer. Monthly Mag. iii. 16. (β) *Loxerates* [=*Aphis*].

1819. Samouelle, Ent. Useful Comp. 232. (α) *Eriosoma* t. *mali* (=*lanigera*).

1824. *Blot, Mém. Soc. Linn. Calvados, i. 114. (α) *Myzoxyle* t. *lanigera*.§

1825. Latreille, Fam. Nat. (β) *Monophlebe*.

† Homot. *Livia*, 1798.
‡ Homot. *Orthezia*, 1784.
§ Homotypical with *Eriosoma*, 1819.

[1826. Leach and Risso in Risso's Hist. Nat. Eur. Mér. v. 217. (δ) *Doralis* and *Pharalis*, not descr.]

1827. Latreille, Natürl. Fam. Thierr. (Berthold), 426–8. (δ) *Myzoxylon*, 1824; *Monophlebus*, 1825.

1828. *Boitard, Man. Entom. 171. (β) *Kermes;* *Guilding, Feoriep Notiz. xx. 120. (α) *Margarodes* t. *formicarum*;† *Costa, Prosp. Div. Met. Gen. Coccus, 1–8. (β) *Calymmata*, *Diaspis*, *Diaprostecie* (?).

1829. Latreille in Cuv. Règne Anim. v. (δ) *Monophleba*, 1825.

1830. *Blot, Mém. Soc. Agr. Caen, ii. 332–4. (δ) *Myzoxylus*, 1824; *Gray, Spic. Zool. 7. (β) *Ceroplastes*.

1833. *Brandt, Mediz. Zool. ii. 355. (α) *Porphyrophora* [=*Margarodes*, 1828] t. *polonicus;* Bouché, Naturg.-Schädl. Ins. 52. (α) *Aspidiotus* t. *nerii* (=*hederæ*).

1834. *d'Aveilly, Du Myzoxile, 1–35. (δ) *Myzoxile*, 1824; Boyer, Ann. S. E. France, iii. 222–4. (α) *Philloxera* [also *Phylloxera* in the text] t. *quercus*; Westwood, Zool. Journ. v. 452. (γ) *Monophleba* [*-be*], 1825, t. *leachii*.

1835. Burmeister, Handb. (β) *Rhizobius*, *Lecanium*, *Lachnus*, (δ) *Aleurodes*, 1796; Curtis, Brit. Ent. 576. (α) *Cinara* t. *pini* [= *Lachnus*, 1835]. *Costa, Nuov. Osserv. 22. (δ) *Calymmatus*, 1828.

1836 (?). Costa, Faun. Regn. Nap. Cocc. (α) *Dactylopius* t. *coccus* (= *mexicanus*). (β) *Calypticus*. (γ) *Diaspis*, 1828, t. *calyptroides* (=*echinocacti*).

1836. Vallot, C. R. Ac. Dijon, 224. (α) *Adelges* t. *laricis*; Curtis, Brit. Ent. 625. (α) *Livilla* t. *ulicis*.

1837. Heyden, Mus. Senckenb. ii. 287–99. (α) *Paracletus* t. *cimiciformis*, *Vacuna* t. *coccinea*, *Trama* t. *troglodytes*, *Forda* t. *formicaria*.

1838. Haliday, Ann. Nat. Hist. ii. 189–90. (α) *Byrsocrypta* t. *bursaria*, (β) *Atheroides;* *Zetterstedt, Ins. Lapp. 625. (α) *Leptopteryx* t. *nivalis* (=*? punctipennis*).

1838–41. Westwood, Introd. Mod. Class. ii. 434–50. (α) *Pseudococcus* t. *cacti* (=*mexicanus*).‡ (γ) *Lecanium*, 1835, t. *hesperidum*, (δ) *Ceroplastus*, 1830; Westwood, Synopsis, 117–8. (α) *Thelaxes* t. *quercicola* [=*Vacuna*, 1837]; (γ) *Lachnus*, 1835, t. *roboris;* *Atheroides*, 1838, t. *serrulatus*. (δ) *Brysocrypta*, 1838.

1841. Guérin, Rev. Zool. 129–31. (α) *Callipappus* t. *westwoodii;* Hartig, Germar's Zeitschr. Ent. iii. 358–76. (α) *Tetraneura* t. *rugicornis;* *Rhizoterus* t. *vacca* (= *formicaria*).§ (β) *Schizoneura*.

† This is an abstract; Guilding's paper was apparently not published till 1833, *in extenso*.

‡ Homotypical with *Dactylopius*, 1835.

§ Homotypical with *Forda*, 1837.

1843. Gurtis, Gardeners' Chron. 444. (*a*) *Trechocorys* t. *adonidum* (= *longispinus*); Amyot & Serville, 588–676. (*a*) *Cnaphalodes* t. *pini*. (*δ*) *Chermes* (nec Linné) t. *variegatus* (=*roboris*) [=*Kermes*, 1828].

The following notes refer to Part I. (1758–1843), and conclude it :—

(B). Deletions.—Vol. xxxiii.

P. 240. The notes relating to Guérin's descriptions in 'Voyage of the Coquille.'

P. 265. 1829, Latreille, *Gonocerus*, *Syromastes*, *Anisoscelis*, *Nematopus*, and add (*γ*) *Otiocerus*, 1819, t. *coquebertii*; and Fallen, Hem. Svec. 1–186, (*α*) *Clinocoris* t. *lectularius*. Delete note 7.

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P. 176. Note 7; Guérin's entry (1830), and Herrich-Schäffer's entry (1830? recte 1836). From Laporte, Mag. Zool.; *Zosmenus*, *Megymenum*, and footnotes 40 and 66, Stephens's names being invalid.

P. 178. First half of footnote 69.

P. 179. Line 6, *Xylocoris*.

P. 218 Footnote 107, and read "=*Phlœa*, 1825."

P. 219. Line 14, *Oncocephalus squalidus*; line 21, *Otiocerus stollii*; line 31, *Phyllocephala*.

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P. 213. Footnote 1.

P. 213. (Brulle), *Meropachys*.

P. 214. Line 22, *Dinidor amethystina*.

P. 215. 1840 (last line of text), *Oxyrachis*, and (line 8 from bottom) *Phyllomorphus*.

P. 216. 1842, *Tectocoris*.

P. 231. Line 14, *Brachystethus marginatus*.

P. 232. (Line 6 from bottom), *Saccoderes*, and (last line) *Spartocera geniculata*.

(C.) Additions, &c.—Vol. xxxiii.

P. 28. See also p. 238.

P. 263. 1802, Latreille, "(*δ*) *Tettigonia*, 1762"; and for "*irroratus*" read "*irrocatus*."

P. 264. Footnote 12 should be 13, 13 should be 14, and 14 should be 12.

P. 265. Line 1, for "1819–21" read "1822"; *Otiocerus* is therefore a synonym of *Cobax*. 1822, *Pendulinus* is preoccupied in Aves by Vieillot, 1816, *Dasynus* superseding. 1823, *Podicerus* dates from 1806 (? Zool. Anal.). 1825, line 3, *Pachymerus* is preoccupied in Coleoptera, 1805; *Pamera* (1832) and *Aphanus* (1832) were erected to supplant this, and are therefore homotypical. The following synonymy will elucidate :—

1. *Pamera*, Say, 1832 (= || *Pachymerus*, Lep. Serv. 1825 = *Aphanus*, Lap. 1832), type *pedestris* (=*alboacuminatus*).
2. *Orthœa*, Dallas = *Pamera*, auctt.
3. *Calyptonotus* = *Aphanus* of my former notes, type *rolandri*.

P. 265. 1825, line 8, add "*Astemme*."

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P. 176. 1827, add "Latreille, Natürl. Fam. Thierreichs (Berthold), 414–27. (δ). *Heteroscelis*, 1825; *Tessaratoma*, 1825; *Gonocerus*, 1825; *Syromastus*, 1825; *Pachlysd* (! sic), 1825; *Anisoscelis*, 1825; *Nematopus*, 1825; *Stenocephala*, 1825; *Leptocorixa*, 1825; *Pachymera*, 1825; *Heterotoma*, 1825; *Holoptila*, 1825; *Pœcilloptera*, 1796; *Otiocera*, 1822; *Penthima*, 1821." 1831, add Dufour, Ann. Sci. Nat. xxii. 425. (*a*) *Xylocoris* t. *rufipennis*. 1832, Laporte, Mag. Zool., add (*a*) *Opinus* t. *pictus* [changed later to *Tapeinus*], *Zosnanus* t. *maculatus* [changed to *Zosmerus* later], *Ratymeris* [later *Platymeris*] t. *biguttata*. (β) *Megymenum*, *Oncomeris*, *Scutiphora*, *Agapophyta*. (γ) *Syromastes* (recte *Syromaste*, 1825) t. *quadratus*. (δ) *Pelegonus*, 1809; *Syromestes*, 1825; *Holiptilus*, 1825; *Macrophtalmus*, 1832.

P. 177. Line 22, to "*hæmorrhoidalis*," add "(= *bipustulatus*)"; line 26, to "*cinereus*" add "(=*laticornis*)."

P. 178. Line 7, *Platycephala* is preoccupied, and is superseded by *Brachyplatys*, 1835.

P. 178. 1832–4, line 2, to "*elegans*" add "=*bilineatus*."

P. 178. 1833, line 6, to "*marginatus*" add "=*saltitans*"; to footnote 73 add "also preoccupied"; line 9, for "15–90" read "159–90."

P. 179. Line 1, add "(*a*) *Selenocephalus* t. *obsoletus*"; for "*Dictyophara*" read "*Dictyophora*"; line 3, *Lamproptera* is preoccupied.

P. 218. Transfer "Guérin, Ins. Voy. Bélanger," to 1833 (Aug. 31), add (α) *Ugyops* t. *percheronii*; (β) *Aphœna*; and for "*lepeletieri*" read "*lepelletierii*"; line 13, to "*paradoxus*" add "= *corticalis*."

P. 218. For "? 1834 [1832–5]" read "1834."

P. 219. Boisduval, for "60946" read "609–46"; add (γ) *Agapophyta*, 1832, t. *bipunctata*; *Megymenum*, 1832. t. *dentatum*; Hahn (line 7), *Stenogaster* is preoccupied; Burmeister, add (β) *Arilus*, (δ) *Tapinus*, 1832; *Pirates*, 1829; *Copium*, 1822; line 12, *Hynnis* is preoccupied, and is also synonymous with *Cobax* and *Otiocerus*; line 18, *Hypselopus* is preoccupied; line 22, to "*umbilicatus*" add "=*tenebrosus*, Fabr."

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P. 213. Serville, remove *Dysdercus* to (*a*) and add "t. *decussatus*"; line 5 from bottom, for "*productus*" read "*sardea*."

P. 214. Line 25, for "1834" read "1833." 1837, add Westwood* in Drury, Ill. Exot. Entom. (n. edn.), (*a*) *Diaspidius* t. *scapha*. 1838, add "Guérin, Voy. Coquille, Zool. ii. pt. 2, 165–93." (*a*) *Leptoglossus* t. *dilaticollis*. (β) || *Platycoris*. 1839, line 7, remove "*Phylloscelis*" to (*a*) and add "t. *pallescens*."

P. 215. Last line of 1839, "*Philia* is a synonym of *Calliphara* and *Callidea*."

P. 216. Line 5, for "1838–42" read "1840."

P. 230. Line 14, for "*Piezostemum*" read "*Piezosternum*."

P. 233. Line 5 from bottom, for "*Ugyogs*" read "*Ugyops*."

NOTES AND OBSERVATIONS.

British Setting.—In the excellent little butterfly book of the "Wayside and Woodland" Series recently published, which will no doubt become *the* book for beginners, I was disappointed in one particular, the instructions for setting. The continental setting-board, and the old English "oval" or sloping side setting-boards, are both carefully figured and described, but no mention at all is made of the one that is, I suppose, chiefly used now, *i. e.*, the ordinary English "flat" board, exactly like the "oval," but with flat instead of sloping sides. Why encourage the beginner to waste money on boards that will ultimately have to be got rid of? The continental one is not yet adopted by British collectors, and there is no sense in using it unless wishing to exchange with foreigners. The old "sloping sides" board is absolutely out of date, and few people would say "thank you" for insects offered for exchange that have been set on it. Then, too, a *pair* of setting-bristles should be used (and not one only), and the whole insect "placed" before any braces are put on, otherwise the body is very liable to be drawn to one side, and the insect be crooked. And tracing linen forms the best brace whatever method of setting be used, and if placed on the wings before the cotton is wound round (in Scotch style) prevents the "stripy" appearance caused by the indenting of the cotton.—K. M. Hinchliff; Instow, N. Devon.

CAPTURES AND FIELD REPORTS.

Cymatophora octogesima, &c. in London.—On July 5th I took a freshly emerged specimen of *C. octogesima* at light near here, and a friend of mine, Mr. G. D. Millward, visiting the same spot with me on the 7th, took another, also in perfect condition. This year I have taken several species within the west and south-west districts that I have not seen in London before, such as *Calligenia miniata*, *Gastropacha quercifolia*, and *Dicycla oo* (a female, unfortunately much damaged).—H. G. Place; 11, Norland Square, W., September 2nd, 1906.

Laphygma exigua and Heliothis peltigera at Bournemouth.—On September 21st I took a male specimen of *Heliothis peltigera* while

dusking in my garden. I also took *Laphygma exigua* in my light-trap. The next day I took another male *H. peltigera*.—E. de Geijer; Boscombe Manor, Bournemouth.

Laphygma exigua in Kent.—On September 8th last I took a specimen of *L. exigua*, at rest, in early morning, among the rubbish collected in the corner of the Salem Chapel, Biggin Street, Dover.—F. P. Abbott; 8, Beaconsfield Road, Dover.

Laphygma exigua in Hampshire.—While staying with my sister at Fernbank, near Milton, I took two specimens of *L. exigua* at light in my bedroom on July 28th.—H. G. Place; 11, Norland Square, W.

Laphygma exigua in October at Torquay.—We have taken six examples of *L. exigua* at ivy flowers; one on the 4th, two on the 5th, and three on the 6th of this month. They are in perfect condition, and are better than a lot that were taken in August. *Heliothis peltigera* is still out; a good specimen was taken at ivy by my brother on October 5th. *Plusia gamma* is swarming at the ivy here by thousands; I have never seen so many before.—J. Walker; 3, Goodwin Terrace, Carlton Road, Torquay, October 8th, 1906.

Deilephila livornica in Hampshire.—On August 31st I took a very fine fresh specimen of *D. livornica*, which came to light in the drawing-room of the house where I was staying, at Headley, Hants, about nine p.m.—K. M. Hinchliff; Worlington House, Instow, North Devon.

Deilephila livornica in Hants.—A fine specimen of *D. livornica*, taken in August in a cottage at Whitmoor Bottom, Grayshott, Hants, near this place, by A. Alderton, was brought to me yesterday.—H. T. G. Watkins; Ridgeways, Hindhead, Haslemere.

Noctuæ at Sugar in Daylight.—I can beat Mr. Tarbat's record. One morning in August last I noticed a specimen of *Miana bicoloria* on a sugared tree at 9 a.m., which was not there when I passed previously at 8 a.m., and was gone again at 10.—(Rev.) W. Claxton; Navestock Vicarage, Romford.

Nyssia lapponaria emerging in September.—I may mention that I bred a female specimen of *N. lapponaria* in September; I believe that this is a very unusual occurrence.—(Rev.) W. Claxton; Navestock Vicarage, Romford.

Xylina semibrunnea in Wiltshire.—On September 27th this year I took, at sugar, a very fine specimen of *X. semibrunnea* about 7.15 p.m.; night was cold and starlight.—J. C. Moulton; The Hall, Bradford-on-Avon, Wiltshire.

Melanthia albicillata Double-brooded.—I find that *M. albicillata* is double-brooded with us this year. I took about two dozen specimens on the night of September 29th.—H. D. Kenyon; Lamorna Villas, Mt. Charles, St. Austell.

Colias edusa in Cornwall.—On September 27th I saw a female *C. edusa* flying over the "towans" (sandbanks, links), near Hayle. It was apparently a perfectly fresh specimen. This is the only *C. edusa*

I have seen this year, if, as I believe, one I saw next day in the same place was the same specimen.—Harold Hodge; 9, Highbury Place, London, N.

Dragonflies bred in 1906.—I have bred this year *Cordulegaster annulatus*, *Æschna grandis*, *Æ. cyanea*, *Cordulia ænea*, *Calopteryx virgo*, *Erythromma naias*, *Pyrrhosoma nymphula*, *Agrion puella*, and *Enallagma cyathigerum*. I have found the nymphs as plentiful this year as last year I found them scarce, collecting in the same localities. — Harold Hodge; Highbury Place, London, N.

Cirrhœdia xerampelina in Hertfordshire. — In early spring I secured, by searching the bark of an old ash-tree, three larvæ which seemed to be those of *C. xerampelina*. I put them in a box with a piece of flannel, which they seemed to welcome in the prevailing cold. When the buds came out I tempted them and found that they ate them greedily. They fed up and changed. A week ago I had the reward in two imagines emerging. I searched at the root of this tree and have found two pupæ.—(Rev.) E. Everett; Markyate, near Dunstable, August 29th, 1906.

Deilephila livornica and Sphinx convolvuli in South Wales.— During the second week in September last my brother captured a specimen of *D. livornica* and eleven examples of *S. convolvuli* at one patch of tobacco in flower. He was also fortunate in obtaining, in the same garden, a specimen of the first-named moth last spring.—Leslie F. Burt; Broadley, Coedcanias, Begelly, R.S.O., Pembrokeshire.

Sphinx convolvuli and Colias edusa in Sussex.—A good female specimen of *S. convolvuli* was brought me on October 1st, which had been caught near here, fluttering over some waste ground. I also beg to report the capture, on the 10th inst., in a garden close here, of a perfect male *C. edusa*.—G. E. H. Peskett; 4, Clermont Road, Preston, Brighton, October 21st, 1906.

Some Entomological Notes from Barnstaple.—Wasps have this year been quite rare in the district, and I scarcely saw one till the beginning of September. Now (September 13th) they are growing more numerous, and in South Devon I am told they have been common all the summer. A fine specimen of *Sirex gigas* on August 27th, crawling over a felled larch-tree. It was rather sluggish, and I could not induce it to fly. At Santon, on June 5th, I saw and watched for nearly five minutes a perfect specimen of *Deilephila livornica*. It was flying about in the sunlight and pitched on a piece of sandstone rock, where I was able to observe it closely. Several others, I believe, have been taken in the neighbourhood. Among the sandhills near Braunton lighthouse the ladybirds *Coccinella 7-punctata* and *11-punctata* have, this summer, been in immense numbers. I first noticed them at the end of July, when all the herbage was covered with them and their larvæ and pupæ. On several occasions I detected a "seven-spot" larva feeding on another larva of the same species. In each case the grub that was being eaten had a large round hole on the under side of the abdomen, where its cannibalistic brother was gnawing. The "eleven-spot" was the less numerous of the two.

That part of the Burrows is very bare of plants except for marram grass.

In 1902 I took several specimens of *Callimorpha quadripunctaria* (*hera*) in South Devon. They were numerous in the garden of the house where I was staying, and I could have taken many more. They have not occurred there since.

Macroglossa stellatarum was very common this year at Santon. One which was hovering over a thistle allowed me to gently touch it without the least sign of disturbance. I do not know if this is at all unusual. From about August 8th to the beginning of September *Satyrus semele* was very common on Down End, Santon; and at the same spot, and also at Baggy Point, a few miles further along the coast, *Vanessa cardui* has been swarming, but they were all faded specimens. I first observed these on June 4th, and they remained in undiminished numbers till about July 17th. However, all through the summer untarnished specimens have been common everywhere.

On June 17th and June 6th in the years 1905 and 1906 respectively, I took a good supply of a local beetle (though quite common where it occurs), *Pachyta octomaculata*. They frequented *Œnanthe crocata* on the banks of the River Yeo.—Bruce F. Cummings; 14, Cross Street, Barnstaple, North Devonshire.

An Autumn Night's Sugaring at Strensall.—October 9th had been a very warm, muggy day for the time of the year, so I thought I would try sugaring. Just as dusk was coming on a fine drizzling rain started, The wind was a gentle breeze from the south-east, and the atmosphere was oppressive and thundery. I was rather late in getting to my sugaring ground (a row of mixed trees on the edge of an oak wood), and in the hurry of trying to get everything ready on the ground before darkness set in I accidentally poured more than my usual allowance of essence of almonds into the sugar mixture. Whether this fact, or the weather, had most to do with the result I cannot say, but the result was the best sugaring night I have ever had this year. I had about a quart of sugar mixture, and I had accidentally poured half the contents of an essence bottle into it. The moment I had put the mixture on the rain began to fall heavily, and the air was as warm as midsummer. When I started round the sugar patches—about twenty in number and quite small patches—I was astonished at the quantity of moths. The smallest number at any one patch was fifteen, the largest thirty-five, Besides those actually counted sucking the sugar, others were flying up and alighting on different parts of the tree-trunks. The species were:— *Orthosia macilenta*, *O. lota*, *Anchocelis pistacina*, *A. litura*, *Cerastis vaccinii*, *C. spadicea*, *Scopelosoma satellitia*, *Xanthia ferruginea*, *Agriopis aprilina*, *Miselia oxyacanthæ*, and *Calocampa exoleta*, and all of them well distributed. At light that same night I got *Scotosia dubitata*, *Oporabia dilutata*, *Chesias spartiata*, and *Diloba cæruleocephala*. This last is so common just now at Strensall that I got five in as many minutes just by putting a lamp in a window overlooking some fields bounded by hedges of hawthorn and blackthorn. Whether the quantities of moths at the sugar were due to the weather, or to the overpowering smell of the almond essence, I cannot say, as the next night was not

a good sugaring night from an atmospheric point of view, and I did not try again.—B. Tulloch (Captain, K.O. Yorkshire L.I.).

Pyrameis cardui in 1906. — During the late spring and early summer (end of May and first half of June) great numbers of immigrant *P. cardui* arrived on this coast and steadily pursued their way inland, so we expected great quantities this autumn; but so far (October 15th) very few specimens have been seen, nothing to compare with the numbers in other "*cardui*" years. — K. M. Hinchliff; Worlington House, Instow, North Devon.

Acherontia atropos in Roxburghshire.—A fine specimen of this moth was taken on the school wall at Newtown St. Boswell's by one of the schoolboys on October 8th, and brought to me by the schoolmaster the same day. Though taken by hand and brought in a wedding-cake box, it was quite fresh and practically perfect.—B. Weddell; Selkirk.

SOCIETIES.

Entomological Society of London. — *Wednesday, October 3rd*, 1906.—Mr. F. Merrifield, President, in the chair.—Mr. A. Hall, of 16, Park Hill Rise, Croydon, and Mr. E. E. Bentall, of The Towers, Heybridge, Essex, were elected Fellows of the Society.—Commander J. J. Walker exhibited a specimen of *Calosoma sycophanta* taken in Denny Wood, New Forest, June 16th; *Lygæus equestris*, L., found in the Isle of Sheppey on September 22nd; *Sitaris muralis*, taken near Oxford in August by Mr. A. H. Hamm; two varieties of *Vanessa urticæ*, with a strong black ligament connecting the second costal and dorsal spot on the fore wings, from the Isle of Sheppey, August; a variety of *Argynnis adippe*, male, caught at Tubney, Berks, on July 7th; a slate-coloured variety of *Lycæna icarus*, male, taken near Chatham, August 24th; and examples of an almost black form of *Strenia clathrata*, occurring at Streatley, Berks, in August—all taken this year. — Mr. G. T. Porritt showed a series of *Abraxas grossulariata* var. *varleyata*, bred this year from a pairing of the variety obtained from wild larvæ the previous season at Huddersfield. All the brood were of the variety, none showing the least tendency to revert to the ordinary form.—Mr. C. P. Pickett brought for exhibition a gynandromorphous specimen of *Angerona prunaria* bred by him, and a male specimen of *Fidonia atomaria*, caught at Folkestone, with six wings. — Professor Charles Stewart, F.R.S., exhibited a remarkable unnamed exotic larva, found in a collection of specimens received at the College of Surgeons. It displayed a series of iridescent spots about the spiracles.—Mr. W. J. Lucas exhibited, on behalf of Messrs. F. W. and H. Campion, specimens of the rare dragonfly *Sympetrum flaveolum*, taken near Epping in August last, and read an account of their capture, in which it was suggested that these were part of a migration of the species such as occasionally takes place. — Dr. F. A. Dixey exhibited specimens of *Nychitona medusa*, Cram., *Pseudopontia paradoxa*, Feld., *Terias senegalensis*, Boisd., *Leuceronia pharis*, Boisd., and *L. argia*, Fabr., remarking that, although there did not exist, so far as he was aware, any

direct evidence that the members of the genus *Nychitona* are distasteful, their habits are such as to suggest this mode of protection; and there is little doubt that they have served as models for other insects.—Mr. H. J. Donisthorpe exhibited examples of *Dinarda pygmæa*, Wasm., with our other three species, *D. hagensi*, Wasm., *D. dentata*, Gr., and *D. märkeli*, Kies., with their respective hosts, and read a note on their occurrence in this country. He also exhibited a larva of *D. dentata* sent to him by Father Wasmann, and a larva of *D. pygmæa* taken by him in Cornwall.—Dr. Norman Joy showed the following species of Coleoptera first recognized as British in 1906:—*Laccobius sinuatus*, Mots., from Lundy Island and Cambridgeshire, distinguished by its smaller size and more parallel form from *L. nigriceps*, Thoms.; *Homalota paradoxa*, Rey., taken in moles' nests in Berks and Devon; *Quedius vexans*, Epp., and its larva, from moles' nests in Berks; *Euplectus tomlini*, Joy, from a starling's nest at Bradfield, Berks; *Corticaria crenicollis*, Mannh., from under bark at Basildon, Berks, and at Epping; *Cardiophorus erichsoni*, Buyss, taken on Lundy Island. He also exhibited:—A variety of *Lathrobium elongatum*, L., from South Devon, with entirely black elytra, and which he proposed to call var. *nigrum*; a curious dull aberration of *Apteropeda globosa*, Ill.; *Heterothops nigra*, Kr., taken in moles' nests from various parts of the country; a species of *Gnathoncus* differing in certain characters from *G. rotundatus*, Kugel, and which occurs almost exclusively in birds' nests.—Mr. L. B. Prout showed, on behalf of Mr. G. B. Oliver, of Tettenhall, Wolverhampton, a melanic female of *Acidalia marginepunctata*, Goeze, and a melanic male of *A. subsericeata*, Haw., both taken in North Cornwall this summer, together with the typical forms for comparison; also a dark aberration of *Cœnonympha pamphilus*, Linn., taken in the same district in 1903, which, on the whole, is noted for light and brightly-marked forms.—The President, exhibiting a series of *Selenia bilunaria*, drew attention to the curious angulation of the wings in these examples.—Mr. H. W. Southcombe communicated a note on the formation of a new nest by *Lasius niger*, the common black ant.—Mr. W. J. Kaye read "Some Notes on the Dominant Müllerian Group of Butterflies from the Potaro River District of British Guiana."—Mr. G. J. Arrow read "A Contribution to the Classification of the Coleopterous Family Passalidæ."—H. Rowland-Brown, M.A., *Hon. Secretary.*

The South London Entomological and Natural History Society. —*September 13th.*—Mr. H. Main, B.Sc., F.E.S., Vice-President, in the chair.—Mr. Goulton exhibited a long series *of Calymnia trapezina* from the New Forest, the only species met with in several nights' sugaring in August. Many were var. *rufa*, and a few var. *ochrea*. He also showed larvæ of *Craniophora ligustri* from ova.—Mr. Bellamy, series of *Adopæa lineola* from Gravesend.—Messrs. Harrison and Main, long bred series of *Hadena contigua* and *Coremia unidentaria* from the New Forest.—Mr. Barnett (1) very dark bred examples of *Abraxas grossulariata* from Greenwich larvæ, one of which was rayed on the hind wings; (2) very pale, dark suffused, and extremely dark forms of *Hybernia marginaria* from West Wickham.—Mr. Sich, living larvæ of *Pieris daplidice* from Geneva, feeding on mignonette.—Dr. Chapman

(1) a short series of *Lampides telicanus*, bred from eggs and larvæ found in North-West Spain, and discussed the relation between the marbling of the under surface and the usual Lycænid spotting; (2) specimens of *Chrysophanus phlæas*, *Polyommatus bellargus*, *L. bætica*, and *L. telicanus*, in illustration of his further remarks on the spotting. —Messrs. West and Ashby, some seventy species of *Chrysomelidæ* and *Curculionidæ* from the New Forest this year.—Mr. Clark reported numbers of *Catocala nupta*, resting on the walls of Paddington Infirmary, all most conspicuously situated. Mr. Main had met with numbers near *Cossus*-infected trees.—Mr. J. W. Tutt made some interesting remarks on his trip to the French Alps in August.—Mr. Kaye exhibited very large specimens of *Thecla betulæ*, bred from Huntingdon larvæ, which had been kept close in tin boxes.

September 27*th*—Mr. Robert Adkin, F.E.S., President, in the chair. —Messrs. Harrison and Main exhibited (1) a long series of *Bisulcia ligustri* bred from larvæ taken at Box Hill; (2) a brood of *Thyatira batis* from New Forest ova; and (3) a series of *Melitæa cinxia* bred from the Isle of Wight, several specimens having the white band of the under side very strongly developed.—Mr. Step, for Mr. Carreras, an extremely remarkable variety of *Polygonia c-album*, from the banks of the River Wye, having the usual dark markings suffused, enlarged, and confused almost beyond recognition.—Mr. Tonge, a further series of photographs of Lepidoptera at rest.—Mr. Carr, larvæ of *Anticlea nigrofasciaria*, ready to hybernate.—Mr. Colthrup, (1) a specimen of *Heliothis peltigera*, taken in August on the south coast; and (2) some nice forms of *Melitæa cinxia* from the Isle of Wight, of which one had the apical area almost devoid of markings, and the remaining markings much reduced.—Mr. West (Greenwich), forty-three specimens of Coleoptera taken at Great Yarmouth in June; collecting was poor, and the only species at all common were Donacias in the Caistor marshes. —Mr. South, (1) a specimen of *Amphidasys betularia*, intermediate between the type and var. *doubledayaria*; (2) *Orobena straminalis*, with very wide blackish borders on the outer margin of all the wings; and (3) *Pyrausta nigrata*, with unusually broad white bands.—Mr. Sich, a specimen of *Heliothis peltigera*, bred from an ovum sent him by Mr. Eustace Bankes, and a drawing of the larva.—Mr. Turner, (1) life-history of *Coleophora obtusella* from the Isle of Wight; (2) specimens of *Goniodoma limoniella* and *G. auroguttella* for comparison; (3) species of *Erebia* taken by Mr. Harrison and himself in Switzerland, *E. lappona*, *E. epiphron*, *E. ligea*, *E. tyndarus*, *E. goante*, and *E. blandina*; and (4) *Enodia hyperanthus*, specimens showing great variation in ground colour of the under sides.—Mr. L. Newman, a very large number of specimens, mainly bred this season, including *Xylomiges conspicillaris*, *Cucullia gnaphalii*, yellow males and melanic *Ematurga atomaria*, selected forms of *Melitæa aurinia*, a yellow *Callimorpha dominula*, an extraordinary suffused dark chocolate *Eugonia autumnaria*, varied *Chrysophanus phlæas*, melanic *Macaria liturata*, *Leucania sparganii*, a very pink *Amorpha populi*, very varied *Mimas tiliæ*, var. *taras* of *Hesperia malvæ*, bred *Brephos notha*, Rannoch forms of *Drepana falcula*, a smoky *Arctia villica*, *Agrotis cursoria*, *A. ripæ*, and *A. præcox* in numbers.—Hy. J. Turner, *Hon. Rep. Sec.*

Lancashire and Cheshire Entomological Society.—The opening meeting of the session was held in the Society's rooms, at the Royal Institution, Colquit Street, Liverpool, on Monday the 15th inst., Mr. Richard Wilding, Vice-President, in the chair.—This being the annual exhibition meeting of the Society, there was a good muster of members from other towns. The number and interest of the exhibits was quite up to the high standard maintained for several years past, and those present had an opportunity of seeing many rare and noteworthy insects. In the order Lepidoptera Mr. F. N. Pierce, F.E.S., showed a case of varieties of *Abraxas grossulariata* from Wallasey, some of the forms being of exceptional interest. Mr. Prince also showed the same species, together with other insects from Wallasey.—Dr. Edwards, two drawers of Lepidoptera from Lancashire and Devon, including among others short series of *Limenitis sibylla*, *Calligenia miniata*, *Epione apiciaria*, *Geometra papilionaria*, and *Cidaria silaceata*.—Mr. B. H. Crabtree, F.E.S., brought a couple of cases containing beautiful bred series of *Odontopera bidentata* ab. *nigra*, from Manchester; *Heliothis peltigera*, from Sidmouth; *Boarmia repandata*, *Agrotis ashworthii*, and *Epunda lichenea* from North Wales, and many other interesting species. —Mr. R. Tait, junr., long series of bred insects, showing variation:— *Agrotis agathina*, *A. ashworthii*, *Boarmia repandata*, and *Cleora lichenaria*, from North Wales; *Thecla quercus*, *T. betulæ*, and *Angerona prunaria*, from Hunts; *Aplecta nebulosa* var. *robsoni*, and a beautiful melanic specimen of *Acronycta alni*, from Delamere, the last taken as a pupa from an alder.—Dr. Bell, of New Brighton, showed cases of life-histories illustrating the early stages of many of our rare as well as common moths, mounted upon their food-plants; also the results of four days' collecting in fenland.—Mr. W. Mansbridge, a series of *Aplecta nebulosa* and its black variety *robsoni*, bred from ova deposited by a wild black female; a long series of *Macaria liturata* and var. *nigrofulvata*, both from Delamere; a series of *Cabera pusaria* var. *rotundaria* from Knowsley, and a series of *Rumia lutcolata* from Allerton, showing seasonal variation between the spring and autumn broods. The last member also read a communication to the Society upon the general causes of insect variation. In the Coleoptera section Dr. Corbett, of Doncaster, showed series of various species of beetles from that district, including the very rare *Carpophilus sexpustulatus* recently taken in an isolated locality and undoubtedly indigenous British specimens. —Messrs. J. F. Dutton and George Ellison, interesting varieties of *Cicindela campestris* (the common tiger-beetle), *Agabus nebulosus*, *Cœlambus novemlineatus*, *Otiorhynchus blandus*, and many others, from the Orkney Islands, collected during a visit last summer to that locality. Mr. George Ellison further exhibited two specimens of the Orkney vole, *Microtus orcadensis*, a new British mammal, together with its parasitic fleas *C. penicilliger*, *C. gallinæ*, and *T. agyrtes*, and stated that all of these parasites were well known to occur on the domestic fowl. —H. R. Sweeting and Wm. Mansbridge, *Hon. Secs.*

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NOTES ON REARING *TORTRIX PRONUBANA*, Hüb.

BY ROBERT ADKIN, F.E.S.

WHILE at Eastbourne in September last I was strolling one morning at about nine o'clock when I noticed a small bright-looking moth fly across the road, settle for a moment on a gate-post, and then disappear over a garden. Its appearance seemed familiar to me; it was certainly a *Tortrix*, and I came to the conclusion that it was more like a specimen of *T. pronubana* that I had seen exhibited at the Entomological Society some months earlier (Proc. Ent. Soc. 1905, p. lxiii) than any other member of the genus that I could call to mind. The specimen there exhibited was taken at Eastbourne, and the only other known British example was obtained at Bognor (Ent. Mo. Mag. xli. p. 276). If, therefore, my conclusion was a correct one, it appeared probable that these were not merely casual visitors, but that the species was established on our south coast, and only wanted working for to be found.

After a week spent in fruitless search, I chanced one morning upon a euonymus hedge in a private garden, to which I had managed to gain access, and obtained from it, as the result of many hours close searching, seven or eight very ordinary-looking small pupæ, and three or four very evident *Tortrix* larvæ, from which I eventually reared both sexes of *T. pronubana*. The species did not appear to be by any means common, but it has evidently obtained a footing in this country, and having regard to the abundance of what appears to be a suitable food-plant on many parts of our southern coast, there is good reason to hope that it may become firmly established as a British species.

The larva is green, of a shade a little lighter than the young leaves of the euonymus, hairs whitish, and head of a somewhat paler and yellower shade than the body and glabrous. It spins together the terminal developed leaves of the euonymus, and feeds upon the tender shoot enclosed between them.

The pupa is very dark brown, almost black, from 9 mm. to

10 mm. in length, and enclosed in a dense silken web between the leaves where the larva had fed.

The imago is easily recognized by the bright orange colour of its hind wings. The male measures from 15 mm. to 16 mm. in expanse. Fore wings rich greyish brown, reticulated with darker brown, with a broad deep red-brown fascia from the middle of the costa, where it is narrowest, to the inner margin, where it broadens out, extends to the anal angle, and unites with an irregular triangular patch of the same colour that occupies the apical and hind marginal areas. Hind wings bright orange bordered with black, usually with a few black scales scattered along the veins; but in one of the specimens reared, they are so dense as to almost obscure the orange colour of the wing. Cilia orange.

The female is a larger and more sombre insect. It measures 18 mm. to 22 mm. in expanse, is slightly paler in colour than the male, and the reticulations more clearly defined. The brown fascia is of a duller and less reddish tone, and its central portion is often indicated only in outline, as is also the triangular patch of the apical region. The body in both sexes is ringed with yellow.

The imago emerges during September and October, and its time of flight appears to be in the morning sunshine between eight and ten o'clock.

Lewisham: November, 1906.

THE GENERIC NAME *SCOPULA*.

By Louis B. Prout, F.E.S.

When I wrote on the correct names for the genera formed from the old "*Acidalia*" (Entom. xxxviii. pp. 7–8), I entirely ignored *Scopula*, Schrank ('Fauna Boica,' ii. part 2, p. 162). Although I have long been acquainted with the (apparently overlooked) history of the inception of this genus, I "hoped against hope" that some loophole might be found for escape from its adoption in a corrected sense. However, on looking into the matter again, I am convinced that there is no such escape, and it will therefore be a loss rather than a gain to postpone the inevitable any longer. The genus was erected for two species only—(1) *paludalis* (= *paludata*, L. = *ornata*, Scop., *certo*) and (2) *dentalis*, Schiff. For those few extremists who take the first species to be the type, whether it agrees with the diagnosis or not, this will be decisive in favour of *ornata*; but what will carry more weight with the majority is that the generic diagnosis fits only this species. Treitschke, in 1828, was therefore *ultra vires*

in using the name for a large Pyralid genus commencing with *dentalis*, while some later restrictions (such as Stephens's, in 1834) and type-citations (as Curtis's, in 1830; Duponchel's, in 1831; and Guenée's, in 1854) are manifestly beside the mark.

In a word, that long-suffering genus of Acidaliids, in which veins 6 and 7 of the hind wing are separate, &c., and which has been variously called *Arrhostia* (Herrich-Schaeffer), *Leptomeris* (Meyrick), *Craspedia* (Hampson), and *Emmiltis* (Warren)—not to mention *Dosithea*, Dup., "type *ornata*"—obtains an inalienable right to the older name of *Scopula*, Schrank.

Nov. 7th, 1906.

THE OVUM OF *LAPHYGMA EXIGUA*.

By Alfred Sich, F.E.S.

In October last Mr. South kindly sent me some egg-shells of this species, the eggs having been laid September 8th, 1906, and larvæ hatched out on the 14th of the same month. The eggs were hidden beneath a tangle of long greyish-brown hairs, which under an eighth-objective appeared quite smooth. Some of them measured 1·23 mm. in length. Quite similar hairs occur on the terminal segments of the abdomen of the female imago of *L. exigua*, and one suspects that in laying her eggs she moves the abdomen over them, and the easily detachable hairs remain partly adhering to the eggs. Some eggs, however, which Mr. V. Eric Shaw was kind enough to forward me later (together with the female parent) were not covered with hairs at all; but, as this imago was in a terribly worn condition, she may have already parted with the hairs which otherwise might have covered the eggs. My material was too scanty to allow me to hazard an opinion as to whether the ova of *L. exigua* are or are not normally covered with a tangle of hairs.

In shape this upright egg is a rather depressed sphere, flattened at both poles. The vertical axis measures 0·34 mm., and the horizontal 0·45 mm.; though the shape is not regular, these measurements would suit an average egg. Sculpture: the surface is covered with a network of rather large elongate more or less quadrangular cells, so disposed as to give the effect of vertical primary, and horizontal secondary ribs, especially down the sides of the ovum, where the primary ribs become stronger, and the cells between bear some resemblance to hammer marks on copper. The secondary ribs or walls of the cells run between, but not over the primary ribs. On the top of the egg, as the micropylar area is approached, the primary ribs become weaker and the secondary stronger, so that together they

form a rather open network around the micropyle. The rosette consists of usually, I believe, nine, but sometimes ten or even eleven, cells. These are of an elongate pear-shape, and are arranged in the usual way, with their more pointed apices meeting together in the centre. These cells are not all of the same size, but the whole rosette is usually about 0·07 mm. in diameter. The rather small base of the egg is flattened and smooth.

From the fair state of the empty egg-shells it may be presumed that the larva does not eat the shell after leaving the egg.

DESCRIPTION OF A NEW SPECIES OF *ODYNERUS* (VESPIDÆ) FROM VANCOUVER'S ISLAND.

By P. Cameron.

Odynerus mathewi, sp. nov.

Black, with the following pale yellow: the clypeus, mandibles except the teeth, labrum, a mark more than twice longer than wide and rounded above on the front, a broad line on the lower edge of the eye incision, a short narrow line on the upper part of the outer orbits, a line of almost equal width on the sides of the base of pronotum, tegulæ, a conical mark below them, a line on the base of post-scutellum, the spine on the lower part of metapleuræ, lines on the apices of the abdominal segments (that on first on top only), a small spot on the sides of first segment near the middle, and a large transverse one—its outer side rounded, widened, the inner smaller and transverse—pale yellow. Antennal scape pale yellow below, the flagellum yellow, tinged with fulvous, its hook broad, thick, not much narrowed towards the apex, reaching to the base of the penultimate segment. Wings hyaline, tinged with fuscous violaceous, the stigma and nervures black. ♂. Length, 8 mm.

Vancouver's Island (G. F. Mathew, R.N.).

Clypeus longer than wide, its apex transverse, somewhat broad. Base of thorax transverse, the sides hardly projecting. Apex of post-scutellum broadly rounded. Sides of metanotum broad, rounded, rugosely punctured, not margined. Second abdominal segment if anything wider than long, the apex more strongly punctured than the rest, not reflexed, flat; the yellow band on it is wider than on the others; below it is roundly incised on either side of the middle. Legs pale yellow, the coxæ behind, the fore femora to beyond the middle above, the middle behind and below, the hinder entirely, and the trochanters, black.

Belongs to Saussure's Section B., Syn. Amer. Wasps, 290.

DESCRIPTIONS OF TWO COTTON PESTS FROM WEST AFRICA.

By W. L. Distant.

Mr. G. C. Dudgeon has placed in my hands for determination some Lygæids which he found parasitic on *Gossypium* in West Africa. They all belong to the genus *Oxycarenus*, and include the widely distributed *O. hyalinipennis*, Costa,* and two other species, which are here described. Another specimen, also found on the same plant, may or may not belong to this genus, but is in too mutilated a condition for correct identification.

Mr. Dudgeon is now preparing a report on the cotton pests of West Africa, and will use the names given in this short communication.

RHYNCHOTA.

HETEROPTERA.

Fam. Lygæidæ.

Oxycarenus dudgeoni, sp. n.

Head, pronotum, and scutellum black; hemelytra hyaline, base of corium, the whole of clavus, and a spot at apical angle to corium, black; subcostal vein to corium piceously punctate; abdomen beneath subflavous; sternum black, acetabula, and posterior margins of meso- and metasterna greyish white; legs piceous, tibiæ excluding bases and apices greyish white; antennæ black, bases of third and fourth joints white; head, pronotum, and scutellum coarsely punctate, head about half as long as pronotum, the anterior lobe of which is much shorter than the posterior lobe, and is transversely impressed before the anterior margin; antennæ with the basal joint not quite reaching apex of head, second joint more than twice as long as first, third and fourth joints subequal, each much shorter than second; rostrum shortly passing the posterior coxæ. Long. 3½ to 4 millim.

Hab. Sierra Leone; Moyamba (G. C. Dudgeon).

Allied to *O. breddini*, Bergr., from the Congo region.

Oxycarenus gossipinus, sp. n.

Head, antennæ, scutellum, and clavus black; pronotum testaceous, its anterior and posterior margins centrally narrowly black; hemelytra stramineous, with a small black spot at apical angle, and with a short basal subcostal black line; pro- and mesosterna testaceous, their disks and the metasternum black; acetabula greyish white; legs and rostrum black, tibiæ broadly centrally annulated with stramineous; abdomen beneath ochraceous, stigmatal spots and apex black; head, pronotum, and scutellum thickly and somewhat coarsely punctate; head more than half as long as pronotum, the anterior and posterior lobes of which are

* *Cf.* T. Kuhlgatz, Mt. Mus. Berlin, iii. pp. 53 and 88 (1905).

subequal in length, the latter a little paler than the former, which is slightly globose; antennæ with the third and fourth joints greyish at base, basal joint not quite reaching apex of head, second joint twice as long as first, third and fourth joints subequal in length, each shorter than second joint; rostrum shortly passing posterior coxæ. Long. 3½ to 4 millim.

Hab. Sierra Leone; Moyamba (G. C. Dudgeon).

Allied to *O. exitiosus*, Dist., from South Africa, but to be distinguished by the much more elongate pronotum, and different colour of the same, &c.

ON A FEW TACHINIDÆ AND THEIR HOSTS.

By Claude Morley, F.E.S.

It is well known to lepidopterists that this extensive family of Diptera prey entomophagously upon many kinds of moths and butterflies in almost exactly the same manner as do the Ichneumons, and consequently many correspondents have been so good as to send me from time to time specimens which have appeared in their breeding-cages. Dr. Meade gives (Entom. 1881, pp. 285–9) a very interesting account of twelve species of this family with their hosts, and it may not be out of place "to add my mite"—as he expresses it—in extension of his own paper, although I hope that both combined will be but a fraction of that which we shall, I trust, soon learn from the extensive researches of Mr. Colbran J. Wainwright, to whom, together with Mr. Albert Piffard, Dr. Meade, and Rev. E. N. Bloomfield, I owe the determination of the species.

Exorista jucunda, Mg.

This species was bred in March by Mr. Edward Ransom, at Sudbury, in Suffolk. He writes:—"I bred it from a larva of *Liparis salicis*, but there is no sign, so far as I have observed, that the larva has been attacked by a parasite until it is full-fed, when it spins a cocoon in the usual way. In then dies, and the larval skin breaks, revealing the pupa of its parasite. The parasitical larva does not seem to make its way out of the caterpillar as do the parasites so common on *Pieris brassicæ* [the braconid, *Apanteles glomeratus*, L.], but changes to a pupa in the body of its host, and its presence is not suspected until the caterpillar is found to be dead. I think those caterpillars that are affected do not grow so large as is usual. So far as I have observed, there is only one parasite to each caterpillar. I do not think *jucunda* can be very rare here, as I have often seen the cocoons of *salicis* with the parasitical pupa in them. I assume they are all those

of *jucunda*, as I do not recollect having bred any other kind from *salicis*, nor have I bred *jucunda* from any other species."

Blepharidea vulgaris, Fln.

Mr. E. Goodwin, of Wateringbury, in Kent, has bred four specimens of this common species there from *Thecla quercus* on 20th June. I have bred it at Epsom from *Pieris rapæ* in 1891. Mr. J. Wigin sent me five puparia bred at Methley, near Leeds, from *Acronycta psi* on 15th September. Of these, two died just before emergence of the imagines; one was eaten of Chalcid flies —some small green species of *Pteromalus*, a score of which emerged from a single hole in its side; the fourth was out with its wings fully developed at midnight of 27th May following; and the last, whose wings it was quite easy to *see* stretch and expand, three days later. It is also a common parasite of *Abraxas grossulariata*, from which I possess specimens reared by the late Mr. E. G. J. Sparke at Tooting in November, and by Mr. C. T. Gimingham, at Tottenham, Middlesex, on 21st June. Mr. Hubert Phillips has bred a similar fly, though the species is doubtful, from *Hadena pisi* and *Mamestra brassicæ*. The puparia is, I believe, never concealed within, though occasionally attached to, the defunct larva.

Frontina fugax, Rnd.

On October 7th Mr. Wigin sent me six puparia of this species from Methley, bred from larvæ of *Acronycta psi*. One of these emerged *en route*, and bored through its paper covering, apparently by wetting it with oral fluid, and then bursting through, since one wing was crumpled, perhaps through the extra expense of the fluid. The remainder emerged on, or slightly before, the 18th June following, though one died with only its head discovered. Again, the following autumn, he sent me three more from the same host, which emerged on 26th May, and two on 2nd June of the next year. One of these emerged between 9 p.m. and midnight; another between midnight and 10 a.m. In the same parcel was enclosed a Tachinid, which emerged too crippled for identification, bred from *Plusia gamma* (*cf.* also E.M.M. 1900, p. 244). *F. fugax* appears to be solitary in its parasitism; I possess specimens of the puparia occupying about half, and quite covered by, the old caterpillar's entirely empty skin.

Phorocera serriventris, Rnd.

Mr. J. C. Haggart, of Galashiels, was so good as to forward, on 3rd April, three puparia of this species, which he had bred from Chiswick pupæ of *Acronycta aceris*. The first emerged on the 30th of the same month with fully-developed wings; the other two followed on 8th May—one at 11 a.m., the other a little before midnight—but neither managed to expand its wings. At the

end of May, Mr. Alfred Sich also sent me this species, bred from the same host at Chiswick; and on 25th a puparia from *Acronycta psi*, which emerged as the same species during June. On 16th May, I received another, bred by Mr. F. H. Peachell from a dug pupa of *Tæniocampa gothica*, found at High Wycombe, Bucks, during the preceding April. In the middle of July came three more (dead, I believe) from Mr. A. Bacot, which had been bred by Mr. E. M. Dadd from Belgian *Liparis chrysorrhœa*. Mr. Phillips has also bred a *Phorocera*, probably referable to the present species, from *Spilosoma* (*Arctia*) *menthastri*.

Sisyropa hortulana, Egg.

Among the *B. vulgaris*, bred by Mr. Wigin from *Acronycta psi*, was one specimen of this species, whose puparium is much larger and darker; it was received 15th September, and emerged on 28th of the following May. When first noticed, at 11 a.m., it had no visible wings, but while I watched it I saw, in the course of almost exactly two minutes, the wings fully expand to their normal size, the body at the same time lose its immature transparency, and the frontal sac assume its mature proportions.

Sisyropa lucorum, Rnd.

A specimen of this handsome species was bred in a Lepidoptera breeding-cage in Ipswich in July, 1895.

Tachina larvarum, L.

In March, Mr. Haggart took eight larvæ of *Macrothylacia* (*Bombyx*) *rubi* about Galashiels, of which five each produced a single puparium of this fly about 10th May. These he kindly sent to me, and they all duly emerged during the following month. I probably kept them too dry, however, for they were all dead, with only one fully developed, on 1st July. Mr. W. G. Clutten gave me two dead specimens of this species in August, which he had bred from *Malacosoma* (*Bombyx*) *neustria* at Bungay, in Suffolk.

Tachina rustica, Mg.

Examples which Mr. Piffard thought probably referable to this species have been bred from *Acronycta aceris*, *Hadena oleracea*, and *Mamestra brassicæ* by Mr. Phillips.

Thelymorpha vertiginosa, Fln.

Four specimens of this handsome species were received, dead, from Mr. Clutten in August; they had been reared from *Malacosoma* (*Bombyx*) *neustria* at Bungay, in Suffolk. I have taken the species on the wing myself in the same county, though it is certainly uncommon here.

Baumhaueri gracilis.

A single dead specimen of this species, named by Mr. Piffard, was sent by Mr. Clutten, who bred it from an unknown species of Lepidoptera at Burnley, in August.

Myiobia inanis, Fln.

On October 9th Mr. Clutten sent two Tachinid puparia from Halifax ex *Spilosoma* (*Arctia*) *lubricipeda*, and two others ex dug pupæ of *Tæniocampa* (probably) *instabilis*, from Burnley. Unfortunately the two former died, and their species was undetermined; but of the two latter, one was emerged with very tiny wings at 10.30 a.m. on 22nd June following, and its wings were not fully developed the same evening, though by the morning of 23rd they were fully expanded—how different from those of *S. hortulana*, above!

Erigone radicum, Fab.

From *Arctia lubricipeda*, Mr. Wigin bred eleven puparia of this fine species at Methley, near Leeds, in October, and ten of these emerged between the 5th and 23rd of the following June, though only two remained alive at the latter date. They were in all degrees of development—five with perfect wings, one fully expanded but crumpled, two reaching apex of basal abdominal segment, one emerged but not at all developed, one attached to its puparium by a leg, and two with only their heads protruded.

Plagia ruralis, Fln.

Mr. Clutten has twice sent me batches of this species, bred in both cases at Burnley from *Plusia iota*. The first I received on 3rd August, the second on 16th June. It is a gregarious parasite, and the two larvæ-skins I possess are each a mere bag distended by six close-packed puparia of the fly, which are placed somewhat irregularly, transversely, or obliquely.

Plagia curvinervis, Zett.

One specimen of this species was received on 25th May from Mr. W. M. Christy, who writes that it "emerged from a pot containing pupæ of *gracilis* and one *myrtilli* from the New Forest, and *Dianthœciæ* from West Sussex. As the *gracilis* and their ichneumons have ceased emerging for more than two weeks, probably these flies are referable to the *Dianthœciæ*."

Digonochæta spinipennis, Mg.

I bred this species in the winter of 1895–96, in a box containing, as far as I am aware, only *Scolytus intricatus*, at Ipswich (for Tachinids on Coleoptera, *cf.* E.M.M. 1894, p. 107, &c.); and again, on 14th May, one emerged from its puparium, which I had found beneath the pine-bark of a railing at Sproughton, near Ipswich, on 9th of preceding April.

Thriptocera crassipennis, Mg.

This species I bred in the spring of 1895 from its puparium, which I found among moss near Ipswich.

From the above it will be at once seen how much lepidopterists can, by simply preserving the parasites they may happen to breed, assist in the elucidation of the life-histories of insects of quite distinct kinds. Is it too much to ask that all such may be forwarded to me—more especially the hymenopterous species, since it is upon those that I am especially engaged?* and our motto still is, "By mutual confidence and mutual aid——"!

Monks' Soham House, Suffolk: Nov. 6th, 1906.

BIBLIOGRAPHICAL AND NOMENCLATORIAL NOTES ON THE RHYNCHOTA.

By W. L. Distant.

Mr. Kirkaldy's communication on the above subject (*ante*, p. 247) necessitates some comment. He states, "The following new names are necessary," in the Fulgoridæ, and includes *Kirbyella* to take the place of *Kirbya*, Melich. This unfortunately creates a new synonym.

Genus Kirbyana.

Kirbya, Melich., Hom. Faun. Ceylon, p. 37 (1903), *nom. præocc.*

Kirbyana, Dist., Faun. B. I. Rhynch. iii. p. 262 (1906, March), n. nom.

Kirbyella, Kirk., Entom. xxxix. p. 248 (1906, November).

There appears to be no necessity for the proposed new name *Synaphana* to take the place of *Penthicus*, nom. præocc., *Penthicodes*, Blanch., having been already substituted. The type of Guerin's genus *Aphæna* is *A. fuscata*, from New Guinea, which is structurally distinct from the other species considered congeneric. I have endeavoured to make the question clearer elsewhere (*cf.* Ann. Mag. Nat. Hist. (7), xviii. p. 24).

I quite agree with Mr. Kirkaldy that *Coanaco*, Dist., = *Copidocephala*, Stål, having already published that correction elsewhere (*cf.* Ann. Mag. Nat. Hist. (7), xviii. p. 23).

It is also stated that *Opinus*, Lap., = *Tapeinus*, Lap., = *Sminthocoris*, Dist., and that the writer does "not know why Mr. Distant has added to the synonymy of this Reduviid genus."

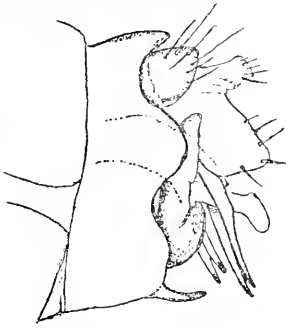
* Many hundreds of lepidopterous hosts are recorded in my 'British Ichneumons,' vols. i. and ii.: Keys, Whimple Street, Plymouth.

Opinus is a name only, as Kirkaldy has previous stated in these pages (Entom. 1900, p. 241). "*Opinus* is only mentioned in the analytical tables." That it = *Tapcinus* is a matter of inference only, and such names (*Opinus* has already caused confusion), in my view, should be discarded.

I am glad to see that Mr. Kirkaldy is still pursuing his bibliographical investigations.

A NEW SPECIES OF *ADICELLA* FROM SPAIN.

By K. J. Morton, F.E.S.



Apex of abdomen of male from side.

Through the kindness of Dr. Chapman and Mr. Lucas, I have been enabled to examine a number of Trichoptera, taken by the former in North-western Spain during the past summer. Amongst other interesting species there are two specimens of an *Adicella* which has not been separated hitherto from *Adicella reducta*, McLach., but which is certainly a good and distinct species. The following notes will suffice for its identification:—

Adicella meridionalis, n. sp.

In general appearance and size much resembling *A. reducta*, but differing much in the appendages of the male.

The superior appendages similar to those of *A. reducta*, and the median dorsal process also similar, but much shorter. The upper penis-cover formed of two roof-shaped plates, the angles when viewed from the side somewhat obtuse. Inferior appendages with a broad basal part, the apical part being blade-shaped, and apparently narrower in its proximal portion. The penis-sheaths forked, the branches lanceolate, the upper branch long and projecting, the lower shorter and not always visible. The last ventral segment with a prominent process, broad at the base and gradually tapering.

Two males; Casayo, July 2nd–8th, 1906 (Chapman).

The most essential points of difference are the ventral process, which is absent in *A. reducta*, and the upper cover and sheaths; the cover in *reducta*, in the side aspect, is sickle-shaped, while, as far as I can see, the sheaths in *reducta* are simple, strongly hump-backed before the apices, which are curved downwards, and rather inturned when seen from the side.

I possess another male which I refer to *A. meridionalis*. This was taken by Father Navás at Moncayo, and was one of several which I returned to him at the time under the name of *reducta*. In referring these examples to *reducta*, I had before me the fact that Mr. McLachlan has recorded this species from several localities in Portugal (Eaton). I have not examined any of Mr. McLachlan's material, but this should be done in view of the existence of a new and closely allied species in Spain.

13, Blackford Road, Edinburgh: Oct. 25th, 1906.

NEUROPTERA AND TRICHOPTERA TAKEN BY DR. T. A. CHAPMAN IN SPAIN, 1906.

By W. J. Lucas, B.A., F.E.S.

A short time ago Dr. Chapman was good enough to hand over to me his captures of Neuroptera and Trichoptera made in Spain during the past summer. Some of these specimens, including the Trichoptera, were passed on to Mr. K. J. Morton, who kindly assisted in the identification, especially of these last, of which one—*Adicella meridionalis*, n. sp.—turns out to be new.

Dr. Chapman's headquarters were at Vigo, June 18th–27th; Casayo, July 2nd–8th; Branuelas, July 10th–16th; Pontevedra, July 19th–22nd.

The insects belonging to the Neuroptera are all included in the suborders Odonata and Planipennia, except two female Perlids of the genus *Nemoura*, which without males can scarcely be identified. The remainder belong to the Trichoptera. For purposes of comparison extra-British species are marked with an asterisk.

Odonata.

Sympetrum flaveolum, Linn.—Branuelas.

S. sanguineum, Müll.—Casayo (one female).

Orthetrum cærulescens, Fabr.—Vigo (one male being in teneral condition); Branuelas; Pontevedra.

**Onychogomphus uncatus*, Charp.—Vigo.

Cordulegaster annulatus, Latr.—Vigo; Casayo; Branuelas.

Calopteryx splendens, Harr.—Branuelas (one male).

C. virgo, Linn.—Branuelas.

**C. hæmorrhoidalis*, Lind.—Vigo (one male being in teneral condition).

**Lestes virens*, Charp.—Casayo (one, a male, in rather teneral condition).

**L. barbara*, Fabr.—Vigo (one male).

Pyrrhosoma tenellum, Vill.—Branuelas.

P. nymphula, Sulz.—Branuelas.

**Platycnemis acutipennis*, Selys.—Vigo.

**Ischnura grællsii*, Ramb.—Vigo (one male).

**Agrion scitulum*, Ramb.—Casayo (one female).

A. mercuriale, Charp.—Branuelas.

PLANIPENNIA.

**Panorpa meridionalis*, Ramb. — Vigo (one female); Casayo (two females). Although no males are present, the identification is no doubt correct.

**Creagris plumbeus*, Oliv.—Vigo; Branuelas.

**Ascalaphus bœticus*, Ramb.—Casayo; Branuelas.

**A. longicornis*, Linn.—Vigo; Casayo; Branuelas; Pontevedra.

**Dilar meridionalis*, Hagen.—Branuelas. The identity of the Spanish examples of this interesting genus is at present somewhat uncertain. Father Navás is investigating the genus as far as Spain is concerned. The three examples in the present collection seem to be *D. meridionalis*.

Hemerobius micans, Oliv.—Casayo (one rather large example).

Chrysopa vulgaris, Schn. — Vigo (one with aberrant neuration, and in that respect resembling a specimen received from Spain by Mr. Morton).

TRICHOPTERA.

**Limnophilus submaculatus*, Ramb.—Branuelas (one female).

**Sericostoma bœticum*, Ed. Pict. — Casayo (several of both sexes); Branuelas (one female).

**Helicopsyche lusitanica*, McL.—Vigo (one male).

**Adicella meridionalis*,† n. sp.—Casayo (two males).

Hydropsyche pellucidula, Curt.—Casayo (one male and one female).

H. exocellata, Dufour.—Casayo (two males).

Diplectrona felix, McL.—Casayo (one male).

**Tinodes fœdella*, McL.—Casayo (one male).

THE DRAGONFLIES OF EPPING FOREST IN 1906.

BY F. W. & H. CAMPION.

THE dragonfly season of 1906 proved to be the most interesting one within our recollection. Not only did we re-take most of the species occurring in our district in previous years, but we were able to add to our local collection, which now consists of twenty species, five species not hitherto represented there—*Brachytron pratense*, *Cordulia ænea*, *Sympetrum scoticum*, and, most important of all, *S. vulgatum* and *S. flaveolum*. The genus

† For description, see page 275.

Sympetrum was especially well in evidence, no fewer than five out of the six British species having fallen to our nets. The exceptionally fine weather which characterized the summer extended far into the autumn, and we enjoyed the unusual experience of taking dragonflies so late in the year as October 21st.

Representatives of seventeen species were obtained, *viz.*:—

(1) *Pyrrhosoma nymphula.*—The taking of immature females of this dragonfly—always our earliest—opened the season on May 13th. It became tolerably common throughout the district, and was last met with on July 22nd.

(2) *Brachytron pratense.* — On May 27th we saw at a pond occupying the site of an old forest gravel-pit what appeared to be a newly-emerged dragonfly resting on a rush far beyond our reach. We threw twigs at it, but, instead of causing it to rise, we only succeeded in covering it up. On the evening of the following day we found the insect occupying much the same position, and, by lashing together two or three sticks, we were able to reach and secure the specimen with the net. It proved to be a female of *B. pratense*, a species new to our collection. It was in good condition save for the undeveloped state of the wings on the right side, a blemish which remained in spite of our keeping the insect alive a day or two longer at home. The circumstances point to the specimen having been bred in the pond where it was found. The species was not met with again during the season.

(3) *Agrion puella* was first found on June 3rd, when some individuals were in a mature state. On June 24th two males bearing a close superficial resemblance to *A. pulchellum* were taken at one small pond. The U-shaped marking on the second abdominal segment was connected by a slender black line with the circlet behind. The base of the marking was thicker than in typical *puella*, and its posterior margin was not so deeply excavated. In a third specimen, taken at the same time and at the same pond, the connection with the circlet behind was not complete; the circlet was crossed transversely by a short median black line, which anteriorly nearly joined a backward process from the U-shaped marking. Another male, with the connection complete, was obtained at a different locality on July 15th. That these specimens must be regarded as *A. puella*, and not as *A. pulchellum*, is clear from the morphological characters which separate the two species. It is interesting to compare this aberration of *puella* in the direction of *pulchellum*, with the variation of *pulchellum* towards *puella* described by Mr. W. J. Lucas in 1901 (Entom. xxxiv. 215). On July 1st we had an opportunity of watching at close quarters a pair of *A. puella* ovipositing; the female was evidently placing her eggs within the bark of the floating twig upon which she was resting, while the male,

which held her *per collum*, poised himself on his wings in an almost erect position. The species was not met with after July 22nd.

(4) *Ischnura elegans* was first taken on June 3rd; it was afterwards very abundant, especially at the end of July, and was collected regularly until September 8th, the latest date which we have yet recorded for the species. A female with the ground colour of the thorax purple was obtained on June 10th. On July 15th we took a very curious female *in cop.* with a normal male. The proximal two-thirds of segment eight were of a colour approaching to that seen in the same segment in var. *infuscans* (dark orange-brown), but the distal third of the segment was occupied by a dorsal black spot having a semicircular front margin. Moreover, there was a thin line of blue at the anterior margin of the segment, and a strong line of blue at the posterior margin. The spots behind the eyes were bright blue, the stripes on the thorax were dull blue, and the sides of the thorax bright green. The smallest male of which we have any knowledge was taken on July 22nd; its measurements were 28 mm. in length, and 31·5 mm. across the hind wings.

Var. *infuscans* was procured on July 1st and 15th, one only on each occasion. In the first specimen, which was taken *in cop.* with a typical male, segment eight was of so dark a hue as to be indistinguishable, so far as colour was concerned, from the other segments of the abdomen. Such a specimen might, if seen alone, be easily mistaken for the female of *I. pumilio*.

(5) *Libellula depressa* was, as in former years, found to be common at the shallower ponds. The earliest specimen was seen on June 3rd; it was secured, and proved to be an incompletely coloured male. The latest observation made was on July 22nd. It is a curious fact that, unlike other observers, we have never seen *L. depressa* flying except over water.

(6) *Cordulia ænea*.—Single specimens of this species—then entirely new to us in the living state—were obtained at ponds near Loughton, June 5th and 10th. A little later it became quite common at a locality further to the north, where we took no fewer than eight examples on June 17th, and four more on July 1st, the last occasion upon which we saw it. All the specimens taken were males, and no immature individuals were noticed. Our attention was drawn by Mr. Lucas to the large size of these insects, and, upon measuring them, we found the smallest to be 49·5 mm. in length and 71 mm. across the hind wings, and the largest to be 53·5 mm. long and 72 mm. in expanse. Females were very seldom seen—probably they were actually very scarce—but on July 1st we had opportunities for watching two of the sex engaged in the business of oviposition. While so employed they neither received assistance from the males nor sought support

from the water-plants, but they dropped their eggs into the water, apparently at random, while hovering upon the wing. *C. ænea* is a beautiful creature to look at in the hand, but it is not very attractive when seen hawking for its prey. An exception must be made, however, in favour of its eyes, the liquid emerald-green of which immediately arrests attention and excites admiration. It is not so difficult to capture as are most of the other larger dragonflies, for its flight, which is very characteristic, is not so erratic, and it is not alarmed so readily. Although it can fly strongly on occasion, it usually glides over the water at one uniformly low level, and quite close to the margins of the pond. It seems to avoid alighting on low herbage, and to prefer resting on bushes surrounding the pond.

(7) *Enallagma cyathigerum* was collected pretty frequently at the particular localities where it occurs from June 10th to August 26th. On the first-named date a blue female was taken attached *per collum* to a very brilliantly coloured male, and a female of the typical form was obtained at Walthamstow on July 8th.

(8) *Libellula quadrimaculata* is always scarce in Epping Forest, and for the only specimen obtained during 1906 our thanks are due to a stranger. On June 17th, he, seeing us engaged with other dragonflies, himself pursued and secured a male, which he afterwards kindly gave to us.

(9) *Anax imperator* was much commoner than usual, but a male taken on July 1st was the only specimen secured. On the date named we watched two females ovipositing, without any aid from the males, in a shallow arm of a large pond. It has been remarked that the sense of hearing in dragonflies appears to be in a very rudimentary state, and we have obtained a striking confirmation of this view. We were watching a male *A. imperator* at a pond abutting upon the main road through the forest. Motor cars and bicycles and other vehicles were passing in an incessant stream, but, although the pond was a fairly large one and more retired ponds were near at hand, the insect continued its flight, without manifesting the slightest alarm or irritation, parallel with the road, and at a distance of not more than a few feet from its noise and dust.

(10) *Æschna grandis* was first seen and taken on July 22nd, when it was common; it afterwards became quite scarce, and was not observed after the first week in September.

(11) *Æ. cyanea.*—This dragonfly, which is always abundant with us, was first taken on July 29th. On September 30th we came across a female so intent on oviposition as to pay little or no heed to our near approach; she was crawling along a fallen tree-trunk lying beside a small pond much frequented by the species, and inserting her ovipositor into the interstices of the

wood and bark. As late as October 21st a male was captured on the wing, a date later by a full month than our previous latest record for the species.

(12) *Sympetrum striolatum* was not taken earlier than July 29th. We did not find it really common until October 14th, and it was still pretty plentiful a week later (October 21st), when it was last met with. A female of extraordinary size was taken on September 9th; it measured 43 mm. in length, and 65 mm. across the hind wings. On the same date some females were obtained having a considerable amount of red upon the abdomen.

(13) *Lestes sponsa.*—As was the case last year, this pretty little insect was not found within the limits of Epping Forest, as strictly defined. On August 8th, however, a visit to Coopersale Common, one of Doubleday's favourite localities to the north-east of Epping, revealed an abundance there of both males and females.

(14) *Sympetrum flaveolum.*—We took this species, which has not been previously recorded from the British Isles since 1900, pretty plentifully in Epping Forest from August 8th to September 2nd. On the first-named date a single male was obtained near Epping. On August 12th, when we revisited the old gravel-pit which had produced *Brachytron pratense* earlier in the year, we were fortunate enough to get a female, in addition to four males. The same pit yielded eight more males a week later. The last specimen, a solitary male, was taken on September 2nd at a neighbouring pit, at which not a single example had been hitherto seen. It seems almost certain that these insects had not originated at the ponds where they were taken, for they appeared suddenly, at the principal site at all events, fully matured; moreover, several of them presented broken wings or legs. We found this dragonfly to differ in some of its habits from the common species of the same genus, for not only did it seem to be as active on dull days as on bright ones, but it manifested none of the fondness of its congeners for returning again and again to precisely the same spot. It is worthy of remark that a search for the species at the larger sheets of water proved unavailing. Our specimens were got at wet hollows more or less overgrown with rushes; and in all cases we found the insects, when not on the wing, resting about midway down the stems of the rushes. The general agreement of their coloration with that of the rush flowers, added to the grasshopper-like spring with which they commenced their flights, rendered successful pursuit a matter of great difficulty. Their flights were neither very rapid nor very prolonged, but, when an individual was very closely pressed, it sometimes took refuge in the tops of tall trees. The large saffron patch at the base of each hind wing readily distinguished *S. flaveolum* from its allies, even on

the wing. In the living males the colour of the thorax appeared to us to be, not deep red, as has been stated, but brownish, in decided contrast with the red of the abdomen. Females of this species are seldom met with in Great Britain, and the latest recorded capture was that made by Mr. B. Harwood at St. Osyth, Essex, on August 21st, 1899. In the wings of our specimen the small saffron patch at the cubital point is connected by a streak of the same colour with the large basal patch. The measurements agree with those of the two Continental specimens referred to in Mr. Lucas's 'British Dragonflies,' the length being 33 mm., and the width across the hind wings 56 mm.

(15) *S. vulgatum*.—On September 4th we took a *Sympetrum* which we at once suspected to be *S. vulgatum*, a dragonfly but thrice recorded, with authority, as a British insect. It was a male, and appeared to be the sole representative of its kind then present, although other *Sympetrum* dragonflies, including at least one *S. sanguineum*, were flying in its company. We were led to distinguish it from *S. striolatum*, with which the rare species is frequently confused, by the uniform brownness of the sides of the thorax, crossed only by black lines, and by the richer coloration and more pronounced posterior expansion of the abdomen. Closer inspection showed that the vertical black line upon the frons where it abuts upon the eyes, a character proper to *vulgatum*, was present in our specimen, and that the wings were more hyaline than the wings of the common species, which are frequently tinged with brown. The measurements were found to be: length 40 mm., expanse of hind wings 59 mm. The specimen was subsequently submitted, for examination, to Mr. K. J. Morton, of Edinburgh, who determined it to be *S. vulgatum*, "beyond all question," and courteously furnished us with material for the comparative study of the genitalia, the real test of distinctness, in the two allied species. The previous British records for *S. vulgatum*, for which we are indebted to Mr. Lucas, relate to single male specimens, all taken south of the Thames, *viz.*, by Mr. C. A. Briggs, Bookham Common (1891); Mr. W. J. Lucas, Richmond Park (September 11th, 1898); and Mr. A. H. Hamm, Torquay (August 15th, 1899).

(16) *S. sanguineum* was met with for the first time since 1903. It occurred very sparingly, only two males being taken, one on September 4th, and the other on the 8th; both specimens were flying over ponds some miles to the north of our old locality for the species.

(17) *S. scoticum*.—On September 8th we detected at a pond near Loughton two or three specimens of this species, not hitherto seen by us in the forest, flying over the horsetails (*Equisetum*), which partly filled the pond. After much time spent in waiting for an opportunity, a male was at length secured, and we were thus enabled to add the species to our

Epping Forest list. A solitary specimen was seen at another pond as late as October 14th, but it could not be taken.

Æschna mixta was probably seen on one or two occasions in October, but a capture was not effected. It is somewhat remarkable that, notwithstanding the unusual abundance of *Ischnura elegans*, not a single female of the orange variety (*rufescens*) was met with.

Erratum.—By a misprint in our note on *Orthetrum cærulescens* in Essex (*ante*, p. 160), we were made to say that "we *were* unable to find any other record of the occurrence of the species in Essex," instead of "we *are* unable," &c., which was what we wrote.

33, Maude Terrace, Walthamstow, Essex:
November 13th, 1906.

CURRENT NOTES.

By G. W. Kirkaldy.

(Continued from p. 203.)

33. Reuter, O. M.: "Hemipterologische Spekulationen. I. Die Klassification der Capsiden." Festschrift für Palmén. No. 1, pp. 1–58, and a genealogical tree (dated 1905, but probably published in 1906) [Hemiptera].
34. Perkins, R. C. L.: "Leaf-hoppers and their Natural Enemies—Introduction." Bull. Hawaiian Sugar Planters' Div. Ent. i. pp. i–xxxii, 8 figs. (May 1st, 1906).
35. *Id.*: "Ditto, pt. 1, Dryinidæ." *Op. cit.*, 1–69 (May 27th, 1905) [Hymenoptera].
36. *Id.*: "Ditto, pt. 2, Epipyropidæ." *Op. cit.*, 71–85, 3 figs. (June 3rd, 1905) [Lepidoptera].
37. *Id.*: "Ditto, pt. 3, Stylopidæ." *Op. cit.*, 87–111, plates i.–iv. (Aug. 8th, 1905) [Coleoptera].
38. *Id.*: "Ditto, pt. 4, Pipunculidæ." *Op. cit.*, 119–57, plates v.–vii. (Sept. 9th, 1905) [Diptera].
39. Terry, F. W.: "Ditto, pt. 5, Forficulidæ, Syrphidæ, and Hemerobiidæ." *Op. cit.*, 159–81, plates viii.–x. (Nov. 13th, 1905) [Orthoptera, Diptera, and Neuroptera].
40. Perkins, R. C. L.: "Ditto, pt. 6, Mymaridæ, Platygasteridæ." *Op. cit.*, 183–205, plates xi.–xiii. (Nov. 13th, 1905) [Hymenoptera].
41. Swezey, O. H.: "Ditto, pt. 7, Orthoptera, Coleoptera, Hemiptera" [*i. e.* Heteroptera]. *Op. cit.*, 207–38, plates xiv.–xvii. (Dec. 30th, 1905).

42. Perkins, R. C. L.: "Ditto, pt. 8, Encyrtidæ, Eulophidæ, Trichogrammidæ." *Op. cit.*, 239–67, plates xviii.–xx. (Jan. 6th, 1906) [Hymenoptera].
43. Kirkaldy, G. W.: "Ditto, pt. 9, Leaf-hoppers." *Op. cit.*, 269–479, plates xxi.–xxxii. (Feb. 3rd, 1906) [Hemiptera].
44. Perkins, R. C. L.: "Ditto, pt. 10, Dryinidæ, Pipunculidæ, Supplementary." *Op. cit.*, 481–99, plates xxxiii.–xxxviii. (March 1st, 1906) [Hymenoptera, Diptera].
45. Kirkaldy, G. W.: "Ditto, Index, Errata," &c. *Op. cit.*, 501–8, and 2 pp. (May 1st, 1906).
46. Friederichs, K.: "Zur Biologie der Embiiden . . ." Mt. Zool. Mus. Berlin, iii. 213–39, text-figs. 1–19 (April, 1906) [Neuroptera.]
47. Buttel-Reepen, H. von: "Apistica. Beiträge zur Systematik, Biologie, sowie zur Geschichtlichen und Geographischen Verbreitung der Honigbiene (*Apis mellifica*, L.) ihrer Varietäten und der übrigen Apis-Arten." *Op. cit.*, 117–201, text-figs. 1–8 (April, 1906) [Hymenoptera].
48. Holmgren, N.: "Studien über Südamerikanische Termiten." Zool. Jahrb., Abt. Syst., xxxiii. 521–676 [Neuroptera].
49. Perkins, R. C. L.: "Entomological and other Notes on a Trip to Australia." Proc. Hawaiian Ent. Soc. i. 8–11 (April 3rd, 1906).
50. *Id.*: "Notes on a Collection of Butterflies made during a Recent Trip to Australia." *Op. cit.*, 23–5 [Lepidoptera].
51. Van Dine, D. L.: "Notes on a Comparative Anatomical Study of the Mouth-Parts of Adult Saw-Flies." *Op. cit.*, 19–22, plates 1–2 [Hymenoptera].
52. Osburn, R. C.: "Observations and Experiments on Dragonflies in Brackish Water." Amer. Nat. xl. 395–9 (June, 1906) [Neuroptera].
53. Jackson, C. F.: "Key to the Families and Genera of the Order Thysanura." Ohio Nat. vi. 545–9 (June, 1906).
54. Distant, W. L.: "A Synonymic Catalogue of Homoptera. Part 1. Cicadidæ." (London, British Museum), 1–207.
55. Pawlowsky, E.: "Über den Stech- und Saugapparat der Pediculiden." Zeitschr. Wiss. Insektenbiol., ii. 156–62, figs. 1–4 (June 18th), and 198–204, figs. 5–13 (July 10th, 1906).
56. Doflein, F.: "Ostasienfahrt. Erlebnisse und Beobachtungen eines Naturforschers in China, Japan, und Ceylon." (Leipzig), i–xiii and 1–512, 18 plates, 5 maps, and numerous text-figures (1906).
57. Girault, A. A.: "The Present Status of the Bedbug in the Transmission of Human Diseases." Journ. Amer. Med. Ass. xlvii. 85–7 (July 14th, 1906) [also sep. 1–8].

Reuter's memoir (33) on the classification of the Miridæ (Capsidæ) is the most important paper on the Heteropterous Hemiptera issued for some time, and is specially noted here, since it is practically a separate publication. The learned Finlander resents Distant's allegation (in the 'Fauna of British India—Rhynchota,' vol. ii.) that the current classification of Miridæ is more for cabinet-arrangement purposes than as exhibiting a philosophical conception, and refutes Distant, showing, in great detail, that the English author's groups are entirely artificial, and that his own are based, as far as present knowledge permits, on philosophical principles.

The first bulletin of the Hawaiian Sugar Planters' Division of Entomology (34–45) comprises some 542 pages, with thirty-eight plates and eleven text-figures, and deals with the Fulgoroid and Tetigonioid Hemiptera (principally those of Australia), and their enemies. The main scope of the work is biologic and classificatory, but there are also described 120 new genera and subgenera, and 356 new species and varieties, principally in parasitic Hymenoptera and in Siphonata (Homoptera). The contents of the bulletin may be summarized as follows :—

Parts 1, 6, 8, and 10 deal with the parasitic Hymenoptera. It is remarkable that the Dryinidæ which attack Tetigoniids (Jassids), while often superficially resembling others parasitic on Asiracids (Delphacids), "always differ essentially in the structure of the chelæ from the latter. Consequently the same species, or rather the same genus, does not attack both of these indiscriminately. The nature of the larval sac is explained, and a similar sac is shown to exist outside the group in an anomalous insect (possibly allied to *Embolemus*) parasitic on Orthoptera. . . This is also the case with some European Belytidæ, which also form larval sacs on small Jassids. The economic value of Dryinidæ is discussed, and the effect of hyperparasites on their utility; some species reproduce parthenogenetically, though males occur." Parthenogenesis is shown to be usual in some Mymaridæ. Part 2 deals with the parasitic Lepidoptera of the Epipyropidæ. Their habits are given, and the remarkable form of the young larva is described. In part 3, some forms of the coleopterous family "Stylopidæ are discussed, their habits, the effect of their attack on their hosts, the frequent occurrence of a parasitic fungus in connection with their attack, the structure of larvæ and adults." The habits, and the form of the larvæ and puparia of the Dipterous family Pipunculidæ occupy part 4. The life-histories of the Forficulid *Chelisoches morio*, and of the lacewing *Chrysopa microphya*, are detailed in part 5. The life-histories of the Locustid *Xiphidion varipenne* (formerly confused with the European *X. fusca*), and of some Coccinellidæ and Heteroptera, are discussed in part 7. Part 9 is devoted to the leaf-hoppers of the superfamilies Tetigonioidea and Fulgoroidea. A summary

of what is known of their life-histories, of their systematic position and classification, with criticisms on the latter, is given, their external structure dealt with at some length, as well as such topics as polymorphism of the organs of flight. The introduction gives a general account of Koebele and Perkins's expeditions to Australia, Viti, and the United States; deals with the most approved mode of handling beneficial insects, summarizes the previous parts of the bulletin, and lists the parasites and their hosts.

The biology of certain "Neuroptera" has been discussed recently, *viz.* that of the Embiidæ by Friederichs (46), Termites by Holmgren (48), and Dragonflies by Osburn (52).

Buttel-Reepen (47) deals with the Honey-bee, *Apis mellifica* (recte *mellifera!*). First, there is a reprint of Gerstaecker's scarce work on the geographical distribution and races of the Honey-bee, published in 1862. The original home of the bee, its biology, and that of its varieties and allies are then discussed at considerable length.

Perkins (49) briefly records his impressions of an entomological trip to Eastern Australia, and subsequently (50) makes remarks on the typical Rhopalocera of Queensland.

Doflein's (56) work deals with his travels in China, Japan, and Ceylon, and is fully illustrated. It is of a general character, treating of anthropology, zoology, botany, pisciculture, and so forth. But, in the last three chapters especially, there are many notices on insects—birds hunting butterflies, mimicry, butterflies' sense-organs, termites (a whole chapter being devoted to these), ants, and coccids.

Van Dine (51) discusses in detail the mouth-parts of the Tenthredinidæ, illustrating his studies by two excellent plates.

Pawlowsky (55) has published an account of his studies on the mouth-parts of fleas.

Distant's Catalogue of the Cicadidæ of the World (54) supplies a long-felt want, though it is a pity it was not issued as a part of Lethierry and Severin's well-known series. It would also have been better to give the geographical distribution in greater detail. As is often the case with this author, accuracy of dates seems a minor matter. The work is more than a mere list, as analytical tables of the genera in each "division" are provided, and the larger genera are divided into sections of which the characters are stated; a synopsis of the divisions themselves would have been useful, as one has now to refer to two volumes of a magazine to compare the several divisional diagnoses. Amyot's mononymics, accepted by Distant, have no place in binomial nomenclature. They were "species," and avowedly proposed to replace the Linnean method. *Cicadetta*, Kolenati, should then replace *Melampsalta*, Kol., and the other "names" of Amyot, attributed to Kolenati.

On p. 146, *Cicada angulata*, Hagen, is cited as a synonym of *Tibicen annulatus*; on p. 168 it is given by Distant as a synonym of *Cicadetta hageni*. On p. 28, *Cyclochila australasiæ* var. *spreta*, God. & Frogg., 570 has been omitted. The genus *Tibicen*, Latr., has been altogether ignored! In 1825 (Fam. Nat.) Latreille mentioned it, giving "*plebeia*" as the type, but not describing the genus. The same was done in 1827 in the German translation. I cannot now refer to Cuvier's 'Règne Animal," vol. v. p. 215 (1829), but apparently Latreille therein founded *Tibicen* with type *plebeja* (=*hæmatodes*, Scop., or perhaps Latreille referred to the species as *hæmatodes*, a matter of no account, however, in this connection). If not, then Burmeister, in 1835, was responsible for its erection; so that in any case it must supersede *Tibicina*, Fieber, used by Distant (who attributes it wrongly to Amyot).

Girault (57) discusses in an interesting manner the status of *Clinocoris lectularius* in the transmission of human diseases. Nothing has as yet been definitely proved against the bedbug, but it is now regarded with deep suspicion as being implicated in the dissemination of syphilis, leprosy, tuberculosis, bubonic plague, and other diseases.

NOTES AND OBSERVATIONS.

Pionea decrepitalis, H.-S., and Herminia tentacularia, L., var. modestalis, Heyd., in Northern Scandinavia.—Since the publication of my notes on the insects captured and observed by me in Northern Scandinavia, Mr. L. B. Prout has finally determined the only two unidentified species as belonging to the above. Neither *Herminia* var. *modestalis* nor the type occur in Britain, and it is now reported from the Abisko district of Lapland (? Bossekop also), so far as I know, for the first time. *Pionea decrepitalis* is recorded as "very rare" in Leech's 'British Pyralides,' and the British localities given are all in the highlands of Scotland. From the references in Staudinger's Catalogue (ed. 1901) it seems to be generally distributed in the mountains of Norway and Lapland. These specimens have now been placed in the British Museum Collection.—H. Rowland-Brown; Oxhey Grove, Harrow Weald, Nov. 17th, 1906.

British Setting.—It is to be hoped that no beginner will be misled by the remarks on this subject in the November number to imagine that flat setting-boards are a necessity. In my humble opinion they are an abomination, for not only do they give the insect an artificial appearance, making it look as if cut out of paper, but in a considerable proportion of insects so set there is an invincible tendency for the wings to spring up and meet over the thorax. I think the boards now made with a very slight oval by Watkins and Doncaster (and doubtless by others) are just perfect, and, like the tramp with Pears's soap,

since trying them I have used no other. — (Rev.) W. Claxton; Navestock Vicarage, Romford.

Early Stages of Limenitis sibylla.—On August 15th last, in the New Forest, a search was made on the honeysuckle for the eggs of the "white admiral" butterfly. It was not difficult to find them near the margin of the leaf, but it was a week or two too late—all found were empty. A number of little larvæ were seen, some of which were probably a fortnight old, and by their size were nearly ready to go into hybernation. They feed from the tip of the leaf downwards, leaving the midrib, on which some were resting. Usually a bit of the leaf left uneaten had curled up and turned brown, reminding one of the appearance of the hybernaculum. It almost looked as if this had been brought about by the foresight of the little brown larvæ as a means of protection!—W. J. Lucas.

Gnophos obscuraria at rest.—On July 30th last a visit was made to a locality of this insect near Brockenhurst, in order to obtain photographs of it in its resting position. Several were found, but only by disturbing them—not one was discovered *in situ*. They were resting on the grey or brown soil above the sand on the sides of a small pit. When after being disturbed they were watched down again, they usually almost defied detection. Often they hid away in a small chink, but their colouring is so protective that this hiding away seemed scarcely necessary.—W. J. Lucas.

Potamanthus luteus.—One female specimen of this mayfly, little known as British, was taken at the River Itchin, near Eastleigh, on August 14th, 1906. Records for it are chiefly from Weybridge. A characteristic feature is the process or lobe on each side of the ninth abdominal segment. I have to thank Mr. C. A. Briggs for identifying the specimen.—W. J. Lucas.

Resting Habit of Satyrus semele.—Early in the morning of July 30th last I noticed one of these butterflies settle two or three times in the bright sunshine on a sandy track in the New Forest. It adjusted itself somewhat after settling, but not so that the shadow thrown was a line. In fact, it seemed purposely to arrange itself so that a broad shadow was produced. This, however, did not seem to make it more conspicuous, for other objects threw shadows. The last time it lay with its wings nearly flat on the sand, when of course there was practically no shadow.—W. J. Lucas.

Cleaning, Relaxing, and Resetting Lepidoptera.—First remove the data-labels. Should an insect be dull or dusty, brush the wings lightly with a piece of cotton-wool; I prefer cotton-wool to a camel-hair brush. Brush from the base of the wings outwards; then brush the body from the thorax downwards. Not a scale will be disturbed, and the appearance of the insect will be much improved. If the insect be a clearwing, immerse it wholly in benzine, chloroform, or benzoline for a week or a fortnight after brushing. Greasy bodies of other species should be broken off close to the thorax, and steeped in benzine, &c., as above. Refix the bodies with shellac dissolved in spirits of wine; add a little Stephens's liquid gum, and stir it up well. Pointed forceps,

as sold by chemists, will be found useful. Take care, in refixing the abdomen, to get the natural pose as nearly as possible. Apply the shellac, &c., with a blunted setting-needle in preference to a brush. For relaxing purposes get a good-sized shallow meat-dish with cover; cheap tin ones can be bought in any market for a few pence. Fill the dish nearly full with clean sand, add a little water, but only sufficient to make the sand *damp*—never *wet*. Mix fifteen drops of carbolic acid with the sand to prevent the formation of mould. Cover the sand with a piece of clean blotting-paper, and lay the insects on the blotting-paper; place a piece of blotting-paper over the insects to check possible condensation; lastly, put on the dish-cover. A couple of days, as a rule, will be sufficient to relax any moth or butterfly. The wings should not be allowed to get wet, or they will be spoilt, especially in the case of whites, blues, &c. Before re-setting it is often desirable to re-pin. The old pin is to be got rid of without damage to the specimen. Press the nails of the thumb and forefinger of the left hand close together so as to form a *sensitive* vice; grasp the pin with this vice—underneath the insect, and closely touching the thorax. Press the pin downwards, using the first finger of the right hand. Having loosened the pin, press it up again through the thorax, and see that it is clean. Stick the pin, with the insect, into a piece of cork; then, with two setting-needles pressed on the thorax close to the pin, free the insect entirely. When inserting a fresh pin use the hole through the thorax made by the old pin. A slight departure from the angle made by the old pin will render firm the new one. Resetting now follows, and the wing-surfaces should by this time be free from damp. In resetting, the front legs should be stretched out obliquely so as to be well shown. Loose antennæ, as well as wings, are best replaced while the insect is resting in the groove of the setting-board. The edges of the groove act as supports. Care should be taken that such antennæ or wings are relaxed, or they will easily break, especially the antennæ. As a rule, the insects will be dry in a week. As a further safeguard against mould, place them a yard in front of a moderate fire for a quarter of an hour; then take them off the setting-boards, refix the data-labels, and they are ready for the cabinet.—J. Arkle; Chester.

CAPTURES AND FIELD REPORTS.

Manduca (Acherontia) atropos at Chichester.—Several larvæ of *Manduca atropos* were found here in potato-fields during the month of September, and pupæ dug up.—Joseph Anderson; Chichester.

Notes from Chichester.—*Macroglossa stellatarum*, in company with *Pyrameis atalanta*, was a frequent visitor this year to the garden, and one I noticed on the evening of October 2nd was hovering over geranium flowers in the border (with much enjoyment apparently) in the midst of torrents of rain and high wind. The last date this season that I saw any of the "whites" was on October 25th—one of the many beautiful sunny days of that month—when a *Pieris rapæ* was settled on the blossom of a white cactus dahlia, in which position it

so closely resembled the petals of the flower as almost to escape detection.—Joseph Anderson; Chichester.

Late Occurrence of Spilosoma mendica.—Last night Mr. H. J. Baker, a brother entomologist and colleague of mine, captured a specimen of this moth, in beautiful condition, on the window of his room, which had evidently been attracted by the light. I think this is rather an exceptional occurrence, is it not? It must, of course, be due to the very warm autumn we have had.—W. A. Bogue; Woodspring, London Road, Salisbury, November 4th, 1906.

Lithosia caniola at Bournemouth.—On August 22nd I took at light a freshly-emerged specimen of *L. caniola* of yellowish colour. The local collectors do not seem familiar with it so far east.—(Rev.) Archibald Day; Malvern Link.

Laphygma exigua in Surrey.—I have been fortunate in rearing two examples of this rare British Noctuæ from ova obtained from a female captured on August 27th last (*ante*, p. 212). The larvæ fed up very rapidly on dock and plantain, and pupated on September 24th and 27th, forming a slight earthen cocoon, attached to the side of the breeding-cage, about half an inch below the surface of the soil. The pupæ were kept in a warm room, and the imagines emerged on October 26th and 27th.—Ernest Warne; "Mount," Liverpool Road, Kingston Hill, November 3rd, 1906.

Laphygma exigua in Wiltshire. — I was fortunate enough to capture a very good specimen of *Laphygma exigua* on the inside of a street gas-lamp on the night of October 21st last.—W. A. Bogue; Salisbury.

Heliothis peltigera in South Devon.—Whilst at Sidmouth, South Devon, in August last, I took about thirty larvæ of *H. peltigera* feeding on *Ononis*. From these I obtained eighteen pupæ, four of which dried up at once. I placed the remaining fourteen pupæ in a flower-pot on the kitchen mantel-shelf. Imagines emerged at dates varying from September 18th to October 10th, a dozen fine specimens and two cripples.—B. H. Crabtree; Cringle Lodge, Levenshulme, Manchester, October 25th, 1906.

Heliothis peltigera in Dorsetshire.—On August 10th last I took a fresh example of this species, on heather bloom, near Wimborne.—Gervase F. Mathew; Dovercourt, November 7th, 1906.

Leucania vitellina in West Cornwall. — When forwarding my list of captures, dated 23rd inst., I had a moth which I could not identify. It has since been authenticated as *L. vitellina*, and is a grand specimen in perfect condition, undoubtedly freshly emerged from the pupa. I took it last month on the coast at sugar about 8.30 p.m. Is not this a record for the county?—W. A. Rollason; Lamorna, Truro, Cornwall, October 27th, 1906.

Pieris daplidice in Devon and Cornwall.—This year, on August 10th, in Newton Abbott, South Devon, I captured *Pieris daplidice*, and also a very battered specimen at the Lizard on September 13th.—

M. Lyon; 86, Kensington Park Road, London, W., November 8th, 1906.

Colias edusa in Hants.—The records of the occurrence of this species during the past season have been very few, so it may be interesting to note that on August 13th, when I was riding between Wimborne and Ringwood, a fine fresh-looking male crossed the road in front of me just before I entered the latter town. This is the only one I have seen.—Gervase F. Mathew; Dovercourt, November 7th, 1906.

Plusia moneta in Cheshire.—My friend Mr. H. S. Slade recently showed me a somewhat worn specimen of *P. moneta*, which his father had captured in his house early in September, the moth having been attracted to the room by light. Another friend also records the finding of two pupæ of this species on monkshood at Bramhall, in the same county. The imagines appeared early in September.—B. H. Crabtree; Cringle Lodge, Levenshulme, Manchester, October 25th, 1906.

Interesting Planipennia (Neuroptera). — On October 17th last, Mr. G. C. Champion gave me two specimens each of *Micromus variegatus* and *Sisyra fuscata*, taken recently at Woking, in Surrey.—W. J. Lucas.

Dipterygia scabriuscula in September.—This species seems to be rather erratic in its time of appearance. I generally expect to see it at sugar about the end of the first week in July, but in 1905 I took rather a worn specimen as early as May 29th, and this year a fine fresh example as late as September 6th; the latter no doubt from June or July parents. I have on several occasions bred large numbers from the egg. It is an easy species to rear, the larvæ feeding up rapidly on knot-grass; but each time I have bred them, more than half the moths have emerged the second year.—Gervase F. Mathew; Dovercourt, November 7th, 1906.

Deilephila livornica, Sphinx convolvuli, and Laphygma exigua at Lewes, Sussex.—A specimen of *D. livornica* was brought to me about June 26th, and I took one example of *L. exigua* at light. Three records of *S. convolvuli* have come under my notice; one, which I possess, being a very large and fine specimen. *L. exigua* is, I believe, a new record for Lewes, but a single specimen was taken at Brighton, by Mr. Vine, in 1884. *D. livornica* has been captured at Lewes on several previous occasions, but not recently. Mr. Tonge, however, exhibited a living larva of this species at the meeting of the South London Entomological and Natural History Society held on August 9th last.—W. Jarvis; 22, Leicester Road, Lewes, October 29th, 1906.

Deiopeia pulchella in Sussex.—Some time towards the end of September I noticed a moth in a spider's web, but although passing the spot almost every day, I did not consider it worth while to climb up and inspect it. After passing and repassing the insect some forty times or so, my curiosity was aroused, and climbing up, I secured the enveloped moth. You may imagine my surprise when I found that the insect was a specimen of *D. pulchella*. Luckily I managed to relax and extricate it from the web, and it now graces my collection. It is

in very fair condition, only a portion of one of the antennæ and just a *morceau* of one of the fore wings spoiling an otherwise perfect specimen.—W. Jarvis; 22, Leicester Road, Lewes, October 29th, 1906.

Deiopeia pulchella, Deilephila livornica, Laphygma exigua, &c., in West Cornwall.—I took a beautiful specimen of *D. pulchella* in my garden on October 3rd last, about 1.45 p.m. My little daughter first noticed it at rest on a strawberry plant; it was easily disturbed, and attempted to fly away, but the costal nervure of the left upper wing was broken, so that its flight was short, and it was easily boxed. The day was close and warm, with occasional sunshine—direction of wind N.W. by W., but scarcely perceptible; there was a westerly gale of wind and rain the day before, and two days previously a southerly gale of wind and rain. Of *Polia xanthomista* I took twenty-eight specimens this year (and twenty-seven specimens last year), and have this year succeeded in obtaining a considerable number of ova. *D. livornica* was taken on June 8th inside a kitchen window, and is a fairly good specimen. Of *Eupithecia constrictata* I bred three imagines, June 11th to 19th, from larvæ obtained last year in August by searching wild thyme at night by the aid of a lantern. Of *L. exigua* I took a single specimen at sugar last month. *Epunda lichenea*, a single specimen on a gas-lamp on September 26th; and *Nola confusalis*, on June 8th, at rest on palings.—W. A. Rollason; Lamorna, Truro, Cornwall, October 23rd, 1906.

Melanthia albicillata: a Correction.—I very much regret that through a clerical error *Melanthia albicillata* (*ante*, p. 258) was given as double-brooded; this should have been *Larentia viridaria*.—H. D. Kenyon; Lamorna Villas, Mount Charles, St. Austell, Nov. 13th.

SOCIETIES.

Entomological Society of London.—*Wednesday, October 17th*, 1906.—Mr. F. Merrifield, President, in the chair.—Mr. H. St. J. Donisthorpe showed living examples of the beetle *Mononychus pseudacori*, and seed-capsules of *Iris fœtidissima*, which contained more specimens, found at Niton, Isle of Wight, where the species occurred commonly.—Mr. A. H. Jones exhibited specimens of *Pieris napi* var. *bryoniæ*, *Argynnis thore*, *Erebia glacialis* ab. *pluto*, a small form of *Lycæna arion* from Arosa, Switzerland, at 6000 ft.; a variety of *Melanargia galatea*, in which the dark patch on the under side of the hind wings was much enlarged; and two varieties of *Argynnis niobe* (female), one very pale, the other of a bluish copper colour, taken on the Splugen Pass in July last; also specimens from other localities for comparison.—Mr. W. J. Kaye exhibited a fine example of the remarkable moth, *Dracenta rusina*, Druce, from Trinidad. The species bears a wonderful resemblance to a decayed dead leaf, the patches on the wings suggesting the work of some leaf-mining insect.—Mr. E. M. Dadd showed a number of Noctuids common to the British Isles and Germany, and, remarking on the insular racial characters of some British Lepidoptera as compared with the predominant form occurring

on the continent of Europe, said that while England was the home of many dark races, e. g. *Polia chi* var. *olivacea*, *Amphidasys betularia* var. *doubledayaria*, the dark forms of *H. abruptaria*, &c., it was all the more curious that in the twenty-two species of Noctuæ enumerated the tendency was always for the British form to be lighter and the continental darker.—Dr. F. A. Dixey exhibited specimens of *Ixias baliensis*, Frühst, and *Huphina nerissa*, Fabr., from the island of Bali, Malay Archipelago. He said that in this instance the *Huphina* had, on the whole, acted as the model, under whose influence the *Ixias* had drifted some distance away from the usual aspect of its genus; but in the particular case of the hind wing the process was reversed, the *Ixias* having been the model, and in its turn mimicked by the *Huphina*. If his conclusions generally were well founded, the associations between the two must necessarily be Müllerian and not Batesian.—Mr. S. A. Neave exhibited a number of Lepidoptera selected from the collection made by him in North-east Rhodesia in 1904 and 1905, comprising the following rare species:—*Melanitis libya*, Distant; *Leptena homeyeri*, Dewitz; *Pentila pencetia*, Hew.; *Catochrysops gigantea*, Trim.; *Crenis pechueli*, Dewitz, and *C. rosa*, Hew., which are evidently two distinct species; and *Crenidomimas concordia*, Hopff., the mimic of the last two species. Also two notable species of the genus *Aphnæus*—including the female, so rarely taken in this genus—*Acræa natalica*, Boisd., and *A. anemosa*, Hew., with two remarkable moths showing a close mimetic resemblance to them. The exhibitor further stated that his collection should prove interesting as regards seasonal forms, especially in the Acræinæ and Pierinæ, of which he showed additional examples. He suggested that the brilliant dry season phases of *A. induna*, Trim., had been evolved, by stress of circumstance at that time of year, from a duller coloured phase, such as, in this region, we still find in the wet season, when the struggle is not so keen.—A discussion of seasonal forms in these species followed, in which the President, Prof. E. B. Poulton, Dr. F. A. Dixey, Mr. G. A. K. Marshall, and other Fellows joined.—H. Rowland-Brown, M.A., *Hon. Secretary*.

The South London Entomological and Natural History Society. —*October* 11*th*, 1906. — Mr. Robert Adkin, F.E.S., President, in the chair. — Mr. Kaye exhibited a specimen of the extremely rare Thyrid, *Draconia rusina*, from Trinidad, resembling an irregularly injured leaf, the surface of which had been eaten by larvæ.—Mr. Sich, the pupæ of *Pieris daplidice*, and a photograph of the larva by Mr. Tonge; they were from Geneva ova. — Mr. Step, a larva, probably of *Prodenia littoralis*, found feeding inside the skin of a banana. — Mr. Jäger (1) fine series of dark green and light yellow forms of *Bryophila muralis*, from Starcross; (2) *Heliothis peltigera*, bred from South Devon larvæ; (3) *Agrotis vestigialis*, with unusually clear white markings, taken at sugar at Starcross; with (4) specimens of *Laphygma exigua*. — Mr. R. Adkin, a series of *Peronea permutana*, reared from larvæ feeding in *Rosa spinosissima*, from Wallasey. — Mr. South (1) nearly full-grown larvæ of *L. exigua*, feeding on plantain, dandelion, and groundsel; they were from ova deposited by a female taken at Kingston by Mr. Richards; (2) *Euchloë cardamines*, from larvæ fed on wallflower; for Mr. Hayward (3) a *Cabera pusaria*, leaden grey in colour, and the

transverse lines obsolete; (4) a dark form and a red form of *Xylophasia monoglypha*; (5) an almost black *Tæniocampa incerta*; (6) a smoky grey *Cymatophora duplaris*; (7) a grey-brown *Grammesia trigrammica*, with only very faint transverse lines; (8) a unicolorous fuscous-brown *Ematurga atomaria*; and (9) several dark powdered and sprinkled forms of *Tephrosia crepuscularia*, from near Burton-on-Trent.—Mr. West (Greenwich), the extremely local hemipteron, *Liburnia lepida*, from Esher.—Mr. Barnett, varied forms, including var. *flavescens*, of *Xanthia fulvago*, from Wimbledon.—Mr. Hy. J. Turner, two extremely large *Argynnis aglaia* females, from Gavarnie, Pyrenees, with two males from the Alps, extremely small; also var. *eris*, with typical forms of *A. niobe*.—Messrs. Main, Dennis, and Lucas, a large number of photographic slides of ova, larvæ, and imagines at rest.

October 26th. — The President in the chair. — Messrs. Harrison and Main exhibited bred series of large light forms and small dark forms of *Boarmia cinctaria*, from the New Forest; and of *Spilosoma fuliginosa*, from Cornwall. — Mr. Newman (1) a *Drepana falcula*, bred on Oct. 25th, with others; (2) long series of *Agrotis obelisca*, *Aporophila australis*, and *Anchocelis lunosa*, from the Isle of Wight; (3) very dark to very light forms of *L. exigua*; (4) very dark *A. segetum* and *A. saucia*; (5) *B. muralis* and *Polyommatus corydon*, taken on Sept. 16th in the Isle of Wight; (6) full-grown larvæ of *L. exigua*; (7) long series of var. *artaxerxes* of *P. astrarche*, from Aberdeen; (8) fine series of *Lobophora hexapterata*, from Bexley ova; and (9) short series of *Eupithecia togata* and *E. venosata*, from North Wales. — Mr. Tonge, a photograph of a pear-stem, with a ring of ova of *Malacosoma neustria*.—Mr. South, for Rev. W. Claxton, an *Aglais urticæ*, with nearly the whole fore wings whitish in ground colour; and for Mr. Hayward, a *Cerastis ligula* (*spadicea*), with the left antenna duplicated, but both shorter than that on the right.—Mr. Brown, a living *Mantis religiosa*, from South-east France.—Mr. McArthur, a *Mygale avicularis*, from South America, and an unusually large *Sirex gigas*, from Mus Tor, Dartmoor.—Mr. Barnett, short series of *E. rectangulata*, from Welling (all dark forms), and of *Hyria muricata*, from Wanborough. — Mr. West (Greenwich), short series of the until recently very rare Apions, *A. astragalis* and *A. sanguinea*, from Oxford.—Mr. Edwards, pupa of *Manduca atropos*, from Shooter's Hill. — Dr. Chapman, specimens of *L. argus* (*ægon*), from North-west Spain, very large, pale beneath, with fine red borders above. —Mr. Adkin, a series of somewhat suffused specimens of *Acronycta leporina*, bred from Abbot's Wood larvæ.—Mr. Kaye, several broods of *Hemerophila abruptaria* from dark parents, and gave results of the breeding.—Mr. Turner read a paper, "Further Notes on the genus *Coleophora*," and showed life-histories of *C. badiipennella*, *C. gryphipennella*, *C. artemisiella*, *C. argentula*, and *C. genistæ*. — Hy. J. Turner, *Hon. Rep. Sec.*

City of London Entomological and Natural History Society.—*October 2nd*, 1906.—Mr. H. M. Edelsten exhibited a series of *Leucania favicolor*, including a canary-coloured specimen.—Mr. T. H. L. Grosvenor, *Lycæna icarus*, from Witherslack, having black dots on fringes, as in *L. adonis*.—Mr. E. Harris, a scorpion from the Gold Coast, measuring about 10½ inches in length.—Mr. A. Harrison, *Hadena contigua*, *Diphthera orion* and *Scotosia undulata* bred from New Forest parents;

also *Geometra smaragdaria*, lacking usual white hair on fore wings.—Mr. G. H. Heath, ova of *Laphygma exigua*.—Mr. A. W. Mera, *Cucullia asteris*, bred from larvæ found on sea-aster on Essex marshes.—Mr. L. W. Newman, *Papilio machaon*, from Wicken, with red coloration in all the lunules on hind wings, *Acronycta rumicis* var. *salicis*, from Barnsley, and *Macaria liturata* var. *nigrofulvata*, from Delamere.—Mr. L. B. Prout, on behalf of Mr. G. B. Oliver, melanic specimens of *Acidalia subsericeata* and *A. marginepunctata*, from North Cornwall.—Mr. V. E. Shaw, a series of *Scoria dealbata*, Wye Downs, June, 1906, *Deilephila livornica*, Torquay, June 2nd, 1906, and *Tapinostola bondii*, Folkestone, July 10th, 1906.—S. J. Bell, *Hon. Sec.*

Birmingham Entomological Society.—*June 25th*, 1906.—Mr. G. H. Kenrick in the chair.—Mr. J. Simkins showed a boxful of forced Sphingidæ, including *Acherontia atropos*, L., *Chærocampa elpenor*, L., and *C. porcellus*, L., from Kent, and various other species of continental origin.—Mr. A. H. Martineau, a small collection of Hymenoptera formed at Warwick by Mr. R. L. Thompson when a boy at school there. It included *Sapyga clavicornis*, L., *Agenia hircana*, F., *Odynerus sinuatus*, F., *Nomada borealis*, Zett,, and other interesting species.—Mr. Gilbert Smith, a number of specimens of *Tetropium*, part of a large number he had reared from one batch in a tree-trunk. They proved to be 17 per cent. *gabrieli* and the rest *crawshayi*, and as, moreover, they paired *inter se*, it would appear that there is but one species, and not two, as supposed. The species would be called *gabrieli*, and *crawshayi* would be merely a form with darker femora. His opinion was that the darker femora appeared when the species had fed in fairly new moist wood, and the lighter femora when it had lived on older dry wood.—Colbran J. Wainwright, *Hon. Sec.*

RECENT LITERATURE.

Insect Pests of the Farm and Garden. By F. Martin-Duncan. Pp. 143, with 44 illustrations. 2s. 6d. net. London: Swan Sonnenschein & Co., Ltd. 1906.

After discussing, in Part i., insects and insecticides, the author, in Part ii., treats seriatim of a considerable number of small creatures injurious to plants of farm and garden. Notwithstanding the title of the book, mites of various kinds (Arachnida) are included in both parts. The species selected are mainly those treated in the pamphlets of the Board of Agriculture and Fisheries, which, we must confess to thinking, will better serve the purpose of the farmer or gardener. No doubt they will find the present book of much use also, but the author scarcely seems to speak, to our thinking, with sufficient directness and authority. Of the illustrations, the microscopical ones and some of those made from drawings are good; those of the Lepidoptera are, generally, poor. In the language are a number of solecisms—for instance, ocelli and tracheæ used as singular nouns, and ovæ for ova more than once.

W. J. L.

Entomology with Special Reference to its Biological and Economic Aspects. By Justus Watson Folsom, Sc.D. (Harvard). Pp. i–xvi, 1–485. With five plates (one coloured) and 300 figures in the text. London: Rebman, Limited. 1906.

Classification having been so thoroughly dealt with by Comstock, Sharp, and others, the author of the present volume on Entomology has treated his subject chiefly from the biological and economic sides. The thirteen chapters into which the contents of the book are divided are arranged as follows:—i. Classification (pp. 1–26); ii. Anatomy and Physiology (pp. 27–145); iii. Development (pp. 146–183); iv. Adaptations of Aquatic Insects (pp. 184–192); v. Colour and Coloration (pp. 193–215); vi. Adaptive Coloration (pp. 216–236); vii. Origin of Adaptations and of Species (pp. 237–251); viii. Insects in Relation to Plants (pp. 252–275); ix. Insects in Relation to Other Animals (pp. 276–306); x. Interrelations of Insects (pp. 307–344); xi. Insect Behavior (pp. 345–365); xii. Distribution (pp. 366–392); xiii. Insects in Relation to Man (pp. 393–408). There is also an important list of entomological literature (pp. 409–466), grouped under subject headings and chronologically arranged. The author estimates that there now exist something like 100,000 titles, and he has selected those that appeared to him to be most generally useful and accessible.

The book is abundantly illustrated, the figures in the text being exceedingly good. One of the five plates is coloured, and represents cases of protective mimicry among butterflies.

The author claims to have incorporated a good many facts that have not hitherto appeared in text-books, and we think that in this he is justified. Among other observations that attract our attention are the following:—"Pictet, by feeding larvæ of *Vanessa urticæ* on the flowers instead of the leaves of the nettle, obtained the variety known as *urticoides*" (p. 196); and again, on p. 200: "Pictet has recently found, however, that humidity, acting on the caterpillars of *Vanessa urticæ* and *V. polychloros*, has a conspicuous effect on the coloration of the butterflies. Thus, when the caterpillars were fed for ten days with moist leaves, the resulting butterflies had abnormal black markings on the wings, and the same results followed when the larvæ were kept in an atmosphere saturated with moisture."

Unsuitable food certainly causes stunted growth. Where larvæ can manage, under such conditions, to struggle through and finally attain the imago state, the imagines are usually dwarf and the markings on the wings are sometimes more or less abnormal. In the case of *V. urticæ*, larvæ fed on hop produce very small butterflies, often veritable pigmies.

With regard to classification, we ought, perhaps, to note that the system adopted is practically that of Brauer. Thysanura and Collembola, however, rank as separate Orders. The earwigs (Dermaptera) are treated as a family of Orthoptera. Platyptera, of Packard and Carpenter, less the stoneflies (Plecoptera), takes the place of Corrodentia, Brauer. The Embiidæ are here included in Platyptera, and Packard's Mecaptera is retained for the scorpion flies, but the form Mecoptera is used. Rhynchota gives place to Hemiptera.

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